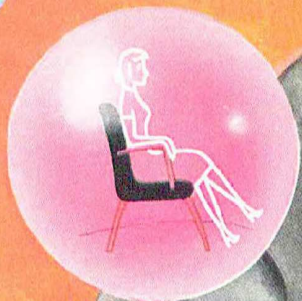
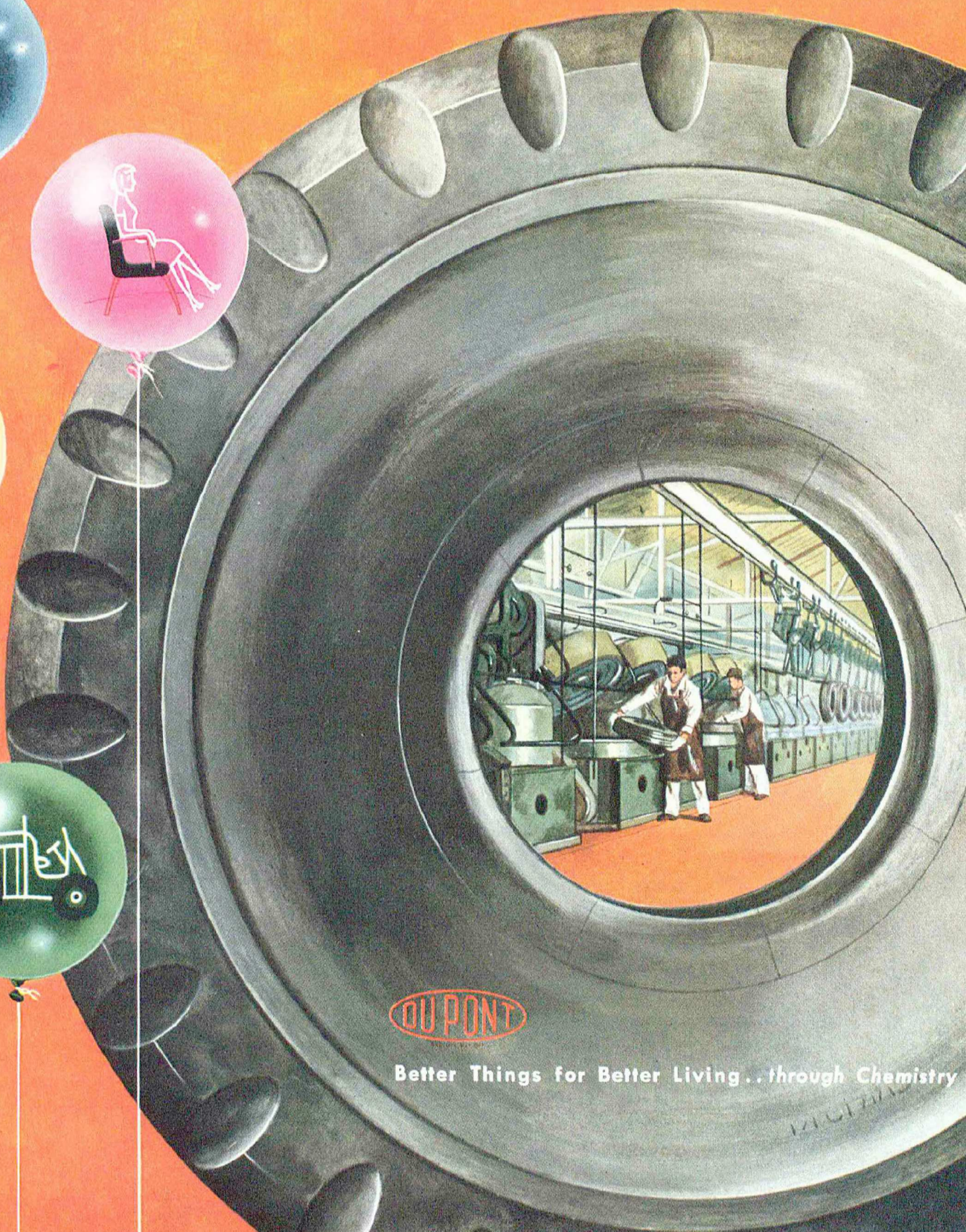


DUPONT

APRIL • MAY 1951



rubber industry



DUPONT

Better Things for Better Living...through Chemistry

DU PONT *Rug Anchor*®



PICTURE COURTESY OF GEORGE WESTON LTD.

... helps prevent accidents

A throw rug on a well-polished floor can cause a painful fall. If you have such a danger zone in your home, play safe with Du Pont "Rug Anchor".

"Rug Anchor" is a sponge rubber underlay for small rugs. Sponge rubber is naturally non-skid. For added protection, "Rug Anchor" has a specially textured surface that hugs both the floor surface and the rug. On almost any kind of flooring, this underlay helps prevent slipping and creeping.

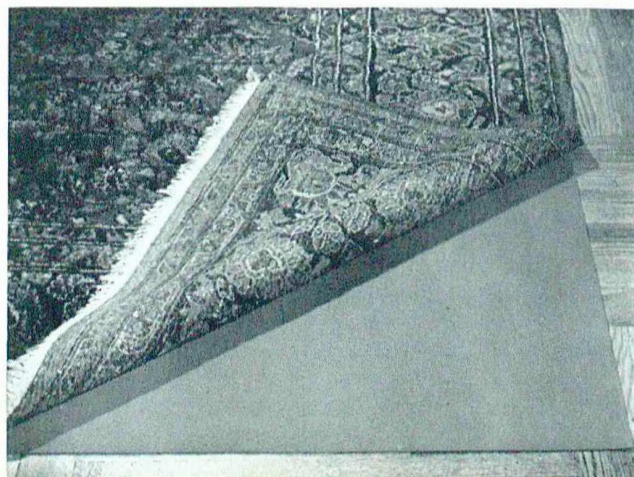
Your rugs look neater with "Rug Anchor". There's no need to stop countless times each day to smooth or straighten a roving rug.

Phone your local rug dealer or department store and order "Rug Anchor" now. It is sold in convenient widths that trim to any size rug.



BETTER THINGS FOR BETTER LIVING... THROUGH CHEMISTRY

"Rug Anchor" is Du Pont's registered trademark for its sponge rubber rug underlay.



Why five fibers?

In our October-November issue, we announced plans for the manufacture of a new fiber as soon as a plant could be built for the purpose. This newest product of Du Pont research, "Amilar" polyester fiber (formerly called Fiber V), comes close on the heels of "Orlon" acrylic fiber. It is the fifth synthetic fiber in the Du Pont family.

First of all, the Company manufactures two kinds of rayon—viscose and acetate. It also manufactures nylon. Then why, when these three fibers are already highly successful, has Du Pont invested many years of research and more millions of dollars to develop "Orlon" and "Amilar"? Is "Orlon" better than nylon? Will "Amilar" be better than "Orlon"? Why five?

It is not just a question of being "better." No "wonder yarn" yet developed has been all things to all men under all circumstances. Each has certain properties which make it ideal for certain jobs. None has properties which make it perfect for all jobs.

For thousands of years the human race had to depend on a few fibers from plants and animals. You can count the most important of these on the

fingers of one hand—wool, cotton, silk and flax.

Then came chemical science. For the first time it became possible to create fibers with entirely new properties. The whole textile picture changed. Manufacturers of all of the articles making use of fabric, from filter cloths to raincoats, now see an infinite opportunity ahead to improve old products and develop new ones. They are limited only by the qualities science can provide in engineered fibers.

This is the inspiring challenge Du Pont research teams are meeting. This is the reason why "Amilar" has joined the four other synthetic fibers already in production—and why the Du Pont Company is at work now on others. In years to come, Du Pont and other chemical companies must supply textile manufacturers with an ever-widening array of improved fibers designed to fit special needs.

Already, American-made fabrics are the best the world has ever known. One, five, ten years from now they will be better still, and there will be many more of them. Du Pont fiber research will continue its contributions to these improved fabrics of tomorrow and the day after.

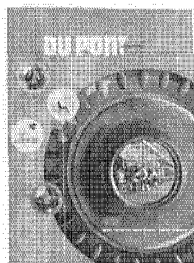


BETTER THINGS FOR BETTER LIVING...THROUGH CHEMISTRY

JAMES H. McCORMICK, *Editor*

Vol. 45 No. 2

Associate Editors, MARGARET MINER
GORDON H. KESTER



OUR COVER: We don't have technical experts on our Magazine staff, but there are plenty in the Company for us to call on. Take this cover, for instance. We wanted to show how Du Pont serves the rubber industry—how a variety of items call for the Company's chemicals or for neoprene, its chemical rubber.

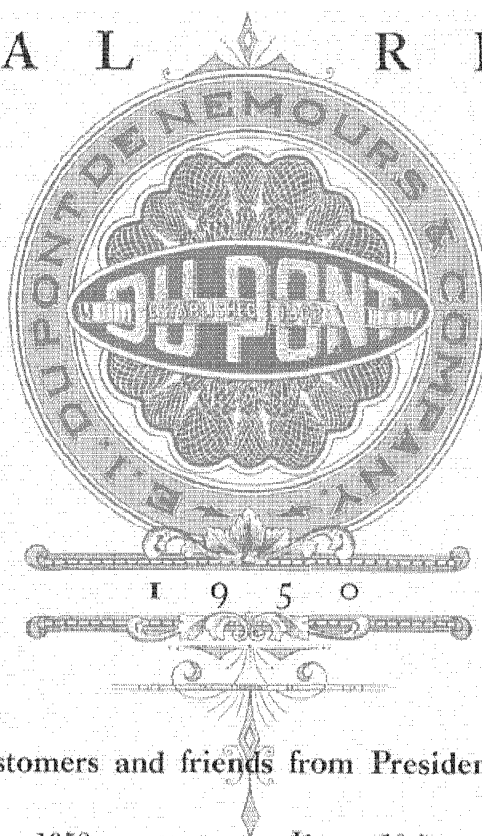
The tire was a good symbol especially since millions of them contain "Cordura" rayon yarn. But technically, it was a stumbling block. The artist had to dream up a tread design that was both practical and original. This matter was chewed over with the technical boys.

The tire vulcanizing scene was based on a photograph, so that wasn't much of a problem. Nor were

the balloon spots: "technical" OK'd them. However, we didn't ask our Color Conditioning experts about using a pink balloon against an orange background. We may hear about that.

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Highlights of interest to customers and friends from President Greenewalt's annual report



President Greenewalt discusses annual report with Walter Carpenter, Chairman of the Board of Directors.

The year 1950 was one of high activity for the Du Pont Company, as well as for the chemical industry as a whole. All ten of the Company's industrial departments participated in the record business. The great demand for the Company's products taxed manufacturing facilities to the utmost, particularly in

the latter part of the year. Still the demand for many products could not be filled.

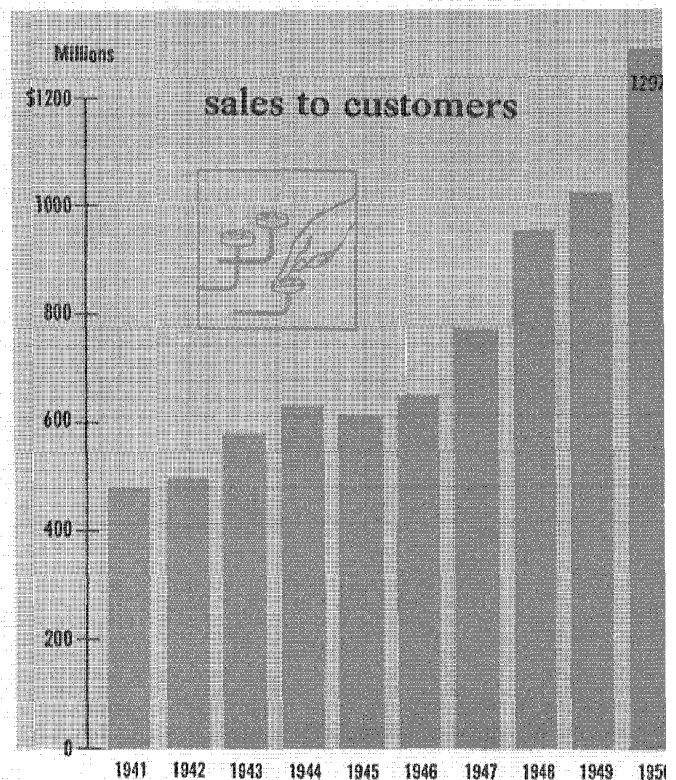
Sales totaled \$1,297 million, exceeding 1949 sales by 27 per cent. Substantially all of the increase in dollar sales was due to the greater quantity of goods sold. Sales in 1950 from new facilities placed in operation since World War II amounted to \$460 million.

Earnings applicable to the common stock for 1950 were \$6.59 a share and dividends amounted to \$5.35. This compares with earnings of \$4.52 a share for 1949 and dividends of \$3.40. The year-end dividend for 1950 was the 185th consecutive quarterly dividend paid on the common stock.

The return on operating investment—net earnings from operations as a percentage of average operating investment—was 13.3 per cent for 1950.

It was 10.5 per cent for 1949.

Total dividends paid on the preferred and common stocks amounted to 82 per cent of total earnings. This is the same percentage as the average for the 10-year period, 1940-1949. The portion of 1950 earnings retained was largely for financing



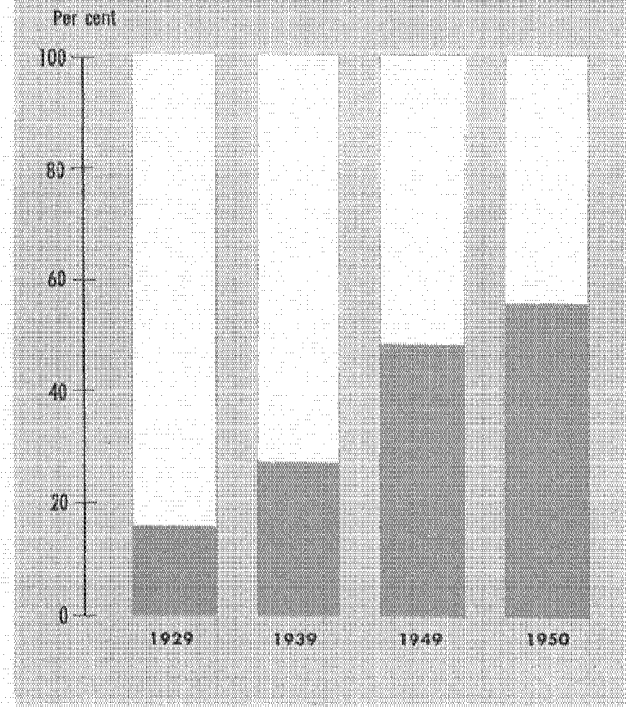
projected plant expansion and increasing working capital. Research expenditures in 1950 were \$38 million, excluding cost of new facilities, compared with \$33 million in 1949.

Sales Prices

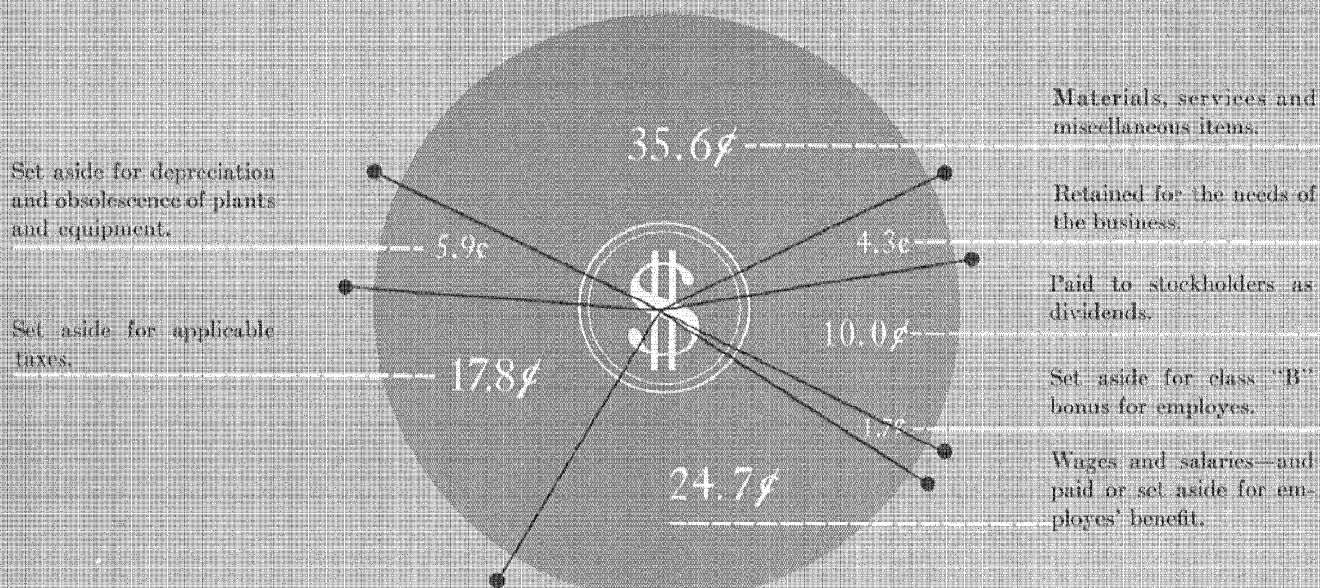
The Company's index of selling prices showed little change for the year as compared with 1949. However, there was a rise in operating cost, beginning in the third quarter. This made it impossible in some cases to absorb these higher costs and still maintain a reasonable profit at prevailing sales prices. Market prices of the principal raw materials bought by the Company went up about 29 per cent during the year. Wages were higher. Therefore, late in 1950, prices were increased on certain products. These raised the index at the end of the year six per cent higher than at the end of 1949. In comparison, the national index of all wholesale prices, as computed by the U. S. Bureau of Labor Statistics, increased 16 per cent during the year.

