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for your highest yearly average

... shoot **DU PONT MX!**



THE 1933 trapshooting season is already under way. How does your average look now? How will it look at the end of the year?

One way to build your score is to have confidence in your trap load. And that's one reason for specifying DU PONT MX for your trap loads now and for the rest of the season.

DU PONT MX is just one year old. In that time, it has made an amazing record. Hundreds of shooters demand it. G. A. H. champions recommend it . . . and use it.

Here are the reasons trapshooters have confidence in DU PONT MX. Here are the reasons it will help you improve your score. DU PONT MX is a snappy load. It is easy on the shoulder because of its balanced recoil. It is clean burning. It provides uniform loads and better patterns. Positive, hard hitting, it insures CLEAN BREAKS.

Specify DU PONT MX for your trap loads in 1933. Get a better score—with a better powder.

E. I. DU PONT DE NEMOURS & CO., INC.
Sporting Powder Division
Wilmington, Delaware



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DU PONT MX

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SMOKELESS SHOTGUN POWDER

THE DU PONT MAGAZINE

VOL. XXVII

MARCH, 1933

No. 3

Nineteen Thirty-Two in Review

Some excerpts from President Lamont du Pont's annual report to stockholders of E. I. du Pont de Nemours & Company, Inc.

PRESIDENT DU PONT introduces his report with a brief survey of general business conditions, comments on the readjustments made, and discusses some of the efforts which are being put forth to restore economic stability. In his review he says:

"The downward trend of industrial activity of the preceding two years was continued during the first half of 1932. Since then in some important branches of industry there has been a noticeable improvement, which has continued to the present time with only seasonal changes. Several of the company's activities have participated in this improvement.

"The numerous readjustments that have been taking place since 1929 may ultimately be found to have helped to clear the way for that reappearance of more normal conditions which inevitably follows an interruption of industrial activity occasioned by over-zealous enthusiasm and unbalanced efforts for too rapid expansion. While the magnitude and severity of the current depression and the geographical area involved have been perhaps greater than in any previous experience, there have appeared no ailments which may not be

expected to yield to patience, enterprise and courage.

"It is perhaps not unnatural that, in a desperate effort to better conditions, we are promised relief by a departure from those policies which have proven so beneficial to this country through scores of years. We are told that, by reducing our tariffs and surrendering our home markets to manufacturers in foreign countries, employing impoverished labor and often debased currencies, our own factories by some magic will not be closed and our unemployment not increased. We are told that by violating the integrity of our medium of exchange we may in some way escape the grief which has invariably followed in the wake of similar efforts

in this and other countries. We are told that extravagance in government aids employment, though it results in wasteful dissipation by political bodies of that money which could be expended directly by the taxpayer in the useful employment of labor. We are told to abandon efficiency in operations and to declare a moratorium on technical research because they increase unemployment, though they but multiply man's opportunity to enjoy in greater measure the products of his own industry. These and other similar plans are advocated though they shock our judgment and common sense.

"The success of business will be secure when confidence fully returns. Confidence cannot return until the fears arising from the threat of unwise and disturbing legislative projects are allayed.

"Most important of all steps in the restoration of confidence is further drastic curtailment of public expenditures and a lowering of the tax burden. It is estimated that in 1929 total public expenditures consumed 15 per cent of the national income, and for 1932 it is estimated that these expenditures will aggregate at least

We believe the information published here will be of interest to DU PONT MAGAZINE readers as well as to the company's stockholders for whom it was originally prepared. It outlines some developments that have not been referred to previously in these columns.—Editor.

30 per cent of the national income. During the past year the company has vigorously advocated immediate and substantial reduction in federal, state and municipal expenditures. Unless this situation is promptly and effectively corrected, any real business recovery will be greatly retarded.

"We have endured great trials during recent years. Many readjustments, painful though they may have been, are now behind us. There are many reasons to hope that better times are ahead of us. It is no time to experiment with unsound theories. We should, instead, place our confidence in those principles and institutions which have served us so well through generations. The country may then expect to emerge from its recent atmosphere of fear and despair into one of courage, confidence and security. With this change of sentiment, individuals and corporations will increase their purchases for current consumption, will renew and put into effect their plans for the future, and industrial activity will go forward again and attain previous or even greater heights."

After making explanatory references to the financial statements included in his report, the details of which are chiefly of interest to stockholders, President du Pont reviews the operations of the company. In this connection he notes:

"The company's volume of business during the first seven months of 1932 declined steadily in line with the decrease in activity in the broad group of basic industries consuming its products. Beginning in August and continuing through the autumn, a substantial and more than seasonal increase in volume occurred. More specifically was this the case in the rayon and dyestuffs industries whose products are consumed largely by the textile industry. There was a less than seasonal slackening in demand for the company's products toward the end of the year . . ."

NEW INDUSTRIES

Reference is made to the Gardinol Corporation, organized during 1932, and to C. G. Bartlett & Cia, Ltda., of Buenos Aires, Argentina, in which the du Pont Company is interested.

The first named organization will exploit certain new and superior cleansing materials of value to the textile industry, while the South American affiliate will supply sulphur and various derivatives, also serving as a distributor for certain du Pont products manufactured in the United States.

OTHER DEVELOPMENTS

"A new and efficient denaturant for ethyl alcohol, sold under the trade name 'Pontol.'"

"A new and highly efficient fuel sold under the trade name 'Dynax.' This fuel is particularly adapted for certain types of internal combustion engines and is used principally in outboard racing motors.

"A considerable number of new perfume materials and new detergents.

"Dehydrated aluminum sulphate; used in the manufacture of certain new insecticide dusting mixtures and for other purposes.

"Du Pont MX shotgun powder; represents a distinct improvement in its line. Made by an entirely new process, this powder is outstanding for clean-burning and uniformity of performance in all makes of ammunition even under the most unfavorable conditions of storage. It produces balanced recoil and consistently good patterns.

"The use of urea ammonia solution for the ammoniation of super-phosphate, thus introducing into mixed fertilizer two valuable nitrogenous compounds, urea and ammonia, in a new form.

"The manufacture of synthetic camphor, by a new and improved process. The company is a large consumer of camphor, particularly in manufacture of pyroxylin plastics.

"High-velocity gelatin dynamite with improved sensitiveness, due to low density; also, a new low-density, low-velocity permissible explosive, which increases percentage of lump in coal mined.

"Process for manufacture on a commercial scale of chemically pure nitrate of ammonia, used by some manufacturers of anesthetics. Heretofore, the nitrate of ammonia required for this purpose has been imported.

"Improved process for the produc-

tion of tin oxide, a white pigment widely used in manufacture of plumbing fixtures and other vitreous enamel products.

"The marketing of methyl formate for use as a low-pressure refrigerant has also been initiated. This product has not been used commercially heretofore as a refrigerant.

"Development and initial distribution by Du Pont Film Manufacturing Corporation of an improved type of X-ray film, which has been accorded a favorable reception by the medical profession.

"Manufacture of the new synthetic rubber, 'DuPrene,' in a plant erected at Deepwater Point, New Jersey. A sufficient commercial demand has been developed to consume the entire output of the present small plant, thus demonstrating the superiority of 'DuPrene' over natural rubber for many purposes.

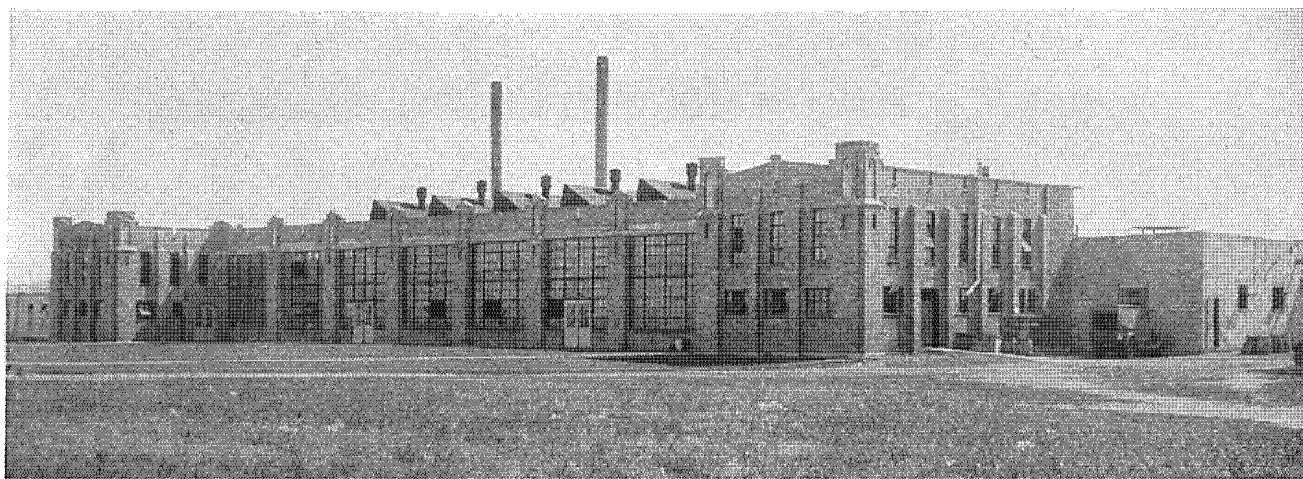
"As a result of research work in the inorganic chemical field, the company has initiated the manufacture of certain other products which, because of purity or physical form, are especially adapted to the specific requirements of the consuming industries.

