

The
DuPont
Magazine
April — 1923





You Can Sell Farmers

$\frac{1}{3}$ MORE Dynamite for a Dollar

THE cleared acre is a *trade-maker*,—every acre in crops adds to the purchasing power of the farmers.

Today land-clearing is cheaper because a dollar will buy more explosives than formerly. DUMORITE,* the newest explosive of the du Pont Company, contains about 140 $1\frac{1}{4}$ " x 8" sticks to the 50-lb. case. Stick for stick, DUMORITE does the work of 40% dynamite but has a slow, heaving action like 20%,—but the farmer gets $\frac{1}{3}$ more sticks in a 50-lb. case. Besides, DUMORITE doesn't give a headache from handling nor will it freeze.

DUMORITE is widely and constantly advertised in the leading farm papers in every section of the country. Readers are directed to "go to your dealer for DUMORITE." Cash in on this sales opportunity. Stock DUMORITE,—and urge land-clearing with the new, low-cost and efficient DUMORITE. For prices, terms and advertising helps, write to our nearest office.

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

Explosives Department

Wilmington, Delaware

Branch Offices: Birmingham, Boston, Chicago, Duluth, Huntington, New York, St. Louis, Seattle, Spokane, Portland (Ore.)

* Known as PACIFIC STUMPING in Oregon, Idaho and Washington.

$\frac{1}{3}$

more per dollar by using

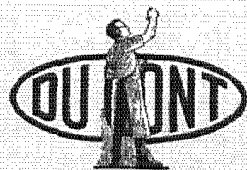
NON-HEADACHE

DU PONT

NON-FREEZING

DUMORITE

THE DU PONT MAGAZINE



Vol. XVII

APRIL, 1923

No. 4

Better Times Are Coming

An era of large production is at hand

DO you believe that the population of the United States has been continually increasing dur-

ing the last twenty years? The census figures show that result. Do you think they are wrong? If you are old enough, think back twenty years. Have not the towns with which you were familiar very definitely increased in size within your recollection? Does not the country seem to be more thickly populated than it used to? To me it seems so, and I believe the census figures; consequently, I am going to assume the population has been increasing.

Do people have more of the good things of life than they used to? Are not houses on the average materially better in that practically all houses now are lighted with electric light, provided with steam heat and furnished with running water and sewer connections? Twenty years ago, within my recollection, this was not so to the extent it is today.

Are not people better dressed than they used to be? My personal observation is that the average man or woman on the street is very materially better dressed. Even a beggar is tolerably well clad. A bare-footed adult would be a curiosity in any of the larger towns.

Are people not provided with better food and of much greater variety than they used to be? Even the poorest enjoys his coffee or tea, and sugar is used by all.

Consider, also, that there are now some 11,000,000 automobiles in use, or say one for each ten of the population; that the number of talking machines, radios and pianos have been increasing at a most remarkable rate.

By IRÉNÉE DU PONT
President
E. I. du Pont de Nemours & Co., Inc.

It, therefore, seems safe to assume that the scale of living has very definitely improved.

Now, if there are more people and they are consuming more of the good things of life per capita, it is clear that consumption of materials must be increasing more rapidly than the population and more rapidly than the improvement in the scale of living; in fact, in proportion to the product of these two rates of increase.

Notwithstanding this, statistics show that the production of many staples necessary for producing these same things has not progressed since 1914 even as rapidly as the population.

How can this apparent paradox be accounted for? It seems to me there is no alternative from the conclusion that the people as a whole must have been consuming the reserve supply. If the scale of living continues as at present or, better yet, if it continues to improve, and it probably will, factories must turn out a considerably larger volume of goods than they have been during the last few years.

This is the line of reasoning from which I have concluded that better times are coming. Frankly, I am rather disappointed that the delay in the return of prosperity has been so great; but even this delay is not without its advantages, for surely the longer the delay the greater the inroads on the supply on hand and the bigger the business required for replacement.

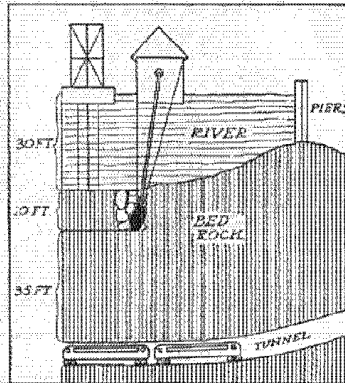
I expect that the rather abrupt rise observed in many lines in January and February of 1923 is the beginning of an era of production larger than any yet recorded.

Ripping Up Diamond Reef with Dynamite

Deepening the channel in East River over subway tubes is a job without precedent in harbor engineering

VISUALIZE a map of New York City. Imagine yourself standing at the southernmost point on Manhattan Island at the eastern side of Battery Park where you can look up the East River and get a good view of the Brooklyn Bridge. Beautiful old bridge, isn't it? Wonderful monument to engineering skill! But forget that for the present. Let your mind's eye focus on the river itself, and you will see two curious-looking boats anchored somewhere between the bridge and the place where we have asked you to stand. Those boats are making engineering history, too.

Before we get to that it is necessary to explain that two subway tubes connecting Manhattan and Brooklyn extend under the river bed, and the position of the drill and dredge boats illustrated here gives you some idea of their general location. One of them is called the Brooklyn Rapid Transit or Montague Street tunnel. Through it subway trains roar back and forth between Whitehall Street, Manhattan, and Court Street, Brooklyn. The other is called the Clark Street tunnel, maintained by the Interboro System. Hundreds of thousands of people ride to and from work daily through these tubes—and probably not one in a hundred knows that blasting operations in



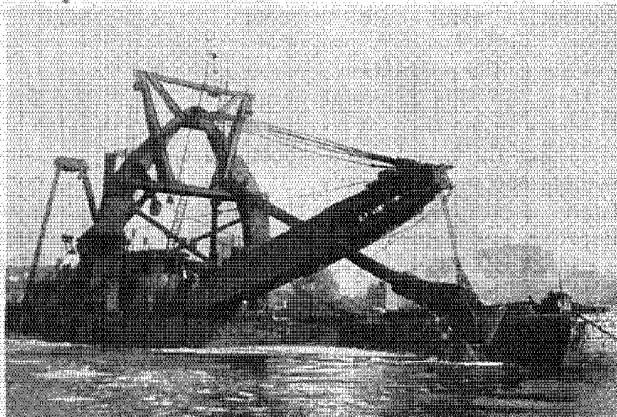
when ten feet more of depth is necessary to accommodate the largest freight ships and war craft. The big handicap to making the channel deeper is the Diamond Reef, which is an exceedingly hard rock formation jutting up in the river bed. Cutting the channel to a forty-foot depth thus involves what amounts to under-water rock-quarrying with the added complication that considerable rock must be excavated *directly* over the subway tubes. So far as we know it is the first time in the history of harbor engineering that

a situation of this kind has been encountered; and it is certain that on no Government undertaking of the kind has it been necessary to take such elaborate safety precautions as are effectively carried out each day by those in charge of the operation.

The New Jersey Shipbuilding and Dredging Company of Bayonne, New Jersey, is doing the work. Incidentally, this concern has done a great deal of important work in East River. In 1886, to cite one instance, this concern very largely assisted in blowing up Hell Gate and in opening up a passageway for boats of large size to come through the channel. Just what the company is doing to Diamond Reef is illustrated by the cross-section diagram on this page. It gives you a clear-cut idea of where and how the drill boat, dredge boat and du Pont dynamite are together cutting, blasting and removing the solid rock without endangering the lives of those who ride each day on the tube trains.