The year 1951 presents many new uncertainties which may substantially affect the sales and earnings of business enterprises generally. For instance, raw materials for non-defense operations may be seriously curtailed.

Taxes vs. Operating Income



These problems arise out of the defense economy to which this country seems committed. As always, Du Pont stands ready to make its full contribution to the nation's defense. In doing so it is hoped that the dislocations inherent in such a transition can be minimized.



Where the customer's dollar went in 1950...

Expansion of Facilities

Expenditures for the construction of additional manufacturing capacity and service facilities, and for improvement or replacement of existing ones, totaled \$114 million in 1950. Additions were made to the manufacturing capacity for many products, including nylon, polyvinyl alcohol, neoprene, polythene plastic, acetate rayon yarn, sulfamic acid and "Teflon" tetrafluoroethylene resin.

The new "Orlon" acrylic fiber yarn plant in South Carolina was completed and began commercial production during the year. A plant to make "Orlon" acrylic staple was started at the same place. The new plant for making nylon intermediates, at Victoria, Texas, is expected to begin operation early this year.

The Company bought new plant sites during the year. One at Memphis, is for the manufacture of sodium cyanide and hydrogen peroxide. Another, at Kinston, N.C., is for making "Amilar" polyester fiber. Construction has begun on the Memphis plant, but the one at Kinston is still in the design stage.

The principal laboratory installations completed and occupied during 1950 are as follows:

- Enlargement of Experimental Station near Wilmington, Delaware.
- Marshall Laboratory of Fabrics & Finishes De-

partment, Philadelphia, Pennsylvania.

- Parlin Laboratory of Photo Products Department, Parlin, New Jersey.
- Petroleum Laboratory of Organic Chemicals Department, Deepwater Point, New Jersey.

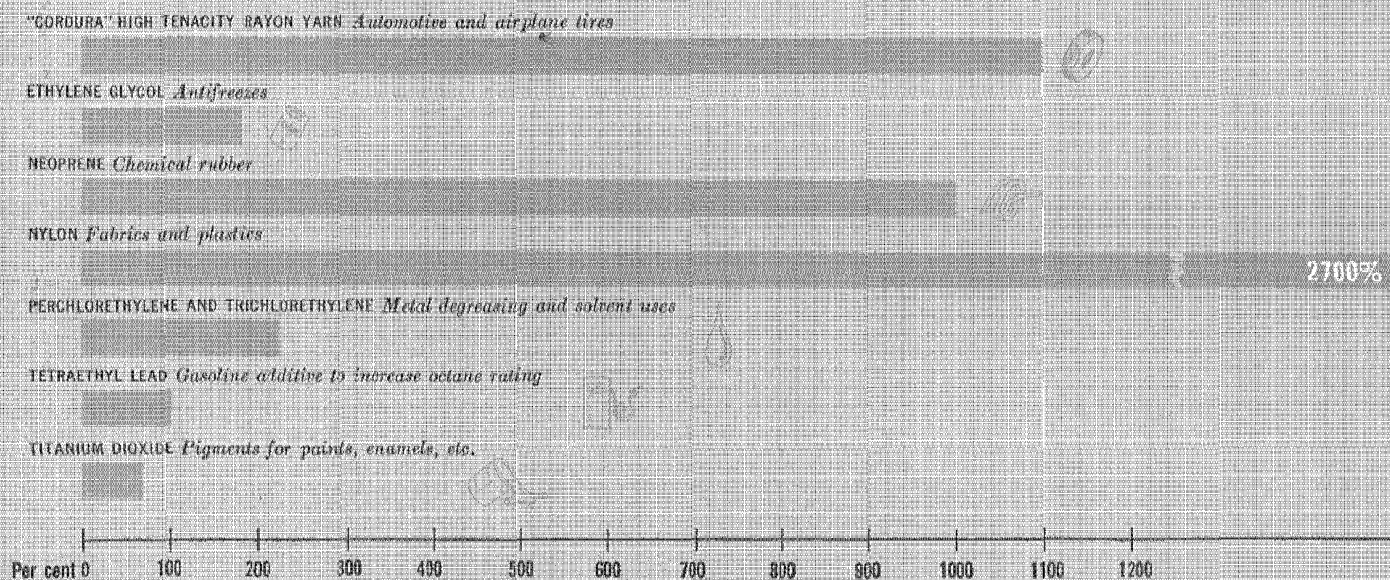
The Company's research facilities now house some 1,800 technical personnel—an increase of about 40 per cent since 1945.

If you would like a free pamphlet dealing with plants and expanded facilities on which Du Pont has spent almost \$550 million since World War II, write to the Du Pont Stockholders' Relations Division, 1410 Nemours Bldg., Wilmington, Del.

Licensing of Products

Some of the Company's products have become so popular that the demand is greater than can be met from existing and planned capacity despite large sums spent for additional manufacturing facilities. In order to use its capital to a greater extent for diversification into new product lines, the Company has sought to interest others in the manufacture of certain products. It has offered other companies extensive engineering assistance and its patents under license arrangements. Such arrangements were made in the cases of cellophane and sodium, and are being negotiated

increase in production capacity . . . defense products since 1940



in the case of nylon. All of these products are in short supply at the present time.

A contract is being negotiated with The Chemstrand Corporation. They would be licensed under DuPont patents to make and sell nylon fiber. Nylon is manufactured by other concerns in several foreign countries. If Chemstrand enters the field, however, they will be the first domestic company other than Du Pont to make this fiber.

National Defense

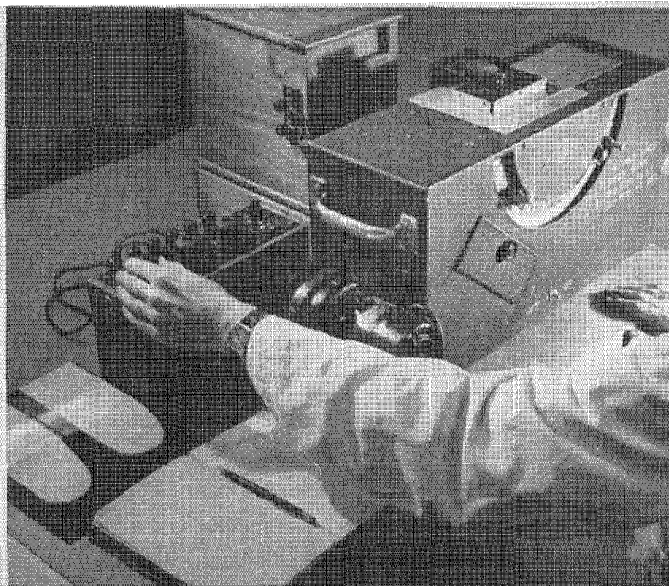
The Du Pont Company, at the urgent request of the Atomic Energy Commission, has executed a Letter Contract covering the design, construction and operation of new production facilities for atomic materials. The project is expected to involve an effort at least as great as that needed to carry out the Hanford atomic project in World War II. As in the case of the Hanford project, this is an undertaking in a relatively new and uncharted technical field.

At the Company's request, it will receive a fee of one dollar over and above costs, and any patents growing out of Du Pont's work become the property of the U. S. Government. It will be recalled that the Hanford project was undertaken on the same basis. The Company's management, while recognizing its obligation to earn a profit on Du Pont operations, felt that it was inappropriate to require a fee commensurate with its services.

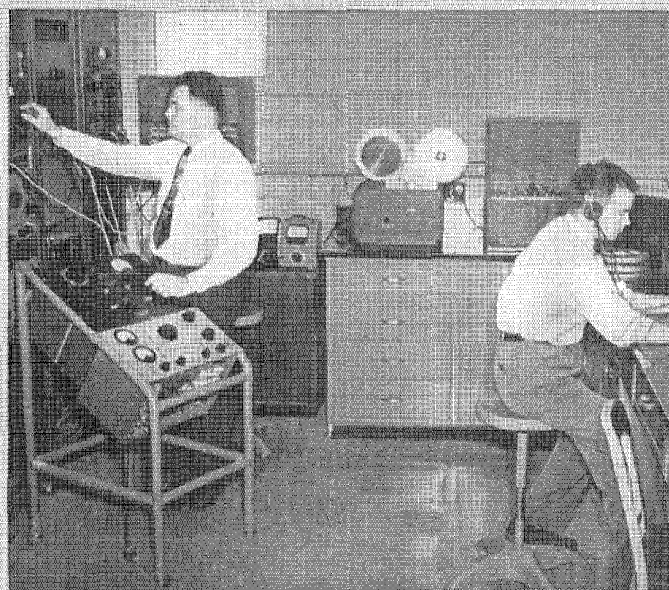
This project has already detached a number of the Company's ablest management and technical personnel from their regular jobs. Undoubtedly, more will be required in the future. Their compensation will, of course, be paid by the Government. Their withdrawal from normal Du Pont work, however, is a substantial contribution by the Company to the defense program.

Du Pont took this assignment upon assurances from highest governmental sources that the project is vital to the security and defense of the United States. These Government officials feel that the Company is particularly well equipped in technical personnel and resources, as well as by experience, to undertake this important project.

The Atomic Energy Commission recently acquired a site in South Carolina, near the Savannah River, where Du Pont will soon construct new production facilities for the Government.



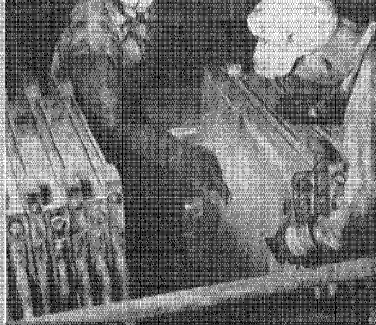
MARSHALL LABORATORY OF FABRICS & FINISHES
DEPARTMENT, PHILADELPHIA, PENNSYLVANIA.



PARLIN LABORATORY OF PHOTO PRODUCTS
DEPARTMENT, PARLIN, NEW JERSEY

Other Defense Activities

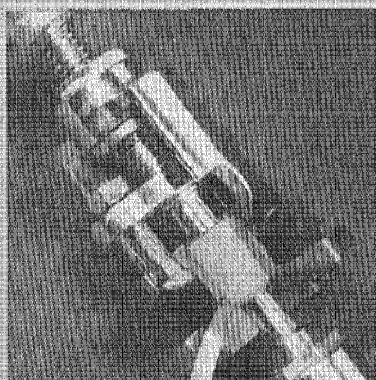
Defense orders for the Company's products are being received in increasing quantities. So far, though, the volume is not significant in relation to the Company's over-all sales volume. As the country's defense program develops, it may well require an important portion of the Company's production resources.



"ORLON" ACRYLIC FIBER



TITANIUM METAL



"TEFLON"
TETRAFLUOROETHYLENE RESIN

PRODUCTS, ESSENTIAL
TO DEFENSE, FOR WHICH
DU PONT HAS PROVIDED
CONSIDERABLE NEW
CAPACITY SINCE 1940.



POLYTHENE



METHOXYCHLOR

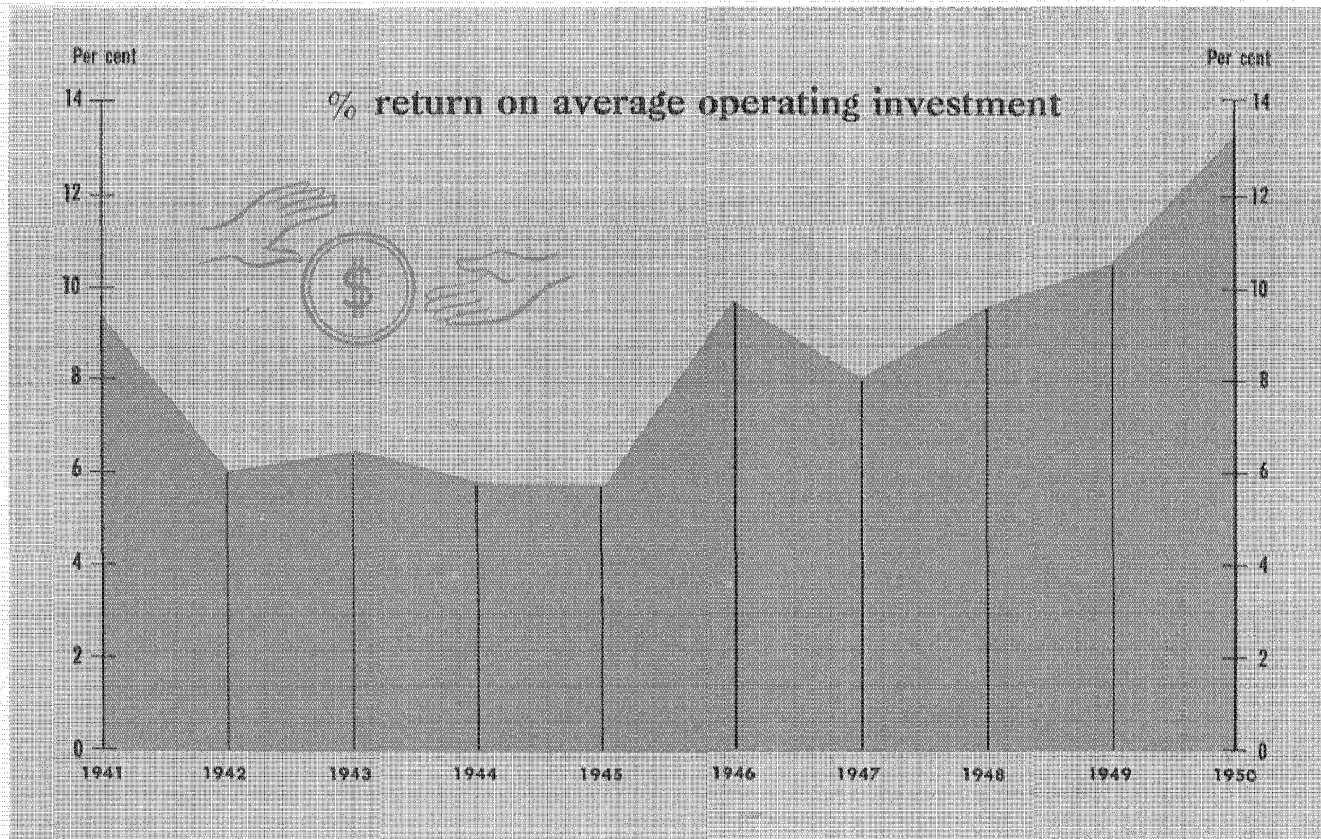
Preparedness of the Chemical Industry

The chemical industry's role in World War II, in providing materials essential to national security, was unprecedented in scope. Chemical research and manufacture produced not only elements of ordnance, but other materials. These went into conserving and strengthening the nation's economy.

Now, as then, the chemical industry's ability to meet an unexpected national emergency is the direct result of its peacetime activities—in creating new products, finding new uses for established products, and expanding to increase the supply of essential goods. The accomplishments of industrial science have benefited both peacetime living standards and the national security.

The present national emergency finds the chemical industry in a much stronger position to meet the country's defense needs than in 1940. Production capacity for badly needed chemicals and chemical products has been greatly expanded. At first, it was the result of the Government's requirements during the war period. Later it was because of unprecedented customer demand to meet peacetime needs.

Du Pont's expansion has been typical of the chemical industry's. The chart on page 4 shows a few of the products, essential to defense, for which



the Company has provided considerable additional capacity since 1940.

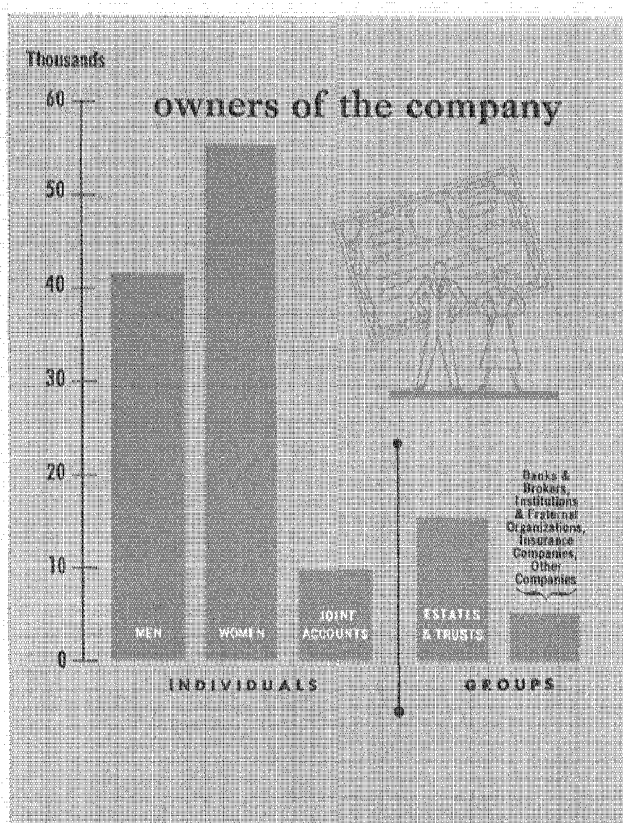
The Company's preparedness in the present emergency is further strengthened by certain post-war consumer products that have important defense applications.

