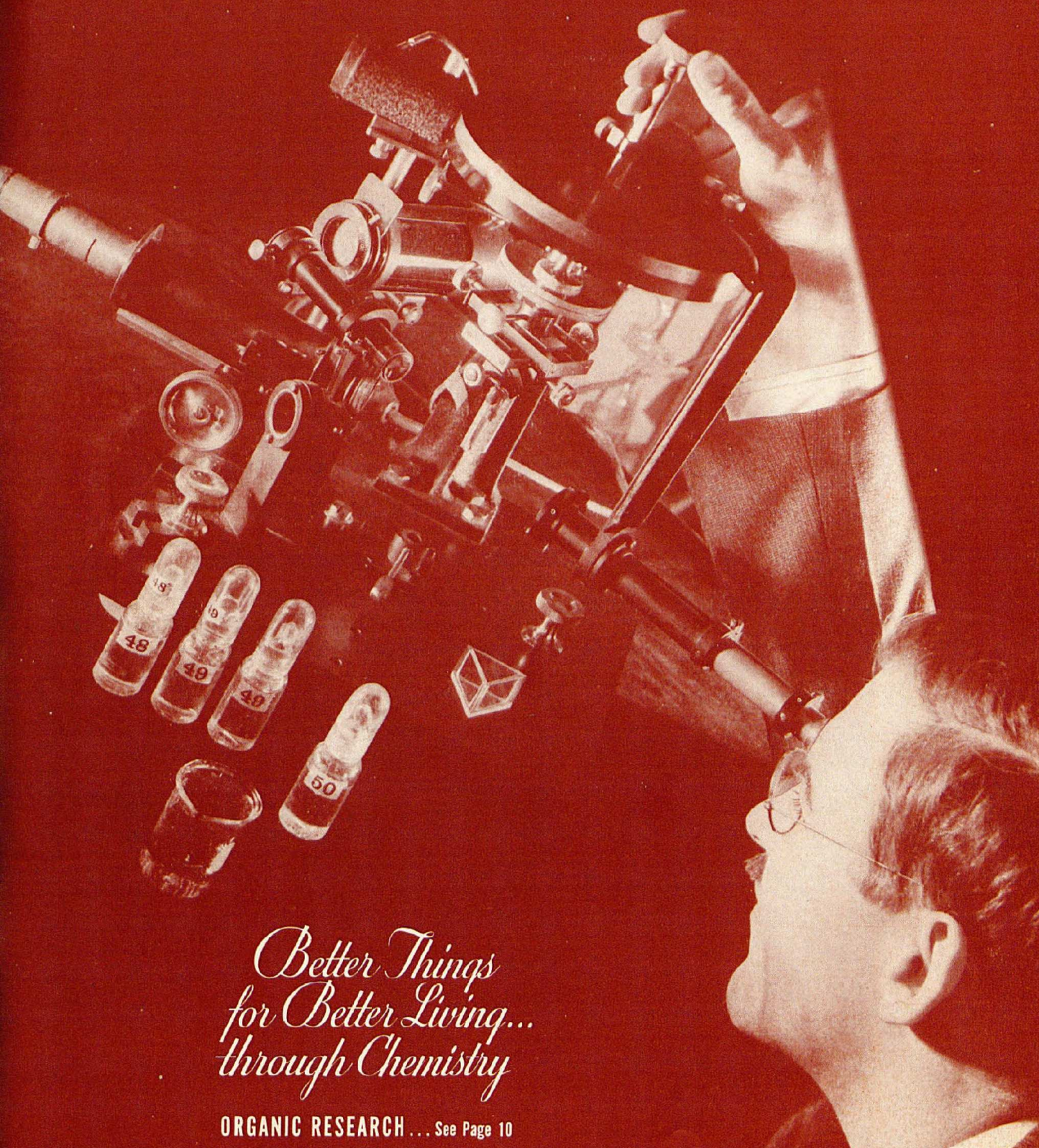


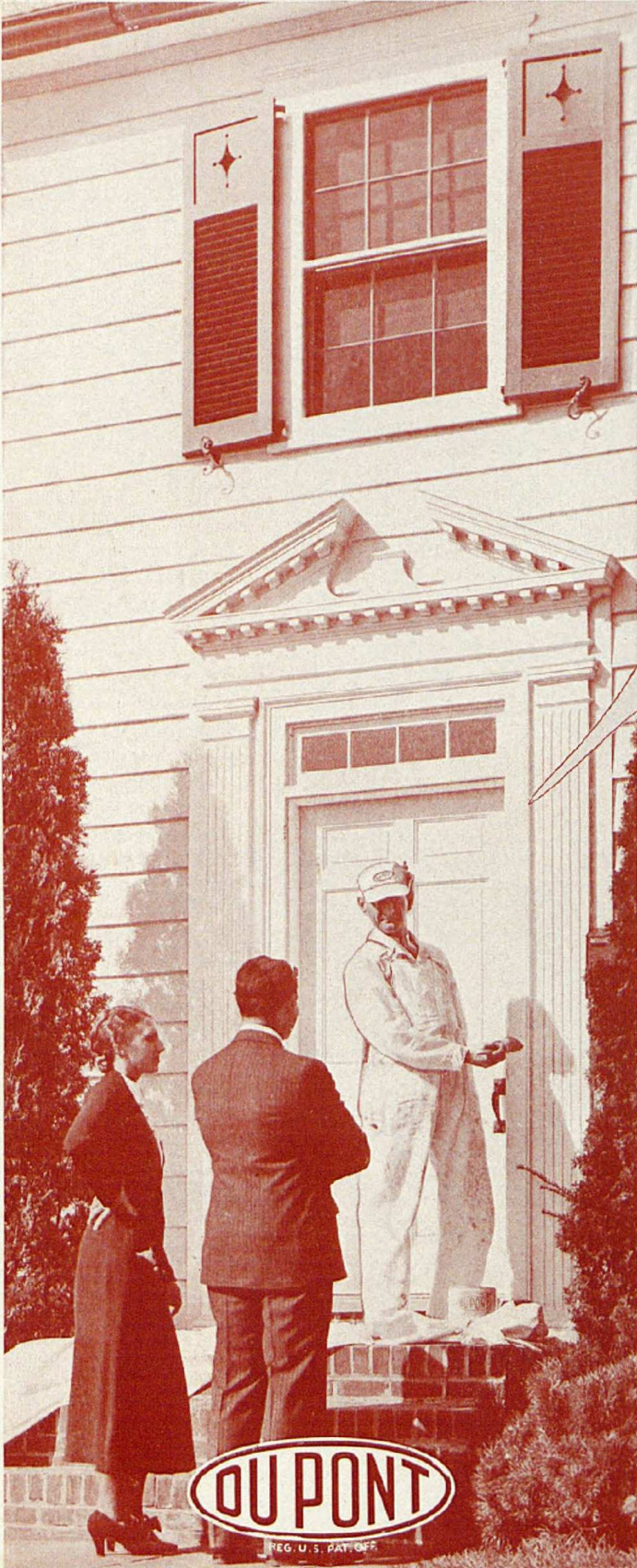
THE DU PONT MAGAZINE

APRIL 1938



*Better Things
for Better Living...
through Chemistry*

ORGANIC RESEARCH ... See Page 10



*You folks
will be proud
of this house
a mighty
long time...*

"... THIS PAINT STAYS WHITER"

"I'm an old hand at this painting business. And I'm glad you folks agreed with me when I recommended Du Pont House Paint.

"This paint is the finest house paint I know of. It's got the whitest pigments in it known to chemistry; just see how much whiter it is than that house next door.

"Another thing. Du Pont House Paint stays white, even in this factory city, where there's smoke and soot all over the place. This paint is what we call 'self-cleaning'. It's made so that rain washes dirt right off, leaving your house as white as it is right now. Dirt just can't stick to it!

"Yes sir, you're saving money by having your house painted with Du Pont House Paint. It stays whiter than other paints . . . and it needs fewer repaintings."

HOUSE PAINT

**STARTS WHITER
STAYS WHITER - SAVES MONEY**

New Frontiers

By DR. CHARLES M. A. STINE

Vice-President, E. I. du Pont de Nemours & Company

The text of an address broadcast over the Columbia Network, February 19, as a part of the U. S. Department of Commerce Radio Series, "Stories of American Industry."

JULES VERNE amazed and delighted the world of fifty years ago by his stories of scientific romance. Could the incomparable Verne be resurrected today, it would be his turn to be amazed. He would find many of the creations of his imagination fully realized.

Curiously enough, the pioneer inventors of our machine age were taken no more seriously than was Jules Verne. Benjamin Franklin's early experiments with electricity were ridiculed. Even the learned British Royal Society was unmoved by his carefully prepared reports. Edison's first demonstration of the incandescent electric lamp caused Henry Morton, president of the Stevens Institute of Technology, to say, "Everyone acquainted with the subject will recognize it as a conspicuous failure." Commodore Vanderbilt, a leading railroad man of his time, dismissed George Westinghouse, the inventor of the airbrake, with the remark that he had no time to waste with fools. The privately organized telegraph companies declined Alexander Graham Bell's offer to sell his telephone for \$100,000. The astute Chauncey Depew confessed that he warned his nephew not to invest \$5,000 in Henry Ford's company because "nothing has come along to beat the horse and buggy."

In the light of modern industry, it seems incredible that these epochal discoveries and inventions were derided, ridiculed and scorned. Yet neither hostile public opinion, restrictive legislation nor threat of physical violence has ever long retarded the efforts of scientific pioneers. Happily, profound changes have occurred in the public attitude toward scientific men and their work. Science has "arrived"; the public is eager to be informed about the latest developments; and scientists themselves are generally regarded as an essential and normal part of society. Perhaps the reason is that virtually everyone has become more or less technician and amateur scientist. At 16 years our children drive the family car, and at less than that age some of them are familiar with the internal mechanism. The elements of aviation, radio and air conditioning are known to millions of people. Although we may have ceased to wonder at science, we still ask, "What's next?"

Without indulging in long-distance prediction, here are a few "next things" that I believe will materialize within our generation. Despite the years of development in the field of synthetic textile fibers, rayon accounts for little more than 7 per cent of the consumption of textile fibers of all kinds. I foresee a vastly greater use of synthetic textile fibers.