The drill boat works constantly. It is a floating platform supporting three drill frames, a big steam boiler, and a superstructure housing the crew and machinery. On these drill frames about twenty feet above the water are the little engines that operate the drills. Thirty feet below the water level these drills, spaced ten feet apart, twist and bore into the solid rock to a depth of ten feet. When the holes are bored and the tide is right, charges of 80 and 90% du Pont gelatin are packed into lengths of galvanized iron leader pipe and lowered into the holes; then it is only a moment's work to make the wires leading to the charge ready for service. The drill boat moves away about seventy-five feet, riding on her anchor chains, and the preparatory work is done.

Then the shot-firer takes his station and turns his eyes shoreward. He signals that he is ready. An inspector on the pier raises a red flag indicating that he has seen the signal and that his assistant is telephoning



This huge dredge scoops up the rocky fragments after each blast.

the rock above the tube are an everyday occurrence.

The reason for that, too, needs explanation. The ship channel in the East River isn't deep enough. Thirty feet of water was ample in days gone by, but not now

the Brooklyn Rapid Transit train dispatcher. The telephone wire remains open as the dispatcher watches the little green signal lights flickering across the lines which represent the tunnel. Each flash progressively shows the progress of the trains as they pass the block signals. He holds up other trains from entering the tunnel. Then, as the last green light fades, showing that the tunnel has been cleared of all trains, he gives the word by 'phone to the inspector's assistant.

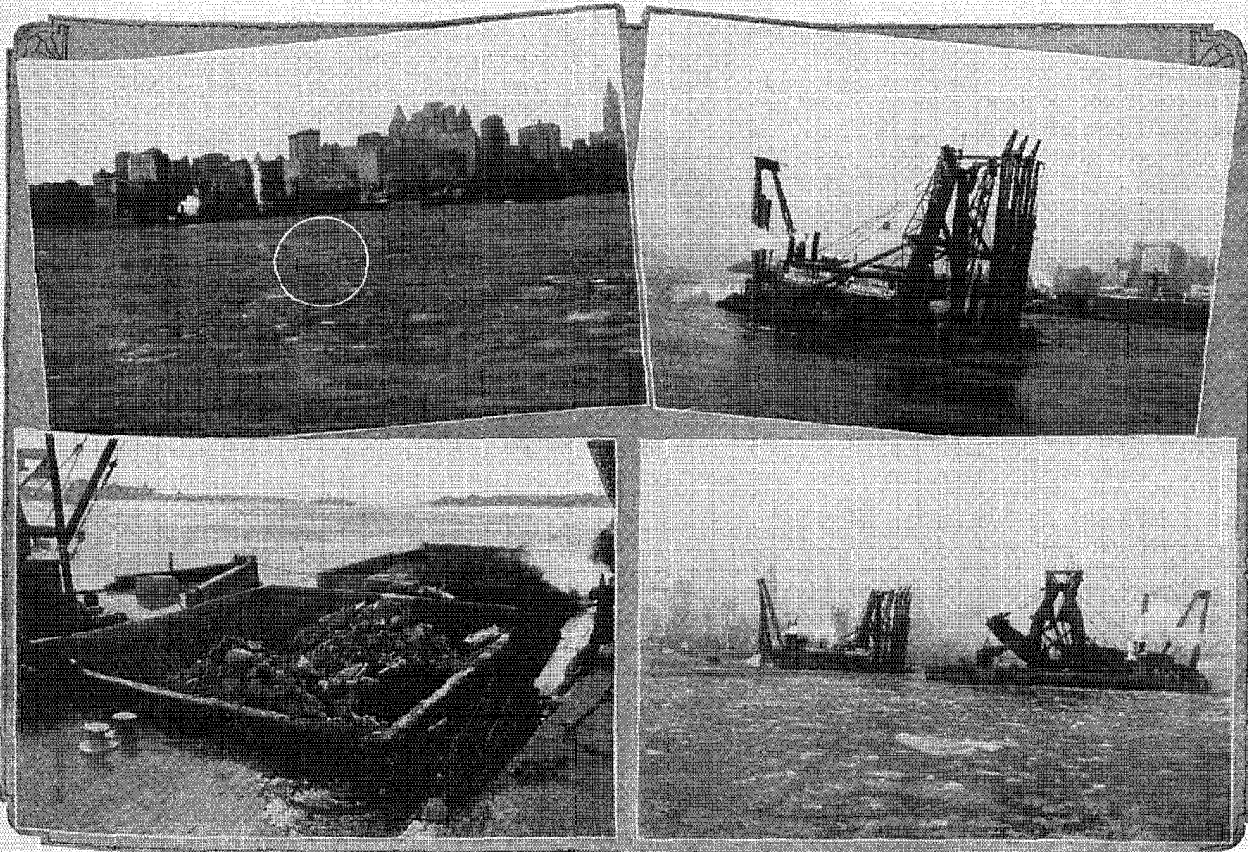
Down goes the flag. The shot-firer quickly sends the electric current through the wires to the charge and the force of 100 pounds of dynamite is released. Forty feet below, the rock has been shattered, but there is so little disturbance of the water at the surface that unless someone were to point out a circle of foam surging up from the bottom, it would likely escape your notice. A few seconds later and it's gone. One of the accompanying illustrations shows the only visible effect of a 100-pound blast. The people on Brooklyn Heights occasionally feel a slight tremor as a charge goes off, but that's all. Within another ten seconds the impatient subway trains are rushing through the tunnel

again, the dredge edges up to do its work, and the drill boat goes back to put down another row of holes.

Speaking of the blasting, Charles D. Pullen, vice-president of the dredging company, is quoted as saying: "We push the rock apart. We do not attempt to blow the reef up. The charge cracks the reef. Then the dipper goes down and lifts the boulders slipped off from the parent rock up into the scow. When filled, the scow is towed away, and that's really all there is to it, except that it takes a lot of planning, a lot of figuring and a lot of money."

Even though the blasts are being set off directly over the tubes, with only thirty-five feet of solid rock intervening, the shock of an exploding charge can scarcely be felt inside the tube. Before the first blast was made over the Clark Street tunnel, officials went inside to note its effect. It is said that as the charge went off, "the surface of a glass of water placed on the floor of the tube shook ever so slightly." It was a reassuring test.

So much rock must be excavated that this work will probably continue into next year before it is completed.



Upper left: The only visible effect of a 100-pound blast. Upper right: The drill boat bores into Diamond Reef thirty-five feet above the B. R. T. Tunnel. Lower left: Broken stone chipped off from the reef and loaded into the scow by the dredge. Lower right: The drill boat and the dredge boat work night and day, even in the floating ice.

Less Vermin—More Game

In the interest of game conservation every sportsman should do his part to kill predatory birds and animals

IF you go into a drug store and ask for a vermin eradicator, the clerk will probably ask you whether you want soap, powder, or a phosphorous paste. Put the same question to a sportsman and he will recommend either a shotgun or a steel trap. In the parlance of the gunner, conservationist or game breeder, the word "vermin" is applied to all birds, animals and reptiles that prey upon game.

In many sections predatory birds and animals are the worst foes with which game has to contend. This has long been recognized in Europe where gamekeepers are employed to wage war on vermin the year round; and we Americans must do likewise if we are to perpetuate the game which furnishes us with sport.