CHEMICAL AND ENGINEERING RESEARCH

"The company has continued, with practically no reduction, its chemical research organization for the control of quality and yields of existing products and development of new products and processes. This group has developed some very interesting new products which are in course of preparation for manufacture. In collaboration with the chemical research organization, a group of industrial engineers is constantly studying the manufacturing operations with a view to increasing the efficiency of existing processes through adoption of new and improved equipment.

"The coördinated efforts to these two groups have developed notable new processes and improvements in existing processes. In coöperation with the operating managements, substantial savings in manufacturing costs have been effected, all contributing to improve the company's position in the chemical industry.

(Continued on page 16)



The plant of the youngest ammunition company in America. It is located at Anoka, about twenty miles from the city of Minneapolis, Minnesota

The Youngest Ammunition Company

The Federal Cartridge Corporation came into existence only ten years ago, but it has made rapid strides in the industry

EDITOR'S NOTE: This is the fifth in a series of articles on the arms and ammunition industry in America.

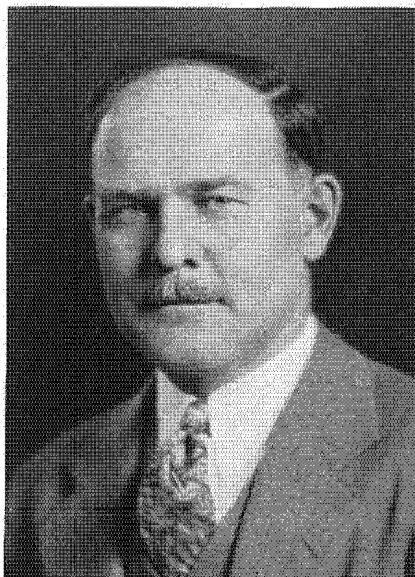
By V. L. SIMPSON

IN 1922 the youngest ammunition company in the United States came into existence. On the rolling prairies of Minnesota, not far distant from where the Rum River empties into the Mississippi, and on the outskirts of the little town of Anoka, is located the plant of the Federal Cartridge Corporation. Established at a time when the country was convalescing from a drastic economic depression, it has struggled against many odds to achieve its present position in the industry.

The driving force back of the company is its young, dynamic president, Charles L. Horn, who entered the ammunition business in July, 1922, through the purchase of the abandoned plant and machinery of the defunct Federal Cartridge & Machine Company at Anoka, Minnesota.

The youngest ammunition company was launched on its career under the name of the Federal Cartridge Corporation. Sales offices were opened

in Minneapolis and soon the Federal plant was whirling with activity. Men were employed, buildings re-



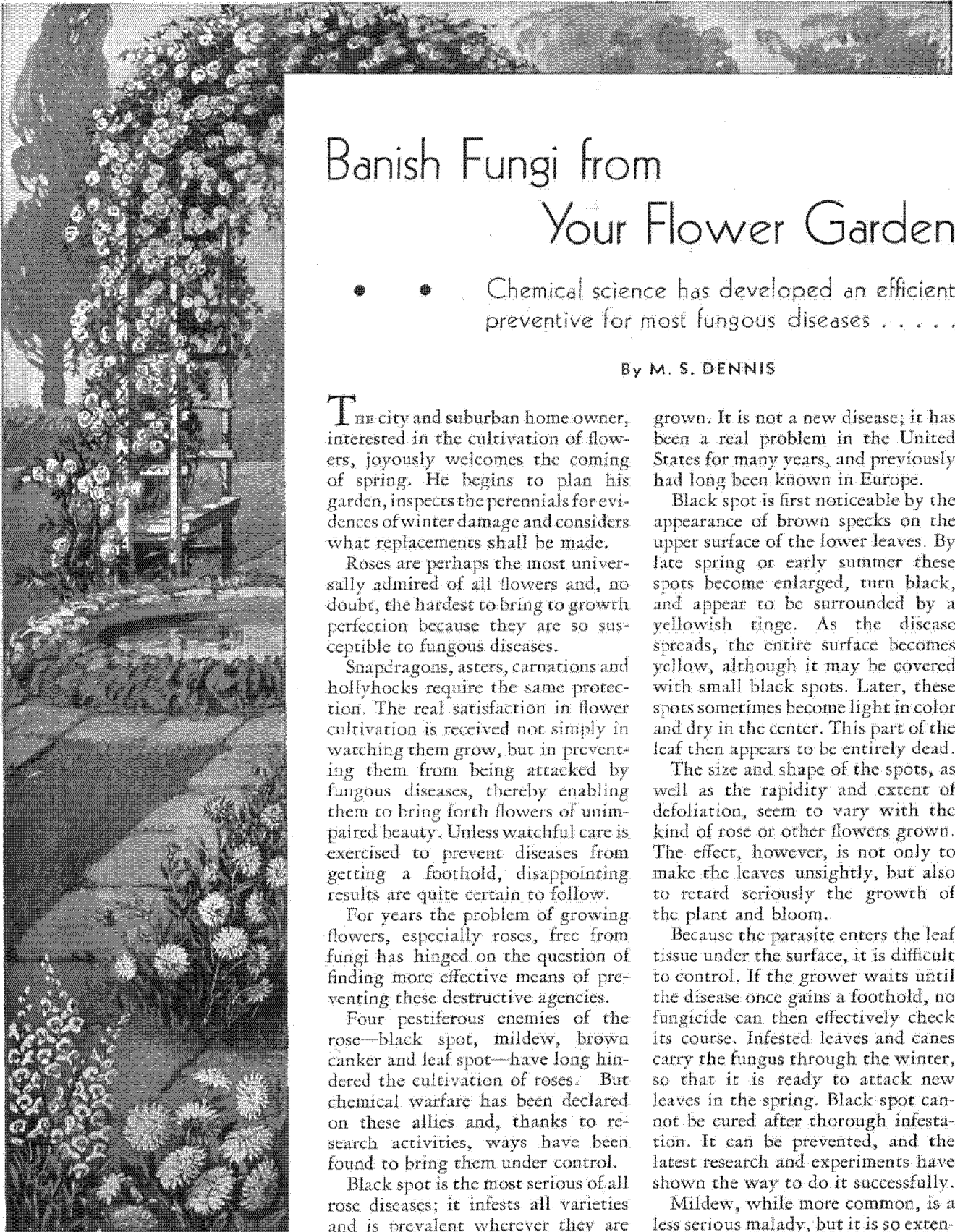
Charles L. Horn, who organized the Federal Cartridge Corporation in 1922 and has been responsible for its success

modeled, old machinery repaired and new equipment purchased. Manufacturing operations were begun late in the summer of 1922.

It took courage to organize a company during this period of uncertainty. Although general business was showing signs of improvement, no one knew when it might suffer a relapse. Many people thought Horn unwise to undertake such a venture. But the president of this newly-formed company was determined, energetic and highly capable. From the outset he gathered all of the reins of his business into his own hands and became the active head of each department. He surrounded himself with many assistants and has worked closely with them on all matters pertaining to the business.

The energetic individual who controls the destiny of Federal was born in a log cabin on an Iowa farm in 1889. When he was old enough, he

(Continued on page 16)



Banish Fungi from Your Flower Garden

• • Chemical science has developed an efficient preventive for most fungous diseases

By M. S. DENNIS

THE city and suburban home owner, interested in the cultivation of flowers, joyously welcomes the coming of spring. He begins to plan his garden, inspects the perennials for evidences of winter damage and considers what replacements shall be made.

Roses are perhaps the most universally admired of all flowers and, no doubt, the hardest to bring to growth perfection because they are so susceptible to fungous diseases.

Snapdragons, asters, carnations and hollyhocks require the same protection. The real satisfaction in flower cultivation is received not simply in watching them grow, but in preventing them from being attacked by fungous diseases, thereby enabling them to bring forth flowers of unimpaired beauty. Unless watchful care is exercised to prevent diseases from getting a foothold, disappointing results are quite certain to follow.

For years the problem of growing flowers, especially roses, free from fungi has hinged on the question of finding more effective means of preventing these destructive agencies.

Four pestiferous enemies of the rose—black spot, mildew, brown canker and leaf spot—have long hindered the cultivation of roses. But chemical warfare has been declared on these allies and, thanks to research activities, ways have been found to bring them under control.

Black spot is the most serious of all rose diseases; it infests all varieties and is prevalent wherever they are

grown. It is not a new disease; it has been a real problem in the United States for many years, and previously had long been known in Europe.

Black spot is first noticeable by the appearance of brown specks on the upper surface of the lower leaves. By late spring or early summer these spots become enlarged, turn black, and appear to be surrounded by a yellowish tinge. As the disease spreads, the entire surface becomes yellow, although it may be covered with small black spots. Later, these spots sometimes become light in color and dry in the center. This part of the leaf then appears to be entirely dead.

The size and shape of the spots, as well as the rapidity and extent of defoliation, seem to vary with the kind of rose or other flowers grown. The effect, however, is not only to make the leaves unsightly, but also to retard seriously the growth of the plant and bloom.