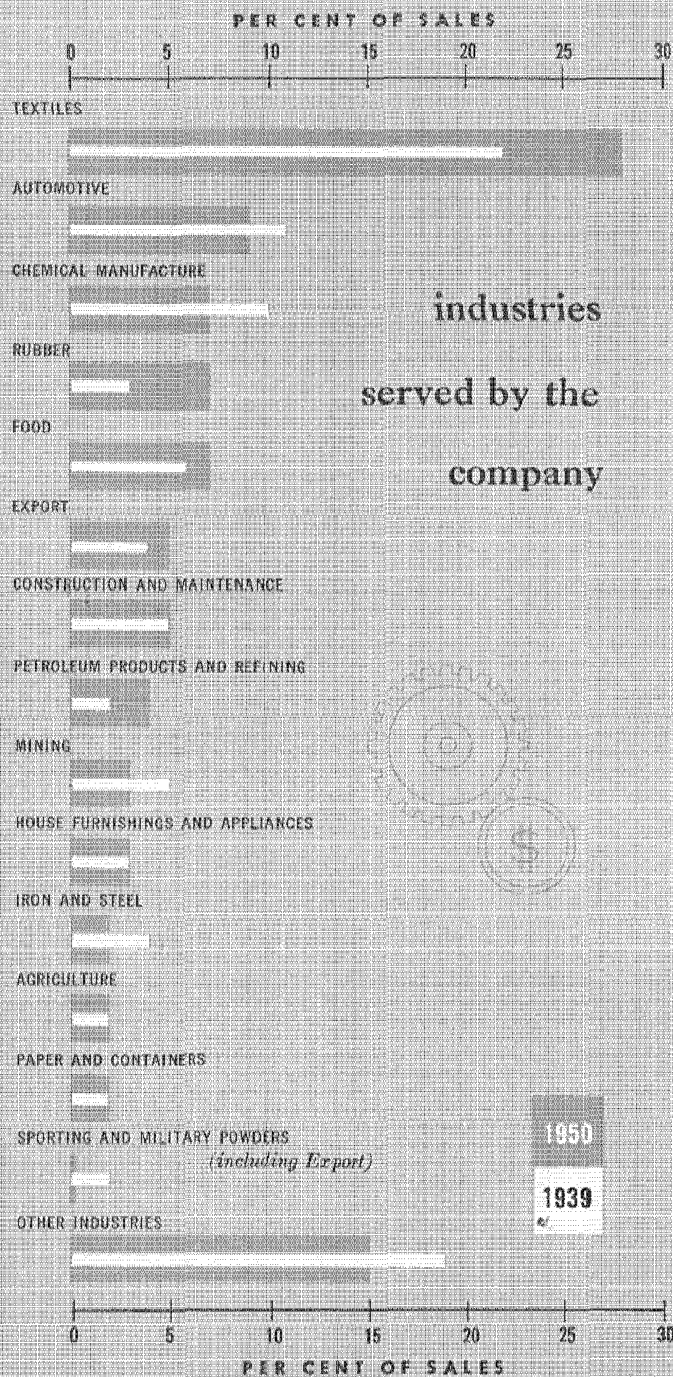
These materials, products of Du Pont research, include:

- "ORLON" and "AMILAR"
... *synthetic textile fibers, particularly important because of their wool-like properties.*
- TITANIUM METAL
... *a strong, light, corrosion-resistant metal for aircraft and other uses.*
- "TEFLON" tetrafluoroethylene resin
... *a plastic having unusual electrical properties and outstanding resistance to chemical attack and high temperatures, for special military and industrial uses.*
- POLYTHENE
... *a thermoplastic material with physical and electrical properties suitable for many important military and industrial uses.*
- METHOXYCHLOR and EPN MITICIDE
... *potent new pesticides.*

This Company, like other important chemical

companies, has provided such substantial additions to the national defense potential largely from stockholders' money. This demonstrates one of the values of large enterprises to the nation. They can undertake large tasks which inherently require large resources, both technical and financial.





industries
served by the
company

Ownership of the Company

At the end of 1950 there were 125,504 different owners of the Du Pont Company's stock, an increase of 15,559 during the year. Most of the increase was in common stockholders. There were 108,774 of them at the end of the year. Preferred stockholders number 23,435. Of the total, 105,850, or 84 per cent, are individuals. The remaining

19,654 are groups such as charitable organizations, insurance companies, churches, schools, and estates and trusts.

Du Pont stock is owned by residents of every state in the Union, the District of Columbia and several territorial possessions. Less than one per cent of the stock is held by residents of foreign countries.

Employees

Relationships with employees were generally good throughout the year. The number of Du Pont employees at the end of the year, including those engaged in construction at the Company's plants, totaled 84,595. This is an increase of 11,080 since the end of 1949. Wages and salaries paid amounted to \$330.1 million in 1950.

Wage and salary increases were made during the year. They maintained the Company's position in relation to pay rates prevailing where it operates.

The Company's personnel training programs have been an important factor in attaining mutually satisfactory relationships at all levels of the organization. The programs have been important in developing a capable supervisory organization and an efficient work force.

For many years the Company has maintained plans designed to promote greater job satisfaction and a reasonable measure of economic security. These plans assist employees in times of illness and accident, provide liberal vacation periods, pension payments upon both age and disability retirement, and insurance benefits to dependents in case of death.

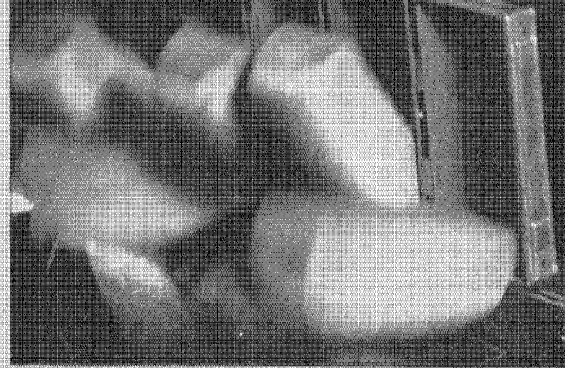
About 99.8 per cent of Du Pont employees went through the entire year without a single lost-time or disabling injury. This was the best safety performance in the Company's history. It is substantially better than the rate established by the chemical industry as a whole.

New products

The following new products, results of Du Pont research, were announced to the trade during the year:



AMERICANA DEEP COLORS in flat wall paint.

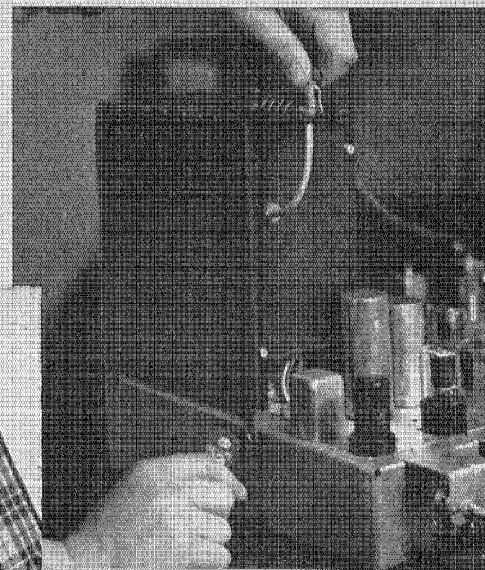


"TEFLON" polytetrafluoroethylene coated glass fabric and laminates for low tension electrical insulation; also spray finishes having anti-sticking properties.

DU PONT SPRAY GLAZE, a new waxing and polishing process for automobiles.



"Zeset" fabric stabilizer to impart wrinkle and shrink resistance.



"RULAN" flame-retardant plastic for electrical insulation.

"AMILAIC" polyester fiber, a new synthetic fiber formerly called Fiber V.

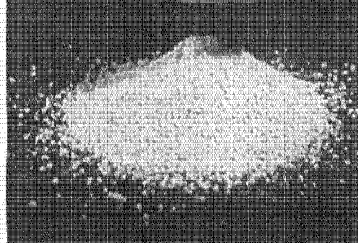


announced in 1950



Steel rolls revolving in opposite directions knead and soften the crude rubber as an operator adds a chemical accelerator.

Recipe for rubber



With a host of little-known chemicals,

the rubber industry tailors products for a variety of specific uses

By ARTHUR M. VALZ

It may be that a rose is a rose is a rose, as Gertrude Stein maintained, but rubber isn't rubber isn't rubber by a long shot.

Take the rubber in auto tires, the rubber heels on shoes and the elastic in swim suits, for example. Each is a different composition, "tailored" to do its special job by the type of rubber itself and by the addition of rubber chemicals. Formulas for combining these chemicals with natural and man-made rubber to achieve the proper balance have been evolved over many years.

The modern rubber industry began one day in 1839 when Charles Goodyear carelessly allowed a mixture of crude rubber and sulfur to fall on a hot stove in his laboratory. It didn't smell good, but he found that the mixture was transformed from a soft, sticky mess into a firm, yet resilient substance. Goodyear reasoned that if the heat were controlled, crude rubber could be made as tough and elastic as desired. He had discovered vulcanization.

Vulcanized rubber, while it represented a major advance, still had drawbacks. For one thing, vulcanization was a time-consuming process. And the rubber, even after this lengthy treatment, was attacked rapidly by the oxygen in the air.

Progress in clearing these two hurdles was slow. Chemists sought diligently for a way to hasten the curing process. They found that certain metallic oxides, such as lime, litharge and magnesia, were moderately effective but by no means the final answer.

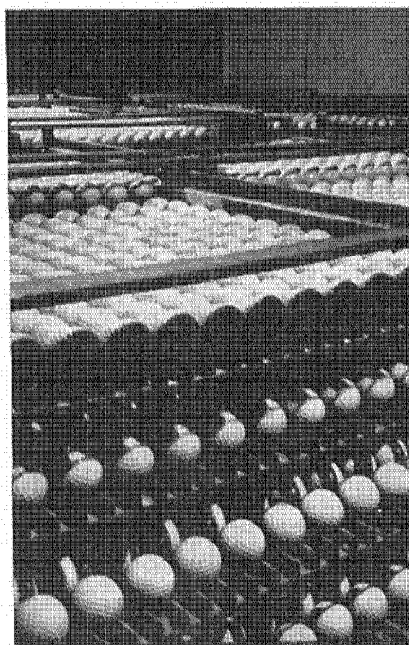
Then in 1906 a Harvard-educated scientist named George Oenslager made a startling discovery. He found that small amounts of aniline, an oily organic liquid, accelerated the vulcanization process. This plentiful chemical was even more welcome to the rubber industry because it also produced compounds that were stronger and longer lasting than those made with sulfur alone. Its one major disadvantage was high toxicity. Researchers, however, found that nontoxic aniline derivatives did the job even better.

DU PONT ENTERS FIELD

These derivatives were kin to the famous aniline dyestuffs, so it was logical that Du Pont, which began manufacturing dyes during World War I, should turn in 1922 to the production of chemicals for the rubber industry. In a short time the Company developed a line of chemical accelerators. These stepped up pro-

duction and reduced costs by speeding the vulcanization process. For example, at one time it required several hours to properly vulcanize a passenger car tire; now it takes less than one hour.

Today, accelerators range from ultra-fast to slow curing to meet the varying requirements of a thousand-and-one rubber products. Some are odorless, tasteless and nondiscoloring. Others, which function in the



Many kinds of rubber chemicals help put "bounce" in golf balls.



Accelerators impart resilience to these rubber printing rollers.

Light-fast yellow pigment is used in coating for fisherman's suit.



Stabilizers and wetting agents aid in making weather balloons.



that won't tarnish metals.

The early success with accelerators still left finished rubber goods prey to rapid destruction by oxygen, heat and flexing. In the 20's several companies, including Du Pont, searched for materials which would protect the rubber from these enemies. One compound this Company's scientists developed was "Neozone" antioxidant. It increased the road life of tires and greatly reduced cracking caused by flexing. A later development was "Thermoflex" antioxidant, designed to prolong the life of belts and tires—and further cut down cracking due to flexing.

The early antioxidants, however, caused discoloration on exposure to sunlight and made colored products unsightly. Chemists have now solved that problem.

Du Pont also supplies a line of color pigments for the rubber industry especially designed to resist fading in sunlight and to be stable during vulcanization at high temperatures. They do not affect the physical character or aging properties of the rubber.

Since many rubber manufacturers prefer pigments in dustless form, a line of rubber-dispersed colors was

developed. These are added to latex by mixing the color pigment into a water dispersion of rubber. The mixture is then coagulated, dried and further processed to form a slab containing a high concentration of color. Manufacturers find that these rubber-dispersed colors mix more uniformly throughout the rubber batch. The result is brighter finished products.

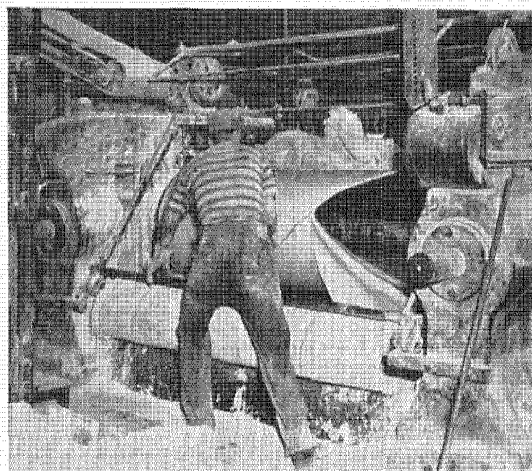
In 1935 Du Pont research filled another long-felt need when it produced the first chemical softeners, known as rubber peptizing agents. Until that time, crude rubber was softened for processing by mechanical means. But this took time and consumed a tremendous amount of power. "RPA" peptizing agents save time and power, and since their introduction millions of pounds have been used.

There are many other outstanding rubber chemicals, each adding its part. Blowing agents put the "sponge" in sponge rubber; bonding agents adhere rubber to fabrics and metals; and there are stabilizing and wetting agents for use in latex compositions; mold lubricants; sunchecking inhibitors . . . these are just a few.

Rubber, today, isn't rubber unless it contains rubber chemicals.



Peptizing agents, added in small amounts during this step, help soften raw rubber.

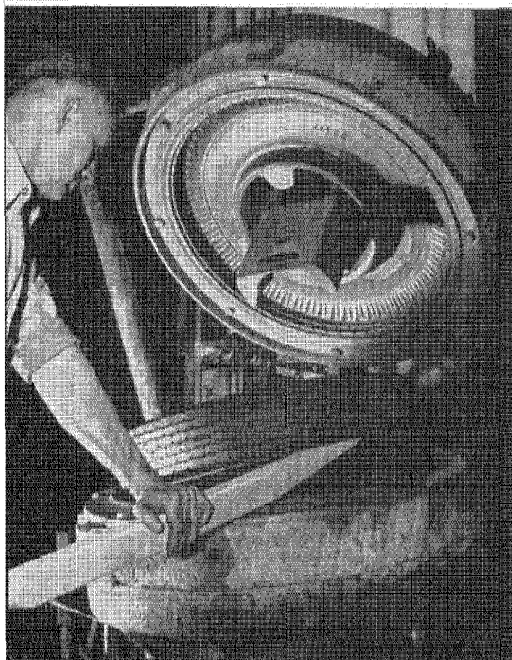


Crude rubber mixture and many compounded ingredients are painstakingly blended.



Proper choice of compounding ingredients improves ease of calendaring operation.

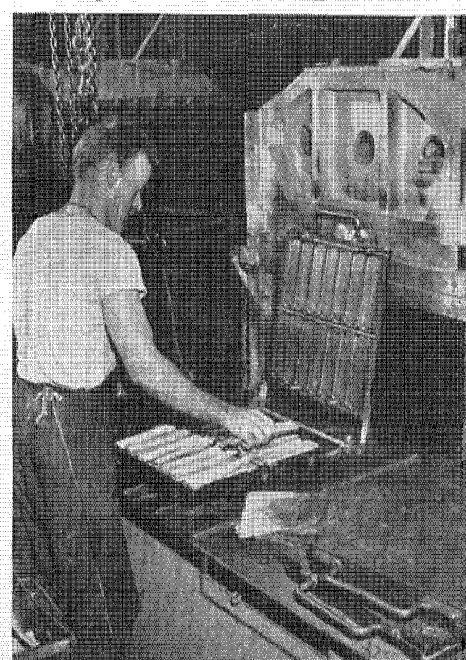
Modern accelerators have cut curing time of automobile tires to less than an hour.



Lubricants added to raw stock during milling facilitate extrusion of inner tubes.



Mold lubricants prevent these automobile foot pedals from sticking in the cavity.





Walls and woodwork are in Moonstone Blue, Mocha Tan and White "Duco" Semi-Gloss Enamel; kitchen cabinets in Bermuda Blue Gloss.

Paint-up time

A new interior finish, "Duco" Semi-Gloss Enamel, is being introduced this spring to meet the demand of homeowners for a durable, washable wall-and-woodwork paint in a velvety, low-sheen finish.

The new enamel comes in 12 dramatic colors, ranging from deep tones of green, blue, red and gray to light pastel shades. Many attractive intermixes are possible, extending the color range through the spectrum.

For years "Duco" Gloss Enamel has been a popular finish for kitchen and bathroom walls and woodwork, and for woodwork in other rooms of the house. Now the many qualities that made "Duco" famous—durability, washability, ease of application and superior covering properties—are available for rooms where a softer finish is desirable.

Aside from the laboratory work that created the new semi-gloss enamel, many months were spent in research by experts to determine consumer color pref-

erences in interior decorations. Sales records of floor coverings, drapery materials and upholstery were tabulated to provide a basis on which to develop the color range of the new finish.

After the color range had been established, the semi-gloss enamel was field tested. Samples were given to representative painters and homeowners to use and judge critically.

When the product had passed these tests it was ready for general release. Now thousands of Du Pont paint dealers across the nation are hanging banners and trimming their windows with streamers announcing the new "Duco" enamel.

Springtime is paint-up time—the season to make old, tired rooms sing again. Du Pont paint dealers are ready to show the homeowner how the job can be done quickly and easily with "Duco" Semi-Gloss Enamel.



Push-button house

*Exercising their technical skills,
Hotpoint Inc. and cooperating companies
demonstrate the latest mode in easy living*

If you lived in the new Hotpoint House of the '50s at Plandome Mills, Long Island, here's how your day would start:

You wake up to music supplied by a clock-radio. Then, by flipping a switch at the bedside, you start your morning coffee perking in the kitchen. Reaching for another nearby switch, you automatically close the bedroom windows. In short—morning becomes electric.