The first expression you hear when game becomes scarce in a locality is that it has been "killed out by the hunters." In some cases this is true; but the clearing up of covers, close farming, which leaves no weed and briar patches, the draining of marshes and swamps, has wiped out certain species of game that would easily have been perpetuated in spite of heavy shooting had not the physical conditions of the country been changed.

In many instances where certain species of game have become scarce and shooters have been blamed for it, the responsible cause has unquestionably been vermin. This can be proved by citing cases where the decrease was fully as noticeable on game preserves, where no shooting was allowed, as it was on open territory where men gunned during the open season.

Many state game departments realize that game cannot be protected merely by controlling the shooter. Such states encourage warfare against vermin. Pennsylvania, for instance, pays bounties on some four-

From an article
By RAY P. HOLLAND
Vice-Pres. American Game Protective Ass'n

footed enemies of game. And even Uncle Sam, peeved at the loss of \$20,000,000 to \$30,000,000 every year through the slaughter of domestic stock by predatory animals, has directed the Bureau of Biological Survey to kill, trap or poison such "varmint" as the mountain lion, timber wolf, coyote, bobcat and the stock-killing bear. Last year the Bureau employed 266 men to do this, and it is estimated that they killed 80,000 predatory animals.

W. R. Bell, assistant biologist of the Bureau, says: "The average destruction of these animals is estimated to be for each wolf and mountain lion about \$1,000 worth of live stock annually; each coyote and bobcat, \$50 worth; and each stock-killing bear, \$500 worth.

When one considers that domestic animals are protected by herders with good dogs, whereas wild game, the natural food of these animals, must shift for itself, it is easy to realize that the toll of game taken by vermin is enormous. It is conservatively estimated that one mountain lion kills at least one deer a week, in many instances two or more; that a wolf will kill ten to twelve, and that coyotes will certainly average one deer each in a season, while the



Photo by Courtesy of New York Conservation Commission

THE BLACK LIST OF GAME-KILLERS

- | | | |
|------------------|-----------------------|-----------------|
| 1. Crow | 4. Sharp-shinned hawk | 7. Red squirrel |
| 2. Cooper's hawk | 5. Great horned owl | 8. Fox |
| 3. Goshawk | 6. Weasel | 9. House cat |

lynx or bobcat preys heavily upon the fawns.

In classing the coyote and the bobcat as vermin, the fact must not be overlooked that they are deadly enemies of all ground-nesting birds. The coyote is known to take great pleasure in hunting the nests of prairie chickens, sage hens and wild waterfowl, and eating their eggs. Both coyotes and bobcats are especially fond of the young birds and systematically hunt a covey until the last bird has been killed.

The wild cat, both the gray and red fox, the mink and the weasel are small mammals that in Pennsylvania

are classed as vermin, and a bounty is paid for their capture. When fur prices are high, the trapper helps to keep most of these animals in check. However, it is especially important that bounty be offered for the weasel; his fur is never sufficiently valuable to pay for trapping him alone, and a great percentage of his food is game.

Mr. Duncan Dunn, head keeper of the New Jersey State Game Farm at Forked River, states that one mink destroyed about \$1,000 worth of game on the New Jersey game farm in three days before it was killed. About 300 pheasants and 66 wild turkeys were killed. Of course, slaughter in this proportion could not take place in the wild state, but it shows this animal as one that apparently kills for pleasure even after its hunger has been satisfied.

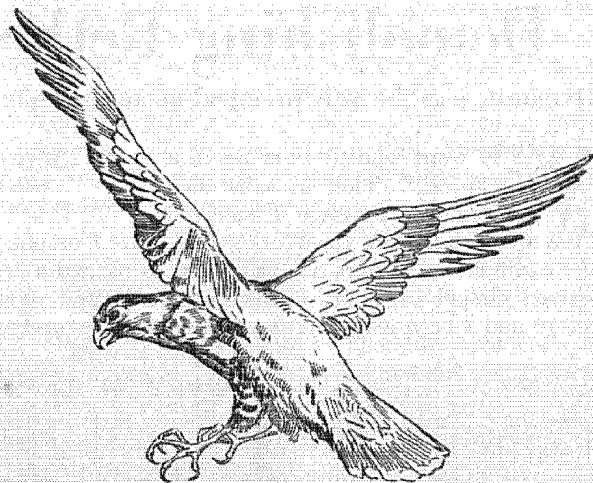
Whenever "vermin" is discussed among sportsmen, the half-wild house cat is apt to monopolize the conversation. Once the sleek, well-fed domestic cat is thrown upon its own resources and learns to make its own living in the wild, it becomes one of the worst enemies of bird life.

Vermin is by no means confined to four-footed species. Certain birds of prey are sworn enemies of our game birds. Principally among these are the goshawk, the Cooper's hawk and the sharp-shinned hawk. These birds rarely ever soar, as is the habit of other hawks, but instead they dart through the woods and over the fields with quickly flapping wings. The mature males are of a slatish blue, while the female is a brown bird. These three species of hawks should be killed on every occasion.

Red-tailed hawks are supposed by ornithologists to be more beneficial than detrimental. In other words, the bulk of their food is rodents and they are, therefore, classed as beneficial birds not to be killed. It has, however, always been the opinion of the writer that abstinence from game is through necessity, not choice. Having an extremely large wing-spread and a comparatively slow flight, they cannot dart into the covers and kill quail and ruffed grouse so successfully as they can catch meadow mice and gophers out in open fields.

Probably it takes the exception to prove the rule, but we doubt if there is any species of hawk that, if he once learns to catch game, will not develop into a game hunter in the locality where he hunts. The marsh hawk that every outdoors man has seen slowly beating back and forth with steady, sweeping wing-stroke across the swamp lands, looking for his principal diet of frogs and reptiles, has been known to develop into a killer of game unequalled by any of his kind.

The great-horned owl is the one member of the owl family that scientists and sportsmen agree should be placed on the black list and



killed upon all occasions. There is a variance of opinion between sportsmen and scientists as to the value of other species of owls. The barred owl, by many, is considered fully as destructive as the great-horned owl.

One of the most common species of winged vermin and one of the most detrimental is the common American crow. His fondness for eggs and his ability to hunt out the nests makes him extremely detrimental to such game birds as prairie chicken and waterfowl where they are nesting on the prairie in the neighborhood of prairie lakes and sloughs. The writer has often seen crows beating back and forth across the grass land, methodically looking over every bit of prairie in search of a nesting prairie chicken or duck. If a crow cannot dislodge the hen from the nest, once he has found her, this black thief sets up a cawing that soon brings others to his aid. Then it is only a question of seconds until they have crowded the setting bird off the nest and are gorging themselves on the partly incubated eggs. Crows are frequently killed that show signs of egg-eating on the feathers around their bills. A friend of mine, living in Nebraska, well described it when he said he had killed crows that were "yellow clear to their eyes."

Some species of gulls are egg-eaters, and while protected by Federal law, we believe permits should be issued permitting them to be killed wherever they are found to follow this practice. The sportsmen of Alaska bitterly condemn the gulls for their attacks upon the eggs of beneficial birds and also for their habit of eating young waterfowl.

A friend of the writer tells of visiting a small, flat bar situated in a western prairie lake. On this bar he counted eighteen birds' nests with eggs in different stages of incubation. Seventeen of these nests belonged to avocets; the other one contained thirteen eggs mothered by a little green-winged teal. The bar was so small and flat that at a glance you could satisfy yourself that no mammals made it their home. Several days

Continued on page 7



Demolishing Bethel Zion Union Church

Dynamite was the only practical means of razing the structure that had stood unshaken for 120 years

"WE want you to blow down a church." That in substance was the message I received a few weeks ago from the Worley Hardware Company, of Reading, Pa. About two years ago I dropped a fire-scarred chapel tower at Princeton, N. J., but never before had I been asked to demolish a whole church.