Because the parasite enters the leaf tissue under the surface, it is difficult to control. If the grower waits until the disease once gains a foothold, no fungicide can then effectively check its course. Infested leaves and canes carry the fungus through the winter, so that it is ready to attack new leaves in the spring. Black spot cannot be cured after thorough infestation. It can be prevented, and the latest research and experiments have shown the way to do it successfully.

Mildew, while more common, is a less serious malady, but it is so exten-

sive that few gardens are entirely free from its destructive effects. Probably no flower is entirely immune to fungous disease, but cultivated roses of certain varieties—especially the crimson rambler—are usually very susceptible to mildew attack. The evidences are apparent on the tender foliage and young buds early in the season. The severity of the attack stunts plant growth, deforms the leaves and buds, and frequently results in heavy defoliation. When plants are infested, grayish spots appear on the leaves and buds, become intense, then disappear, leaving the areas affected black and deformed.

Because the fungus lives on the outside of the leaf, and is therefore better located for fungicidal treatment, mildew is more easily controlled or prevented than black spot. Fortunately, the same method can be used for both diseases.

Brown canker may attack roses so severely that the blooms as well as the leaves and stem are affected. Diseased parts appear brown, frequently with a purple margin. A severe attack may require the destruction of the entire plant. While control measures in the past have not been very encouraging, it is found that the preventive developed for black spot, mildew and other fungous diseases will also control brown canker.

Leaf spot, the fourth enemy of roses and other flowers, may be first recognized by the appearance of small yellowish-green spots which increase in size, become brown and develop a purplish border. This disease is not usually very destructive, but with weather conditions favoring its development, it may cause injury by defoliation. The infection, as in the case of black spot, is also carried over in the dead leaf tissue each fall, and is likely to recur the following spring. The same preventive fungicidal treatment for black spot, brown canker and mildew, if started early and continued throughout the growing season, is effective.

In recent years concentrated efforts have been made to control these diseases. The search has been for a preventive possessing the following properties: It must stick to the foliage sufficiently after application so that the chemicals will remain effective for protection; it must possess the right degree of solubility; it must have a positive control over the growth of fungi and not be injurious to the flowers and their leaves.

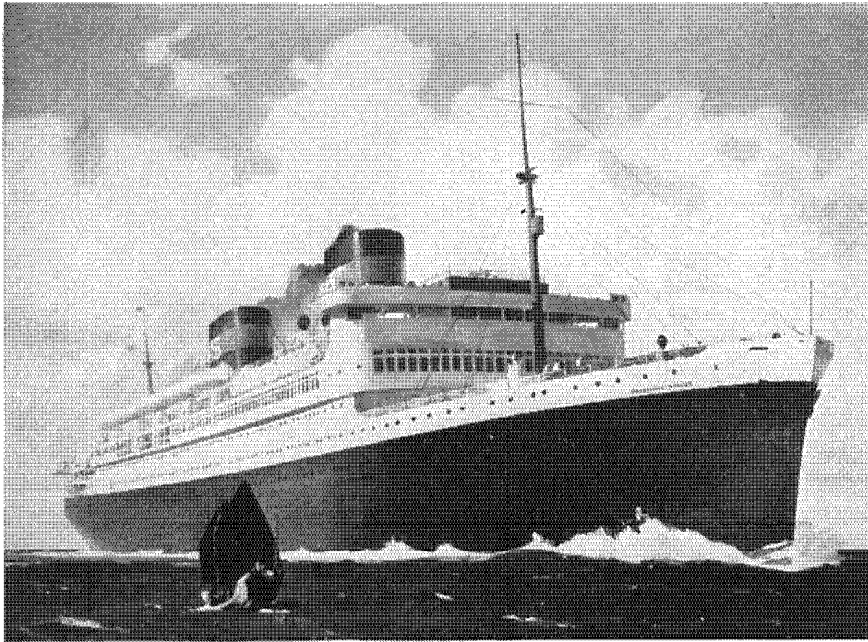
After several years of work, both in the laboratory and the field, an effective compound was developed by the Department of Plant Pathology of the Ohio State Experimental Station and the Research Department of The Grasselli Chemical Company, Inc., at Cleveland. This work was instituted primarily to find some means of controlling black spot. After working with many different preparations, one of them, now called Manganar Rose Dust, has been found to be very effective not only for black spot but also for mildew, leaf spot, brown canker and other fungous diseases. It was discovered, too, that its use on leaves controls red spider and most leaf-eating insects. This preparation is an effective fungicide and insecticide for roses and is also recommended for asters, hollyhocks, carnations and snapdragons.

The dull, grayish-green color of Manganar Rose Dust makes its presence on the foliage quite unnoticeable. It should be applied frequently, and the best time to do so is before infestation develops as a result of rains, dew or excessive humidity.

Those interested in flower culture will be glad to know that Manganar Rose Dust, if used in accordance with the directions, will insure more vigorous plants and better blooms than has been possible heretofore.

Incidentally, more information about this product is contained in a new folder which will be gladly furnished on request to The Grasselli Chemical Company, Inc., Advertising Department, Cleveland, Ohio.





The S. S. President Hoover, one of the latest additions to the fleet of the Dollar Lines. This ship is protected with Dulux Exterior White, and Dulux finishes are also used exclusively in the engine room

A "Round-the-World" Service

• • A little story about a big man in the American shipping industry—Captain Robert Dollar

By W. R. McSTAY

THE present Dollar Steamship Lines are a monument to the energy and foresight of the late Captain Robert Dollar, whose successful efforts to build up trade between the United States, China and Japan made him internationally known as the "Grand Old Man of the Pacific."

Robert Dollar was born at Falkirk, Scotland, in 1844. Fourteen years later he emigrated to Canada with his father and brothers. His first job was that of a cook's boy in a lumber camp. Often the food he served did not please the lumberjacks and he had to take their abuse, but "Bob" Dollar's pleasant disposition soon made him a favorite and at twenty he was foreman of a crew.

In 1872 he started in business for himself and did well until the panic of 1873 struck, leaving him bankrupt.

But he soon got a job as foreman of a logging crew and started anew. Hard work, frugal living and thrift enabled him to pay off his creditors, although he spent more than four years in that effort.

This first business failure did not discourage him. He saved his money and started out again in the district around Marquette, Michigan. There he conducted logging operations on such a scale that he soon became known as the "lumber king." In a few years his search for larger timber took him to the Pacific Coast where he established an extensive business.

In 1901, when he was fifty-seven years old, Robert Dollar entered the shipping business. The high freight rates charged by steamship companies were making his logging operations unprofitable, so he bought a 300-ton schooner to carry his logs to market. That boat paid for itself in less than a year. Encouraged by this venture, he purchased a second vessel of 6,500 tons and with it entered the trans-Pacific trade.

Much of the Dollar lumber was shipped to China, but the problem was to get pay loads for the return trip, so the energetic shipowner went to the Orient to arrange for east-bound cargoes. He learned that Japan was producing excellent oak railroad ties; also that the Southern Pacific Railroad Company needed them. And even though the railroad had shipping facilities of its own, Captain Dollar contracted to transport these ties to America in his own boats—a service of advantage to all concerned.

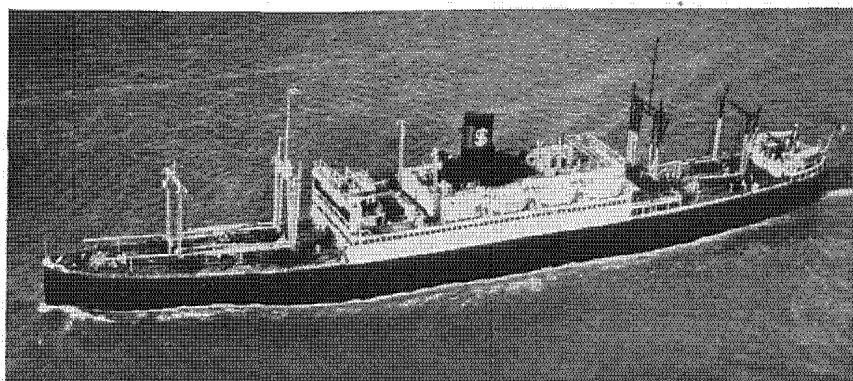
Many times he had to cross the Pacific to develop new markets for products and to find cargoes to fill his vessels. It was he who first brought copra from Sumatra to San Francisco for use in the manufacture of automobile tires. He overlooked no opportunities to build up his business and usually got what he went after by persistent efforts as the following incident shows:

In routing traffic through the Suez Canal, mail ships received preference, and Dollar Line boats had to wait their turn with tramp steamers and other craft. The Captain's boats

Page the world traveler who has been to Egypt and who has not made the trip to see the Pyramids



Airplane view of the S. S. *President Pierce*, another one of the Dollar Round-the-World ships. A number of them are regularly painted with Dulux Exterior White, a du Pont finishing material

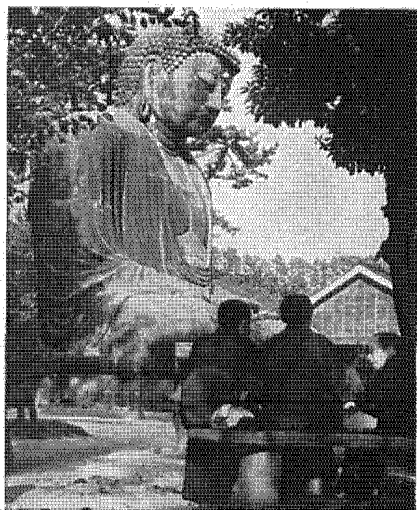


carried mail from Manila to Singapore, where it was transferred to British ships.