This is just an inkling of many unusual features. From the foyer, where you enter the sanctum of the kilowatt-powered house, to the year-'round air condi-

tioning units in the basement, you're served by automatic appliances.

Coming home at night, like getting up, is an electrified experience. As you drive up to the garage, radio controls, operated by a push-button on the car dashboard, open the doors and turn on the garage, kitchen and porch lights.

If you want to relax before dinner, you go to the entertainment room, where a soda-bar provides refreshments. Ice-cold carbonated water, charged by an automatic carbonator in the basement, is always on hand. And, if you feel like having an informal dinner right there, you bring out the electric "Rotissomat"; put a steak in it; and place it in a specially designed fireplace.

For more formal eating, there's an attractive dining room with adjoining patio. These two rooms—separated by a glass wall—become one as you touch a switch that lowers the glass into a recess in the floor.

The power behind the festive board is an ultra-modern kitchen where the chores are done electrically. Besides an electric range, refrigerator and food freezer, you see an automatic dishwasher, and a "Disposal" that grinds up garbage so it can be washed down the drain. Since the kitchen and laundry are combined, the room also has an automatic clothes washer, dryer, and rotary ironer.

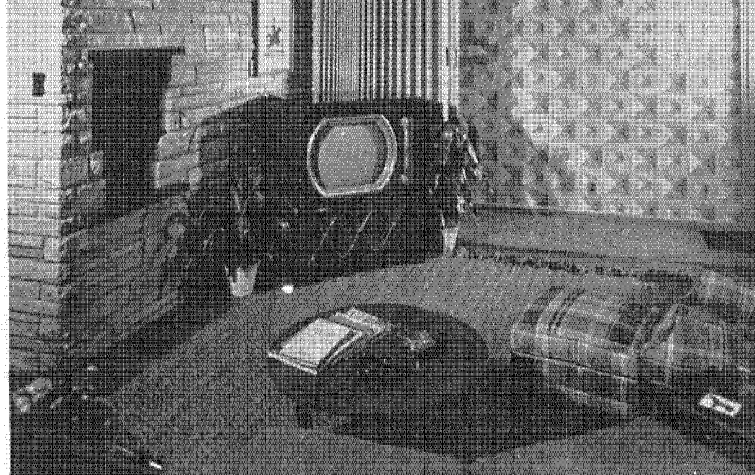
It doesn't take much more to be an efficient homemaker than a good, strong forefinger for manipulating the right button or switch.

The house—sponsored by Hotpoint Inc. and its New York distributor, General Electric Supply Corporation—is full of other appliances that most of us are acquainted with. Among them are radios, phonographs, modern lighting fixtures, thermostatic heat controls, and musical door chimes. Of particular interest to visitors, however, are the startling new features that aren't yet familiar to gadget-conscious Americans. Yet all of them are within the economic reach of a medium-income family.

For example, the entire house is linked together by an intercom system. You can talk, from any room, with any other room or with visitors outdoors. So a housewife can keep in touch with the whole house without leaving the beans to burn on the stove. Throughout the home, low voltage wiring is used for remote control. Lights and appliances in distant rooms can be turned on and off by pushing a button.

In addition to the master bedroom, the kitchen and living room have windows that open and close at the click of a switch, rolling screens into place automatically. Among the other engineering feats are doors that operate by folding and unfolding like an accordion. They're made of a strong metal frame covered with "Fabrilit" vinyl plastic coated fabric and similar materials.

With all of these tricks, electric and otherwise, you'd expect the House of the '50s to have the cold and efficient atmosphere of a mechanized assembly line. But that is not the case. It's really quite homey.

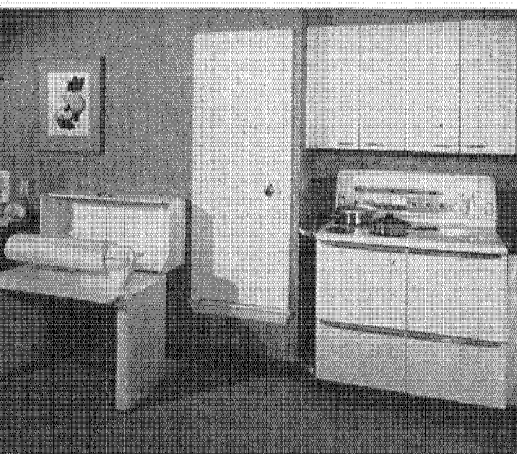


From paints to plaid upholstery, an attractive color scheme adds to the charm of the "all-electric" House of the '50s.

The living room, for instance, with its flagstone open fireplace and huge picture window overlooking the terrace, is a perfect setting for comfortable lounging or gracious entertaining. Much of the beauty of this, and all the other rooms comes from an attractive color scheme, to which finishes make a contribution. In decorating its house, Hotpoint chose all of its paints from the Du Pont line—paints that were easy to apply, dried quickly, and will last for a long, long time.

For the outside, Hotpoint selected Du Pont Cement and Stucco paint, Trim and Shutter paints, and "40" Outside White house paint. The restful grays, cheerful yellows, and cool greens that decorate the inside walls and ceilings are shades of interior flat wall paint. And the woodwork, finished in "Dulux" super-white enamel or colors of interior semi-gloss enamel, sets off each room to best advantage.

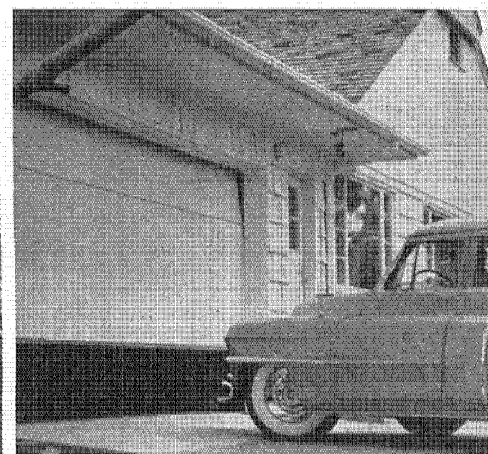
Along with more than 20 other participating companies, Du Pont is glad to have had a part in setting the background for Hotpoint's dream of work-saving, all-electric living.



In its kitchen-laundry, the Hotpoint House features the latest in electrical appliances.



Automatic heat controls keep watch over the soil temperature in the greenhouse.



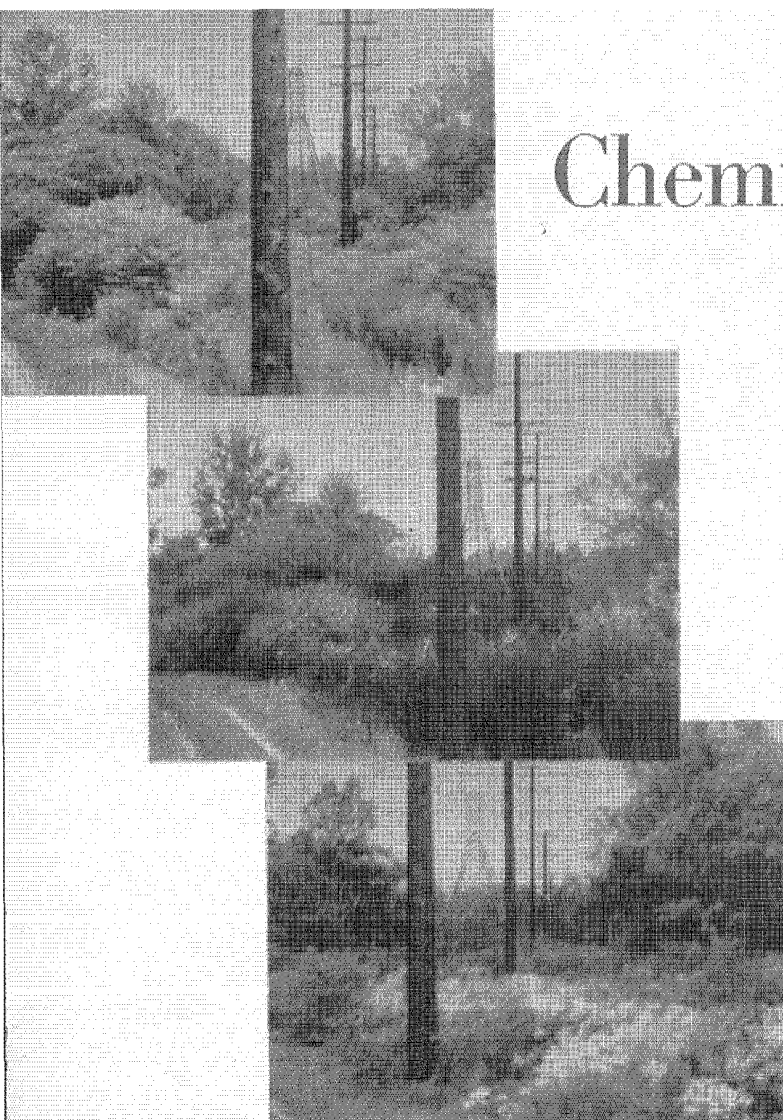
Driver raises garage door by a push button radio control on car dashboard.

Chemical bushwhackers

Two years ago, we told you how the new chemical brush killers were busy clearing rights-of-way.

Here's a progress report

Drifting "Ammate" spray is not likely to damage nearby crops. Note that apple tree below is undamaged although brush is killed. This chemical is outstanding for most right-of-way clearance—along railroads, for example—but 2,4-D is better when water hyacinths are clogging canals.

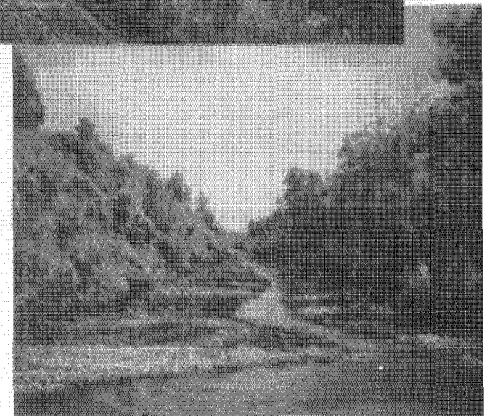
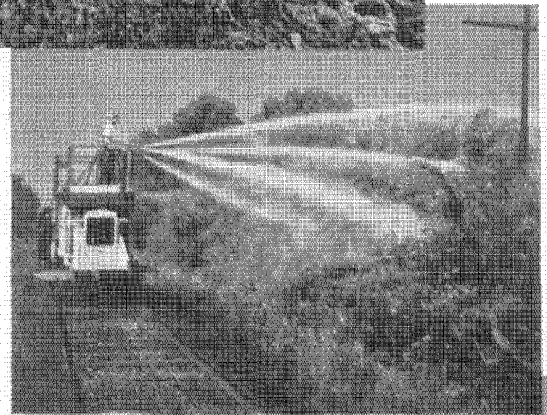
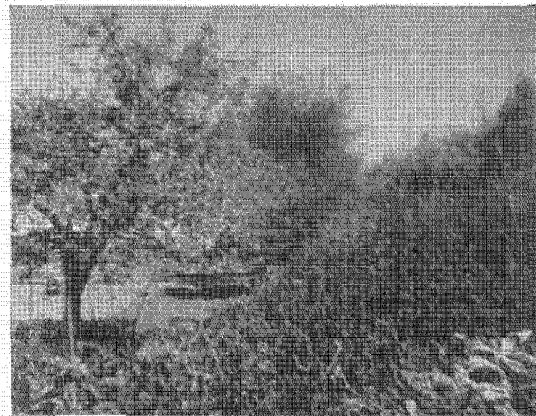


Three stages in controlling hardwood and sumac near a power line right-of-way. Pictures, taken near Dolgeville, New York, show growth at time of spraying, 30 days later and two years later. The regrowth of harmless weeds and grasses, shown in the bottom picture, helps prevent erosion.

Last year, along a 13-mile stretch in southeastern New York, passersby saw a spectacular 50-foot-wide streak of brown cutting across the landscape—plunging down into creek beds and climbing steep hills in the distance.

What they were witnessing was the temporary effect of chemical brush killers along a telephone cable right-of-way. Recently such compounds have made enormous strides toward becoming the universally-accepted method of cleaning up areas near highways as well as oil, power and communication lines.

The use of chemicals to rout brush is just coming of age. For years public utilities and highway maintenance men have known that hand-cutting or bulldozing tends to defeat itself. As a Pennsylvania line superintendent says, "Cut one 6-inch wild cherry this



year and next year you'll have six 1-inch wild cherries." Of course, the plants have to go. A tall sprout eventually can come in contact with wires or cables and cause trouble. Even on routine inspections—and especially in emergencies—service crews have to reach lines without hacking their way through a semijungle.

Through the years many chemicals have been tried for weed and brush clearance. Sometimes, however, they have created fire hazards or have been violently poisonous to livestock. Often they have aided erosion by robbing the soil of its productivity. Gradually, research men have developed new and better compounds.

A prominent contender is "Ammate" weed killer. This material, based on ammonium sulfamate, is a nonselective brush killer. That is, it isn't very particular which woody plants are present. In addition, it seems to travel from the leaves through the stems and finishes the killing of the plant by poisoning the roots.

Any soil unproductivity caused by "Ammate" disappears after the first year. In fact, after rains have washed away the early high concentrations, "Ammate" helps in growing a good turf since it leaves fertilizing nitrogen materials in the soil. When it is handled properly, it is nontoxic and doesn't damage nearby field crops, orchards, ornamental shrubs or flowers.

Last year, at the Weed and Sprout Control Conference at the University of Missouri, Homer L. Jacobs, of the Davey Tree Expert Company, reported: "Ammonium sulfamate is as effective on woody growth 15 to 20 feet high as it is on stems 3 to 4 feet tall. For this reason and because of its nonselectivity, it is perhaps most valuable for the difficult situations where brush is completely out of control."

PRACTICAL EXPERIENCE NEEDED

It takes several years to learn how well a chemical will perform. Questions like these arise: How much regrowth is there—how often do we need to respray—should we change our formulation next time? Among the factors in the picture are the equipment used, weather conditions, methods of application, types of vegetation and terrain, and the degree of kill needed.

On the whole, results are encouraging. The Davey Company, for instance, has already completed its fourth season of large-scale use of ammonium sulfamate. In 1949 it applied nearly 2,000,000 gallons of solution in Louisiana, Michigan, New York, Kansas and other states. Properly used on mixed brush, this product gave almost complete kill of leaves and stems, and perhaps 80 per cent kill of the roots of sprayed vegetation.

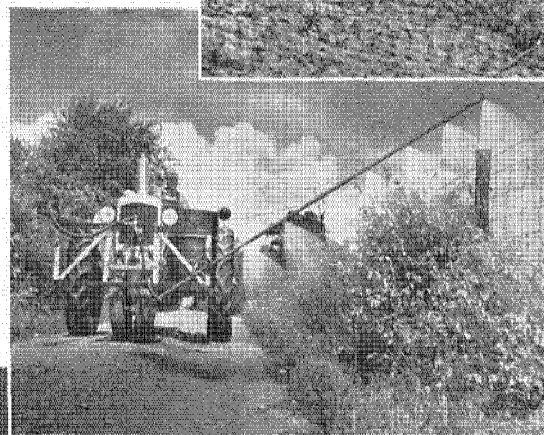
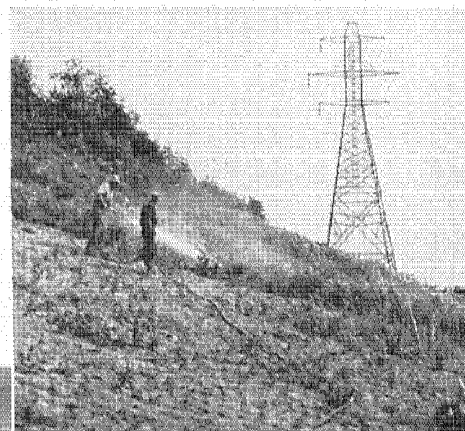
"Ammate" seems to have a continuing effect on some species," says Southwestern Bell Telephone Company, "at least through the following year. In other words, some species of brush that are not killed the first year, succumb the following year." Because of its long-lasting effect, this chemical is more economical over the years than others, although its initial cost is higher.

In the State of Pennsylvania, six companies that carried out spray programs in 1948-49 now work on regular schedules. These range from once every five years to four times in eight years.

Some of these programs are based on ammonium sulfamate. Others are built around hormone-type killers. The hormones, including Du Pont's 2,4-D and 2,4,5-T weed killers, are particularly good for some species, such as osage orange and brambles.

Mr. Jacobs sums things up this way: "The effectiveness of present-day chemicals and power sprayers has brought the brush problem in step with other machine age methods. A skilled workman with a spray gun can reach farther, and work faster and more effectively than a laborer with only a brush axe at his command . . . Chemical brush control is beyond the 'let's hope it works' stage. It's here to stay."

According to the terrain and type of brush, different spraying methods are used. Steep, rocky hillsides are often reached with long lengths of hose. Growth at roadsides may be covered by spray booms. The prime object is to get a thorough job (as in the aerial view below) at the lowest possible cost.



Not the retiring type

A pioneer in tetraethyl lead development, Dr. Kraus is a professor emeritus now . . . but he won't behave like one



Dr. Charles A. Kraus, who developed the ethyl chloride process for making tetraethyl lead some 30 years ago, is not the man to let retirement interfere with his normal working schedule.

He has proved this almost daily since June, 1946, when he stepped down after 22 years as a chemistry teacher and director of chemical research at Brown University in Providence, Rhode Island.