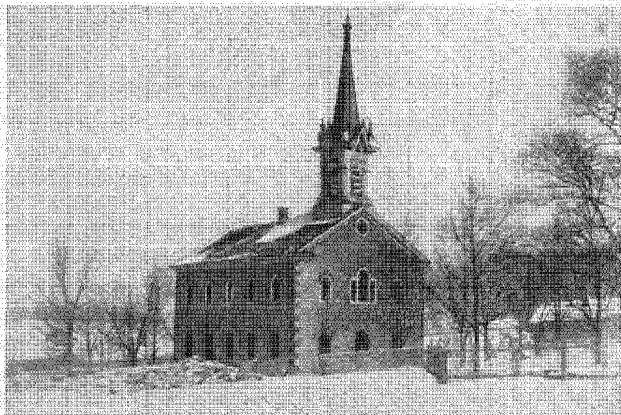
By CHARLES V. WEAVER
Sales Representative
E. I. du Pont de Nemours & Co., Inc.

was proposed only when it became apparent that by no other means could the building be demolished. The church

officials wanted the work done, but they were genuinely concerned to have the building razed without damaging either the valuable shade trees and shrubbery in front of it, or any of the tombstones in the nearby cemetery, some of them bearing dates as far back as 1761. This meant that the steeple had to come down in a narrow space between the trees in front of the building and that the wall on the east side must be thrown toward the center of the structure.

A stiff gale was blowing on February 15th, the first date set for the blasting, so the work was put off until February 21st. A large crowd including members of the two congregations, newspaper reporters, representatives of five motion picture operators with their machines, and prominent business men from Allentown, Kutztown, Reading and other sections assembled to witness the shots. I had carefully worked out a plan of placing and loading the holes to bring down the building with four shots, but I must confess that I set about the task with some little trepidation as to the results.

The first shot was a round of three holes, drilled into the rear wall, or gable end, and each loaded with two



Bethel Zion Union Church, built 1803, at Grimville, Pa.

The church in question was an old stone building at Grimville, Berks County Pa., which had been built in 1803 at a cost of \$4,500, to replace the log church which had been originally raised on the same site by the early Lutheran settlers in 1761. Since 1778 the church at Grimville had been the place of worship for two congregations, the Lutheran and the German Reformed, and was therefore called the Bethel Zion Union Church.

Plans had been made to tear down the old log church and build a larger one of stone even before 1776, but the project was abandoned until after the Revolution. Likewise, plans were under way to demolish this stone church and build a new one, estimated to cost \$65,000, in 1917, but the World War postponed the work until this year.

Upon examination of the building I found that the walls were two feet thick, the side walls forty feet high to the eaves, and those on the gable ends sixty feet to the peak. The steeple, built of wood and metal, extended ninety-five feet from the ground. It was not a large church—in fact, only forty feet wide and sixty feet long—but the thickness and solidity of the masonry made demolishing the structure a difficult problem, while the sentiment and historic associations attached to the old church made the undertaking one of interest to the whole surrounding countryside.

The members of the two congregations had tried in vain to raze the building with hand tools, and dynamite



At the moment of the blast. A few seconds later the entire structure was only a broken mass of stone and wood and twisted tin.

sticks of Dumorite. This was done to weaken the wall, or, in other words, to cut arches through the wall, leaving the corners standing.

The second shot consisted of eight holes—four on each side wall—each similarly loaded with two sticks of Dumorite and fired to weaken these walls by cutting arches as stated above.

The third shot consisted of six holes—three on each side wall—loaded with two sticks of Dumorite each. This shot enlarged the arches so that following the blast there were five arches in all—three in the rear wall, and a large one in each of the two side walls.

This accomplished, preparations were made for the fourth and final shot with which I planned to bring the structure down. In each corner of the rear wall—a gable end—I loaded six sticks of Dumorite. In each of the two corners of the front wall, I loaded five sticks of Red Cross Extra 60 per cent, $1\frac{1}{4}$ by 8-inch sticks; also in this front wall I loaded ten holes with this same explosive, three sticks to the hole, because it was a gable end and, furthermore, this wall supported the weight of the steeple. Then in each side wall I loaded five holes with two and three sticks of Dumorite each. All the holes were $1\frac{1}{2}$ -inch diameter, drilled fifteen inches deep, spaced five feet apart and in each instance located two feet above the foundation. The charges were primed with No. 6 electric blasting caps, which were connected

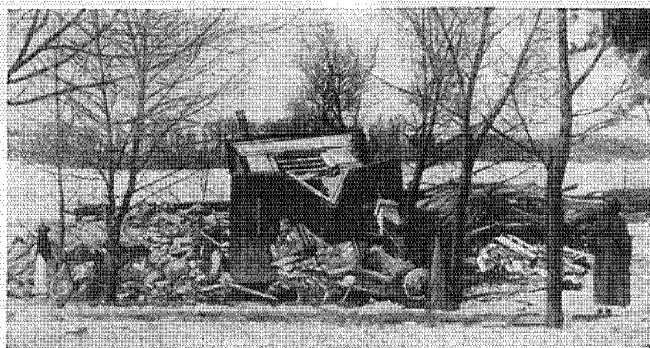
with wires leading to a Du Pont No. 3 blasting machine. In all twenty-five pounds of Dumorite No. 1 and twenty pounds of 60 per cent Red Cross Extra were used, or a total of forty-five pounds of explosives.

When everything was in readiness I warned the crowd back and set off the blast. The building collapsed. The front wall fell outward, carrying the tower with it. After the smoke and dust cleared away a large section of it

was found lying among the roof timbers in the very spot where I had planned for it to fall. The side walls collapsed toward the center of the building, while the rear wall remained standing a few seconds and then fell inside the foundation walls. All of the stone fell within twenty feet of the foundation walls. On the side nearest the cemetery no stones were thrown more than eight

feet away. Many of the roof timbers were found unbroken after the fall and the slate roof was not damaged half so much as had been expected. In short, the shot was completely successful. The President of the United States couldn't have been greeted or congratulated more heartily than I was after the tower fell. The building had been razed without damage and the members of the church were pleased beyond measure.

Naturally, I also was much pleased with the results, because it was the most difficult job I ever undertook to accomplish and du Pont explosives had justified the attempt by doing the work efficiently and economically.



The steeple dropped, as planned, in the space between the trees.

Less Vermin—More Game

Continued from page 5

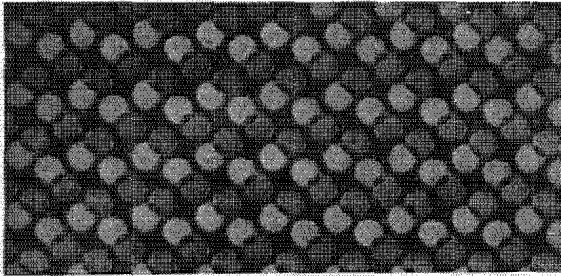
after the island had been visited and the foregoing information secured, a flock of ring-billed gulls were noticed apparently feeding there. The next morning the island was visited again to ascertain what these birds had been doing. The nest of the green-winged teal was the first visited. Each of the thirteen eggs had been neatly pierced and the contents sucked. Of the seventeen avocet nests, only three remained unmolested.