Let's look at another problem—the housing problem. Much has been said about it and, so far, little done. But, compared with other problems that have been solved with the aid of science, it should be easy to achieve not only truly low-cost housing but, at the same time, housing that is vastly better. Improved methods of construction as well as improved materials are necessary if these objectives are to be achieved. The engineer is making much progress toward improved methods. His ally, the chemist, is busily engaged with the development of better materials. Thus, wood can be treated so that it will resist fire, decay, insects and fungi as well as the ravages of weather. Newer materials such as plastics, coated fabrics and metals, and fireproof insulation are destined to be increasingly important.

What about agriculture? Agriculture is a chemical business. Nature, the great chemist, combines air, water, sunshine, and a few mineral salts into countless complex products—starches, sugars, proteins, fats, oils, gums, resins, cellulose. Science will find a way to aid and hasten these natural processes. For instance, there is talk of large-scale "tray" agriculture—farming on a factory plan.

We are learning more about plant hormones, those obscure substances which in minute quantity can and do exercise a remarkable influence on plant growth. Many of the complex substances which have such a vital bearing on the normal growth, development, and possibly upon freedom from disease, in the human body, also belong to the class of hormones. The increasingly close alliance between experimental medicine and synthetic organic chemistry has led to the exploration of these important organic compounds and in some cases to the qualitative and quantitative determination of their constitution.

The first step in the laboratory synthesis of a compound is always a complete understanding of the nature and function of the various parts of the molecule.

(Continued on Page Sixteen)

New Charm for the Bedroom



Metal furniture in pleasing color and design
gives an atmosphere of warmth and beauty...

By FLORENCE M. SCHULTZ

NAPOLEON is said to have remarked, probably at the close of a hard-fought battle: "What a delightful thing rest is! The bed has become a place of luxury to me, and I would not exchange it for all the thrones in the world!"

Not only did the "Little Corporal" express his personal views, he also summed up the opinion of most of us. Just as the bed has become "a place of luxury," so too has the bedroom taken on a new meaning in nearly every home. Once it was not discussed socially or considered a part of the house to be seen by company, but now it is thought of as a room that should be decorative and really attractive. Every effort is made to make it comfortable for the owner and inviting to guests.

As in any interior setting, the artistic value of bedrooms is largely dependent upon the furniture and accessories selected. With the modern metal suite shown here, it is easy to achieve a note of beauty and charm. This group is made by the Simmons Company, nationally-known manufacturers of sleeping equipment, and

is attractively finished in blond maple with a claret striping. The color combinations of du Pont finishes on this and other metal suites manufactured by the Simmons Company harmonize pleasantly with the decorative schemes of bedrooms. Designs range from the classic simplicity of smaller-sized units to the smartness and sophistication of larger and more elaborate pieces.

Although metal furniture now holds an undisputed position in the style world, when it first appeared a sharp division of opinion arose concerning its possibilities. Some people said it would never win public approval; others contended that it would soon replace wood.

Now, however, the controversy has subsided and metal has found its own particular place—not as an interloper supplanting wood furniture, but as a graceful companion.

In addition to its style and beauty, the Simmons furniture offers something more. It is practical for use in any climate, and the lustrous du Pont finish is as easy to keep clean and sparkling as it is long-lasting.

Keep COOL, Men!

Alpinaire suits, of "Acele" acetate rayon yarn, bring you hot-weather comfort

By H. J. BOWEN



Men who wear Alpinaire dinner clothes find dining and dancing cool summer pleasures.

If your temper rises with the temperature . . . if you become literally "hot under the collar," here's news as soothing as a mountain breeze and as welcome as a pay check. A new summer fabric, woven of "Acele" in combination with spun rayon, has made its appearance on the textile horizon.

"So what?" you ask. Well, this fabric is used in Alpinaire suits to give greater protection from heat and humidity. The explanation is simple. Textile fibers absorb varying amounts of moisture from the atmosphere, the approximate content of the principal ones being six and one-half per cent for acetate rayon, eight and one-half for cotton, eleven for silk, twelve for linen and seventeen for wool. Since acetate rayon absorbs relatively little moisture, clothing made wholly or in part of "Acele" will not become damp and cling to the body, but will resist wrinkling and remain crisp and fresh-looking even on high-humidity days.

Threads of "Acele" are twisted with threads of spun rayon—short lengths of rayon fiber spun like cotton—to form the fabric, which is then dyed, finished and cut up for Alpinaire suits.

The Gaynes Clothing Corporation, of 275 Seventh Avenue, New York City, who make a range of men's garments for business, sports and evening wear, now come upon the scene. They are making up these attractive new suits in a wide variety of colors, including browns,

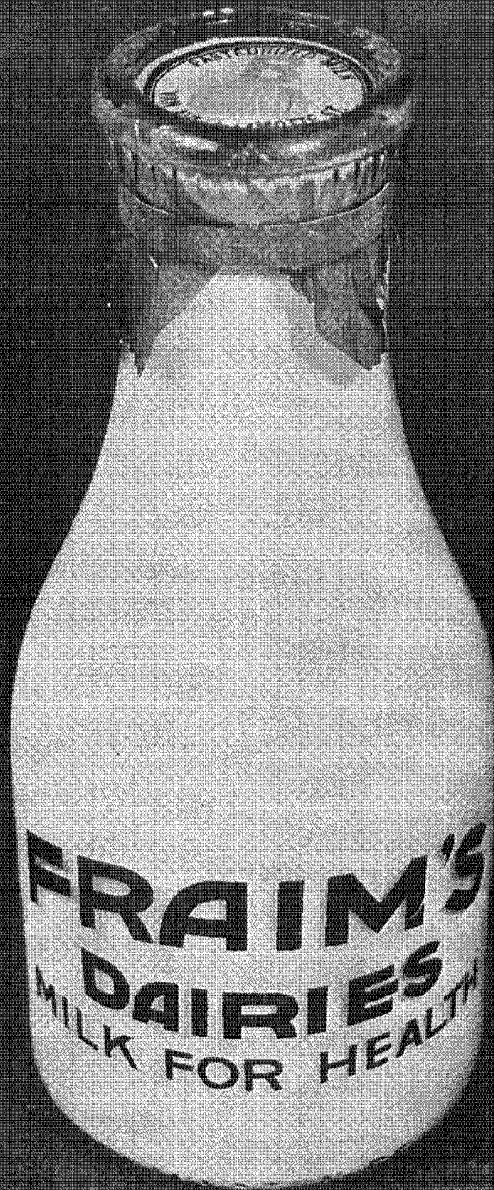
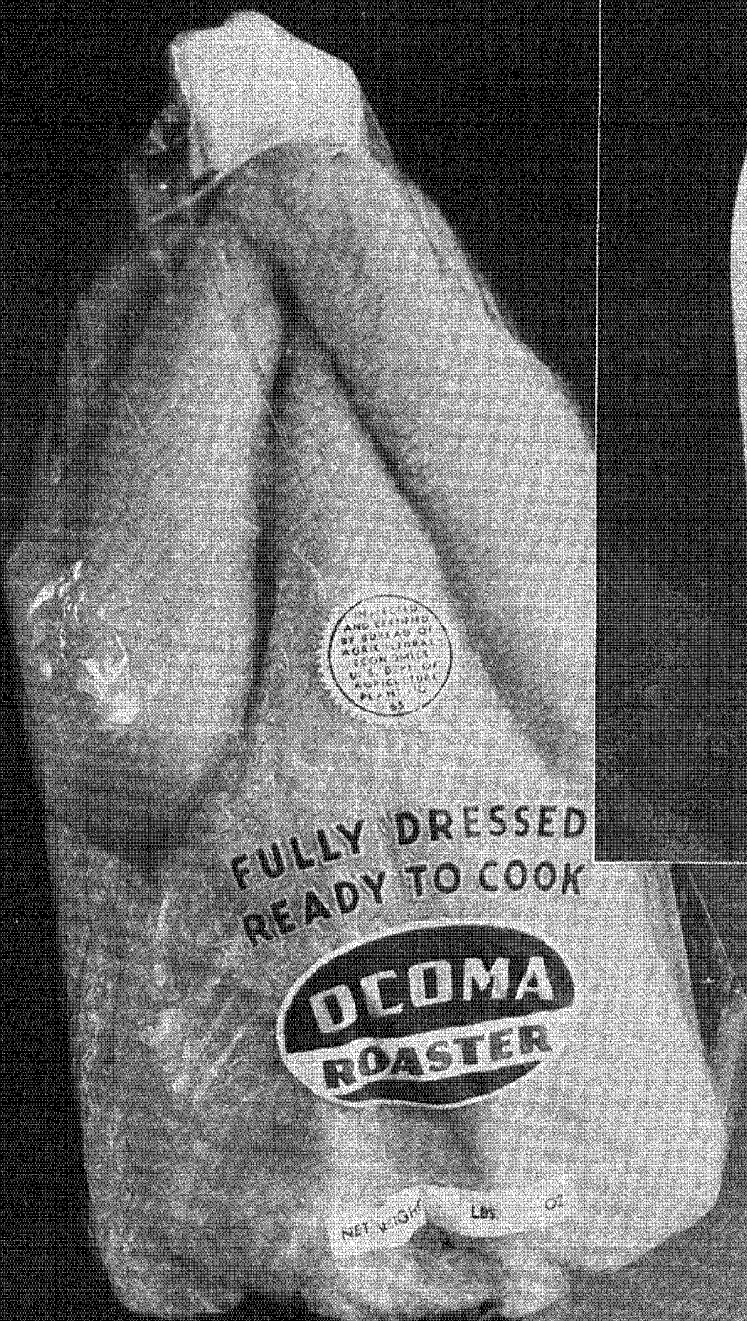


Business men who keep appointments in suits of this new summer fabric can disregard the climbing thermometer.

blues and grays, as well as the light shades always popular in summer suitings. Dinner coats are in black or white. Their entire line features superior construction, custom-made appearance and high style.

With these all-important factors thus neatly handled by the garment maker, and with cool comfort contributed by Du Pont "Acele," men are at last getting a break!

WHAT NEXT?



Added protection for this milk. The colorful "Cellophane" hood styles the bottle, too.

Ready to cook is this fresh-frozen, drawn poultry, and its "Cellophane" wrap keeps it in perfect condition.