One day Captain Dollar asked the postmaster at Manila why he did not send mail all the way to Egypt via the Dollar steamships. When he was told that the subsidized British lines could handle it more cheaply, he agreed to carry mail free from Singapore on. His offer was accepted. But the first Dollar ship to apply for preference at Suez was refused because no contract to carry mail had been made with the Khedive of Egypt.

When the necessary contract was prepared and presented, preference was again refused, because the Egyptian minister at Washington had not signed it. That requirement was met, but the way was not yet clear. Preference was refused a third time for still another reason—and three years elapsed before the Dollar Lines obtained the rating of mail carriers and with it preference at Suez, but persistence was eventually rewarded.

Captain Dollar foresaw the boom in Pacific shipping trade after the World War and prepared for it. He bought several vessels from the U. S. Shipping Board and reconditioned them. Between 1921 and 1926 twenty-two ships were added to his fleet.



With characteristic vigor he extended his shipping services into new fields. As a noteworthy example of this, in 1924 he announced the first fortnightly Round-the-World passenger service. Many old shipping men were sure this venture would not pay. It had never been done. But on January 5, 1924, the Dollar liner, *President Harrison*, left San Francisco on a globe-girdling cruise and the venerable captain, then in his eightieth year, made the trip to book cargoes in the various ports.

In Manila, we are told, he climbed three flights of stairs to call on an exporter who had an aversion to Americans. The man shook hands and gazed coldly at his visitor, who left after a frigid reception.

Three years later on the same mission he climbed those stairs again. This time the exporter shook hands and asked:

"Captain Dollar, how old are you?" Upon being told, he said:

"And at your age you climbed three flights of stairs twice to see me. I've never given you any of my business before, but you deserve it and you'll get it from now on."

A tremendous amount of work was involved in preparing this fortnightly passenger service. Schedules had to be planned, supplies contracted for and innumerable details arranged long before the ship left its home port. And the same painstaking care precedes all sailings of Dollar vessels even though they are numbered in the hundreds.

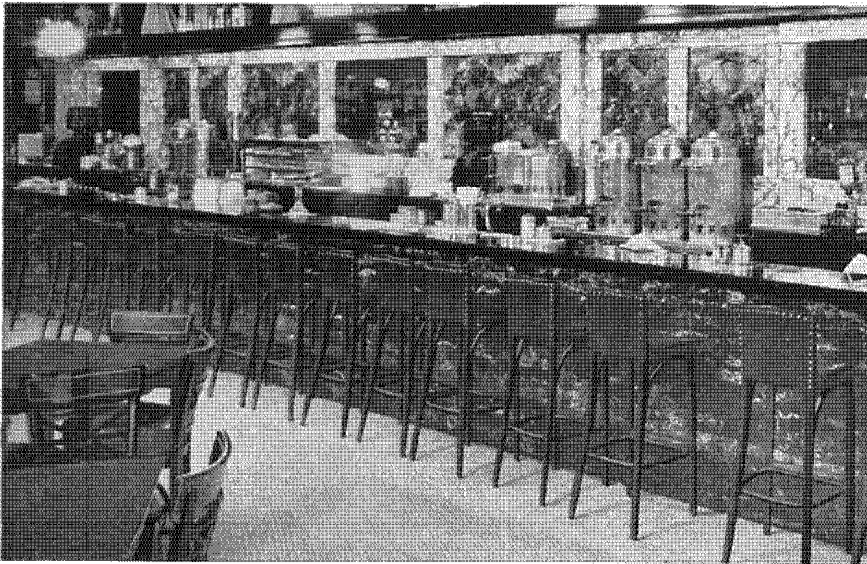
The world tourists see many interesting things, such as this famous bronze image of the Buddha at Kamakura, Japan, twelve miles south of Yokohama

So exactly are calculations made that schedules are now planned two years in advance, and met. The regularity of sailings and arrivals of Dollar ships in the Round-the-World service has made the lines world famous. The sun never sets on the Dollar Line flag, for with the ships scattered all over the seven seas the sun always lights the deck of one of them somewhere.

In the 110 days of their globe-circling cruises each Dollar ship logs about 26,000 nautical miles, and stops at twenty-two ports in fifteen different countries. These ships are as familiar in Singapore, Bombay, Port Said, and Naples as in New York or San Francisco. Efficient management and operation have made it possible for one to make the trip round-the-world at a cost of less than seven dollars a day.

During 1931 two new vessels, the *President Hoover* and *President Coolidge*, were added to the passenger fleet. These ships, said to be the largest electrically-driven liners in the world, are complete in every detail. Great pains have been taken to insure the passengers' comfort. The vessels are equipped with outdoor swimming pools, sand beaches, stock exchange service, talking picture theaters and even eighteen-hole miniature golf courses.

In keeping with methods of efficiency and economy, the Dollar Line management is protecting its ships with du Pont Dulux Marine Finishes. The *President Harrison*, first to sail on the Round-the-World schedule, was also the first to be painted in Dulux. Since then the *President Hoover* and a number of others have been protected with this new finish.



The use of Marbleized Pyralin in this restaurant has added dignity and charm to the surroundings. While chairs partly conceal the counter, the wall panels show the material to good advantage

Marbleized Pyralin for Decorative Uses

- Introducing a new man-made product that duplicates the appearance of Nature's choicest building material

By R. T. ELLIS

A NEW idea in exterior and interior decoration! That's worth investigating, if only for information. Let's pause a few moments and see how the du Pont Company and Pyralin happen to be connected with it.

For centuries, even back in the days of Pompeii, marble has been quarried and used for interior decorative purposes on floors, walls and ceilings, and outside to enhance the beauty of buildings and store fronts. In fact, some of the finest architectural gems in the world today are constructed wholly or partially of marble. Nature never produced a more choice, more beautiful material for construction purposes. But the highest grades are relatively scarce and expensive, and that is why a new idea came into being for practical development.

"Why can't we photograph the

gorgeous colorings and grained effects of quarried marble on transparent Pyralin, and then seal this plastic material between two pieces of polished glass?" said the executives of the Indestructo Glass Corporation of New York City. And from that idea has developed an art that has resulted in a man-made material that faithfully reproduces Nature's production in beauty and one that is superior to it in many ways.

The method of manufacturing Marbleized Pyralin is so interesting that we shall discuss it briefly here.

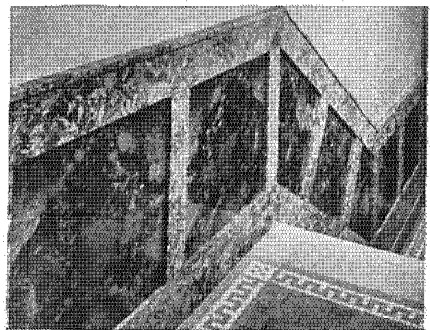
Another use of the product which can be used so effectively to decorate wall areas of public buildings, office structures and the like. This stairway is just one example among the many

By a patented process involving the use of color filters, the exact likeness of a fine slab of marble is reproduced on a photographic film which is then transferred to a sheet of transparent du Pont Pyralin, so that the detailed depths and true colorings of the slab are fully preserved. The back of this sheet is then sprayed to obtain an opaque or translucent color as desired.

The next step in manufacture is most important. This sheet of Pyralin, with its marble-like impression, is securely laminated between the two pieces of glass by means of heat and pressure. It is the Pyralin, cellulose plastic, that makes this composite product both durable and beautiful, and the result is a finished material that looks exactly like, but is actually better than, the real quarried product, because the decoration and colorings are under the surface instead of on it.

The material is now ready for installation. It is ideal for both exterior and interior treatment of store and building fronts, soda bars, shower bath rooms, wall panelings; in fact, any place where decorative marble has been used heretofore.

Marbleized Pyralin has unlimited possibilities in the decorative field. Already it has been used for several store fronts in place of quarried marble. Among its advantages, one of the outstanding is price; it is from thirty-five to fifty per cent less expensive than competitive products, and



Right—Marbleized Pyralin has helped to make the exterior of these auction rooms on the Atlantic City Boardwalk unusually attractive

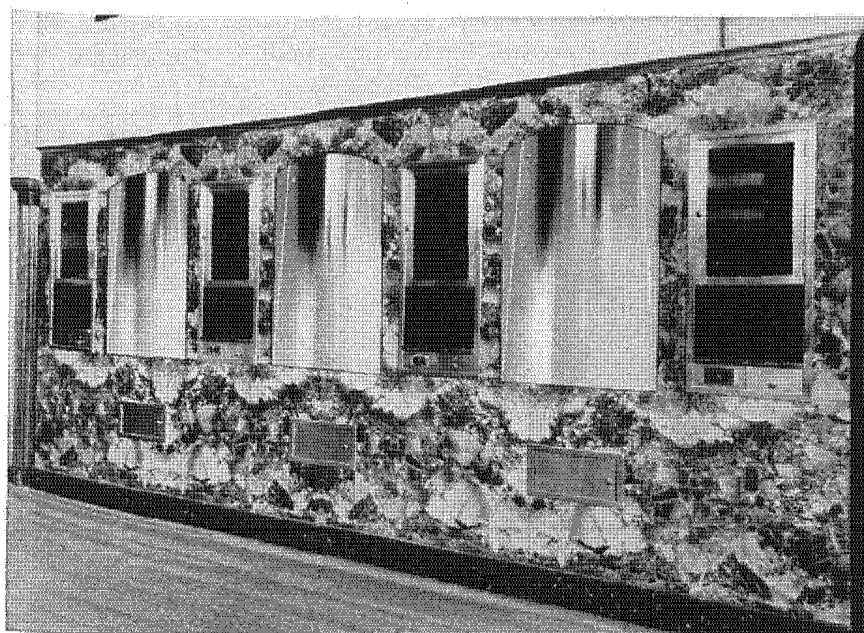
Center—Another store-front installation shows the material to advantage

it is considerably more durable.