Many reptiles are also classed as vermin and their depredations as egg thieves are well known among game breeders. When an egg-eating snake finds a nest of eggs he does not stop until he has swallowed the last one.

Snapping turtles are very destructive to young waterfowl, often pulling them under the water without as much as a ripple.

Everywhere Nature has a balance. Before men disturbed this balance the natural enemies of our game kept it in check, but now with civilization constantly changing the physical condition of the country, with gunners afield after the desirable species of game birds and animals, it is essential that we devote some of our time to thinning out vermin in order to maintain this balance.

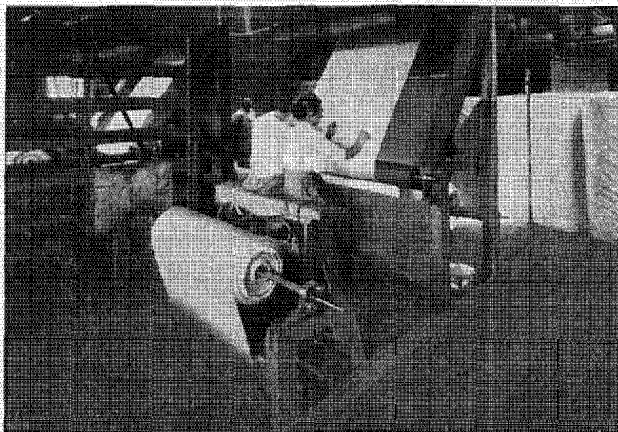
Vermin carry on their destruction through the twenty-four hours of the day for three hundred and sixty-five days a year. They have no bag limit, no closed season. Along with the trapper, the one thing that will keep them in check is the sportsman in the field. An opportunity should never be overlooked by him to kill any of the recognized harmful species; and where an individual or a group not generally recognized as harmful has developed bad habits, the same fate should be meted out without any thought of the good done at other times.



DURING the past year our company has received scores of requests from interested sources for information regarding the process of manufacture of Du Pont Fabrikoid. These requests come from manufacturers investigating the fitness of the material for their own use; from chemical and engineering societies for the enlightenment of their memberships; from publications in the many trades using Fabrikoid; from writers of special articles for magazines; and from a surprisingly large number of college students seeking data for theses on this subject.

We believe, therefore, that interest in this subject is general enough to justify an article on the Fabrikoid process in this magazine. To make that article brief and as free as possible from confusing complications, we will forget for the time being the wide variety of standard and special qualities and combinations in which Fabrikoid is now made to serve the thousand and one demands of industry, and touch only upon the manufacture of a single type of this material known as Craftsman Fabrikoid.

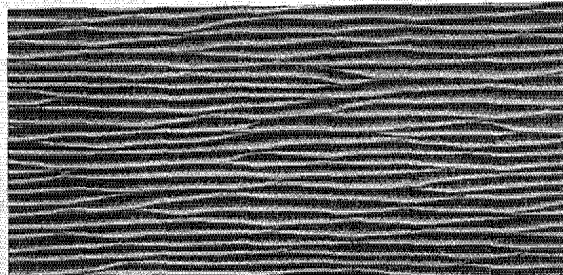
This is the grade, or quality, of Fabrikoid which is generally employed where the best finish and wearing qualities possible in a coated fabric are essential. By following the processes of its manufacture, we will see where Craftsman Fabrikoid inherits the rugged strength, the permanent beauty and the resistance to wear and weather on which depends its usefulness for furniture upholstery, traveling goods, automobile



One of a battery of picking frames where any imperfections in the "gray goods" that might cause trouble are removed.



Making Craftsman



tops of rigid construction and the many other products in which the reader frequently meets it.

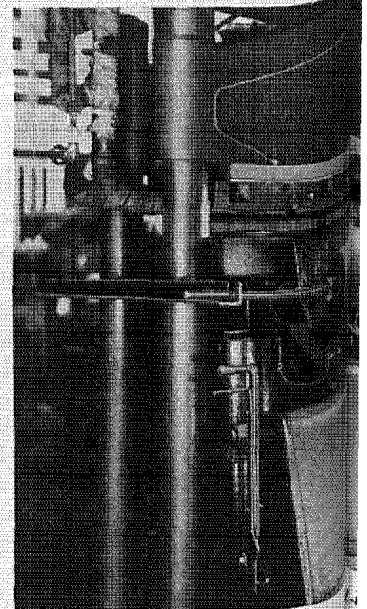
The base of Craftsman Fabrikoid is a cotton fabric of the type known as "heavy moleskin". Du Pont experts have developed this fabric with careful attention to the pattern, number, size and strength of the threads in the warp and woof so as to secure a weave that is exceedingly strong and has great depth, softness and pliability.

Although every care is taken in the production of this moleskin to make it as perfect as possible, and, although it is carefully inspected before leaving the mills that weave it, our first step in the du Pont Fabrikoid factory is on the picking frames where it receives a further inspection before any of the processes of actually turning it into Fabrikoid begin.

The moleskin, unrolling slowly from huge rolls carrying several hundred lineal yards each, passes over these frames and is examined by the keen eyes of female operatives skilled in detecting and removing such defects as it may still contain. These usually consist of dropped threads, lumps and knots, which, though seemingly insignificant, would become increasingly prominent if not removed at this stage.

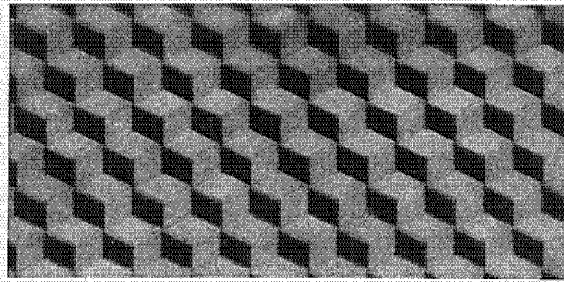
After sharp eyes and deft fingers have done their part, the moleskin is carried, still in huge rolls, to the dye vats. The purpose of dyeing is to change its color from the familiar grayish white of unbleached cotton fabrics to a color the same as, or approximately the same as, the face of the Fabrikoid when the material is finished.

The dyeing is done by passing the moleskin back and forth through boiling dye solutions until the proper amount of color has been absorbed. Only the



A roll of Fabrikoid passing through the dye vat. The material is also examined for defects.

Craftsman Fabrikoid



very best and most stable dyes are used, and practically all are made by the du Pont Company itself, thus insuring complete chemical control over this important process. After dyeing, the moleskin is run over a series of immense steam-heated steel drums to remove its excess moisture. When dry it is inspected for color and strength and then passed through a machine which straightens out any wrinkles or irregularities and rewinds it upon rolls of perfectly even width throughout.

In both the dyeing and drying processes the moleskin shrinks considerably and this shrinkage is purposely made as great as possible so that all tendency of the finished Fabrikoid to shrink or sag in service is eliminated at this stage—a most important point.

The moleskin is now ready to be napped, or as one might say, “to have its back scratched.” If you were to examine a piece of Craftsman Fabrikoid, you would find a leather-like surface on the face and a fleecy nap of downy cotton fibers on the back. This

“napping” adds to the depth and softness of the material, gives it the “feel” of leather, and where it is used for upholstery adds greatly to its comfort-giving character.

The napping machine is a large cylinder or drum that bristles with innumerable needle-like points. As the moleskin runs over this drum, these sharp points pick at the outermost threads and pull out the millions of fine fibers that form the napped back of the finished Fabrikoid.