Concluding the story of "Cellophane" cellulose film

THE PROCESS for the manufacture of this transparent cellulose film was discovered thirty years ago. The story of its development, its introduction in this country and its widespread use have been discussed recently in this magazine. So much for the past and present of "Cellophane." What of its future? Where this extremely interesting chemical product will next find new applications is merely suggested by some of its present ones.

The horizons of its use are constantly broadening. "Cellophane" cellulose film has successfully passed through one stage when it was viewed largely as a merchandising novelty, and through a secondary period when, stimulated by a notable succession of price reductions made possible through increasing volume and greater manufacturing efficiency, it rose on the crested wave of an amazing popularity. Nothing like it had happened since the advent of the "flivver." Cartoonists drew pictures of "Cellophane" wrappings on new-born babies and Presidential aspirants; vaudeville comedians cracked jokes about it. Parlor magicians entertained guests with unusual performances, such as tying a knot in a cigarette wrapped in the film, stepping on the cigarette or doubling it over, then, after undoing the knot removing the cigarette and smoking it—all without breaking the tissue-paper roll. Others crumpled "Cellophane" wrappers, placed them in a glass of water to simulate cracked ice. Since then "Cellophane" has settled down to perform a more serious service of protection, and to demonstrate its usefulness in the marts of trade.

Its greatest value is, and will probably continue to be, in the packaging field, where it meets three vitally important requirements. One is complete transparency. When merchandise is wrapped in "Cellophane," the consumer is not only assured of its freshness and cleanliness, but she

can also see exactly and to advantage what she is buying.

Protection from dirt and soilage is another service the film accomplishes. Delicate silk hosiery, lingerie and writing paper are protected and kept spotlessly clean when wrapped in "Cellophane." Moreover, because the film is absolutely germ-proof it has won the approval of health authorities who are concerned with establishing higher standards of public sanitation.

In addition, when moistureproof film is employed, cakes, cigars and cigarettes remain fresh and keep their original taste or flavor much longer than was possible before. Conversely, moistureproof "Cellophane" prevents crackers from becoming soggy, and keeps hard candies from absorbing moisture and sticking together.

Aside from these functions, "Cellophane" has found its way into many other fields. As a decorative medium, for instance, it has great potentialities. A Parisian milliner, experimenting, found that strips of the film could be woven and braided with novel effects. This started a vogue that is still continuing.

Textile manufacturers, drawn by the beauty and luster of "Cellophane," opened another avenue of expansion. Narrow ribbons of the film have been woven into cloth, providing brilliant high-lighting accents for dress fabrics and drapery materials. Lamination of "Cellophane" to other products is another recently-developed use—one that is somewhat paradoxical inasmuch as Dr. Brandenberger's early experimental work was an attempt in that direction. By this means textile goods are given a sheen, and fine-mesh fabric may be converted into a practical material for shoe-bags, dress covers and other protective articles.

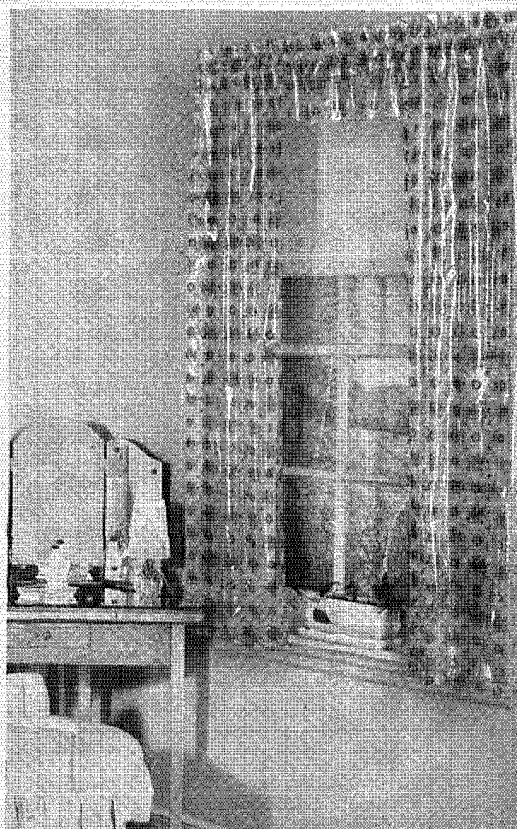
"Cellophane" is employed in the manufacture of wall covering, rugs, curtains, shoes and handbags. It is used extensively for home craft, table appointments, party decorations and other kinds of beauty touches for the house. At Christmas time, an ever-increasing number of people are wrapping their gifts with this colorful and attractive film.

The theatrical world soon learned of the adaptability of this product for costumes and stage properties. Radio technicians are using it to obtain certain sound effects, such as the crackling of a forest fire. Gardeners cover growing plants with it to offset sudden changes in the weather and to safeguard against the ravages of insects.

The electrical industry has developed a wide range of uses, chiefly in connection with the winding of motor armatures, magneto wires and condensers. Narrow, colored ribbons of the film are placed laterally under the outer covering of insulated wires, to identify them when they are "bunched" in cables. Drinking straws, sanitary hoods for milk bottles, mending tape and hundreds of other products are now manufactured from "Cellophane."

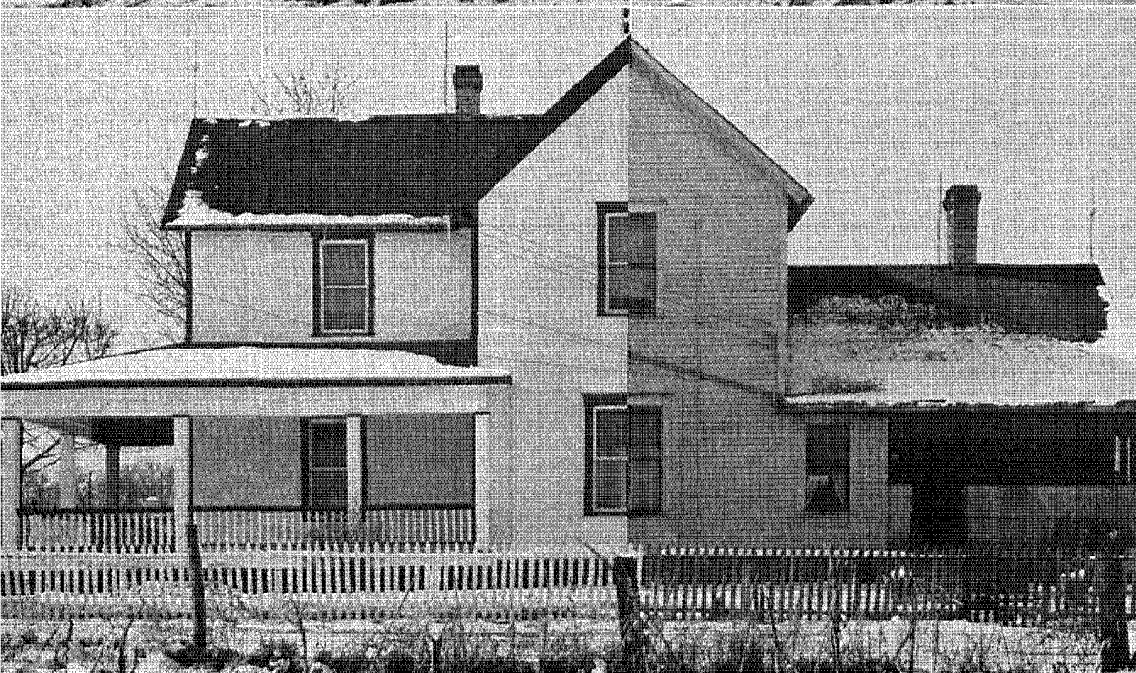
A list of articles wrapped in the transparent film might begin with the original document of the Declaration of Independence and include a miscellany of mops, candles, pickles, baby carriages, shoe laces, spark plugs, golf balls, violin strings, hot water bottles, nipples, plated silver, suspenders, rose bushes, oil paintings, clocks, statuary, a de luxe edition of the New York Herald

(Continued on Page Sixteen)



"Before & After" Houses

A demonstration of the effectiveness of Du Pont Prepared Paint



This house — on U. S. Highway 40, between Columbus and Springfield, Ohio — had not been painted in many years. No one knew for certain when it was last painted. Two coats of du Pont paints were applied to the front-right and back-left quarters of the house to show this startling contrast.



Road signs such as this lead you to the house.

By G. S. GARSTIN

ON U. S. Highway 40, between Columbus and Springfield, Ohio, there is a most curious sight. One-half of each side of an old farmhouse has been painted a brilliant white with a green trim. The other half has been left unpainted. The startling contrast between these sections is dramatic testimony of what painting can do for a house. That's one purpose of this unique demonstration. Another is to visualize in an eye-arresting way the technical advances made in formulating white and green house paints.

Only a glance at this so-called "Before & After" House is necessary to see how dull, drab, unattractive houses can be restored to new beauty by painting with du Pont paints. People who have seen the house say, "That's the whitest white I have ever seen." There is a reason back of this whiteness. It is the result of skillful blending of oils and pigments by du Pont chemists and the use of a new type of pigment—titanium oxide—which has produced a revolution in the paint industry because it combines whiteness, hiding power and chemical stability.

And the most interesting thing about this whiteness is that it is more nearly permanent than has been possible heretofore. In the past, white paints soiled quickly and became dingy, because dirt and dust from the atmosphere settled on the surface, became imbedded in the paint film and usually stayed there until the house was repainted. Houses painted with Du Pont Outside White maintain a cleaner appearance because certain chemical characteristics help this paint to clean itself.

The composition of the paint is such that a fine white powder forms on the surface fairly early in the life of a paint film. As this powder is washed away by rainstorms, it carries off the accumulation of dirt and dust, and as a result the house retains its beautiful whiteness throughout the life of the film. And this self-cleaning advantage has been achieved without affecting durability or protection—the properties that have made Du Pont Prepared Paint a leader in the house paint market through the years.