Today the bearded scientist spends as much time in the college laboratory as he ever did, and university officials admit that putting him on the retired list was

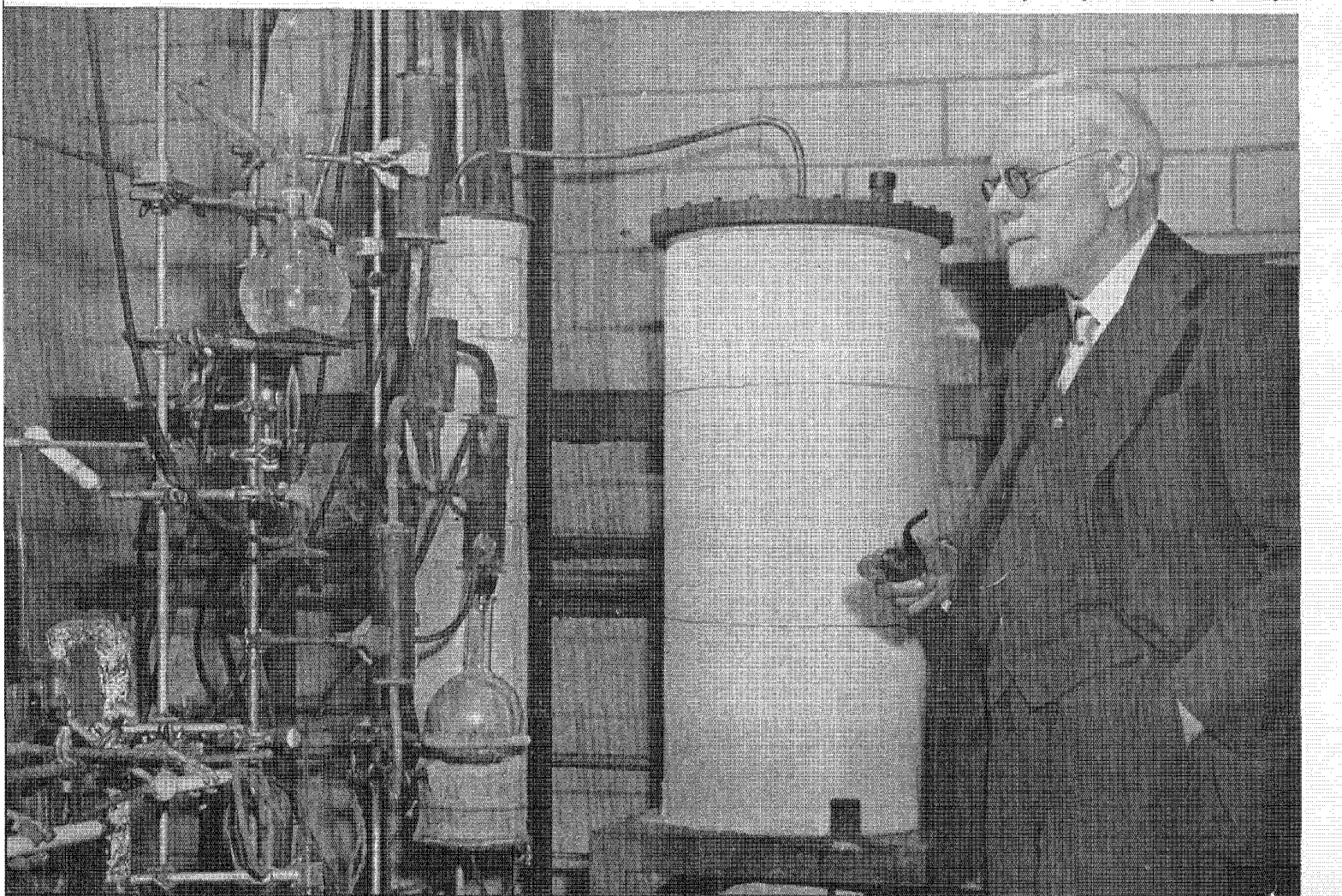
an empty gesture.

At 75, Dr. Kraus can look back on a career which has brought him a full measure of recognition, including four honorary degrees and the Priestley Medal, one of American chemistry's highest awards. A former president of the American Chemical Society, he also holds the Nichols, Gibbs, Richards and Franklin Medals.

This close application to business has not warped his sense of proportion, though. He delights in poking fun at importance, including his own.

"It's easy to achieve distinction," he said recently,

Dr. Kraus, shown in the Brown laboratory, continues his research because "it's not just my work, it's my hobby."



his eyes bright behind his thick glasses. "All you have to do is outlive your more illustrious contemporaries."

Lately, he has begun to talk enthusiastically of his Maine retreat, of strolls through the pine woods and along the seashore. But his Rhode Island friends insist that he never stays there longer than a weekend at a time.

"Gets restless," one of them said. "He can stay away from the laboratory just so long, then back he comes."

Dr. Kraus began experimenting with organic compounds of metals shortly after the turn of the century. He worked first with tin and mercury as a physics instructor at the University of California in Berkeley from 1901 to 1904. He continued the work at intervals through the years, and thus was a logical candidate

ethyl lead was distilled off. Within three months they had run the TEL yield up to 70 or 80 per cent.

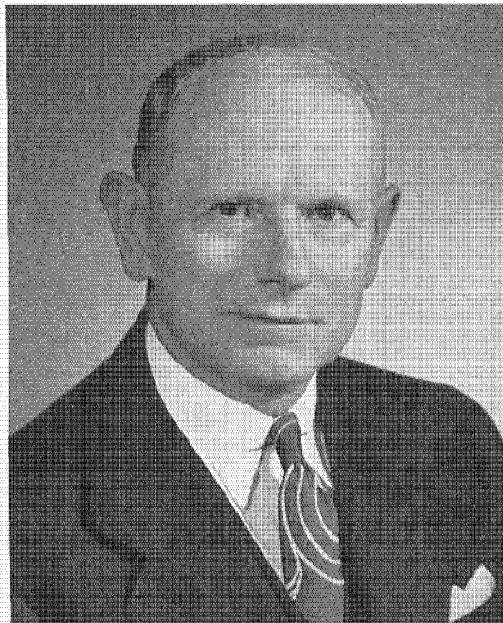
Du Pont chemists, meanwhile, had also been searching for a satisfactory chloride process, and they recognized in the Kraus technique the answer they had been seeking. Dr. William S. Calcott, prominent in the Company's research, was sent to Worcester to look into the new process. Within three months Du Pont had adapted it to commercial production.

"Dr. Kraus explained very clearly how his method worked," Dr. Calcott said recently. "Until a month or so ago, the basic process of producing TEL had changed very little. He did a thorough job."

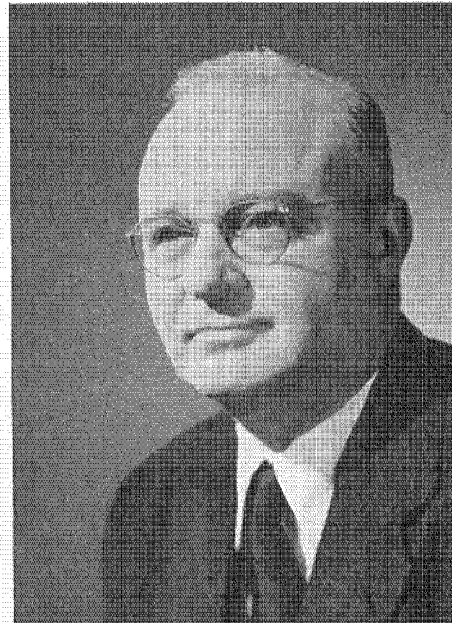
Defining Kraus solely in terms of TEL, however, is like saying that Newton once sat under an apple tree or that Franklin flew a kite.



Du Pont men, led by Dr. William S. Calcott, adapted Kraus process to commercial scale.



T. A. Boyd, member of General Motors research team which studied engine knock.



The late Thomas Midgley, Jr. of GM discovered TEL's antiknock properties

when Standard Oil of New Jersey looked around for a man to tackle the problem of TEL production 20 years later.

General Motors researchers had already concluded that tetraethyl lead was the most effective antiknock additive for gasoline. Du Pont had begun manufacturing the compound by the ethyl bromide process, the best method then known. But bromine was scarce and expensive.

"We knew there was no use fooling around with the more expensive iodides or bromides—the only thing to do was to use ethyl chloride," Dr. Kraus recalled.

He enlisted the help of Dr. Conral C. Callis, one of his former graduate students, and they began the work at Clark University in Worcester, Massachusetts, where Dr. Kraus was then teaching. They carried out a reaction of ethyl chloride and sodium-lead alloy in an autoclave, or laboratory pressure cooker. The tetra-

He has published some 200 research papers in his 50-year career. In 1948 the Navy presented him its Distinguished Service Award for his research on methods of producing potassium, used in World War II oxygen masks. During the war he traveled an estimated 50,000 miles a year as a consultant on the Manhattan District project and directed research on the project at Brown.

Since retiring, he has been working largely in the field of physical chemistry of electrolytes, in which he pioneered. His first papers, published around 1900, dealt with liquid ammonia as a solvent. Subsequent papers have discussed benzene and other related solvents.

He still takes an avid interest in world affairs, too, often discussing them at length with colleagues on the Brown faculty. "We're in a mighty deep hole," he told them recently. "I'm going to take a trip to Oak Ridge pretty soon to see if there's anything I can do."

A new tale about a useful yarn

Already familiar to many users, cellulose sponge yarn mops are now joining industrial and institutional clean-up squads

Like most languages, English keeps changing all the time—picking up new words and new meanings for old ones. The other day, for instance, we saw our first green blackboards. What do we call them? Greenboards? Green blackboards?

Likewise, the definition of a mop needs to be expanded. According to our dictionary, a mop is made from “a piece of cloth, or a collection of thrums, coarse yarn, or rags, fastened to a handle.” But one of the newest types is the cellulose sponge yarn mop. Its story starts at Du Pont, where fine-pore cellulose sponge material is extruded over strong cotton yarn strands. Then other manufacturers take over and produce the final mop.

Many people are already familiar with these handy mops for consumer uses, from household cleaning to swabbing the decks of sailboats. More recently, however, industries and institutions are accepting them as a fine way to do an efficient cleaning job.

Tom Wallace, a maintenance supervisor in the Wilson Meat Packing Company's Chicago plant office, has this to say: “We always like to have sponge yarn mops around for cleaning floors in our building. They save time and effort for the men using them, and they're cleaner to work with—don't pull to pieces.”

The building superintendent of a large public utility company, Roland G. Hughes, would have nodded in agreement. For nearly a year and a half, his company has been a user of cellulose sponge yarn mops. According to Mr. Hughes, “If you have a dirty cleaning job to do, you do it—rinse out your sponge yarn mop, and it's clean.”

Still another large industrial concern now putting such mops to work is the Curtiss Candy Company. The porter foreman at Curtiss' No. 1 plant says that sponge yarn mops are used throughout his plant on all smooth concrete, wood and terrazzo floors.

One important advantage of cellulose sponge mops is their long life. The people at the public utility company found this to be true—and so did Philadelphia's State Hospital.

At the hospital, it was decided to test several dozen mops made of sponge yarn in three kitchens, in administrative buildings, and in buildings that house

hospital personnel. In the different areas they were used on terrazzo, linoleum and tile flooring.

When the experiment was over, the man in charge of the hospital's storeroom reported: “In our place, we found that cellulose sponge mops outwear others.” That's why they are more economical in the long run.



Cross section of a yarn within a yarn: each cotton fiber strand is jacketed by Du Pont cellulose sponge material.

It's interesting to note that after a thorough schedule of tests and careful inspection, the State of Pennsylvania has written specifications on the cellulose sponge yarn mops for general wet-mopping purposes. This means that any state institution has the Commonwealth of Pennsylvania's permission to use this type as a cleaning aid for their buildings. Its State Hospital was one of the first to do so.

Clean floors are essential in hospitals. But they're just as important to restaurant owners. A chain restaurant company, John R. Thompson of Chicago, was one of the first users of sponge yarn mops on a large industrial scale. The purchasing agent for Thompson's Chicago division says they're using them on cement and other types of flooring. The new-style mops do a better job of keeping floors clean. They don't tangle around chair and table legs, or leave lint and loose strands behind.

And that's how maintenance men are making the acquaintance of sponge yarn mops. This mop-with-the-new-face may not have reached the pages of your dictionary yet, but it's rapidly getting to be a byword of many clean-up men.



How you can get the most from nylon

Let's be realistic about nylon. It's a fine fiber, but you need to know more about shirts and socks than the yarn they're made from

Walking into a store and asking for "a pair of nylon socks, size eleven," is like going to an art dealer and saying, "I want a painting made with Smith's oil colors." Right away, the man asks what kind of picture you want and which artists you like. It all depends, in short, on what you need. Excellent as Smith's oil colors might be, they tell you only one thing: the picture was done with good paint.

The same is true of nylon. It's an exceptional fiber and we've spoken before of its long wear and easy care. But there's a great deal more to a garment than the fiber it's made from.

In choosing garments, fabric construction is especially important. So the more you know about it, the better you can satisfy your own requirements. If you want a comfortable material for summer, for example, you need to speak up and ask for it. So, to be sure you get what you want, here are some guideposts to coolness and warmth:

To feel cool, you need a fabric made somewhat like a window screen—that is, loosely woven or porous. Then the cloth will let air circulate freely, so your body can maintain the right temperature. You feel hot when your skin can't throw off excess heat and moisture fast enough.

Suppose you want a warm fabric. Now a tightly woven one is warm. But it doesn't let excess heat and moisture escape. It's fine if you want a windbreaker, but in summer weather it's hot.

If you wish to stay warm without being uncomfortable, you can. The answer lies in yarns spun from short fibers, like springy nylon staple or wool. A fabric made from spun nylon is warm because the fuzzy yarns contain millions of tiny dead air spaces. This dead air acts as insulation, on the principle of the storm window. Although such fabrics keep you warm they don't give you a Turkish-bath feeling. The spaces between fibers have a capillary effect, drawing moisture away from the body so it can evaporate.

Now for the question of quick versus slow drying. Take men's nylon socks as an example. Socks made from multifilament yarn—smooth, virtually endless

strands—dry fast. That's because water simply runs off the long, smooth fibers, so that there is very little moisture left to evaporate when the socks are hung up to dry. But spun nylon, with its fuzziness and dead air spaces, holds moisture somewhat longer and doesn't dry as rapidly.

Which type of socks should you buy? Well, as we said, you're the expert. Are you a traveling man who needs socks that dry extra fast? Or are you a person who likes fuzzy, extra warm ones? It's all up to you.

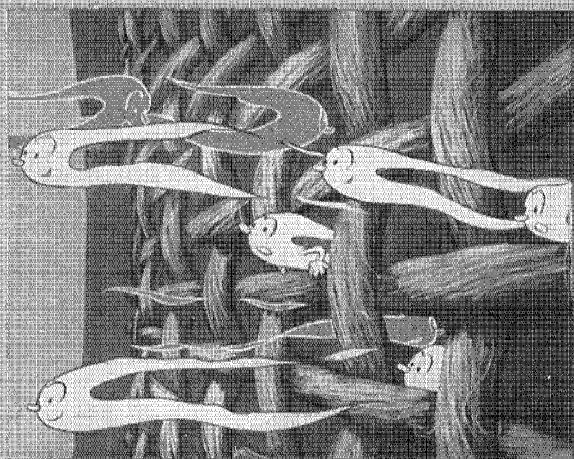
Often nylon is mixed with silk, rayon, cotton or wool. By using blended fabrics, designers can make new and valuable fabrics that take advantage of nylon's durability, light weight and abrasion resistance. A nylon-cotton sports shirt, for instance, can be especially strong. And a rayon-nylon blouse usually will give extra wear. But you wouldn't expect such garments to be identical in performance with all-nylon.

So far we've been dealing with types of fabrics. Textile and garment manufacturers have other factors to consider, such as styling and workmanship. Whether

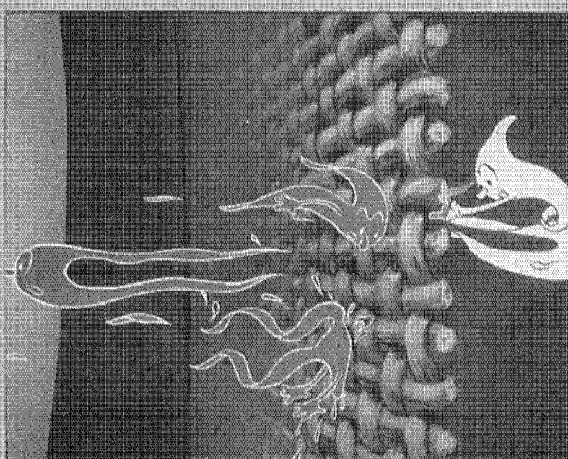
your nylon garments are costly or inexpensive depends largely on styling. Good workmanship, of course, should go into any garment. You should expect to get seams that are correctly sewn with nylon thread, and well-finished so they won't ravel. Belts, shoulder pads and other accessories should be washable or removable. Linings and bindings on nylon articles such as swimming trunks should be nylon so they'll dry quickly and give long wear.

People who sell you clothing are now becoming more adept at picking goods that will fill your needs. Part of their training may come from Du Pont's new movie for retailers, "Close-up of Nylon." Although it's smart to inquire about fabrics, you may find that salesmen now ask what performance you're after even before you tell them.

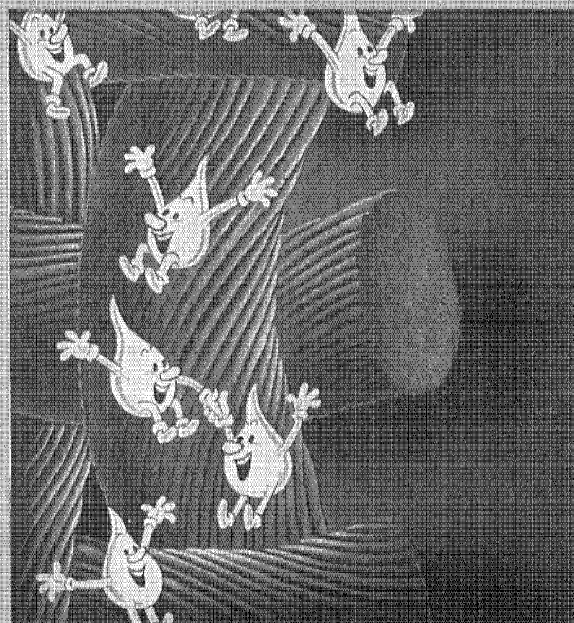
Whoever speaks up first, though, it pays to get the facts. For nylon alone is not the "open sesame" to quality and satisfaction. After nylon yarns leave Du Pont, many other companies both large and small take over. Their skill and integrity are the best guarantee of the fine service that nylon can give.