Marbleized Pyralin can be perfectly "booked" at little or no additional effort or expense. That term, in the parlance of the marble industry, means matching the grains of one slab of material with those of another, so that when the two pieces are placed side by side on a wall, floor or some other place, the grainings will match perfectly. This is a long and very expensive operation where quarried marble is used.

Another feature recommending this new product is its adaptability for use in repair work. Natural marble deteriorates with age and use. Where this condition exists, slabs of Marbleized Pyralin can be cemented permanently over the worn places, thus giving shabby-looking surfaces a new and more enduring beauty.

For valances and detailed decorative purposes, such as indirect lighting, this product is particularly useful. More and more it has become increasingly necessary to "spruce up" the appearance of shops, office buildings, and other places of business, in order to keep step with competitors.



Modernizing old buildings inside and out is the order of the day and for such work this product is especially adapted.

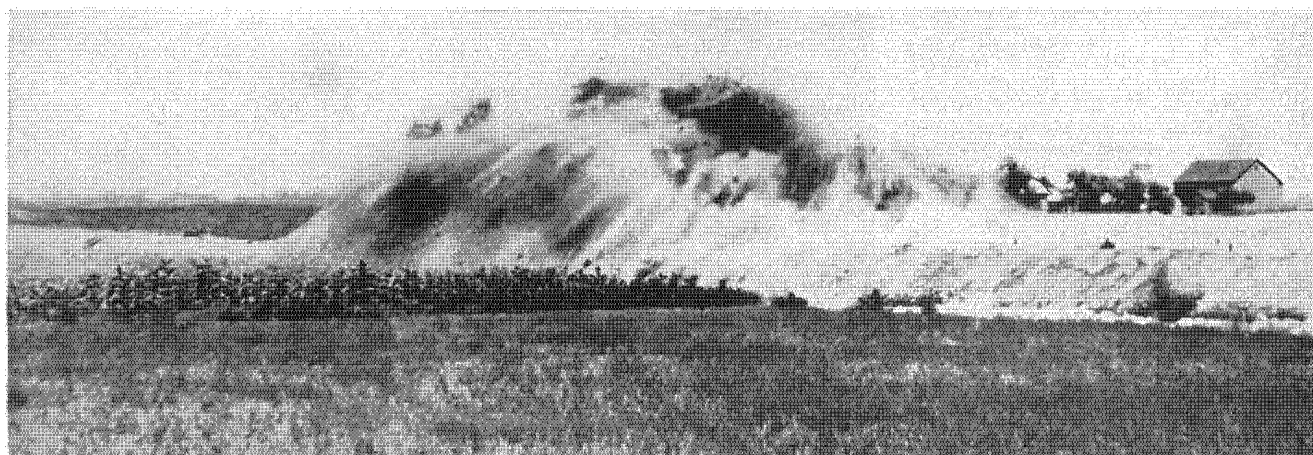
The edges of Marbleized Pyralin may be beveled and rounded. Unique edge treatments are possible, for the material can be fabricated into almost any shape.

Any area, large or small, may be covered with this material. Its use makes possible a considerable saving in time, labor and money as compared with quarried marble. It is lighter in weight and stronger than marble, making for easier and cheaper handling and transportation. It is easy to keep clean, will not stain or discolor, and is absolutely sanitary.

Marbleized Pyralin is sold by the square foot. Stock colors are available, but any color or graining will be produced upon request. Some of the more attractive shades now offered are Verdi Green, Verdi Antique, Red Lavonto, Black and Gold, Grec-Rose, Sky Ross, and Fleuri-Jaune.

The Indestructo Glass Corporation, 160 Varick Street, New York City, is marketing this product and will welcome an opportunity of going over any special problems with you. Requests for further information as to how you can use the material will receive prompt and careful attention.

The barber chairs are not yet in place, but the side wall of a high-class shop shows where Marbleized Pyralin has been used to make it richly decorative



This under-fill shot on the road north of Hicksville, Ohio, caused a surface subsidence of from five to nine feet.

Nature Is Too Slow

A few notes about the methods employed by highway builders to facilitate fill settlement . . .

By L. F. LIVINGSTON

To the engineer who delights in tackling and mastering difficult problems—and most engineers do—there is more or less of fascination in the study and use of explosives for a great variety of practical purposes. Dynamite does its work quickly, and that is a big advantage in expediting one kind of work highway builders frequently encounter these days. In building permanent roads through swamps, it does not pay to lay concrete over any insecure foundation. Fills are necessary, of course, and they settle naturally in time, but not fast enough to suit road builders who want to get things done in a hurry. That is why there is a continuing, lively interest in a new technique of blasting that speeds up the settling of highway fills.

Two noteworthy examples of fill settlement operations are found in work done in Rhode Island and Ohio. The New England project is in connection with a construction program of the Rhode Island State Highway Department. Those directly concerned with it were: Charles Wooley, the

construction engineer, and S. M. Anthony, resident engineer of the highway staff; the Callan Construction Company of Bristol, Rhode Island, with Joe Foley as superintendent of the operation.

There are three ways of accomplishing fill settlement work with explosives—

1. *Trench Blasting*—where the unstable material is less than ten feet deep, and where there is no fill in place prior to the blasting work. The exploding dynamite throws out the muck, leaving a large trench to be filled with stable material.

2. *Under-fill Blasting*—where there is a fill in place. This may be partly an old floating fill or a wholly new one consisting of sand, gravel or other stable materials. Dynamite is placed under the fill in single, double or triple rows, depending on local conditions, and the blast accelerates settlement.

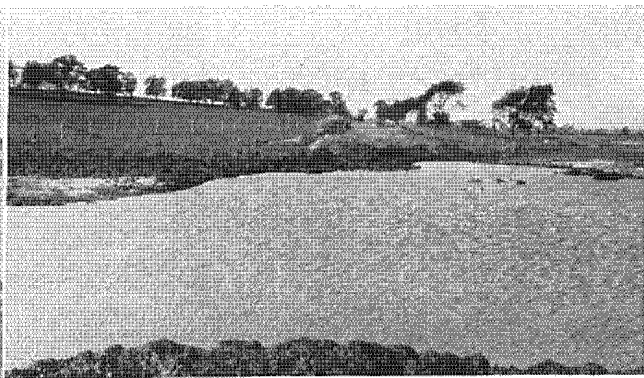
3. *Relief Blasting*—This method is used chiefly where a fill has long been in place or is of clay composition, so that a decided bridging effect has been set up within it. The object is to drop the fill as a solid block by blasting large ditches on either side of the embankment, so that the muck underneath will be pushed aside by the weight of the fill.

The location of the work was on Boyd's Lane cutoff on the Bristol and Fall River Highway, where it was necessary to cross a swamp about 1,800 feet long. The boggy material encountered was muck and sand in alternate layers. The muck strata ranged from three to four feet deep and between them were sand deposits six to fourteen inches thick. The total depth of this unstable material varied from six to nineteen feet. Fortunately, it was a new location and far enough away from buildings to permit open trench shooting. This procedure was decided upon because the sand lenses make under-fill shooting rather difficult.

Charges of dynamite were placed in three rows of holes as one of the accompanying illustrations shows. In the middle line of holes, spaced on two-foot centers, charges from seven to ten pounds of dynamite were loaded in each hole. Those in the outside lines were similarly spaced, but were not so heavily loaded, the charges ranging from five to seven pounds per hole. In each case the



Left—Just before a blast was set off on the Bristol-Fall River Highway job. Note the three rows of pipes, marking the location of charges loaded in the holes



Right—After the blast, with water covering the area affected. Solid material will now be placed on a more substantial foundation by the end-dumping method. It's wet work

explosive requirement was figured according to the depth of unstable material at that point.

The relief method of ditch blasting was resorted to in setting off the shots; that is, the charges in the outside rows were exploded before those in the center row got under way. The effect of the relief shots was to remove completely from five to eight feet of material, and the portion which fell back into the trench was of such a consistency that the sand dropped to the bottom, leaving a very mucky "soup" above it.

The fill, which will eventually be fifty-four feet wide, is being carried through this trench with a thirty-six-foot top. The dumping of solid material in the trench displaces the soft, soupy muck and forces it ahead, and further blasting operations in front of the fill serve to blow this muck away.