While the moleskin is being brought to this point, another type of cotton is undergoing an entirely different treatment in a far removed section of the plant. This is nitrated cotton, cotton which, having

undergone certain chemical changes from the action of nitric and sulphuric acids, has acquired some remarkable qualities, one of the most important being that of being reducible into liquid or semi-liquid form by various solvents.

In the Fabrikoid plant this nitrated cotton is dissolved in large mixing tanks into a colorless syrupy fluid called pyroxylin. This substance is very similar in composition and appearance to the collodion preparations sold in drug stores and to Du Pont Household Cement, with which so many are familiar. It is, when reduced to solid form by being sufficiently freed of solvent, one of the toughest and most wear-resisting substances known, and one of the most immune to deterioration from natural conditions. Absolute water-proofness and permanent flexibility are two of its outstanding qualities.

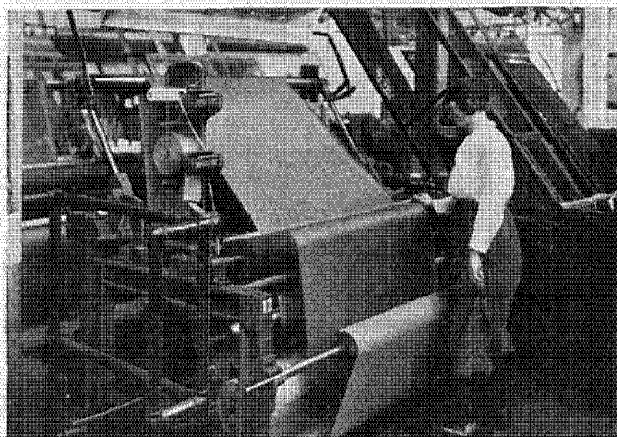
It is this pyroxylin which gives Craftsman Fabrikoid its characteristic appearance and its most important service qualities, but it must first be brought to the proper condition and color.

This is done in the “Mixing House.” Here mineral pigments of almost every hue are mixed with pure, refined, castor-bean oil and fed upon the steel rolls of powerful grinding machines, whence they emerge in the form of smooth, semi-solid pastes.

Carefully weighed batches of this pyroxylin color



bed embossing press. Embossing rolls produce certain grains.



Inspecting and measuring the finished Fabrikoid before it is wrapped ready for shipment.

paste and castor oil are then thoroughly mixed by mechanical means. The mixture is then known as "pyroxylin jelly" and is ready for application to the dyed moleskin which has just passed over the napping machines.

The application of the "pyroxylin jelly" to this base fabric is called "coating" and is carried on in "coating machines" of immense length. At the front end of a coating machine the moleskin fabric unrolls and passes under a heavy knife, the sharp edge of which presses vertically upon the fabric across its entire width with a pressure which can be regulated very exactly.

The "pyroxylin jelly" feeds down upon the fabric just in front of this knife. This jelly is both penetrating and adhesive, but very little is permitted to adhere in a single passage through the coating machine. As the fabric slips under the knife edge all of the pyroxylin is held back excepting a very thin film.

As the fabric now passes through the long coating machine, this thin film dries and the material is ready for another trip under the knife, where another very thin film of pyroxylin is deposited upon the first one. In this way the fabric passes through the coating machine about fifteen times before it has acquired a sufficiently heavy coating of pyroxylin to be of Craftsman Quality.

Anyone who is familiar with the wearing qualities of paint or varnish knows how much superior is the finish obtained by applying a large number of thin coats carefully brushed out and dried, to one obtained by a few applications heavily laid on. So right in the tedious coating process which we have just described lies much of the reason for the wonderful flexibility, toughness and weathering qualities of Craftsman Fabrikoid. Starting with the first or impregnating coat of pyroxylin, which secures a strong anchorage in the fabric base, each overlying thin coat helps build up a film that is homogeneous yet super-strong, as when many strips of veneer are built up into ply wood.

As after every major operation, the semi-finished Fabrikoid is inspected after coating. Strength, toughness, thickness and anchorage of the film are tested. The color must be right, and the material free from all surface imperfections, before it can proceed to the embossing presses.

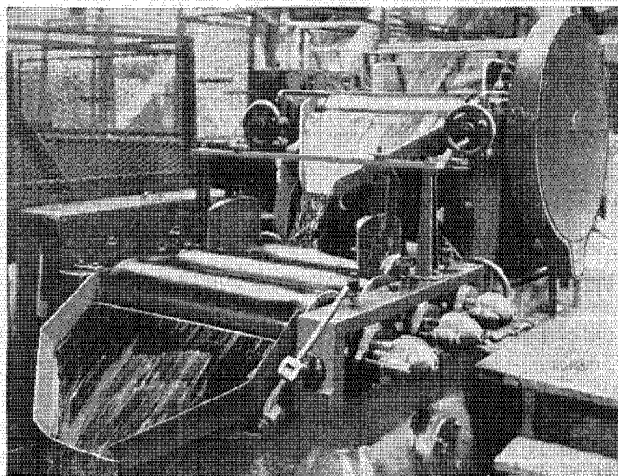
Embossing is what gives Fabrikoid its characteristic

grain, and much of the beauty of the material is revealed in the embossing process. Most of the plates used in embossing Fabrikoid are direct reproductions of selected hides of natural leather. By a process similar to electroplating exact copper duplicates of the grains of these hides are made right from the hides themselves. Every line, pimple, pit and pore mark of the natural grain is seen in the embossing plates and is transferred to the Fabrikoid that passes under them.

The embossing machines themselves are of immense dimensions, capable of exerting many tons of pressure per square inch. They are heated during operation and the combination of heat and pressure leaves an impression in the Fabrikoid which is absolutely permanent.

After embossing, the material is again inspected and, unless it is to receive a special finish or luster or a special color effect, it is ready for shipment.

A great deal of Craftsman Fabrikoid is specially treated before shipment to give it the Moorish, two-color effect which is so popular on furniture upholstery and on the Craftsman (California type) automobile tops that are so much admired for their colorful beauty. This process consists of spreading a color contrasting with the base color of the material over the entire



A color-grinding machine. The pigment and castor oil vehicle are fed from above upon the revolving steel rolls.

surface of the same, and of then wiping off as much of the added color as is possible. The added color will however remain in the valleys of the grain, where the contrast with the original color shown on the tops of the grain gives a vari-colored, or duotone, effect that is exceedingly rich and pleasing.

The Exodus of Farm Laborers

Recently there has been considerable editorial comment in the South about the exodus of negro farm laborers. It is claimed they are being enticed to plants in the North by offers of higher wages. Probably the situation isn't as bad as it has been represented to be; but one can be sure that if the darky with his hoe and shovel, and axe and hand-plow, moves away from the South, more mechanical labor-saving devices and more explosives will be brought in to do the rough work on Southern farms. More explosives are being sold in the South than heretofore, and it is a favorable augury for the continuance of a wonderful record of progress made in that section during the past fifty years.

ONE day, not many years ago, a sailor who had forsaken the sea for a job on land was doing some repair work on the Brooklyn Bridge. It was during the rush hour when thousands of people were going to and from work. A high wind was blowing that morning, and the sailor paused occasionally to watch men—and women, too—chasing their fugitive hats. In particular, he noticed that many girls were losing their hair ribbons. Every little while the wind swept a dainty ribbon over the guard rail into the river below.

These incidents started the sailor thinking. Why not make a device to keep hair-ribbons from blowing away? As he labored he pondered the question, and before quitting time he had seen so many ribbons fly over the rail that he resolved to make and sell the device himself.