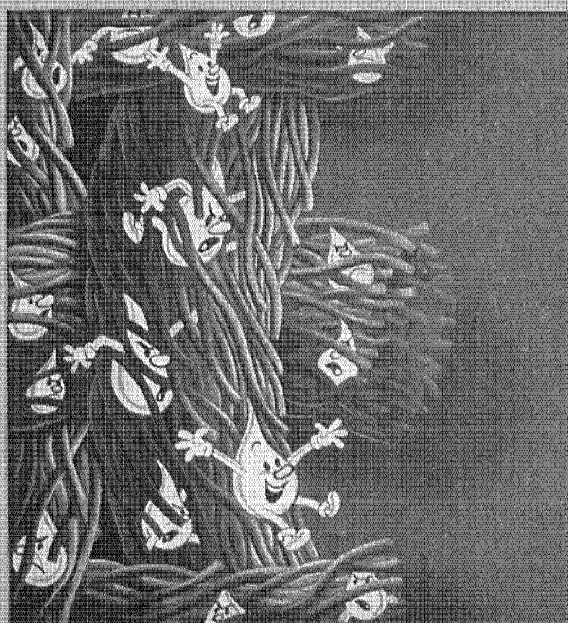
Garments made of open weave fabrics give a "window screen" effect. That is, they're cool because heat and perspiration are able to escape easily.



On the other hand, a tightly woven material is warm, since heat and moisture are pent-up. You wouldn't want such a fabric for summer clothing.



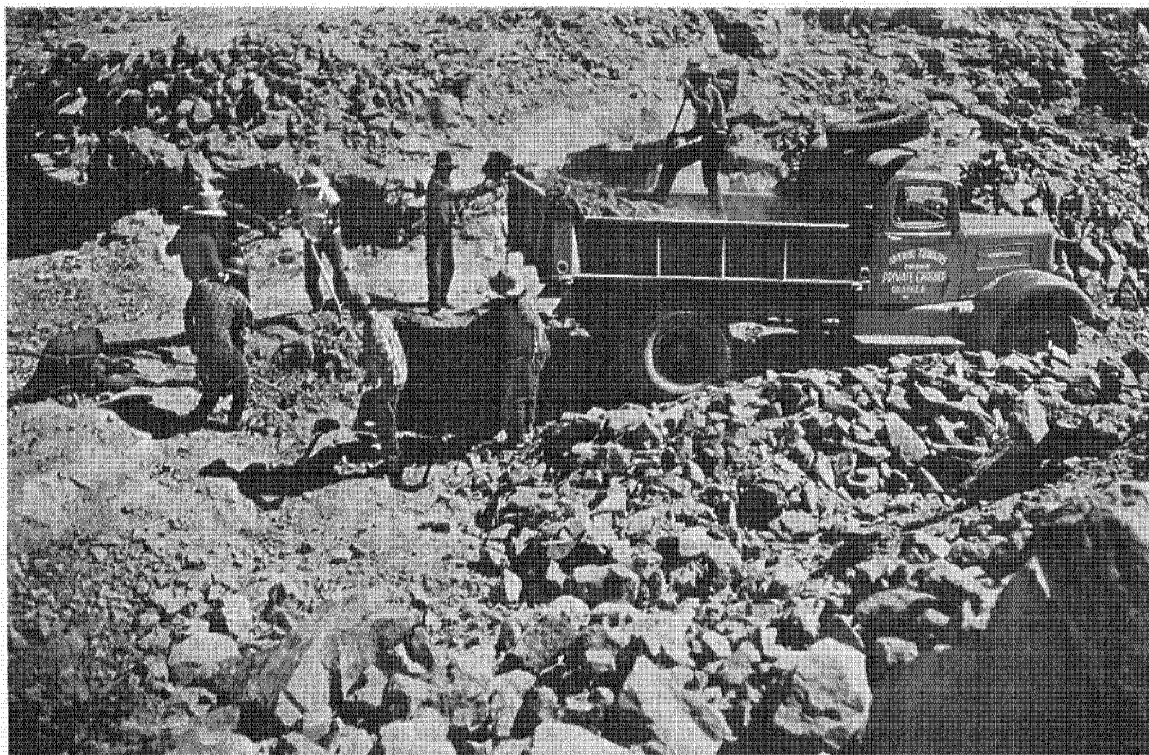
Water droplets slide off smooth nylon multifilaments easily. This, plus the fact that nylon itself absorbs little water, means that fabrics dry quickly.



In spun fabrics, short crimped nylon fibers are twisted together into fuzzy yarns. The millions of insulating air spaces trap water, so drying is slower.

Tracking down the atom

Uranium, raw material for atomic energy, is as common as tin but as elusive as the end of the rainbow



Colorado Plateau uranium ore is taken from rim rock or shaft mines, or from exposed outcroppings.

By FRED B. HYNES

Want to pay off the mortgage? It's easy. Your home is sitting on enough uranium to make you fairly wealthy! If you extract all the ore from your city lot, the Atomic Energy Commission will pay you \$35,840 plus a \$10,000 bonus for production from a new mine.

But don't drop this article for Geiger counter and shovel. The uranium ore in your backyard will probably be of such low concentration it wouldn't pay you to dig for it. That \$10,000 bonus is for the discovery and delivery of 20 tons of ore that contains at least 20 per cent uranium oxide after mechanical processing. Chances are, to get the four tons of uranium oxide, you would have to dig a mine a mile deep and process something like two and one-half million tons of rock.

If your home were in the rugged Colorado Plateau, a mine in your cellar might be profitable. For although uranium is one of the most widely distributed elements in the earth's crust, most large U. S. deposits are in remote sections of the high tableland covering the adjoining corners of Colorado, Utah, Arizona, and New Mexico.

Mining this raw material for atomic energy is no easy task. Uranium appears in more than 100

minerals in various rocks, colors, places and depths. Many of the Plateau mines are on the rims of canyons or near the tops of mesas. Deposits are relatively flat with undulating floor and back. Good heights of ore have an alarming way of narrowing down to ribbon-like stringers, and stringers always offer the alluring possibility of bonanza. The unpredictable nature of the ore bodies prevents advance planning for systematic extraction. The deposits worked to date are shallow, with the usual access an incline seldom more than 300 feet long. As underground haulage lengthens, new inclines are driven.

Roads are dusty washboards in summer and slippery nightmares in winter. Rainstorms and melting snows in spring may wash out all roads. Then in summer the region dries into a vast, kidney-shaped dust bowl. In most seasons miners must haul every drop of water used for exploratory mining.

In spite of its inhospitality to man, the Colorado Plateau produced uranium for the atomic bombs that brought an end to World War II. Now scientists, engineers and statesmen look to the Plateau for the invaluable isotopes for medical and chemical research, bombs for national defense, and future power for industry.

Mining in this region got its start when the

canary yellow carnotite and the blood red meta-hewettite to be fine battle paint. Even today, Navajo women rouge their cheeks with this red ore. As war became a losing game against the white man's more powerful weapons and numbers, interest in these colors—and the minerals—fell off.

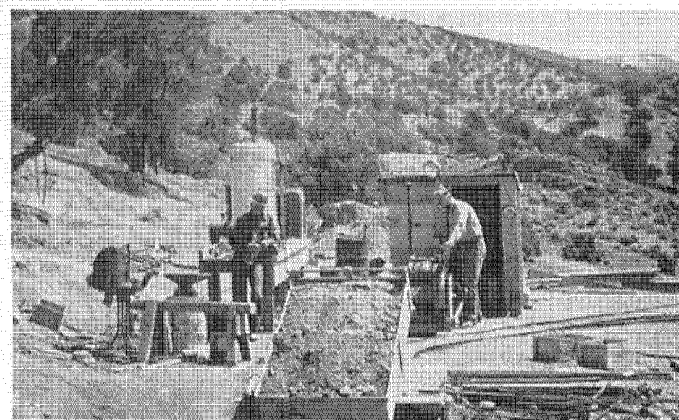
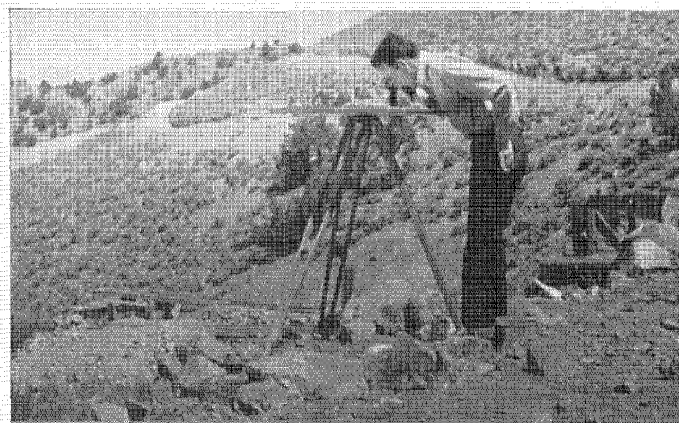
The deposits lay undisturbed until after the turn of the 20th century when carnotite ores in the Plateau were found to contain radium. An industry was born in this remote country. Mills were built and the tedious process of mining radium ores began.

In those days uranium was merely a by-product of radium. By 1923 the Colorado Plateau had given up half a pound of radium—and 1,600,000 pounds of uranium oxide. This poor cousin of radium sold at \$1.75 a pound and was used only in the coloring of glassware and ceramics.

Discovery of high-grade radium ore in the Belgian Congo brought the thriving U. S. industry to a sudden halt. The Belgian miners were able to drop the price so low the Colorado operations could not compete.

In 1936 the United States Vanadium Corporation started construction of a vanadium mill at Uravan, Colorado. Three years later the Vanadium Corporation of America began mining at nearby Naturita. Then came World War II and a critical

Combining of the 60,000 square mile Plateau has increased the number of operating mines from 16 to more than 200.



A ton of uranium ore—about 5 to 10 per cent of a shift's production—being hoisted from the Prospector mine.

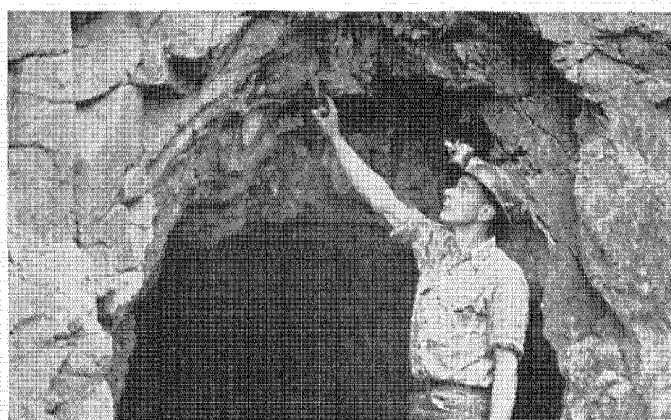
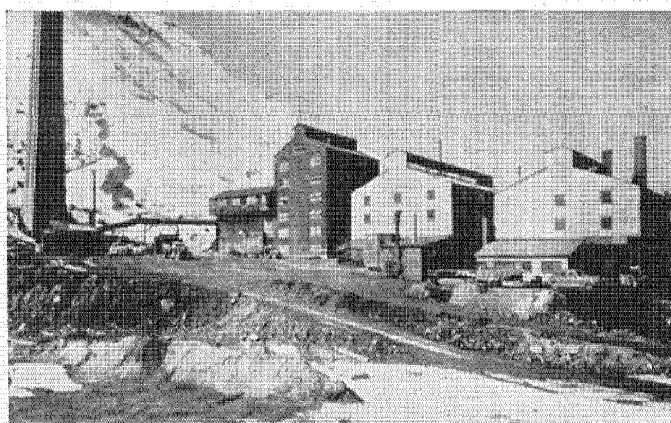
plants were constructed under government contract—one at Durango, Colorado, and the other at Monticello, Utah. A plant at Rifle, Colorado, was rehabilitated. Again the Indian paint pots were paying off.

Uranium re-entered the scene in 1940 at Uravan when United States Vanadium began producing the oxide as a coloring agent for ceramics. Still the real Cinderella of the Plateau lay undiscovered.

Uranium for atomic energy came as a great surprise. In 1939 atomic scientists bombarded uranium with neutrons and concluded that atoms of uranium actually could be split in two by the bombardment. Here, at last, was atomic fission. It can all happen in a fraction of a second, as in a bomb explosion. Or this power can be released slowly in an atomic power pile to do useful work.

When the idea of an atom bomb materialized, uranium jumped to inestimable value in the nation's war effort. The Uravan plant then boasted the only commercial production of uranium in the world. Without an inkling of the bomb, the Plateau companies made available to the Manhattan Project all uranium that could be recovered from known sources. Accumulated stockpiles of waste from vanadium mills were used to fill the immediate need. Plants and housing units were built, facilities modified to

Mining and milling uranium are accomplished by private companies such as this one. The AEC is the sole buyer.



Pratt Seegmiller, discoverer of uranium in Utah's Marysvale district, points to high-grade ore in Freedom mine.

recover uranium, workers recruited and the mining accomplished in secrecy.

After the war all but two of the plants closed. Demand for vanadium fell below prewar level. Again stagnation crept over the Plateau.

This time the slumber was not for long. The race was on among major nations for uranium ores wherever they could be found. The world's richest deposit is the Haut Katanga region of the Belgian Congo. The second most important mine is in Canada's Northwest Territory. But the United States didn't want to remain dependent on foreign sources. In 1948 the then-new Atomic Energy Commission organized the Colorado Raw Materials

technique, "Du Pont" has been synonymous with "dynamite" to the miners.

Mining and milling uranium are accomplished by private business in the Plateau. The Atomic Energy Commission, the sole buyer, furnishes free testing and encourages prospecting and mining by setting good minimum ore-buying prices. Small amounts are resold to schools, industry and organizations for research purposes only.

Collecting of colored rocks by Pratt Seegmiller, a tourist camp operator near tiny Marysvale, Utah, led in 1949 to one of the most important uranium discoveries in America. Underground exploration and development are being pushed by Vanadium



Colorado Plateau—dust bowl in summer and wasteland in winter. To miners here, "Du Pont" is synonymous with "dynamite."

Office at Grand Junction, Colorado, to keep this nation in the lead in the atomic energy field. By mid-1950 all wartime plants were out of mothballs and busy recovering uranium. This time vanadium was the by-product.

Fine-tooth combing of the 60,000 square mile Plateau has increased the number of mine operations from 16 to more than 200 in two years. The Navajo Indian Reservation contains some of the highest grade ores now being mined, and the Indians are again digging the old war paint minerals. Today, though, they work for modern mining companies using jackhammer and dynamite.

Throughout the history of mining in the Colorado Plateau, Du Pont has been on hand to supply the explosives needed. In the early days, Du Pont dynamite was shipped by narrow-gauge railway and then hauled to the mines over bone-jarring roads. Now everything is faster and more efficient. Huge trucks carry a full carload of explosives. Airplanes span the rugged terrain quickly; diesel-powered loaders speed the work underground; and short-wave radio brings the distance between mines to a matter of seconds. From the oldest through the newest mining

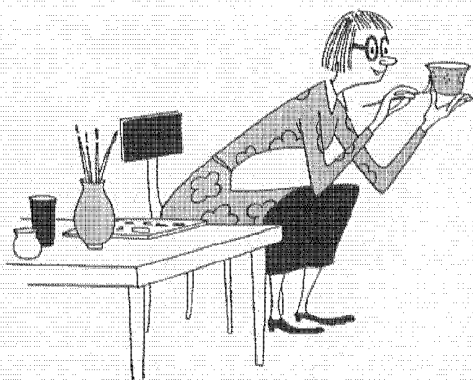
Corporation of America and the Bullion Monarch Mining Company.

In July 1950, a Navajo Indian, Paddy Martinez, discovered uranium ore on Haystack Mountain near Grants, New Mexico. The deposit looks rich and extends in a belt 6 to 10 miles wide for 80 miles toward Gallup. Made public in December, the discovery quickly turned Grants into a "uranium rush" town.

The United States and other countries are still at the stage of rounding up rich deposits. Experts say our chances of finding a Belgian Congo-size mine are slim. Our future in atomic energy lies rather in revolutionizing methods of prospecting and processing low-grade ore. What geologists call "abnormally high concentrations" of uranium deposits, such as Florida's rich phosphate beds and the east-central U. S. oil shale, can furnish the raw material for industrial atomic energy.

There is no magic glass slipper for this Cinderella of metals. But American research and business know-how may soon bring a new era of atomic power. Then your backyard may pay off.

Did you know

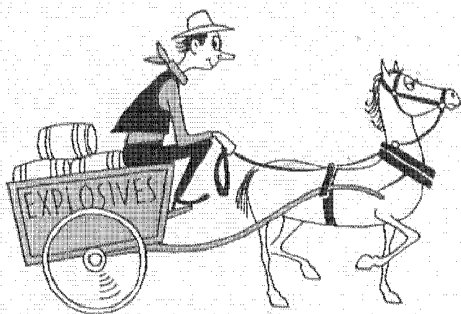


... DU PONT SELLS GOLD? Finely divided gold powder is made by the Electrochemicals Department for decorating pottery, china and ceramic surfaces.