In this connection, Mr. Anthony has developed a clever method of loading the charges. Using slender poles about twelve feet long, he ties cartridges of ditching dynamite to the ends, and then has them pushed down into the muck at an angle parallel to the face of the fill. The

men who do this work facetiously refer to these loaded poles as "Anthony's torpedoes," but that is no reflection on their usefulness for the purpose. After the "torpedoes" are in position, with the charges about three feet apart, the shot is fired by the propagation method.

By this means the fill is carried forward with the point ahead to force as much material to the side as possible. This work was steadily advanced until wintry weather came and work operations were suspended for the season. Thus far the fill has been extended about eight hundred feet according to reports, and it is said to be very satisfactory.

When this thirty-six-foot fill is

Left—Before a shot was fired under the road fill near Hicksville, Ohio. Charges of gelatin dynamite were loaded under the pipes shown at the sides

Right—After the blast. This shot displaced the unstable material so that the central area of a nine-foot embankment dropped down to the clay bottom

completed across the swamp, ditches will be blasted on each side of the embankment and more solid material will be dumped in the excavation to extend the fill laterally until the top width is fifty-four feet, as required.

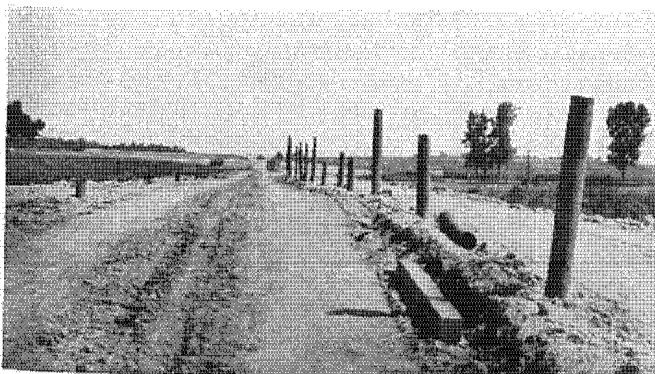
The work thus far described has been so organized and conducted that the contractor, who is making the fill by the end-dumping method, has not been delayed by the blasting operations.

ANOTHER WET JOB IN OHIO

The project in Ohio was carried through under the direction of the State Highway Department, with Elmer Hilty, construction engineer, and Carl Wahl, resident engineer, W. L. Johnson & Company, of Hicksville, were the contractors, with Fred Rowe, superintendent, in charge of the operation.

Located on Route 49, north of Hicksville, this particular piece of work was across a swamp 800 feet long where the concrete was laid up to both sides of the swamp, but the road builders did not want to proceed further until they were sure the fill had settled sufficiently. In this case, the unstable material extended

(Continued on page 15)



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VOL. XXVII MARCH, 1933 No. 3

Quality

"It took three years of violent price appeal to make people forget quality. It may take equally long, with sound advertising and promotion, to bring quality back to its rightful place of supremacy. But it is being done."

Thus, P. A. O'Connell, president of the National Retail Dry Goods Association, sounds an encouraging note in a vigorous nation-wide campaign to restore public confidence in merchandise of merit. This strongly-sponsored movement has the support of manufacturers, merchants and the press. It deserves to succeed.

Making quality products has been a traditional du Pont policy for more than 130 years. It was the woeful lack of good gunpowder that led E. I. du Pont de Nemours to start manufacturing a better grade of that commodity in 1802; in fact, some of his first work was to refine saltpeter and to remake inferior stocks of government-owned powder that had deteriorated in storage.

When his mill was in production he stated in his first advertisement that his powder was "equal if not superior to any manufactured in Europe." Foreign-made gunpowder was the standard of that day. Customers tested his product, proved its merit, came back for more. Thus the reputation for du Pont quality was early established. And from that day to this every product that carries the du Pont name has had to measure up to high standards of quality and dependability.

This company has gone through

many business depressions when cheap goods have flooded the markets, but it has always maintained quality standards. The high repute of du Pont products all through the years attests the soundness of that policy.

This Should Be Helpful

EFFECTIVE and economical uses of agricultural explosives for the physical improvement of Southern farms are described in a new handbook, "How to Use Explosives in the South," recently issued by the Agricultural Extension Section of the du Pont Company.

The text was prepared by experts who know conditions in the South and who have had wide experience in blasting operations in that section. The book describes methods of blasting stumps, especially the Southern pine; what tools to use; when to use a stump puller and when to use dynamite; how to blast boulders and ditches; how to clean out drainage ditches, straighten crooked streams and other work involving the use of explosives. Numerous illustrations from photographs and drawings assist in making clear just how to proceed.

The handbook may be obtained from the du Pont Company by writing to the Agricultural Extension Section, Wilmington, Delaware.

Good News for Wheat Growers

THE research staff of the Bayer-Semesan Laboratory has developed a new dust disinfectant that will materially reduce the cost of wheat production by control of bunt or stinking smut and other seed-borne diseases. This product, New Improved Ceresan, represents several years of research and experimentation in collaboration with important agricultural authorities who observed its effects upon winter wheat planted in 1931 and spring wheat sown last year. Reports show that the treatment controlled bunt or stinking smut of wheat, and also seedling blight caused by seed-borne scab. As one pound of the material treats thirty-two bushels of seed, the cost was shown to be only two cents a bushel.

Proof of Merit

AN interesting test of the quality of smokeless powder which was manufactured forty years ago has just been completed by the Burnside Laboratory of the du Pont Company. A can of the first lot of powder made in 1893 was used. The tests showed no deterioration with age. The velocity was found to be 935 foot seconds over a forty-yard range with a most acceptable pattern. The verdict of the Laboratory staff after making the test was, "A remarkably fine record."

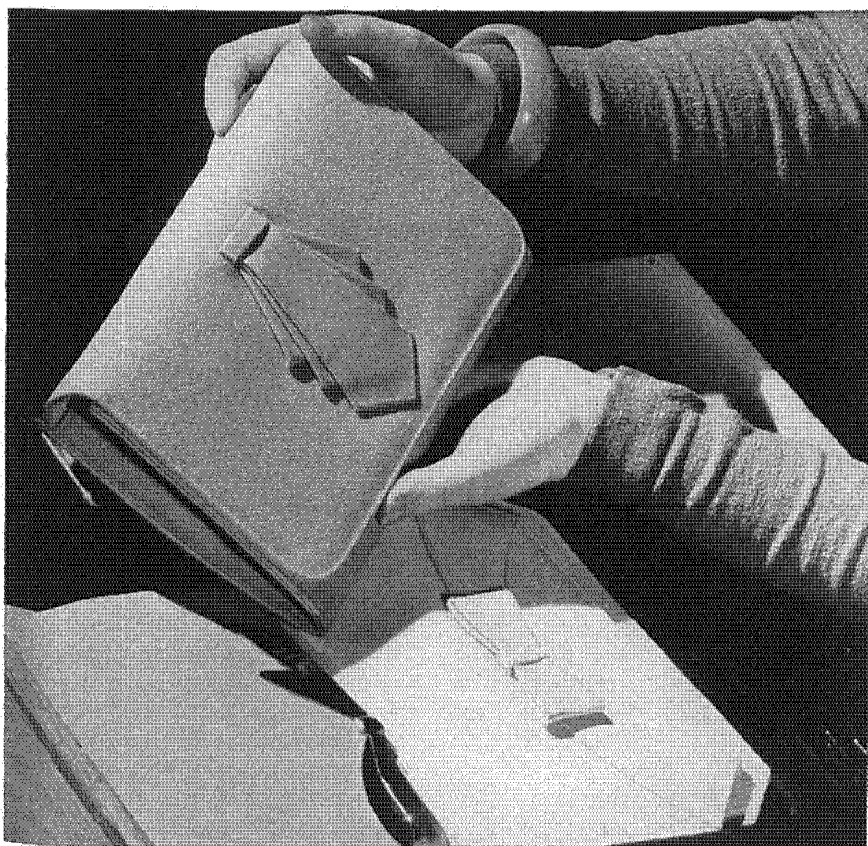
It's a Mill

IF you are familiar with rubber manufacturing operations, you will know at once the type of machine illustrated on the front cover of this number. It is one of the mills in the du Pont plant at Fairfield, Connecticut, where rubber-coated fabrics are made.

Briefly, it consists of two steel rolls between which rubber compounds are mixed by a kneading action. The crude rubber, which is tough when received from the plantation, is plasticized by this kneading action and rubber compounding materials, such as sulphur and accelerators for vulcanization, pigments for coloring, and other materials to give it certain characteristics, are added and thoroughly dispersed. After this, it is "slabbed off" and ready for calendering on the fabric or for making it into a cement which is subsequently spread on the fabric.

The rear roll travels at a slightly faster rate than the front roll and for that reason the rubber adheres to the latter as shown in the picture. The portion that does not adhere forms a "bank" and is worked down between the rolls by the operator who, at intervals, cuts off portions and puts them back into the bank so that there is a constant grinding action on practically the entire batch.

The du Pont Company has been making high-grade rubber-coated fabrics at Fairfield since 1916. Pontop, Ventube, Rug Anchor, raincoat materials and other products are manufactured there.



Handbags! Handbags!

- Those made of Fabrikoid are exceptional values at existing price levels . . .