A contrasting color note for the "Before & After" House is provided by Du Pont Trim & Trellis, Dark Green, which is used for all exterior shutters and trim. Trim & Trellis Finishes, too, have some notable properties. They are of the "DULUX" type and dry faster than ordinary trim paints, thus minimizing the hazard of spoilage due to sudden rainstorms. Moreover, they

hold their gloss and assure more years of brightness, newness and that freshly-painted appearance that is so desirable. But the outstanding advantage is that they hold their color far longer than ordinary trim colors, and are less likely to become dark because of mildew. This color-retention value has been proved many times by long-service tests wherever Du Pont Trim & Trellis finishes have been used, and eventually it will be demonstrated on the "Before & After" House.

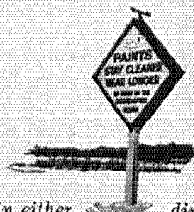
The protective and preservative powers of du Pont paints are revealed by striking contrasts. On the unpainted side will be seen old, dry boards where rain, snow, sleet, driving wind and parching sun have worn to roughness what once was a smooth, even surface, the pride of the builder. When rains come, water will soak into these porous boards, will lodge in the tiny cracks and crevices, and cause further deterioration.

Close inspection of the film of du Pont paint reveals that the wood is truly protected from these agencies. It shows how the paint film stands guard against the ruinous effects of the weather.

The next time you drive through Ohio on U. S. Route 40, keep on the lookout for the "Before & After" House. Or, if you are in the vicinity of Bethlehem or Allentown, in eastern Pennsylvania, drive out the Schoenersville Pike to view another house similarly painted. Stop and inspect the paint film and note what it does. In a few minutes you'll be convinced that painting both for protection and appearance is worth while.



House on Schoenersville Pike near Allentown, Pa.



As you drive away from the house in either direction, other road signs such as the one shown here announce the outstanding qualities of du Pont paints.



This Seal means Fast Color

A new symbol of color fastness
protects the consumer



The Fadeometer tests fabrics for light fastness.



To determine dry-cleaning resistance of fabrics.

OF THE THREE essentials—food, shelter and clothing—it's probably true that mankind knows least about the last. If his food is unsuitable, nature very quickly makes that fact clear. If shelter is unsuitable, he learns that quickly too, and that is true of clothing, considered merely as a means of protection.

But the fact is that clothing is not worn for protection alone. It has an emotional appeal and much of its value in this respect is achieved through the use of color. Whether garments will fade is not usually determined until after a considerable lapse of time. It is one of the strange paradoxes of life that textiles of all kinds, which have been utilized for clothing all through the years, usually have been accepted, not on knowledge but on faith, in so far as color permanence is concerned.

Most of us are sensitive to the appeal of color. Most of us have definite ideas as to what we expect of the colors in the things we buy. If the effect is pleasing, we want it to be permanently so, yet who has not had some sad experience with color failure? Who has not seen some favorite article lose its appeal and serviceability, as the colors faded or streaked after a comparatively short period of use? How many of us have returned merchandise to stores and demanded adjustment?

Reputable merchants usually make replacements or credit the customer's account with the value of the goods. They want their customers to be satisfied. However, in many cases at least, the merchant himself does not know whether the colors in the goods he sells are dependably fast or not. He, too, accepts them on faith from the converter or manufacturer.

Color fastness cannot be seen. Fabrics pass through many hands between the spinning mill and the retail store. Materials are often labeled "Color Fast," "Wash Fast," "Tub Fast" or "Sun Fast" to reassure the purchaser, and these labels are usually applied by the garment maker or by the manufacturer, who may or may not know the fastness properties of the dyestuffs used, or whether they were properly applied. It is not to be expected that each merchant can possibly test each and every article that he sells. Consequently, the question of color fastness is often left to chance, or the merchandise is not sold under a guarantee.

There is under way a movement, sponsored by responsible operators in the textile industry, to disclose

all the facts about the fabrics and garments which are sold over the counter.

Retailers have sincerely tried to find out the fastness properties of the merchandise they sell. They sought to fix definite terms with definite meanings. They analyzed the causes of color failure reported by customers, and from this data learned the degree of fastness that the consumer has a right to expect, as applied to a long list of textile articles. Then they determined the degree of color fastness the dyer could produce on these articles. From this has come a new set of fastness specifications, and those materials that measure up to these standards are now being identified by the "Color-Tested" seal illustrated on the opposite page.

Du Pont chemists and practical technicians collaborated in developing the specifications of color fastness for the materials. Fabrics will be tested at the Official Laboratory of the National Retail Dry Goods Association, the Better Fabrics Testing Bureau, and only those fabrics that conform to the requirements of consumer service will be permitted to carry the official seal.

A few examples will suffice to show how the "Color-Tested" seal will protect the consumer:

Draperies may carry the seal only after they pass the laboratory tests for color fastness to prolonged exposure to light, to water spotting, and to dry cleaning or washing, in each of the last two cases depending upon the nature of the fabric.

Upholstery fabrics will be tested for moderate fastness to light, to rubbing, to perspiration, and to washing or dry cleaning.

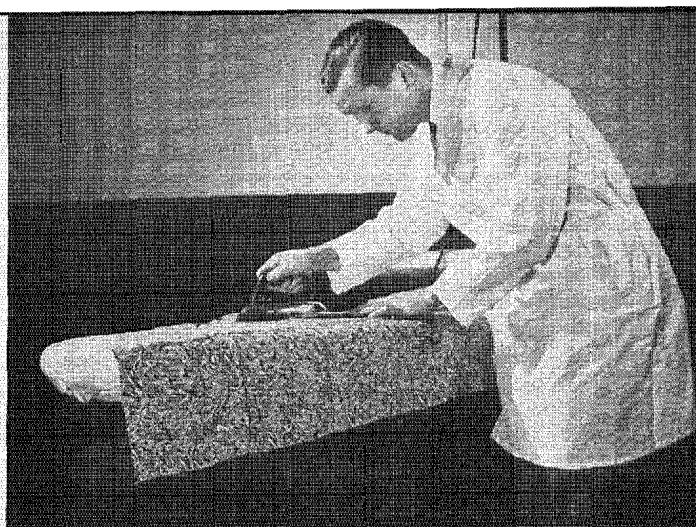
Wearing apparel will be tested for moderate fastness to light, to washing or dry cleaning, rubbing and perspiration.

While it is not possible to certify by this means that every fabric is absolutely color fast, or that it will not fade under severe conditions of abuse or misuse, the seal will, nevertheless, give assurance that satisfactory colors have been specified and correctly applied for the use to which the fabrics will be put.

Customers who buy "Color-Tested" fabrics will know that if they treat them with reasonable care, there is little possibility of color failure during the normal service life of the materials.

The "Color-Tested" seal and the plans for its use were announced at the annual convention of the National Retail Dry Goods Association at New York City in February. Very little merchandise bearing this seal has yet found its way to market. However, the movement for its broad adoption by the trade is fast gaining momentum and it is expected that many fabrics bearing the seal will soon be available.

The Du Pont Dyestuffs Division is fully in accord with the objectives of the "Color-Tested" program and assistance will be rendered to manufacturers and retailers in identifying and advertising "Color-Tested" fabrics to the public. The use of this seal by manufacturers in no way depends upon the type or make of the dyestuffs used. The Company's interest in the program is solely that of helping the industry develop and use a mark of color quality that may be relied upon as a dependable guide for the consumer.



The hot-iron test is important to consumers.



This test demonstrates fastness to rubbing.



Laboratory test for fastness to perspiration.

THE DU PONT MAGAZINE

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Incorporated

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E. R. MANCHESTER, EDITOR

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VOL. XXXII April 1938 NO. 4

CHARGES RETRACTED

FERDINAND LUNDBERG, author, and the Vanguard Press, publisher, of the book *America's 60 Families*, have publicly retracted the statements in that book charging fraud against E. I. du Pont de Nemours & Company with respect to contracts which the Company had with the United States Government during the World War. They have acknowledged that these statements were unfounded, have agreed to expunge from future editions of the book the matter complained of, and the Company's suit for libel against the author and publisher has been dismissed.

The du Pont Company felt obliged in this instance to call to account those who made accusations so grossly false that they could not be overlooked. The libel suit was based on only a few of them. In dismissing its suit the du Pont Company does not admit the correctness of other statements published about it in the book.

GULLY EROSION CONTROL

A FIELD once robbed of its top soil is forever deprived of that fertility. Each year billions of tons of soil are washed away by the uncontrolled forces of water.

Give a little gully enough time to extend its width and depth unchecked, and if conditions are favorable for nature to operate with

normal destructiveness, one finds his land ruined for farm use.

Once gullies take definite form, the water coursing through them gnaws away their banks with astonishing rapidity. Thousands of farms all over the country have been cut through with gullies, which have increased in size from small ditches to gorges many feet wide, and from ten to thirty feet deep. If left unchecked, these gullies will widen rapidly until whole farms are destroyed, either by the encroachments of the gully itself, or by the irreplaceable top soil which it will sluice away every time it rains.

The building of check dams is essential to retard the action, but once a formidable gully has taken shape, the all-important factor in its control is the soil-binding effect of vegetation planted in its bottom and along its lower sides. This means, of course, that a suitable soil must be provided in order to sustain plant life. The problem, therefore, is one of finding some economical way to cast fertile top soil down into the bottom and to change the slope of the banks enough so that small trees and plants will be encouraged to grow.

The use of machine tools is usually out of the question, and hand work, with pick and shovel, entails a prohibitive labor cost. That is why many land owners do nothing and let nature take its course.

Agricultural engineers and erosion-control experts know how to stop the growth of a large gully by blasting down its precipitous upper sides and scattering part of the top soil across the gully bottom. They say, moreover, that blasting improves the condition of the soil; that trees and grass grow better and more quickly as a result of the pulverizing action. Usually from eighty to ninety per cent of the tree seedlings planted on blasted areas survive and flourish.

Certain low-cost, slow-acting dynamites have been developed expressly for gully-bank shooting. County agents, extension workers connected with agricultural colleges and makers of industrial explosives will be glad to show any land owner how explosives may best be employed to help control soil erosion.