... TWO OF THE MOVIES that won the New York Film Critics' 1950 awards were shot on Du Pont motion picture film? They were "Sunset Boulevard" and "Father of the Bride."

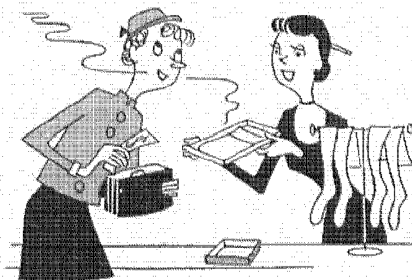
... FLAX SEED TREATED with "Ceresan" seed disinfectant, says an Iowa State College bulletin, "more than doubled the number of flax plants that came up? In addition to cutting seed costs, treating gave an average gain in yield of six to nine bushels."



... A METAL KEG for shipping black powder was designed and patented by young Irénée du Pont, II, about a century ago, to save money for the Company and its customers? These kegs proved to be tougher, safer and more weather-tight than the old wooden ones.

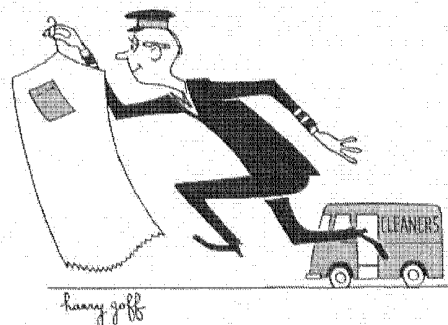
... ONE TYPE OF NEOPRENE, Du Pont's chemical rubber, is made especially for addition to wood pulp at the beater? It improves the wet strength of the resulting paper.

... NYLON MONOFILAMENTS were selected for the Toni doll wig because they are easy to wash and retain their fresh glossy appearance?



... CLOTHING MANUFACTURERS spray perfume on packages containing hose, blouses and other garments? Adding nose appeal with a Du Pont aromatic, they have found, is an inexpensive way to make their products more salable.

... SIX "FREON" FLUORINATED HYDROCARBONS, manufactured by Du Pont's "Kinetic" Chemicals Division, are now available commercially for use as refrigerants, propellents, and for other applications? Still other "Freon" compounds are currently going through the pilot-plant stage of development.



... ACCORDING TO AN ESTIMATE of the U. S. Chamber of Commerce, Americans pay more than a billion dollars a year for dry cleaning? When Du Pont "Perclene" perchlorethylene is used to dry clean your clothes, they come back brighter and cleaner.

... DU PONT'S "CAVALCADE OF AMERICA" was awarded first place in the radio category by Freedoms Foundation for 1950? The award was made by Gen. Omar N. Bradley for "outstanding achievement in bringing about a better understanding of the American way of life." This is the second time "Cavalcade" has won a Freedoms Foundation award.



Western Union operator inserts telegram in facsimile equipment for transmission. At left, telegrams are received on recording paper.

You write on it with electricity

This sensitive paper, developed by Western Union and coated with a Du Pont lacquer, can receive telegrams—or measure heartbeats

A versatile recording paper on which Western Union will "print" more than two million facsimile telegrams this year is also finding an application aboard fishing vessels, in medical research centers and in aircraft engine plants. That's only a sample of its applications. The paper, called "Teledeltos", is electrically con-

ductive and is coated with an opaque lacquer made by Du Pont especially for the purpose. The lacquer turns black instantly after exposure to electric current. The paper can be made in a variety of colors, including gray and the familiar Western Union yellow for telegraph blanks.

The tough but pliant product is backed with an aluminized lacquer that prevents smudging. Its outstanding characteristics, though, are its extreme sensitivity to electricity and indifference to heat and light, the twin scourges of other recording papers.

Western Union developed "Teledeltos" for its facsimile systems, and believes that most telegrams

may be transmitted in this manner eventually. Its main use today is within large cities—between offices of business firms and the central telegraph office—but experimental work is going on to extend its use to intercity communication.

In a businessman's office, facsimile involves placing a typewritten or handwritten message in a machine where it is scanned by a photoelectric cell. Electrical impulses thus created are transmitted by wire to the main telegraph office and transferred to "Teledeltos" recording paper in a second machine synchronized with the first. The result is a clear reproduction of the original message. Many thousands of these machines are now in use or in production, and more than 1,000 are to be installed in Washington alone.

FISHERMEN USE IT, TOO

The unique paper is used aboard ship in recording fathometers. These instruments, by means of echo soundings, indicate on a graph the depth of the sea and provide a continuous record of soundings valuable to the navigator. The fathometer's sound waves also will rebound from schools of fish and record the echo on "Teledeltos". Fishermen are thus able to read the depth and bearing of the school in time to get out their nets.

The paper does a similar job in many other instruments. For doctors it records the tell-tale line of heartbeats and the tiny electrical impulses that are "brain waves"; for aircraft engineers it records the performance of powerful engines, and for the railroad man it provides a record of train movements on a chart 30 inches wide.

Perfecting a formula for the opaque lacquer kept chemists busy for years. Then when production was under way, new problems arose. Certain batches of the finish were too dark, making the electrically-marked records hard to read. This was corrected by improving one of the raw materials.

On top of this, Western Union and Du Pont pressed—then as now—for a still better electrosensitive recording blank. More months of research followed. Their ultimate success was attested when the unusual utility of the new recording paper was recognized by the Franklin Institute of Pennsylvania, with the awarding of a medal to Raleigh J. Wise, Research Engineer of Western Union, for its development.

Wherever electricity has been harnessed to provide a written record in this manner, the useful paper with its lacquer coating made by Du Pont can be counted on to reproduce the information accurately and permanently.

Apple a day? Not without spray!

Many a gardener has nurtured a backyard apple tree to maturity only to find that the worms have beaten him to the harvest. If it wasn't worms it was disease that raised hob with his crop.

Blemish-free apples—the kind illustrated in the nursery catalogues—used to come only from large commercial orchards, because it just wasn't practical to wage chemical warfare against pests on a one- or two-tree scale. Commercial growers may spray a dozen or more times a season with a different combination of chemicals each time. The backyard Burbank had to be pretty set on growing his own to adapt a schedule like that to his garden plot—and besides, safe and easily used chemicals for the gardener were unknown.

Now a new product, Du Pont Fruit Tree Spray, offers the "one-tree" man better than a fighting chance to enjoy the fruits of his toil—his home-grown apples, peaches, pears, cherries and plums. It works well on strawberries, currants and gooseberries, too. The new spray is a combination of chemicals which have proved successful in commercial orchards. This one spray protects plants against most common insects and diseases, and can be applied repeatedly without burning foliage or leaving a toxic film on the fruit. A complete spraying schedule is printed on the label.

If you spray your trees or bushes regularly, fertilize them properly, and follow the other horticultural practices recommended for your locality, you've accounted for most of the hazards.



Toward complete self-service

Prepackaging of produce is out to eliminate the last of the bottlenecks in today's supermarket

By B. L. SMITH

The modern "cook's tour" through a supermarket winds up and down aisles crowded with merchandise in cans, glass jars, boxes and bags, all within sight and easy reach. Baked goods, dairy products and meat, in turn, have joined the trend toward complete self-service. Even the lamb chop has doffed its pantie and donned a full, sparkling suit of cellophane.

In many stores only one major bottleneck besides the check-out line remains to delay shopping—the produce department where outdated merchandising methods often prevail. Here the customer often must wait for fruits and vegetables to be sorted, weighed, packaged and priced.

Elimination of this bottleneck hinges on the "self-servicing" of the produce department; having fruits and vegetables already washed, weighed, packaged and priced, ready for the housewife to pick up. The key to the operation is prepackaging, in which Du Pont cellophane, cellulose acetate and polythene films play a vital part.

Currently, the limited supply of these packaging films has limited this final step toward 100 per cent self-service. But when the film supply picture improves, there is every reason to believe that the old-style produce department will be a thing of the past in the great majority of modern stores.

GREATER EFFICIENCY, LESS WASTE

The impetus for produce prepackaging comes equally from the housewife and the retailer. The housewife has discovered the numerous advantages of prepackaged produce over bulk. She likes the fact that prepackaging preserves freshness and protects vegetables from excessive handling. She appreciates not having to wait for clerk service and enjoys the convenience of products that are already washed, trimmed and graded. And she has found the package ideal for storage in the refrigerator, too.

The progressive retailer recognizes in prepackaging a potent ally in keeping his store overhead low. In the first place, self-service increases the market's efficiency by insuring that more customers can buy more produce in a shorter length of time. Equally important, prepackaging safeguards the natural freshness of vege-

tables, thus reducing losses due to waste. And waste is of interest to consumers, too, because it is reflected in the family food bill.

Today virtually all supermarkets carry some prepackaged produce—the familiar bag of washed spinach, the tray of tomatoes, the bag of potatoes. They may have been packaged at the store, at a terminal warehouse or even on the farm by the grower.

In some cases the supermarket has taken the initiative in adopting a full-scale prepackaging program. Jewel Food Stores in the Midwest, for example, have achieved 100 per cent self-service in some of their units through store packaging. American Stores have pioneered in central warehouse packaging of produce, and many other food chains and independent supermarkets are making comparable progress. A&P conducted an extensive test in Columbus, Ohio. It uncovered basic data on produce prepackaging that formed the basis for the chain's own program.

MARKET STUDIES UNDERWAY

The number of produce items packaged at the grower and warehouse level is constantly growing. Executives of two leading food chains have said they would like to see all fruits and vegetables packaged for them by either the grower or the terminal packer, if the quality and supply were dependable. There is no immediate evidence that prepackaging of produce will be confined to any one level—grower, terminal warehouse, or retail.

Recently a prepackaging association, representing produce packagers at all levels, was organized to maintain standards of quality and to facilitate the exchange of ideas and techniques. The U. S. Department of Agriculture is also delving into the many problems of prepackaging and is releasing information and statistical data to the industry. Suppliers of packaging materials and equipment are improving materials and methods, and providing helpful marketing information.

Du Pont, for example, is conducting a broad survey among consumers who have been exposed to prepackaged produce to find out what they like and dislike about it—basic information that can give direction to the industry's future plans.

This is how produce prepackaging stands today. When transparent packaging materials come into increased supply, the housewife can look for continued progress in eliminating the last remaining department bottleneck in the supermarket.



Of men and hats

How the Lee Hat Company adds longer wear and protection to headgear with Du Pont "Aridex" renewable water repellent

With the decline of long pants as a measure of manhood, the maturity of the average American male may fairly be dated from the time he dons his first felt hat.

This excepts, of course, the one man in five who walks through life bareheaded. He is the despair of the hat industry . . . and often his wife disapproves, too.

For the other four-fifths of the male population, the putting aside of the basketball jacket and the assumption of hat and topcoat is a significant rite.

Perhaps the solemnity of that first moment explains the seriousness with which a man approaches a hat store. A woman may buy a new chapeau because she's blue; a man views the step as a long-term investment.

The Hat Research Foundation reports, for example, that the average hat-wearing male buys one and a half hats a year. His wife buys eight.

Since fashion and fancy have so little to do with

his choice, a man wants a hat that will give him long service, good appearance and will resist the weather.

With this in mind the Frank H. Lee Company of Danbury, Connecticut, has begun treating all of its fur felt hats with Du Pont "Aridex" renewable water repellent. Lee found that a hat treated with "Aridex" stayed cleaner longer and resisted the effect of rain and snow, non-oily spots and stains.

But most important, according to Dr. Harold H. Tucker, the Lee Company's chemical consultant, "Aridex" helped hats keep their block, or shape. Because "Aridex" helps prevent water saturation of the felt, a hat has less tendency to shrink or change its shape.

This advantage is especially important in light of the trend toward pre-shaped hats, which are scientifically molded at the factory to harmonize with the features of the individual wearer.

In testing the effectiveness of various water repellents, the United States Testing Laboratory found that the resistance of a Lee hat to water was almost tripled after it was treated with "Aridex". The Lee Company chose "Aridex" because, as company officials

said, "... We have not found a technique or process, regardless of cost or method of application, that will give as high a water-resistant rating ..."

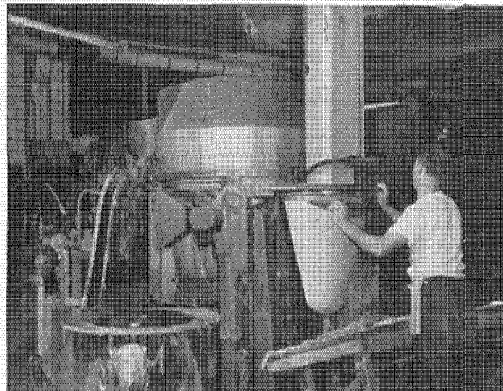
The majority of men's hats are made of hare and rabbit fur from Australia and the British Isles. The felting property of fur was discovered some 300 years ago when, according to legend, a resourceful monk plugged a hole in his shoe with a bit of rabbit pelt. On he trudged, not realizing the significance of his economy until much later, when he removed the hide and found that the fur fibers had knitted together, forming an almost solid layer in his shoe.

In a modern hat factory, the sheared fur is first blown onto a large copper cone. Repeated applications

of heat, pressure and moisture—the principle of the monk's shoe—curl the individual fur fibers tighter and tighter, forming a solid cone of fur felt. Later, the cone is shaped into a crown and brim. It is then dyed, shrunk and finished to the color, size and shape of the hat you see in a store window.

There is a hat for every occasion in a man's life—one for business, another for strolls in the country and still another for churchgoing and the Easter parade. Whether or not he owns the complete selection, a man wants, above all, a hat that will give him good service in all types of weather and retain its new look longer. The Frank H. Lee Company is using "Aridex" to give him just that.

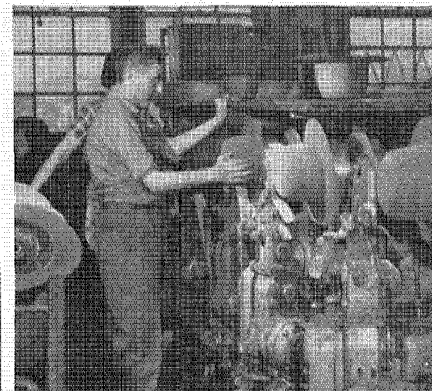
A hat in the making. Cone of fur felt is stripped from copper form by a workman.



Several applications of hot water and pressure shrink cone to half its original size.



Automatic ironer shrinks it further. "Aridex" is applied in latter stages.



Trouble shooting with "Teflon"

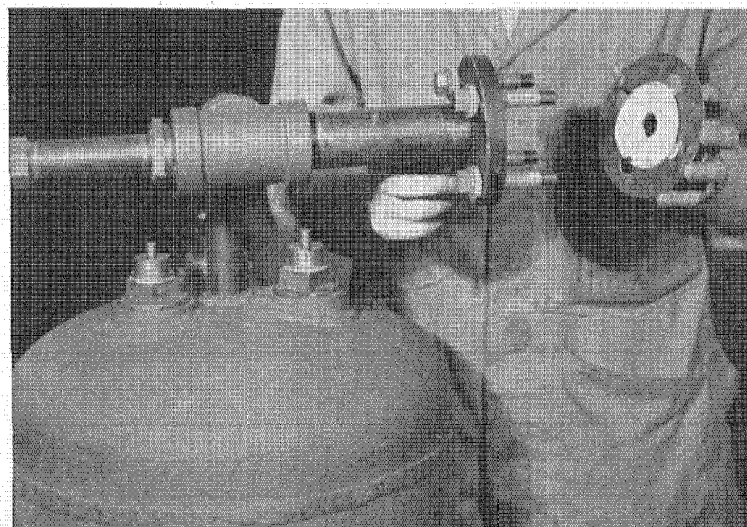
A few years ago, the Livingstone Engineering Company developed a portable steam generator. It looked promising but had one drawback. Too often, steam leaks short circuited the electric generators at the point where the electrodes entered the boiler. Rigid specifications called for complete insulation and steam seal at these points against high temperatures and pressures.

To correct that one fault, a material was needed with exceptional electrical insulating properties, heat-resistance, zero water-absorption, and strength under relatively high pressure.

A number of materials were tried as insulators and gaskets, including plastics, varnished glass-fiber materials, insulating tapes and rubber. A few gave good results for a short time. Invariably, however, electrical breakdowns occurred when the material absorbed enough moisture.

Then "Teflon" tetrafluoroethylene resin was tried. It was used as electrode housings and gaskets and wherever the steam generating tank contacted other parts. Failures stopped. With "Teflon" a complete, long-lasting steam seal was obtained.

Now these unique portable steam generators give trouble-free service for such jobs as sterilizing of food equipment, spray painting, steam-jet cleaning, and as a source of steam for laboratories and small businesses. This is another of the perplexing industrial problems successfully met by Du Pont's "tough guy among plastics." There are so many problems, in fact, that "Teflon" is now in very short supply. However, limited quantities are available from Du Pont's Polychemicals Department for development work.





Buyers prefer "blondes"

And Du Pont "Mycoban" mold inhibitor helps keep these popular Brown 'n Serve products wholesome

The wail of a fire siren in the town of Avon Park, Florida, signalled the birth of the Brown 'n Serve baking process two years ago. Later events have proved that the new process well deserved that spectacular send-off.

The siren's howl interrupted the labors of an ex-GI named Joe Gregor, who had popped a batch of Parker

House rolls into his bakery oven a few minutes before. Joe, a conscientious volunteer fireman, pulled out the partly-baked rolls, doffed his apron and ran out the door.

Returning from the fire, he found the rolls rigid and pale in the tray. Figuring he had nothing to lose, Joe put them back in the oven. Seven minutes later a delicious aroma filled the shop. The rolls were taken out, golden-brown and tempting. Something clicked in Joe Gregor's head, and the Brown 'n Serve interrupted baking process was launched.