By PAUL SAMPSON

If you had told production superintendents in the automobile factories in Detroit at the top of the wave in 1928 that they would be producing cars in 1933 at the present low figures, still retaining high standards of value, they would have questioned that statement.

But what has happened in the automobile industry has its parallel in noteworthy accomplishments by other branches of industry.

There was a sharp, quick descent to shoddy things, but in the past

year there has been a growing movement to quality merchandise at a new level of prices.

People learned quickly, to their sorrow, that the bargain oftentimes was no bargain at all.

The pocketbook industry is one striking example of how high quality has been maintained, and yet lowered cost of materials and production has made it possible to offer an output counted in the millions of units at one dollar or thereabouts.

So rich in value and yet so low

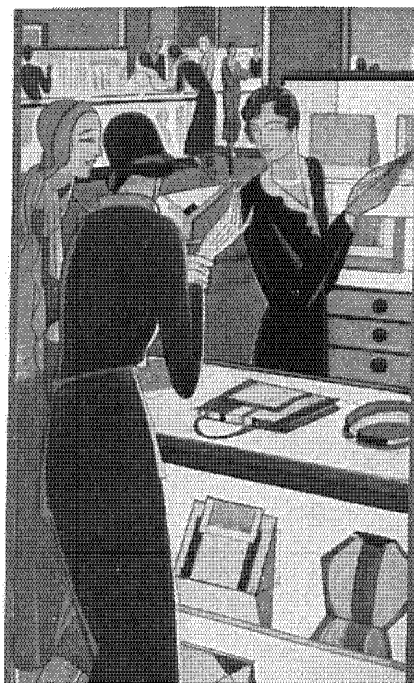
in price have these pocketbooks been, millions of which were made of du Pont Fabrikoid, that women shopping in the great New York stores were seen to be buying not one, or two, but oftentimes half a dozen to harmonize in color and texture with every change of costume.

In the white models, and pastel-toned bags for summer use, Fabrikoid offered advantages of cleaning that made these bags reigning favorites.

Women who have carried Fabrikoid bags for more than one season have been pleased to discover that the bag, instead of showing signs of wear, had become even softer and more supple than when first bought.

A woman who ordinarily paid high prices for all the items of her wardrobe bought a dollar bag for use at the seashore. The bag has been cleaned after a season's campaigning, and is now ready for another strenuous year. She said she had no idea such value could be had for the comparatively small sum she paid for it.

In 1933 bags of du Pont Fabrikoid will still offer old standards of quality, but manufacturers will offer lines that are richer in design, and with colors chosen to the queen's taste.



The Modern "Hands-Off" Policy

New Cellophane advertising campaign dramatizes today's need for protection on many articles . . .

Cellophane says

By D. W. MESERVEY



DR. HARVEY W. WILEY, if you remember, was the great crusader for pure food. As director of the United States Bureau of Chemistry, his nation-wide castigation of unsanitary methods in food preparation and purveyance blew up a cyclone of public opinion which ended in the Pure Food and Drug Act of 1906.

In the wake of that "cyclone" was left a public which was extremely "purity conscious." Foods and delicacies of all types were not only subjected to strict federal inspection, but they also underwent a critical examination by Mr. and Mrs. John T. Consumer as the latter pushed their silver and copper over the counter in the purchase of anything edible.

Many publications helped further this watchfulness through educational campaigns of their own. Out of these came the Good Housekeeping Institute—an outgrowth of that magazine's Bureau of Foods, Sanitation and Health, which Dr. Wiley himself headed from 1912 until his death in 1930; the Delineator Institute and many others. School children also were taught the value of hygienic preparation of foods.

But while all these efforts stressed careful preparation in particular, Mr.

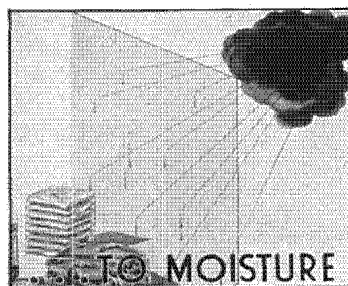
and Mrs. Consumer soon realized that products should not only be prepared properly—but they also need to be *protected* properly.

And as the collective minds of millions awoke to this secondary fact, the cellulose film called Du Pont Cellophane entered the picture as one solution. Slowly, Mr. and Mrs.

gers against which it protects. Illustrations from three of the advertisements in this new series are shown on this page and are part of the campaign to appear in *Good Housekeeping*, *Ladies' Home Journal* and *The Saturday Evening Post*.

It is recognized that as Cellophane has grown in popularity and usage, thousands are desirous of learning the scientific basis for this popularity—a natural reaction to any product on which the spotlight of public interest has been so sharply focused.

This year's campaign will demonstrate more than ever in what manner these protective qualities are not a fad or fancy—but, rather, are chemical and scientific realities. When Cellophane says, "Hands Off!" to moisture, dirt, dust, germs, handling and

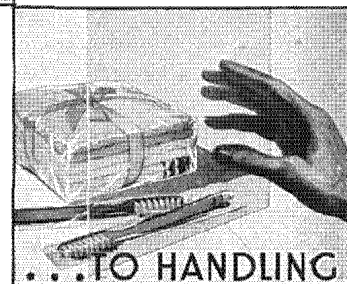
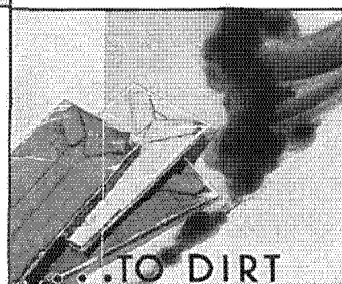


Consumer saw in it an adequate guaranteed protection—not only of foods but *all* articles of personal use.

It is this realization which the Cellophane consumer campaign has sought to strengthen over the past few years. Beginning with a conservative voice in 1926, it now teaches millions the value of selecting quality products of all kinds—products that are well protected in a wrapping permitting complete visibility.

An interesting aspect of this education is that it works side by side with thousands of municipal health departments that strive for the proper protection of food while it is on display in retail stores.

In 1933, extra stress is being laid on Cellophane's protective, "hands-off" qualities by a series of dramatic advertising presentations of the dan-



grease, the command is one to be taken seriously, for this cellulose film has the power to ward off such agencies and prevent their deteriorating and contaminating effects. Many pertinent facts about Cellophane as a guardian and protector will be stressed in this campaign.

Nature Is Too Slow

(Continued from page 11)

from six to twenty-two feet deep and consisted of a mixture of peat, muck and soft "marly" blue clay, with a hard bottom of stiff blue clay below it. There was an old road-bed on the new alignment, so it was decided to use a combination of the "under-fill" and "relief" methods of shooting. Ten feet of super-fill was placed above the level of the required grade. Then three lines of holes were made along the top of the fill, the center line holes on ten-foot centers, the two outside lines on twenty-foot centers.

The top of this fill was twenty-eight feet wide, and the outside lines of holes were placed very close to the shoulder. The holes were made by using pieces of second-hand pipe, four inches in diameter, and driving them through to hard bottom. The pipes were kept free from mud during the operation by means of wooden plugs fitted to the ends and sharpened to a point to facilitate driving them into the ground. The center-line holes were loaded with charges varying from thirty-five to sixty pounds of forty per cent Quarry Gelatin dynamite in three by ten-inch cartridges. In the outside holes loads ranging from twenty to thirty-five pounds of the same kind of dynamite were used.

After these loads were placed, ditches were blasted at the toe of each slope, using five pounds of du Pont Ditching Dynamite in holes spaced five feet apart along the toe. Shooting side ditches, in this instance, seemed desirable because extremely dry weather had caused the first three

feet of the adjacent meadow to be very stiff, and it was essential to make it easy for the under-fill shots to push the soft material to one side.

As soon as possible after shooting these ditches, the under-fill holes were connected up and shot electrically. The results are reported to have been very satisfactory, for the center of the fill settled to the hard bottom, or nearly so, throughout the entire length, and the points below the shoulders were found to be within a very few feet of it.

This fill has been leveled off and covered with a gravel surface which will remain until next spring. It is felt that the fill should have the winter period in which to compact itself before the concrete slab is placed. Complete sounding records are being kept on this work by the Ohio State Highway Department, so that the compaction of the fill and any side movement of the unstable material will be known.

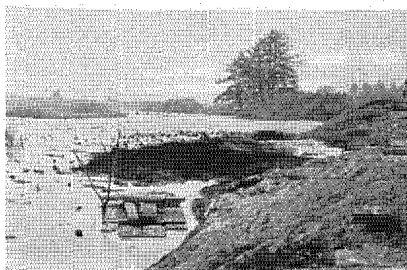
The use of explosives in fill settlement work has increased rapidly during the past year; in fact, the du Pont Company has assisted the highway engineers of eighteen states in handling projects of this type, through services rendered by du Pont explosives engineers, either in person or by correspondence. In many instances highway engineers require little or no help, but the difficulties encountered in constructing perma-

nent roads in some localities are frequently of a kind to require expert advice before proceeding with the actual work.