MODERN CRYSTAL GAZING

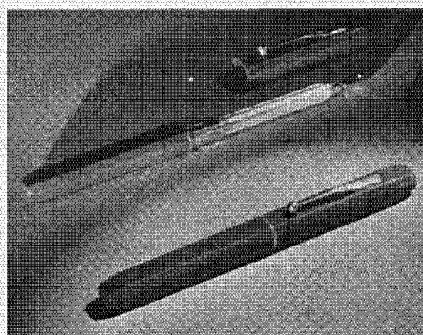
PICTURED on the cover page is a universal goniometer—one of the few in this country. Paradoxically, too, it was originally designed for the study of small inorganic crystals by mineralogists. Du Pont research chemists employ it for the analysis of new synthetic organic compounds in an extremely broad and promising field.

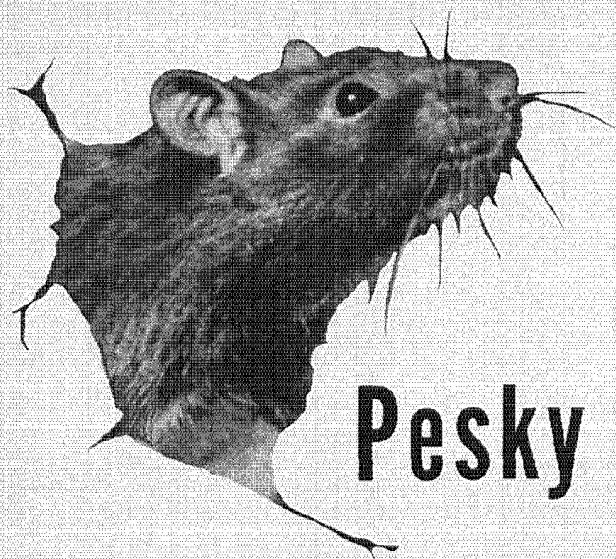
Analysis accompanies synthesis; moreover, these products when received are often extremely complex. But with precision instruments, of which the goniometer is one, exact quantitative measurements of the physical properties of such mixtures can be made.

Research has pointed the way to many new materials of commercial value. Eighty-odd products of synthesis have been developed by the Ammonia Department basically from air, water and coal, and "Lucite" methyl methacrylate resin, a crystal-clear plastic, is one of them. Du Pont is producing "Better Things for Better Living . . . through Chemistry," in part because its research workers have exceptional laboratory facilities for study and creative work.

WHAT'S NEW

HERE are the first thermometer cases produced by the injection molding process and they are made of Du Pont "Plastacele" cellulose acetate molding powder. The cases are molded by Salz Brothers, Inc., New York City, for the Taylor Instrument Company. And, by the way, it is said that one can read the new Taylor Binoc thermometer pictured here three times faster than previous types.





Pesky Pests

Industry is waging war on them on many fronts and with an effective du Pont chemical that works well in a lethal chamber...

MAN is not the only creature that aspires to a higher standard of living. Insects and rodents are also strongly inclined to share the same benefits—and they do so wherever there is a chance to obtain food, water, heat and shelter. Under such conditions they multiply rapidly and become exceedingly destructive.

Although the pest menace started ages ago when man first began storing food for future use, the ravages of these creatures have become more and more apparent in recent generations because of industrial developments and the great growth of urban communities. Transport agencies have helped to carry pests to locations where, secure from natural enemies, they have become a definite menace to human life and property.

According to estimates, each rat in this country costs the people of the United States a dollar a year; and there is at least one rat to every resident. But the rat is only one of some 70,000 species of insect and rodent pests that injure foodstuffs, animals, man himself and his products. Larder beetles, grain worms and weevils alone account for property losses running into millions of dollars annually. The toll taken by

insects and rodents in food-processing plants, storage centers, warehouses, office buildings, ships, public institutions and private homes cannot be estimated with even a fair degree of accuracy.

Fortunately, chemistry has provided effective means for combating these pests. Rats, mice, cockroaches, bedbugs and fleas in homes and ships; insects that infest flour, cereals, meats and other food commodities in industrial establishments and frequently in households as well

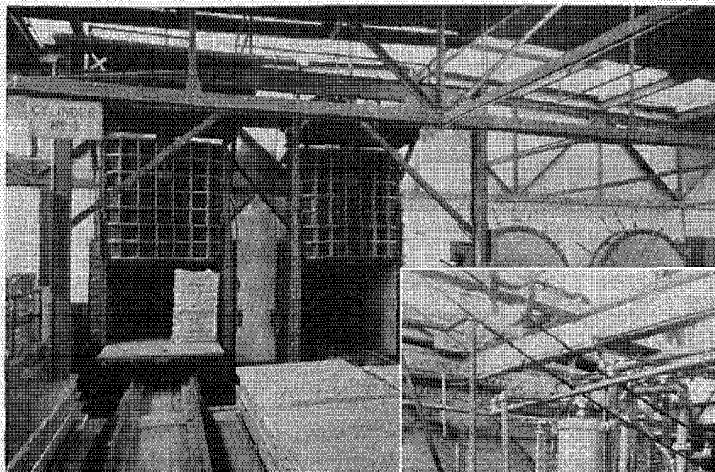
—can be controlled by fumigation. The equipment and materials are now in common use for the control of insects in raw materials and finished products of many kinds.

Fumigation involves the release of a gas or vapor, preferably one that will kill pests in all life stages from egg to adult. Buildings may be treated as a whole or only in infested portions, if the structure permits.

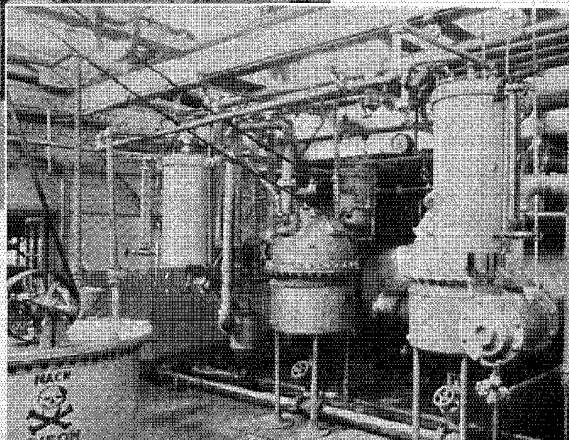
A vault for fumigation is advantageous where there is a hazard of insect infestation in goods brought into a plant, and likewise when the products leave a plant to go into storage. Such goods, on arrival, can be fumigated thoroughly in the vault without interfering with other plant operations. The degree of care to be exercised depends of course upon the nature of the product and its use.

Control of pests in commodities, such as imported cotton, where fumigation is required by law to prevent the spread of insects into uninfested regions, is also accomplished in the same way. Likewise, tobacco in bales, cases and hogsheads is fumigated by the vacuum method which can be successfully applied to packaged goods so that the fumigant will reach the innermost parts of the material to be treated. This is accomplished by means of a specially constructed air-tight chamber in which the bales, boxes or bags are shut in and sealed. A vacuum pump exhausts the air within the chamber, whereupon the fumigant is admitted, and it pene-

(Continued on Page Sixteen)



Here various products are fumigated with HCN gas in vacuum chambers. Loaded freight cars are run into the two chambers at the left.

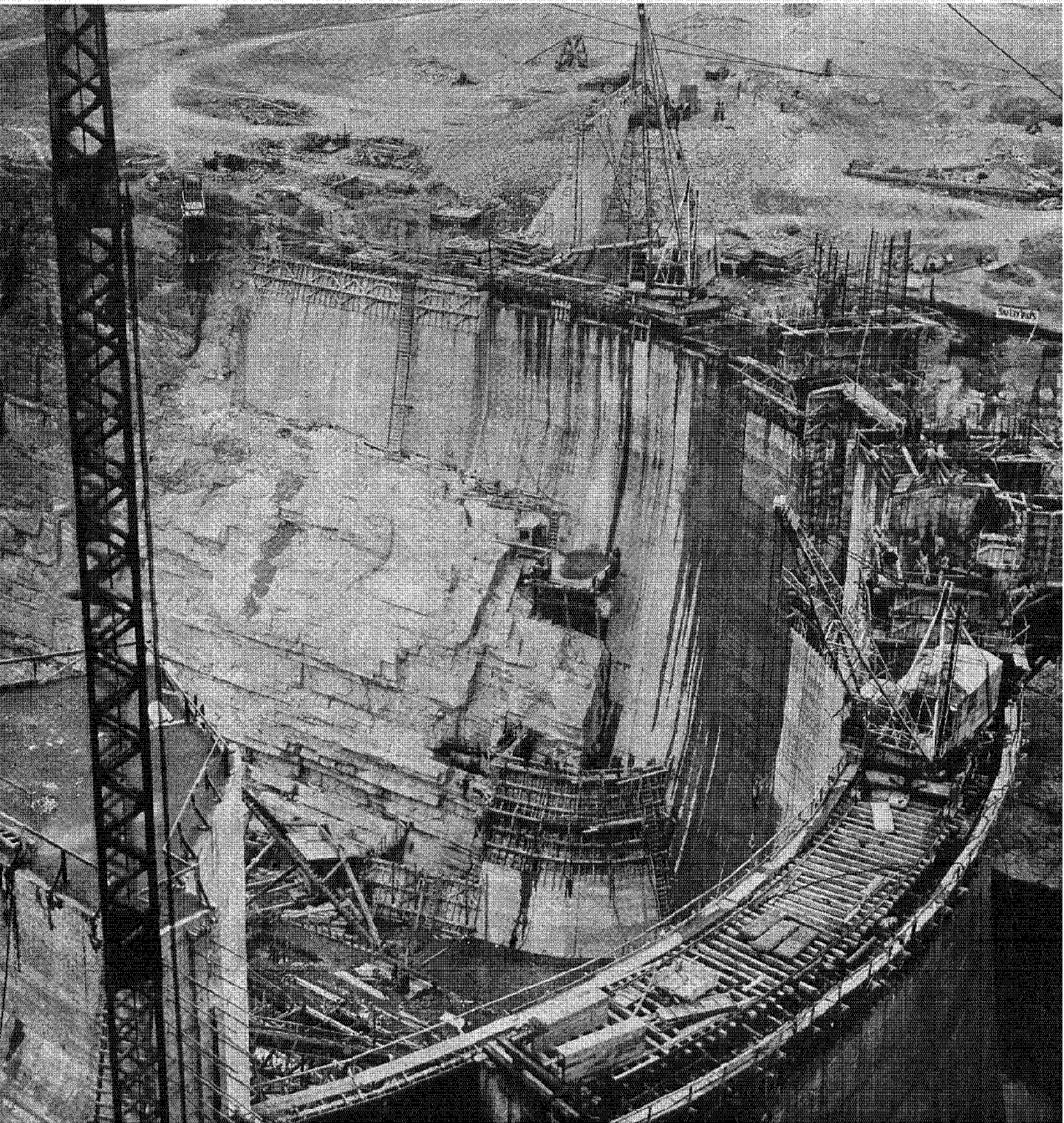


Right: Here HCN gas is generated from "Cyanegg," water and sulfuric acid. The gas is drawn to the vacuum chambers. On the tank, lower left, NACN means sodium cyanide, in this case "Cyanegg."