A General Mills salesman got wind of the new

development and reported it to his company. General Mills bought the process and handed it to the nation's bakers in the fall of 1949. The trade promptly nicknamed Brown 'n Serve rolls "blonde" goods because of their characteristic whiteness. What has happened since they went on the market still has the bakers popeyed.

No one was certain of consumer reaction in the beginning. One cautious baker gave away 3,000 rolls the first week. The next week he sold 22,000. Within seven months, 1,767 bakeries were turning out more than 66,000,000 Brown 'n Serve rolls every week, many of them protected from mold by Du Pont "Mycoban" sodium propionate.

Experiments showed that Brown 'n Serve bakery products, unlike conventional baked goods, could be stored for days without any danger of their turning stale. But this increased shelf life heightened the danger of mold or rope, a bacterial disease. That's where "Mycoban" enters the story.

"Mycoban" is a sodium or calcium propionate mold and rope inhibitor made by the Du Pont Polychemicals Department. Propionates occur naturally in many foods. A well-ripened swiss cheese, for example, may contain twice as much as a loaf of bread to which the recommended amount of "Mycoban" has been added by the baker.

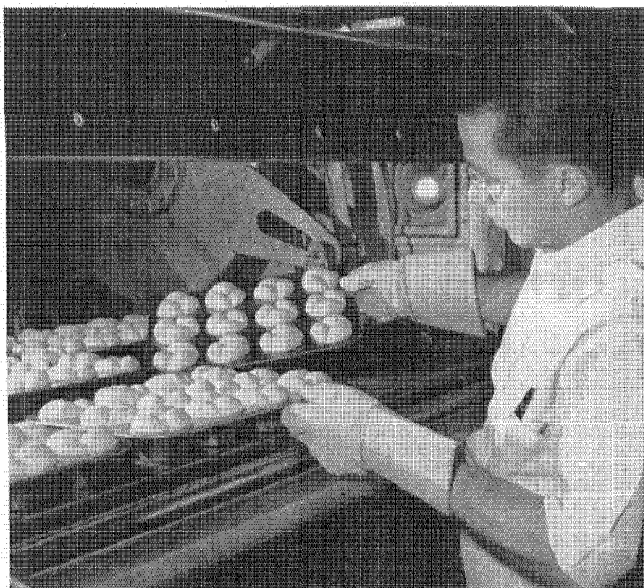
The Polychemicals Department knew that "Mycoban" provided outstanding protection against mold in conventional baked goods. It then conducted a series of tests to measure the effectiveness of the product in the new Brown 'n Serve line. Results were highly satisfactory.

The tests showed that Brown 'n Serve dinner rolls without "Mycoban" became moldy within five days after baking and exposure to mold spores. Rolls containing it, treated similarly, remained mold-free for an average of 12 days—more than twice as long. And "Mycoban" substantially increases the mold-free shelf life of Brown 'n Serve cinnamon rolls as well.

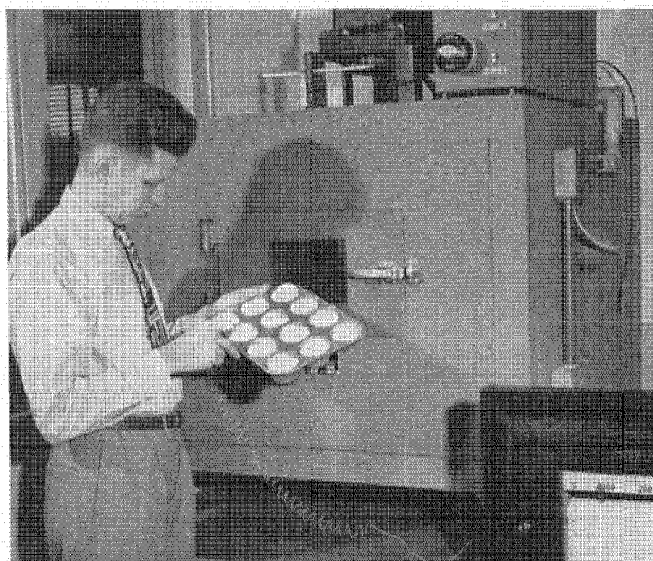
The test results have been backed up by the experience of bakers now using "Mycoban" in their Brown 'n Serve dinner and sweet rolls, coffee cake, Danish pastry, hot cross buns and half a dozen other varieties of bakery products.

A spokesman for one of the largest bakeries in the East says, " 'Mycoban' is used here in all our products to make them stay good days longer . . ." The manager of another large bakery in the South adds, "To fully protect (Brown 'n Serve) products, extend shelf life and avoid molded products reaching the consumer, 'Mycoban' was selected and is being used with 100 per cent satisfactory results." These experiences are echoed by many other bakers all over the country.

At least a dozen varieties of baked goods are prepared now in the convenient Brown 'n Serve manner, and more are on the way. As they win added public favor, "Mycoban" will continue to serve baker and consumer alike by protecting the "blonde" goods' wholesomeness.

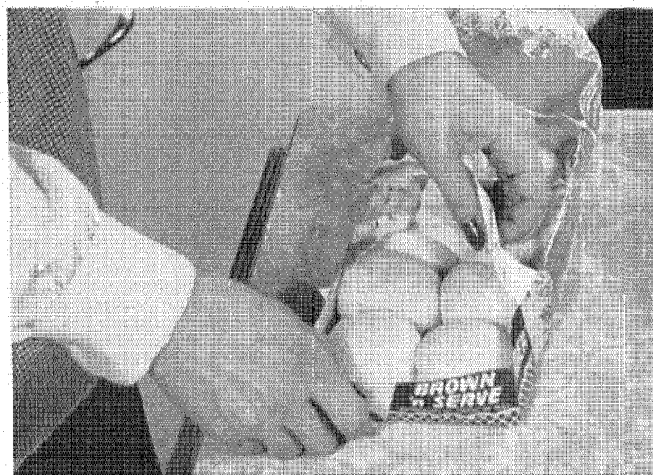


Hundreds of tests like this were run off in the General Mills laboratories to improve the Brown 'n Serve process.



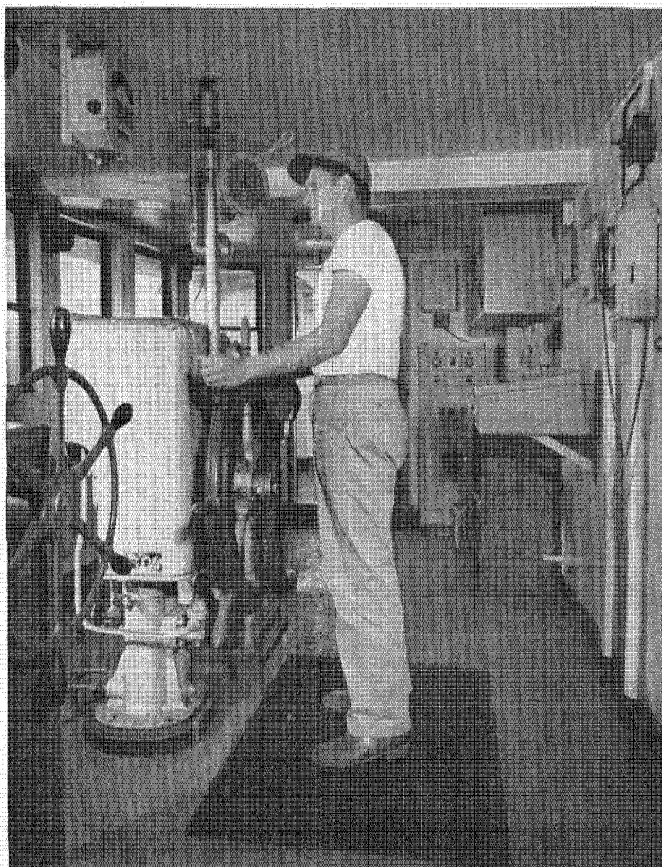
Here physicist prepares to measure temperatures inside a roll during baking, using a recording thermocouple.

Protected against mold by "Mycoban", these rolls can be stored safely in the kitchen for as long as twelve days.

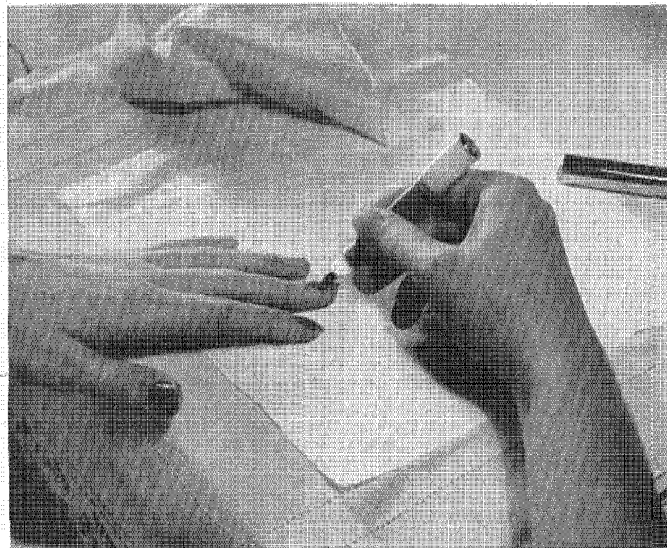


What's New

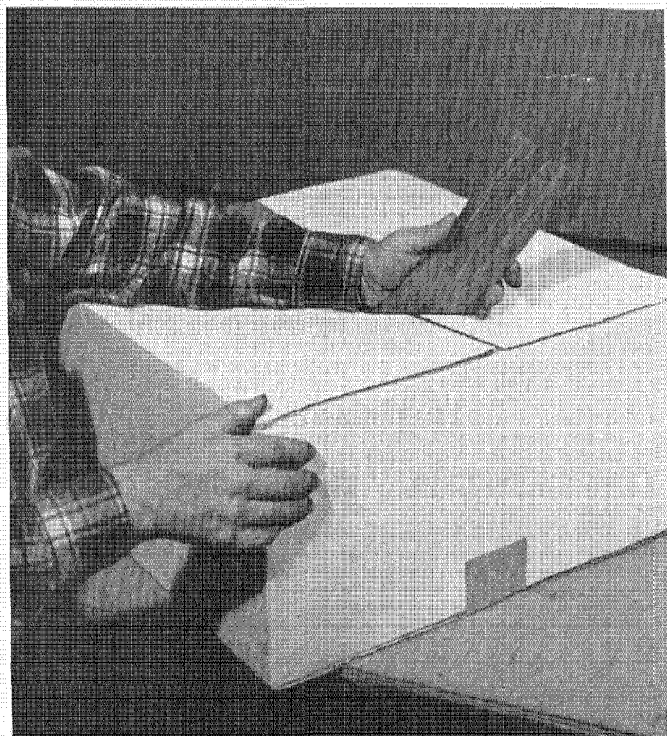
● **FLAT WALL PAINT**—Americana Colors. A new washable, streak- and mar-resistant flat wall paint, under development by Du Pont for more than two years, will be on the market this spring. It comes in nine basic deep colors, which may be intermixed to achieve a wide range of decorator colors.



● **EASIER ON THE FEET.** This fire-retardant neoprene mat was especially developed for use aboard steel-decked ships. Its ribbed construction is flexible enough to help relieve fatigue of helmsmen who must stand watch for several hours. Because neoprene resists oils, grease and many chemicals, the "Sani-Flex" mat also offers long service for use in shops, packing houses, chemical plants and the like. Made by the Mid West Development Company of Pontiac, Michigan.



● **FOR A QUICK, EASY MANICURE** here's a new nail polish applicator made of nylon plastic, containing the polish and brush in a single unit. Remove the gold-finished cap, squeeze the nylon tube gently, and the proper amount of polish collects in the brush. The tube can be refilled easily, and it takes up no more room in your handbag than a long lipstick. Manufactured by Fuller Associates, Inc., of Bridgeport, Connecticut, it's called "appliCator" and is on sale at leading department stores.



● **REINFORCED SEALING TAPE.** A new tape made of two layers of kraft paper interlined with Du Pont "Cordura" rayon yarn is said to have several times the strength of ordinary kraft tape. "Snake Tape" comes in six widths and has a water-resistant asphalt coating. The manufacturer is the Angier Corporation of Framingham, Massachusetts.

● **NEW BUILDINGS PLANNED.** Du Pont will build a \$2,700,000 center for the study of animal nutrition and disease near Newark, Delaware, and has tentative plans for constructing a modern office building near the same town.

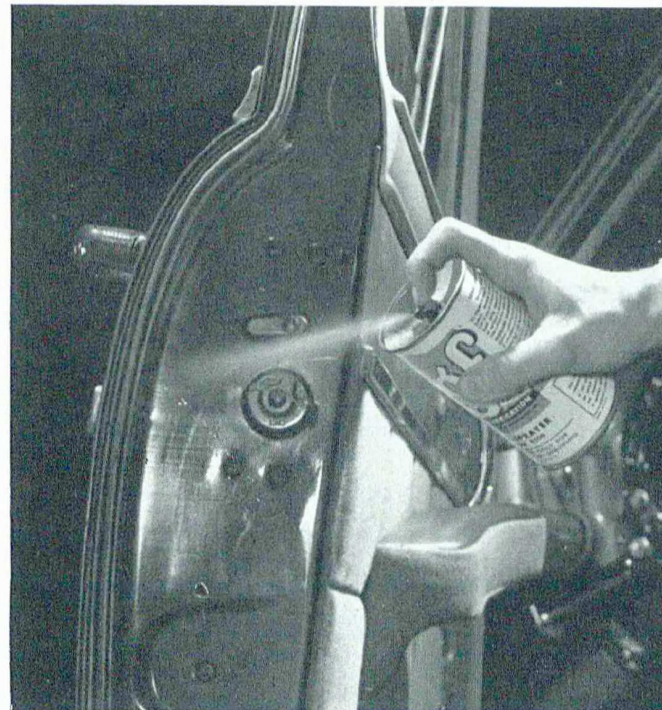
The laboratory, to be built on a 291-acre farm, will be concerned with the application of new synthetic chemicals to the control of parasites and insects and of bacterial and virus diseases in animals.

● **TO EXPAND H₂O₂ PRODUCTION.** Du Pont plans to build a plant near Memphis for the manufacture of hydrogen peroxide, a chemical used widely in the textile, paper and rubber industries. Many natural and man-made fibers are bleached with hydrogen peroxide, and it has been used increasingly as a bleach for paper pulps. The chemical will be produced by an improved process, developed by Company scientists after six years of research. Production, scheduled to begin some time next year, will supplement current output at plants in Niagara Falls and Dresden, New York.



● **SHINES BETWEEN TINES.** This spongy polishing block made of neoprene, Du Pont's chemical rubber, is designed to simplify the chore of cleaning tarnished silverware. It has grooves for getting at stubborn stains on fork tines, a flat surface for knife blades, rounded sections for spoons, and can be used for cleaning trays, vases and other hollow ware. The manufacturer is Seager & Seager, Glendale 5, California.

● **IMPROVED DDT.** Du Pont has developed a new DDT formulation for crop spraying called "Deenate" 75-W DDT insecticide. It contains 75 per cent technical DDT and supplants the 50 per cent DDT wettable powder. Field tests show that the new product leaves a higher deposit of DDT on sprayed surfaces and has the same suspensible and wettable qualities as the older insecticide. It comes in one- to seven-pound packages and in 50-pound bags.



● **SERVICE STATION AID.** This dry graphite lubricant, "dgg-123", is one of the latest products to be packaged in a handy aerosol container. Press the button and the "Freon" fluorinated hydrocarbon propellant inside the can does the rest. Recommended for auto door lock assemblies, leaf springs and speedometer cables. Marketed by the AP Parts Corporation, AP Building, Toledo 1, Ohio.

● **LABORATORY DEDICATED.** The Marshall Laboratory in Philadelphia, a new center for Du Pont paint research to be dedicated this month, houses 130 chemists, engineers and physicists engaged in developing new finishes and improving existing ones. The \$2,500,000 laboratory is one of the most modern in the country.

● **THE BAZOOKA'S NEWEST COUSIN.** The Du Pont Jet Tapper, a new tool for tapping open hearth furnaces, is now available to the steel industry. It's a relative of the armor-piercing "shaped charge" used by the military and the Du Pont Jet Perforator for oil wells, and has many advantages over present tapping methods from the standpoint of both safety and efficiency. For descriptive booklet "D" write the Du Pont Company, Explosives Department, Room 5510 Nemours Building, Wilmington 98, Delaware.

More gorgeous flowers ...luscious vegetables...better fruits

made easier with DuPont Chemicals for the Home Gardener



These products are sold in leading garden supply stores and departments.
Du Pont, Garden Products, Grasselli Chemicals Department, Wilmington 98, Del.

Du Pont Garden Chemicals

AMMATE, FERMATE, and PARZATE are registered trade marks.



BETTER THINGS FOR BETTER LIVING... THROUGH CHEMISTRY

NEW FOR 1951

DU PONT FRUIT TREE SPRAY, an easy-to-use disease and insect control spray for the home fruit grower. Spray schedule printed on every package.

DU PONT TOMATO DUST, for control of blights and insects on this popular vegetable.

COMBINATION PRODUCTS

DU PONT FLORAL DUST, all-in-one protection against most of the common insects and diseases of flowers—with *safety* to tender foliage.

VEGETABLE GARDEN DUST, combining effective control of insects and diseases with safety to plants and people.

WEED KILLERS

DU PONT LAWN WEED KILLER, highly effective formulation of 2,4-D—in half-pint can for small lawns, in quart size for larger areas.

"AMMATE" WEED KILLER, the non-selective chemical that kills poison ivy in one application. Use on tree stumps, woody weeds and brush—kills roots and all.

FOR SPECIFIC USES

For the garden specialist, Du Pont offers home garden packages of Du Pont 50% Technical Methoxychlor and 50% DDT Wettable Powder insecticides; and Fungicide-A ("Parzate" fungicide), "Fermate" fungicide and Du Pont Rose Dust fungicide.