That night he made a crude ribbon-holder of metal; it wasn't much for looks, but it worked. Later he fashioned one attractive enough to warrant asking a young lady of his acquaintance to wear it, and she readily assented. Also, she showed it to her friends and, seemingly, every one wanted one. The sailor was soon hard pressed to supply the demand. As he worked evenings in his little home shop, visions of big business came to him.

The time came when his spare-time work brought in more money than his regular job on the bridge. He determined to go into the business of making and selling clasps exclusively.

Mechanically, his product was good enough; artistically, it lacked something. He concluded that the metal was too commonplace. The problem, as he saw it, was to find a more attractive, light-weight, easily workable material that would not cost too much, and yet be distinctive. He experimented with various materials until finally a friend suggested Pyralin. It was just what he wanted.

He bought a small quantity and made clasps which he sold personally to school girls at recess time. As fast as the ribbon-holder was introduced in a community school, the neighborhood dealer would receive an avalanche of requests for it. Soon the sailor had orders for all he could make, many coming in unsolicited.

His business grew by leaps and bounds. He capitalized it, added to his working force and sales force, and enlarged production. Within a year thriving trade.

Only a few years have passed since then. Today the sailor rides to and from the office in a high-power car with a liveried chauffeur at the wheel, and lives in a fine home in an exclusive, residential section of the city. He is rated a wealthy man.

Luck? Not at all. A commonplace incident furnished him with a business-building idea; he could convert that idea into money if he could find a suitable material. Pyralin proved to be *the* material.

A New York State manufacturer was making pocket-knife handles of bone, stag-horn, and wood. So were his competitors. His product was no better than theirs. Competition increased, and he faced the possibility of losing a substantial portion of his trade unless he could produce and sell handles at a lower cost or gain leadership by bringing out something new. He couldn't cut costs. The only al-



*Here are just a few
of the thousands of
articles that are made
of Pyralin Sheeting*

ternative was to stimulate sales by introducing a novel effect in handles. But what?

For weeks he experimented, but to no avail. One day while visiting another manufacturer who was using Pyralin Sheeting of various shades for making a novelty, the idea flashed on him: Why not use this stock for knife handles? He rushed home and sent in a trial order for Pyralin. When it arrived he set to work, and discovered that his machinery for cutting,

Continued on page 16

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E. R. MANCHESTER, Editor

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APRIL, 1923

No. 4

An Unusually Valuable Book in an Appropriate Binding

WHAT effect has the size of a book upon our attitude toward it? Most of us visualize an atlas of the world as an immense volume which is indispensable for a public library or office, but impractical for the home. Such a huge book seems to intimidate rather than invite us and not to be sufficiently companionable for our fireside hours.

Now comes the Funk & Wagnalls Company and proves that an authentic and attractively bound world atlas can be made of convenient size for the desk or library table. The particular atlas which is making history in this field is approximately seven by ten inches and contains 176 pages; it is just the kind of a book for close-up, comfortable reading. One's first glance into its pages gives a new conception of how interesting an atlas can be. Moreover, this atlas is entirely up-to-date. It was brought out to meet a need created by the sweeping changes in world politics and boundaries wrought by the great war and events following it.

The text matter includes the 1920 Census of the United States, the 1921 Census of Canada and all other British dominions and colonies, the 1921 Census of France and her colonies, and latest official enumerations of all other civilized countries, the greater portion of them being of dates 1921-1922. These new figures, now first published complete, appear in the newly compiled list of countries giving the areas and capitals of each, the list of the principal cities of the world, and

complete indexes of the United States and Canada; tables and diagrams showing the distances between the largest cities of the United States; areas and drainage bases, and lengths of the principal rivers of the world; areas of the earth, the percentage of land and water; the principal religions of the world; interesting descriptions of the principal countries, outlining their physical features, their climates, their people, their governments, commerce, industry; particulars as to products, mining industry, manufacturing, means of communication such as transportation, telegraph, telephone lines, cables; the characteristics of the chief cities and important institutions.

We have devoted one of the covers of this magazine to an illustration of this atlas and some details about it. The illustration gives only a very poor conception of the binding. We were forced to show it in green, whereas in reality the book is bound in a rich red Fabrikoid, handsomely stamped in gold and splendidly flexible. We have seldom seen as fine an example of the bookbinders' art. The publishers say of this binding that "Fabrikoid resists wear and retains its beauty for years. It is waterproof, grease-proof, non-staining, non-fading. It is practically scuff-proof and resists hard usage to a remarkable degree. It is not attacked by mildew or mould, by parasites or insects. Fabrikoid has the feel and finish, the dignity and de-luxe character, that book-lovers admire. It is the ideal binding for books of such a permanent character as this atlas."

Our company not only can thoroughly endorse the good qualities claimed for this binding but feels that the new 1923 Atlas of the World and Gazetteer is a book so valuable for its contents that it is indispensable in the home, in the school and in business. That is why we have made the arrangement, mentioned in the advertisement, with Funk & Wagnalls Company, whereby any reader of this magazine can obtain a copy at the special price of \$1.50.

An Interesting Picture

When powder-making operations were discontinued at the Brandywine works of the Company a few months ago, motion-picture views of the old buildings and the burning of several of the mills were taken. This was the oldest powder plant of its kind in America, established by E. I. du Pont de Nemours in 1802. These views in a one-reel picture are available on request.

To operate
a blasting machine—



"The rack bar should be forced down as hard as possible, the operator using both hands and all his weight."

Clearing Tangled-off Lands

Duco Solves the Auto Finishing Problem

Automobile manufacturers and body builders are interested in this product that adds the quality of permanence to beautiful finishes

WE wonder if a piano manufacturer could be found who would guarantee the finish on his product for a year if he knew that the instrument would be exposed to the elements several hours each day; that in zero weather it would be stored in a warm room at night and left in the open during the day; that after it had stood in the burning hot sun during a summer day, it would be washed with cold water and then polished with almost any polish on the market.

"Ridiculous," you say. Yet car buyers expect a piano finish on their cars and expect their paint jobs to stand up for at least two years.

The paint proposition, we find, is one of the biggest problems confronting the car manufacturer and body builder today.

Durability Required

From the sales standpoint a beautiful finish is just as essential as mechanical perfection to the average prospect. "Give us a beautiful finish but make it durable," say the sales managers. The "buck" is then passed to the production department. The result is a beautiful finish but not a durable one according to the standards of the buyer.

To the layman, fifteen to eighteen coats of surfacer, color varnish, etc., and a four-week finishing cycle represent quality—and it is expected to be reflected in greater durability.

To the manufacturer, this same finishing schedule represents excessive finishing costs, not resulting in correspondingly increased durability but in finer appearance.

Frankly, does the spotlight test of final inspection gauge the quality of the work by durability standards or by perfection of workmanship?

According to our analysis of the situation, motor-car manufacturers and body builders are eagerly waiting for a quicker and better method of finishing cars. Realizing the possibilities of development in this direction, we have for the past two years concentrated our research activities on the problem. This work has resulted in the development of a pyroxylin-type, quick, air-drying enamel which can be applied by spraying. This product is known as Duco Finish.

Knowing that the industry has frequently been disappointed by claims made for finishes having some merit but also some objectionable features, we determined to find and eliminate these objectionable features before offering our product to the industry. In keeping with this policy of conservatism, we have not advertised our product directly, preferring to introduce it

By O. H. BRIGGS
Promotion Department
Chemical Products Division

through a few well-known concerns and depending on the "news travels" agency for advertising.