PHOTOS COURTESY
KROGH TERMINAL,
ROSTON,
MASSACHUSETTS

The Polson Dam

A few notes about one of the world's largest water storage projects primarily for the development of hydroelectric power in a deep gorge below Montana's largest natural lake



Looking down from the heights, following a rock blast in the canyon where excavations were made for the dam. Through the smoke you catch a glimpse of the river.

By J. H. McGRATH

GLANCE at a map of Montana, and in the north-western corner you will readily locate Glacier National Park, with its western boundary the Flathead River flowing southward from the Canadian Rockies. Follow its course and you will note that it leads into Flathead Lake, which is thirty miles long and fifteen miles wide—the largest natural water body in the State. The drainage area above it embraces about 7,000 square miles, and the annual river flow averages about 7,000,000 acre feet. At the south end of the lake, below Polson, the river sweeps through a rocky canyon, dropping about 185 feet in four miles, and then flows down to join Clark Fork and on through the Columbia River basin to the sea.

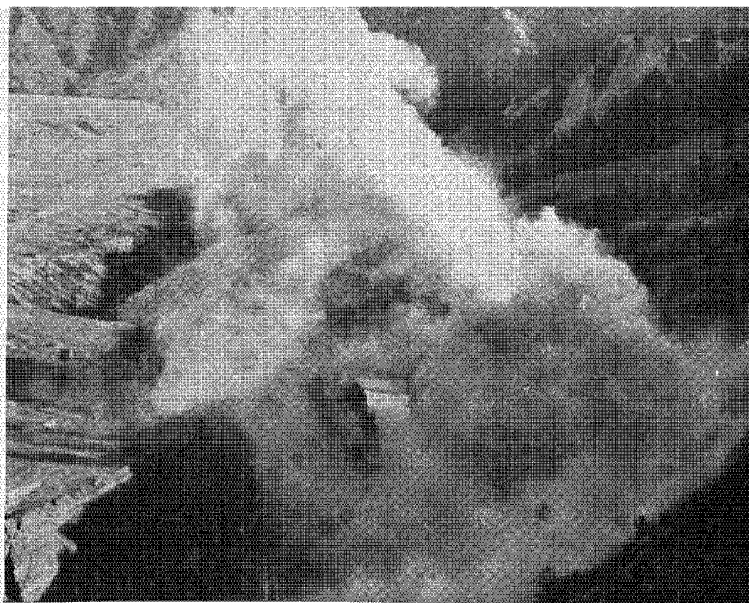
Nearly thirty years ago the U. S. Bureau of Reclamation recognized the power-development possibilities of the gorge site and started a small project to pump irrigation water on adjacent lands of the Flathead Reservation. But it was not until 1930 when the Rocky Mountain Power Company, a subsidiary of the Montana Power Company, began to construct a diversion tunnel 1,800 feet long and twenty-three feet in diameter that any major effort was made to harness the river and put it to work. The operations were suspended the following year, due to the depression, and not resumed until August of last year. Increased mining activity in Montana and the need for more electric power in connection with the construction of Fort Peck Dam are largely responsible for efforts to complete the present work program this summer.

WHAT IS BEING DONE

The project involves the building of a concrete arch dam 200 feet high to control the storage of 1,100,000 acre feet of water in Flathead Lake, including 50,000 acre feet of storage for irrigation needs on the lands of the Confederated Salish and Kootenai tribes of the Flatbush Reservation; the construction of a penstock twenty-five feet in diameter leading to the power house where the river takes a right-angle turn, presenting an unusually advantageous site for that structure. The first unit, now under construction, will produce 56,000 kw., but the ultimate capacity will be 112,000 kw., when a second turbine is installed and another penstock is completed.

THE DAM

As pictured on the facing page the dam consists of an arch section with concrete thrust blocks at both ends. The arch is forty-five feet thick at the base, twenty-five feet at the top and, including the material in the thrust blocks and apron, calls for the placement of 77,000 cubic yards of concrete. Control of the water over the spillway will be achieved by means of fourteen vertical roller-type gates placed along the entire crest of the dam.



The work on the site of the dam has involved the excavation of 120,000 cubic yards of rock, a very hard gray quartzite, and 60,000 cubic yards at the power house location. One of the difficult tasks was the scaling of weathered rock from the 500-foot cliff over the power house. Following the bench method, jackhammers were used to drill holes six feet deep on four-foot centers. They were loaded with Du Pont 40 per cent Special Gelatin and fired with Du Pont Electric Blasting Caps. By this means the desired back-slope was held and excessive overbreak in the seamy formation was avoided.

Construction work at the dam site also presented a special problem, because it was necessary to safeguard against a possible movement of the west abutment, due to a 27° dip of the rock and its cleavage planes. To stabilize this material, three-inch diamond-drill holes were made in it to a depth of forty feet and about 450 steel dowels were inserted and securely anchored to the tight underlying quartzite. This is one of the unusual construction features. Another is the fact that the materials for dam building were handled by gravity from the side of the cliff.

TUNNELING

The 1,800-foot diversion tunnel, previously mentioned, was completed in 1936. One of the two pressure tunnels or penstocks is now under construction; the second will be undertaken later. Both are to be of horseshoe shape, twenty-five feet in diameter, 790 feet long and lined with concrete, supplemented by 110 feet of steel pipe connecting directly with the turbines. The center heading and ring-shooting method was used in driving the first 100 feet of the tunnel, and the bench and heading method thereafter.

H. H. Cochrane, chief engineer of the Montana Power Company, is in charge of this project. The work is being done under contract by the Phoenix Engineering Corporation of New York City, with C. H. Tornquist, general superintendent; R. W. Spencer, resident engineer, and James Traynor, construction superintendent.

The Old Used Cars

... they "ain't" what they used to be!

In an overcrowded market, modern methods of reconditioning and refinishing further the sale of used cars and offer prospective car-owners values unheard of a few years ago

By ROBERT P. MILLER

ASK any automobile manufacturer or motor car dealer what the biggest problem of the industry is. Invariably he will answer: "Used cars!" And there's a real reason for this reply. Since 1935, when new car models were first announced in the early fall instead of in January, dealers' stocks of "trade-ins" have grown larger with each season. From the beginning, it was noted that a fall sales peak piled up burdensome stocks of used cars in dealers' lots. Many of these cars could not be sold until early spring. So slow was the turnover that some dealers were carrying as much as thirty-five per cent above normal stocks. And with spring, still more used cars were turned in for new ones. Inventories grew even larger.

Each year the condition has become worse. Recent surveys show that dealers have a stock of more than 700,000 second-hand automobiles. This means that for every new car a dealer sells he must sell two old ones to cut down his inventory.

Obviously, the sale of new cars depends largely upon the removal of old ones from the showrooms and lots. Because of this situation, automobile manufacturers have joined forces with the dealers to "dignify" used cars. They have conducted "clinics" throughout the country. Dealers everywhere have received expert courses of instruction in reconditioning used cars in both mechanism and appearance. Most of them now have facilities to increase the value of these "step-children" to prospective buyers.

Reconditioning may once have meant a hasty washing, tuning up of the motor and perhaps a replacement of a spark plug or two. But today most used cars go through a much different treatment. Worn or damaged mechanical parts are either repaired or replaced; tires are conditioned for safe driving; new glass is put in where needed; new floor mats are substituted for old ones; upholstery and all interior surfaces are cleaned and torn places are mended. In short, most used cars are now thoroughly checked and reconditioned from radiator to tail-light before they are placed on sale.

And dealers make sure that their cars look right, for appearance is the most important single influence in the sale of a used automobile. Dents or bumps in fenders and bodies are skillfully removed; tires, tops and running-boards are cleaned and painted to present a fresher, newer look; motors are given a coat of enamel. Scratches or broken places in the finish are carefully retouched in a matching color. If the finish has become battered or shabby from hard use and exposure, the

entire car is completely refinished. As shown by the illustrations here, the used car is made to look like new again.

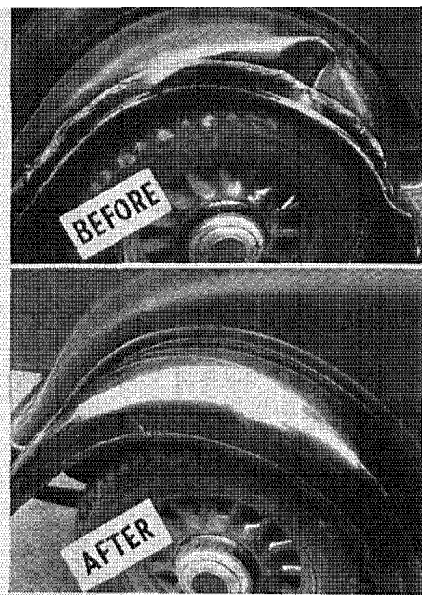
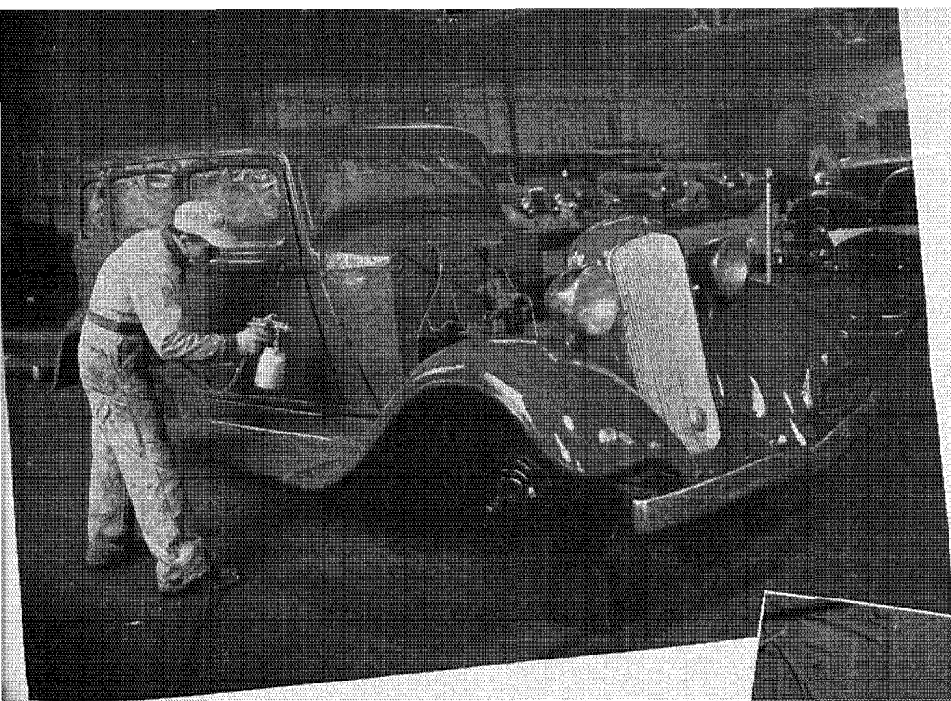
In "appearance" reconditioning, du Pont refinishing materials have long been favorites. "Duco" lacquer and "Dulux" enamel—the same finishes used by many automobile manufacturers—have brought new beauty to thousands of used cars in operation today.