For a clear understanding of each problem, the explosives engineer must know the details, and it is not always possible for him to visit the scene of operations and make a personal survey; nor is that necessary now, unless there are exceptional conditions involved. The du Pont Company has prepared special data sheets, in four-page folder form, on which a highway engineer or contractor can present the necessary facts, together with a description of the project, cross-section drawings, profiles and other details. With this information in hand, an explosives engineer is in position to visualize the work and to make specific recommendations as to the kind of dynamite to use, arrangement of holes, loading requirements and so on.

As an example of the value of these data sheets, some time ago the highway engineer of one of the western states needed expert advice about the use of explosives in connection with a fill settlement problem. He procured one of the blanks, filled out the questionnaire and sent it to the du Pont Company's office. Within twenty-four hours complete instructions were prepared and returned to him by mail. The use of the data sheet greatly facilitated his work. Other highway engineers and contractors who may require similar assistance are invited to write for these "Fill Settlement Data" sheets and to use them.

Below—A view along the Oregon Coast Highway, where fill settlement operations were necessary. A deep ditch shot was made at the toe of the slope, right center, and you can see how the muck was pushed laterally out into the water as a result



Center—In building a section of the Olympic Highway in Washington, the engineers had to cope with such conditions as you see here

Below—Highway building in a swampy region near Pensacola, Florida. Note the relief blasts at the sides of the fill



The Youngest Ammunition Company

(Continued from page 3)

assisted his father to till the soil. This work brought him into close contact with Nature and he became a lover of the great outdoors.

Upon graduation from high school, young Horn decided to enter Minnesota University, where he knew an excellent course was offered in forestry—an occupation which would keep him outside for the greater portion of his life.

Before completion of his college career, however, he realized that tree culture would not always hold his interest. He changed his course and graduated in 1912, with a degree in law. Soon afterwards, he obtained a position in an abstract office in Cando, North Dakota. He remained there until he accepted a position with the Schurmeier Wagon Company of St. Paul. In 1918 he resigned from this firm and became associated with the American Ball and Shot Company of Minneapolis. Here he remained until 1922 when he organized the Federal Cartridge Corporation.

From the very beginning, Horn experienced considerable difficulty in disposing of the shotgun shells made by this newly-formed company. The older and larger ammunition concerns were so firmly entrenched that a newcomer in the field had little opportunity to dispose of its product through regular trade channels for this type of merchandise. To bring his shells to the public's attention, it was necessary for the president of Federal to employ a new, unusual plan of distribution. Having spent many years of his life in or near small towns, he knew that the village sportsmen gathered daily in the corner stores, pool halls or barber shops to swap hunting and fishing yarns and discuss the events of the day. As a result of this knowledge, Horn persuaded barbers in many small towns throughout the country to become Federal dealers. This unique method of merchandising proved successful. Within a short time, Federal shells gained recognition among

shooters. Federal shotgun shells and .22 caliber cartridges are procurable today throughout the United States at automotive supply, hardware and sporting goods stores.

During the past decade the Federal Cartridge Corporation has made rapid strides in the ammunition industry. Its growth has been due, in no small degree, to the infectious energy of Charles L. Horn. The Federal Cartridge Corporation has been successful because its president had the courage of his convictions and was undaunted by seemingly insurmountable obstacles in the form of an economic depression, and long-established business rivals.

Nineteen Thirty-Two in Review

(Continued from page 2)

Referring to changes in organization, the report notes that "The Roessler & Hasslacher Chemical Company, a wholly owned subsidiary, was dissolved at the end of the year and its assets and business transferred to the parent company. The business formerly conducted by that company is now being operated by a newly organized 'The R. & H. Chemicals Department.' The Pacific R. & H. Chemical Corporation, a wholly owned subsidiary, will continue to manufacture and distribute fumigation chemicals, etc., on the West Coast."

"At the end of the year there were approximately 28,000 employees on the rolls of the du Pont Company and its wholly owned subsidiaries."

During the period reviewed, the company "continued its efforts to provide employment for as many as possible through spread of work. The policy of the company has been to take on additional employees to an extent limited only by the desire to assure each employe a reasonable minimum weekly wage." The five-day week for salaried employees, a policy made effective in November, 1931, was also continued with satisfactory results during 1932.

The number of stockholders, by classes, follows:

	Debiture	Common
December 31, 1928	11,278	9,970
December 31, 1929	10,768	25,470
December 31, 1930	10,692	34,643
December 31, 1931	12,031	42,465
December 31, 1932	12,729	50,778

During the year, the number of common stockholders increased by 8,313, or 19.6 per cent over the number at end of previous year.

The Danger of Rust

UNTIL the time came when skyscrapers of New York rose above it, the Eiffel Tower in Paris enjoyed the distinction of being the world's tallest structure. Built in the days before engineers knew as much about construction materials as they do today, the question was often raised by skeptically-minded people as to its ability to stand up against the continuous onslaught of the elements.

But years ago, Alexandre Gustave Eiffel, its builder, when questioned as to the possibility of its collapse, made the following statement: "No, it will never fall; it has never dropped even the smallest fraction of an inch; it stands today just as it was built. The only danger is from rust and you will never find a speck of it on the framework; we are continually going over it." Repeated applications of paint have protected it from rust during the past forty-four years.

Today, the builders of America's big skyscrapers have little to worry about from this source. Chemistry has supplied them with rust-inhibitive finishes that protect metal surfaces from disintegrating, and metallurgical science has also developed non-corrosive materials which are extensively used in the construction industry. But many valuable buildings and other structures are still inadequately protected from rust. So it is well to add that the du Pont Company is in position to supply a complete line of industrial finishes prepared especially to minimize the hazards of rust—the flameless fire.

Fabrikoid scores again

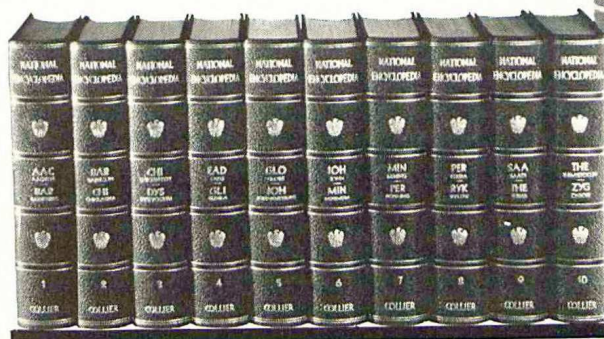
COVERS THE NATIONAL ENCYCLOPEDIA

*Blue leather-like grain
stamped in gold gives
rich effect*

● The photograph of The National Encyclopedia shown at the right is excellent. But you can't realize how handsome this blue and gold binding job is until you actually see the book itself . . . its rich colors.

It's the durability and the versatility of application of du Pont Fabrikoid that make such striking effects possible with this cover material. Fabrikoid will take superfinishing in one or more colors, airbrushing, gold or ink stamping, embossing, printing and lithography.

Our Publishers' Service Bureau is maintained to help leading binderies and publishers create new cover ideas. For that reason it would be extremely interested in seeing any new effects or processes that *you* have executed in FABRIKOID. Or, would be glad to *assist* you in creating new ideas. Just write to:



The National Encyclopedia by P. F. Collier & Son Co., 250 Park Ave., New York City—bound in a beautiful blue leather-like grained FABRIKOID stamped in gold. And the durability of this cover material is equal to its beauty. Bound in the plant of the Robert O. Law Company, Chicago, Illinois.

E. I. du Pont de Nemours & Company, Inc., Fabrikoid Division, Newburgh, N. Y. Canadian subscribers address: Canadian Industries Limited, Fabrikoid Division, New Toronto, Ontario.

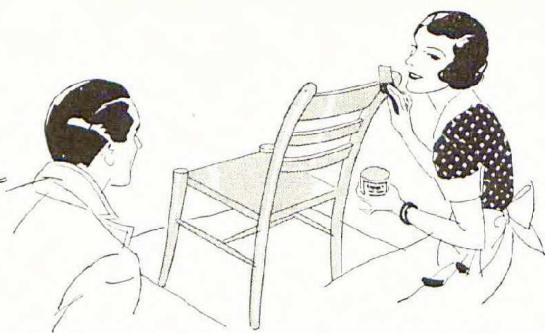


FABRIKOID

REG. U. S. PAT. OFF.

MAKES COVERS SAY "ATTENTION"

"WHY ALL THE
SUDDEN PAINTING,
DEAR?"



"HAVE YOU FOR-
GOTTEN THAT JACK AND
MARGERY ARE COMING
IN A FEW DAYS? THIS
GUEST ROOM WAS SO
SHABBY I HAD TO BRIGHT-
EN IT UP."

this is what she did with

NEW and IMPROVED DUCO
REG. U.S. PAT. OFF.



And the guests said: "WHAT A LOVELY ROOM"

This spring, more than ever, you will want to keep your home bright and cheerful. Even though household budgets may not call for new furniture, you can brighten up every room in the house with New and Improved Duco at a surprisingly low cost.

For New and Improved Duco brushes on easily and covers so well that it is the truly economical finish to use for all household painting. You will be delighted

with its cheerful colors—the satisfaction will be lasting, for Duco is extra durable.

MONEY-BACK GUARANTEE

Go to your nearest Duco dealer and purchase a can of New and Improved Duco. If you are not convinced that it is the finest finish you ever used, return the unused portion of the can to your dealer and he will refund the entire purchase price.



ECONOMIZE and BEAUTIFY with NEW and IMPROVED DUCO