With automobile refinishing now of so much importance to used car dealers, the recent development of a new du Pont automotive finish came at the right time. This new material, known as Automotive "Pyralux," combines certain desirable features of "Duco" and "Dulux." It has a high initial luster that virtually eliminates rubbing and polishing. It dries very quickly. In addition, it is so formulated that it is an excellent finish for retouching "Dulux" and baked synthetic finishes because repair spots will not show up badly after exposure.

Thus, with "Pyralux," used cars are economically given a glossy new appearance with less labor than is required with other finishes. And, because "Pyralux" dries so quickly, used cars are not tied up for more than a few hours.

Current newspapers carry listings of thousands of good "buys." Smart-looking cars with plenty of service are being offered at extremely reasonable prices in showrooms or on used car lots.



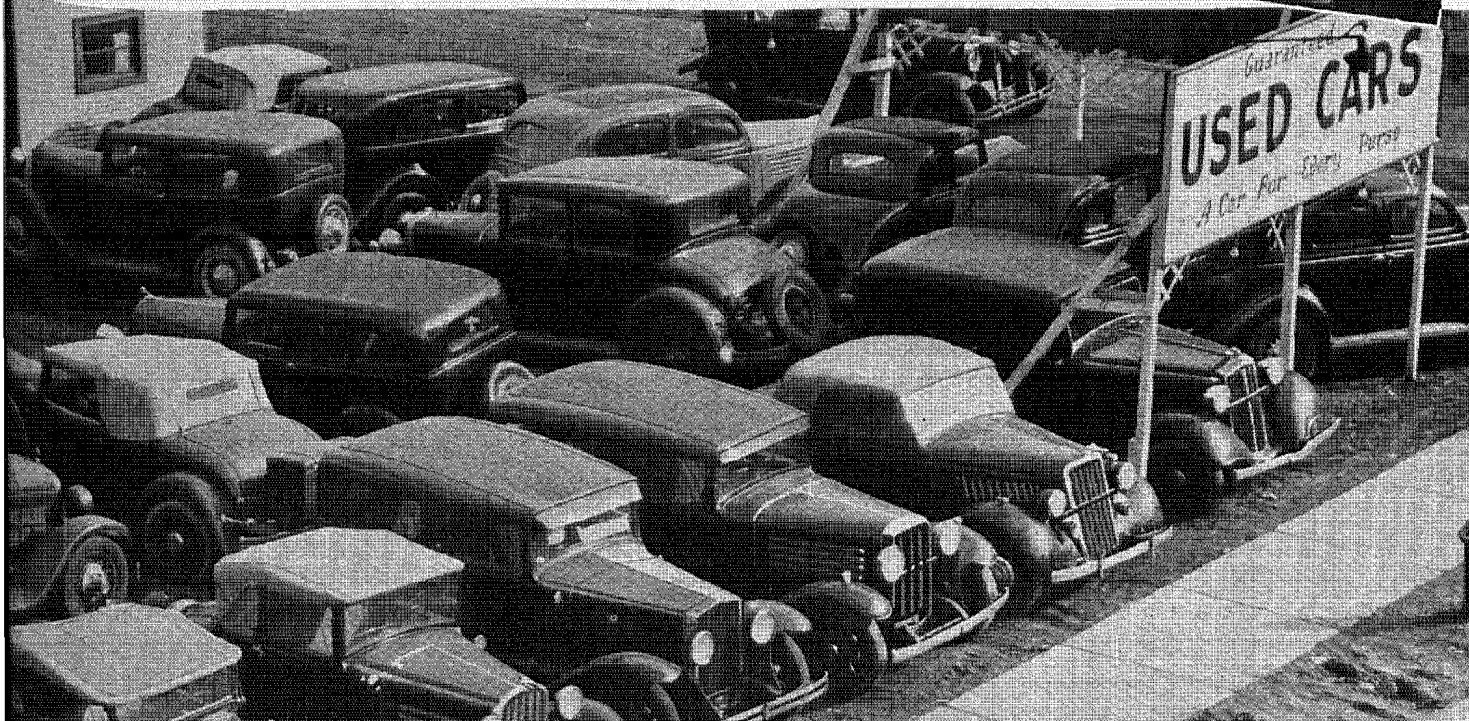
LEFT: When prospects look at used cars, appearance is the first feature they check. And they're always pleased with the lustrous finish provided by Du Pont "Duco," "Dulux," or "Pyralux."

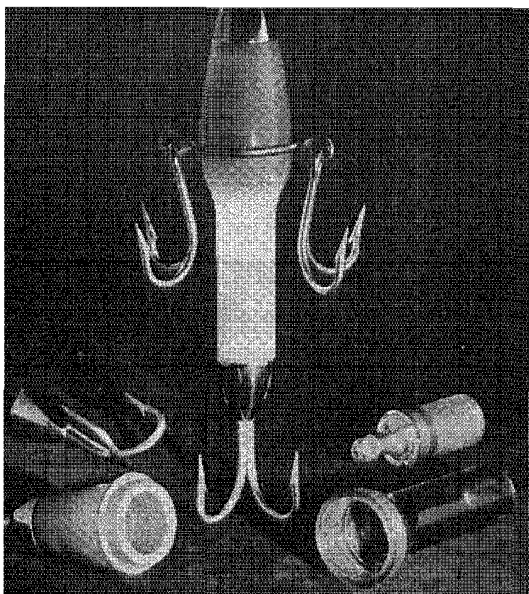
ABOVE: After damaged parts are repaired and dents or scratches removed, the used car is given a glossy, new appearance with du Pont refinishing materials.

UPPER RIGHT: In the hands of skilled automobile refinishers, dents in fenders, doors and other parts of the body are quickly "bumped out" and repainted to look like new again.

RIGHT: Before the car is offered for sale, running-boards and tires are given a protective coating of Du Pont Rubber Finish.

BELOW: On sales lots everywhere prospective buyers find a wide selection of guaranteed used cars—many of them reconditioned and repainted.





Fishes Beware!

There's something new under the water—lights that do not emanate from deep sea fish, but that are made to attract them. The Sure-Catch Lure Company of Irvington, New Jersey, goes a step beyond lures that wiggle, dart, jump and wobble, and are producing a new kind that contains an electric light. Tests off the Florida coast have shown that a little wattage in the waters brings in sailfish, amberjack, kingfish and marlin with unusual success. The illuminated lure, called Lur-o-lite, has been given trial runs and hearty approval by veteran fishermen of southern waters. It was commercially introduced at the Sportsmen's Show in New York.

To construct an illuminated fish lure it was necessary to have a material that was translucent or transparent, water-resistant, capable of threading or grooving, and of sufficient strength to resist the slashing attack of hundreds of pounds of fighting fish. The assignment was met by Du Pont "Plastacele" cellulose acetate molding powder which is prepared by the Boonton Molding Company for the Sure-Catch Lure Company. In a machine tension test, the lure withstood a pull of 480 pounds. In actual service tests the line has broken, but never the lure.

Things are looking too bright for the poor fish to resist. That is understandable, considering how even human beings respond to the lure of the bright lights in every city.

New Frontiers

(Continued from Page One)

When we are able to synthesize all of the various hormones so important to the human body, it will place at our disposal these products, to be prescribed by physicians in carefully measured doses, not only for the control of the body's normal growth and development, but probably for the prevention of many diseases. In many instances, disease is caused by the breakdown of the normal operation of the human machine, and this is coupled with the development of abnormal chemical compounds and chemical reactions of the human body which we call sickness or ill health. Therefore, a more complete knowledge of the hormones and their laboratory synthesis will be a forward step of great importance to the human race.

An increasingly close alliance between experimental medicine and the fields of synthetic organic chemistry and that of physical research is much to be desired, and, as in other fields in which scientific research has been applied, will result in better living and greater happiness for millions of people.

What Next?

(Continued from Page Five)

Tribune, and even a three-story house as an advertising promotion.

"Cellophane" cellulose film has taken its place in the commercial complexity of the modern world. It has become so definitely a factor in present-day, aggressive merchandising that its future is assured in the fields where it is already known and used.

The future of "Cellophane"? Who can say where it will be found useful next? The ingenuity of man is the only measure. Reviewing the phenomenal growth and tremendous success of the product since its modest beginning on this continent, we must salute, once more, the man who is most responsible for its invention and early development—Dr. J. E. Brandenberger.

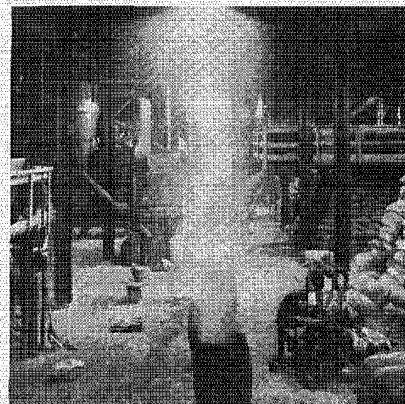
NOTE: This concludes the series of three articles on "Cellophane." A booklet containing the entire series will shortly be prepared, and copies may be obtained by writing to the "Cellophane" Division, du Pont Company, Wilmington, Delaware.

Pesky Pests

(Continued from Page Eleven)

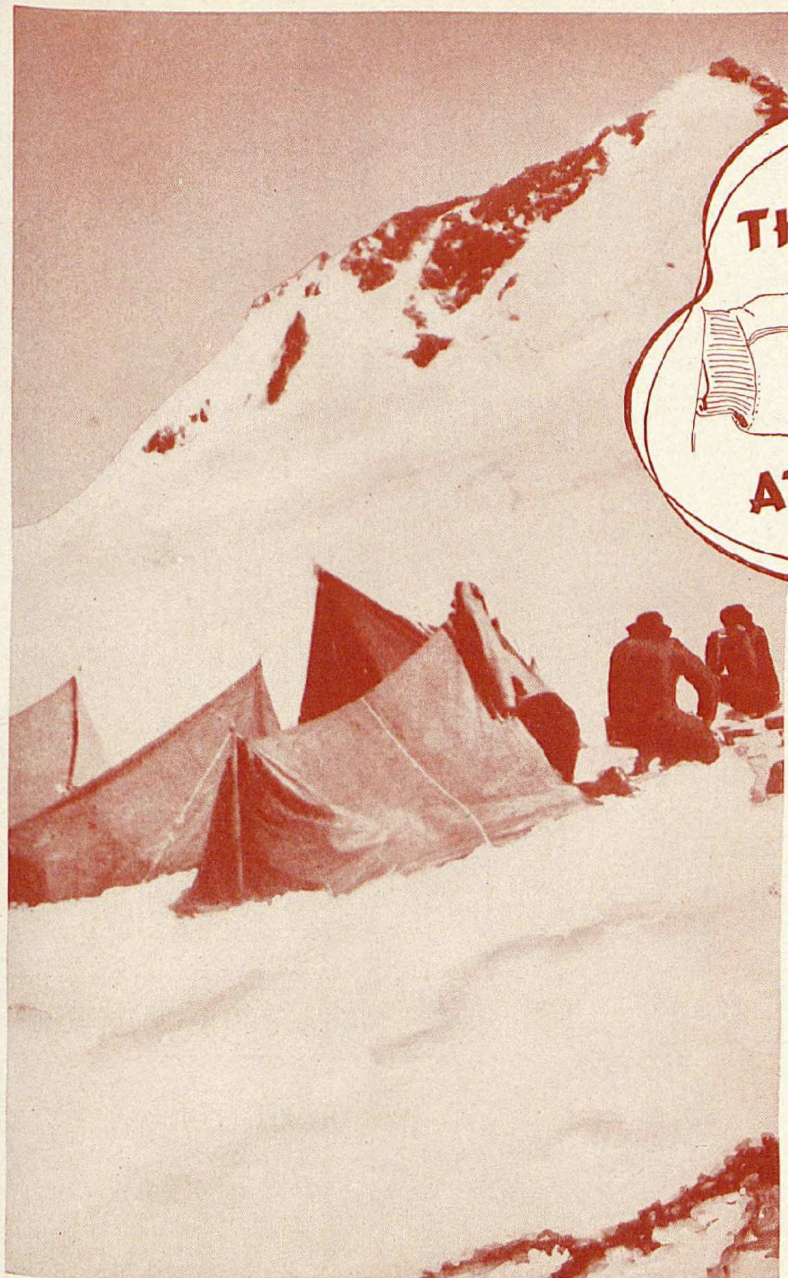
trates the material all the way through, killing any insect that may be in it.

One of the most effective fumigants thus far developed for enclosed structures is hydrocyanic acid gas, HCN. It was first used successfully by California fruit growers in 1886 to destroy cochineal insects infesting lemon trees. Since then the product has rapidly come into use in mills, factories, ships and dwellings, both in this country and in South America. One of the best-known means of generating this gas involves the use of du Pont sodium cyanide, trademarked "Cyanegg." The term is suggestive, for the product is pressed into the shape of eggs, each containing one ounce of the material.



Fumigating a warehouse with HCN gas generated from "Cyanegg" by the barrel-generator method. Note the gas and vapor rising from the barrel.

Insect control by means of fumigation has developed into a well-established field of service for carefully-trained men who know the habits of insects and pests and who can administer the highly toxic HCN gas in a safe but effective manner. "Cyanegg" is manufactured by the R. & H. Chemicals Department. It should be used only by professional pest control operators or by responsible and experienced men. The R. & H. technical staff may be called upon to assist in arranging details for all types of "Cyanegg" fumigations whether they involve the use of special vacuum chambers, atmospheric vaults, localized areas or entire buildings.



THEY DREW LOTS

AT 12,051 FEET...

*...to see
who would sleep
and
who would
shiver*



NEOPRENE

E. I. DU PONT DE NEMOURS & CO., INC.

RUBBER CHEMICALS DIVISION

WILMINGTON, DELAWARE

IMAGINE wind so fierce that men had to crawl on hands and knees against it.

Imagine cold so intense that faces had to be muffled in woolen masks.

Put these two together. Add black nightfall on a snowy plateau high in British Columbia's little-explored coastal range. And you have a fair picture of the Mt. Waddington Expedition's final camp-site before they scaled the peak.

There were four tents . . . two made of fabric impregnated with neoprene. These two neoprene tents had shown that they wouldn't crack in intense cold and high-altitude sunlight. They alone

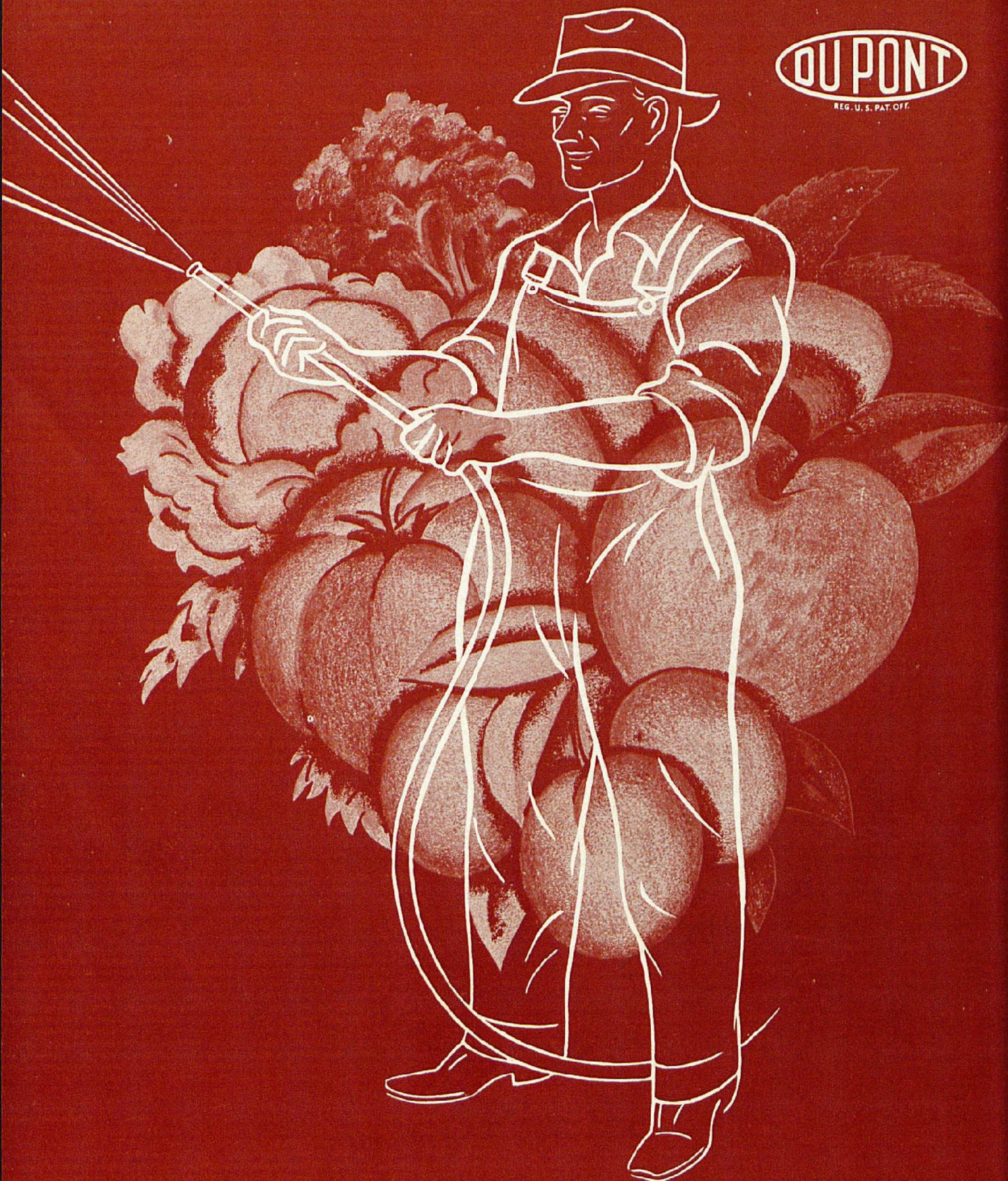
were intact . . . kept the bitter wind out and the warmth in.

So the party drew lots to see who were the lucky sleepers that night.

It's unlikely that you either make tents or climb mountains. We mention this little story just to illustrate another of the widespread uses of neoprene, du Pont's remarkable chloroprene rubber.

It is likely, however, that right in your plant neoprene can serve many uses where rubber or other materials fail. Write for your copy of our interesting, illustrated, 24-page handbook describing the remarkable properties of neoprene.

BETTER THINGS for BETTER LIVING . . . THROUGH CHEMISTRY



GRASSELLI AGRICULTURAL CHEMICALS

protect FRUITS • VEGETABLES • SHADE TREES • LAWNS • FLOWERS