Our system of finishing has a double appeal to the car manufacturer and body builder. The first claim is superior quality; the second is speed and economy of application. Duco Finish will adhere to bare metal if the surface is clean. However, this method of application can seldom be followed, due to the necessity of surfacing bodies to eliminate file marks and so forth. We do not claim unusual filling qualities for Duco, because we find from experience that for production work the regularly employed surfacing process of metal primer, glazing and rough stuff or sanding surfacer is most satisfactory, providing the surfacing coats are oven dried to aid oxidization.

After the body has been brought through the surfacing process, or to the point where the surface is considered ready for color varnish, the use of Duco for the color coats is the modern method of producing a more durable finish in a shorter time. Two or three spray coats of Duco are sufficient to give a solid color of sufficient body to permit rubbing to a regular finishing surface.

Our material can be manipulated to give a high egg-shell gloss finish, or brought through to the high egg-shell gloss finish, and then rubbed to a surface with pumice stone and water, followed by rotten stone and oil, rubbing and final polishing. This process produces a highly polished satin finish which seems to be gaining in popularity due to its greater wearing qualities, ease of cleaning and distinctiveness.

For the manufacturer who requires a high varnish gloss, our process is carried through as outlined for the high egg-shell gloss finish, and that finish rubbed to a satisfactory surface, whereupon the finishing varnish is applied in the usual way.

Why This Process of Finishing is Recommended

Duco Finish possesses merits which especially justify its use as an under surface for varnish. The Duco surface is almost glass-like in hardness. Thus, the entire finishing varnish coat is "held out," giving longer life and greater depth to the finish. Our process supplements the greater speed of spray application with a fifteen-minute air-drying time between coats, thus permitting the successive application of two or three coats of Duco. Overnight drying is required before rubbing. The Duco process eliminates the necessity of using rubbing varnish, which is the least durable of the regular varnishes, and eliminates the delay caused by the long drying time of rubbing varnish.

The fifteen-minute air-drying characteristic of Duco also eliminates much of the factory troubles caused by settling of foreign matter in slow-drying varnish surfaces.

A Duco surface will not check or craze, is not affected by sudden or extreme changes in temperature, will withstand a high degree of heat and is not affected by alkaline climatic conditions. This feature has led to its immediate popularity in the Southwest, where the ordinary auto finish lasts but a few months.

The introduction of the Duco process in production does not introduce problems of increased material cost or expensive equipment installation. Our material costs are comparable with the high-grade auto varnishes, and the regular spray equipment—now a part of most up-to-date shops—can be utilized with slight alterations that are not difficult to make.

In many body-building plants the production is

limited by the length of time required by the painting process. Often this same condition is found in automobile factories. Floor space is always at a premium. Drying ovens are slow and expensive. While our process does not eliminate the necessity for ovens, it does eliminate their use in connection with colored varnish and rubbing varnish coats, thereby hastening the painting process, making available more floor space and lowering the cost of oven operation.

This unique combination—a quicker finishing method and a better quality finish—is naturally attracting a great deal of interest in the automobile industry. In support of our claims, we are willing to send trained technical men to demonstrate our material and methods at automobile plants, when desired. Due to the great amount of such work now under way, however, it is desirable to give us several weeks' notice so that we can arrange our demonstration work accordingly.

Book Moths Have a \$4000 Banquet

SEVERAL months ago it was announced that an important section of the books in the State Library of Kentucky had been irreparably damaged by moths. The committee appointed to look into the matter quoted the records of the librarian as showing that 1219 of the reports stored in the Capitol had been either destroyed or so damaged that they could not be sold. These volumes were valued at \$1830. It was also stated that the backs of a large number of reports were damaged and that to replace them would cost \$2241.80.

What happened in the Kentucky State Library has been happening in more or less degree since men first collected books. Moths, roaches and other insects and vermin are the natural foes of bookbindings made of animal substances, such as leather or parchment, or of vegetable substances such as book-cloth or paper. Fumigation and insecticides are purely temporary preventives. Poisonous coatings have been tried on book-cloth and paper with little effect. If any part of a bookbinding is digestible, that binding is doomed eventually, regardless of how great the insect mortality may be in consuming it.

Had the volumes in the Kentucky library been bound with Fabrikoid, the State would not have suffered the loss it now bears. Fabrikoid consists of a strong cotton base covered with a tough coating of pyroxylin. This coating is a chemical compound that is absolutely indigestible and quite unattractive to insects; moreover, it is so tough that they cannot masticate it or break through it. The coating is also waterproof, mildew and mold resisting, flexible, non-peeling and fast color. It stands wear and weathering better than any other type

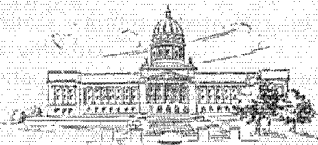
of binding for permanent records. It is thoroughly sanitary and can be cleaned with soap and water.

This sounds like an enumeration of qualities for the ideal bookbinding, and, in fact, that is what Fabrikoid may properly be called. It is one of those products in which Science has vastly improved upon Nature.

It is interesting to compare the destruction by moths of the hundreds of volumes in the Kentucky library with the result of tests made a few years ago in the Philip-

pines. In the tropics, insect life is very prolific, and the guarding of books and records becomes a serious affair. The McCullough Printing Co. of Manila made up a book with various binding materials, dividing each cover into six squares and covering two squares with Fabrikoid and the re-

maining ten squares with other materials, each one said to have more or less merit in resisting vermin and insect attack. After a period of storage, the book was taken out and it was found that the cloth and leather bindings had been thoroughly permeated and destroyed while the Fabrikoid segments had resisted perfectly; in fact, "resisted" is hardly the word, because the insects had passed them over completely. This practical test established fully the value of Fabrikoid bookbindings.



The Kentucky State Capitol

A New Use for Explosives

From one of the Company's southern representatives we learn that dynamite is playing a new role as the advance agency in loosening up silt in the bottom of a river bed, so that a suction dredge which comes on the scene immediately following a blast can more easily remove the material. Dynamite chews it up and the dredge swallows it. Fine teamwork, eh?

Standardize Your Up-keep Painting

There are important advantages to be gained by adopting the system outlined in this article

NO matter what the size of the plant, the adoption of standard colors for all exterior and interior painting has important advantages. Buildings painted a uniform shade are not only more orderly and attractive to the eye, but are cheaper to maintain, as fewer colors of paint need be purchased and carried in stock. Standardization guards against the "rainbow effect," which frequently results when the color of the paint is left to the fancy of the individual in charge of each unit.

The advantages to be gained from such standardization are: (1) greater attractiveness and unity of the entire plant; (2) a standard color scheme for each surface; (3) a ready means of identification in case of trouble; (4) a product for each surface of a recognized standard of quality; (5) a consequent reduction in overhead expense by the elimination of costly experiments with unknown materials; (6) simplification in ordering materials for repainting.

The preparation of a system of this kind requires a careful survey of the plant and the cataloging of all the surfaces or articles in and about the plant to be included in the system. A knowledge of the conditions each surface must meet, together with the proper materials to use to fulfill the requirements, is essential.

The selection of the colors and materials must be based upon the nature of the surface or article and the conditions to be met. Below is a system worked out for interior surfaces of an industrial plant; a similar system has been worked out for exterior surfaces:

Interior Surfaces—Factory

COLOR KEY	COLOR CHIP	SHADE	USE
A	—	Kromate Metal Primer	For new metal surfaces
B	—	Black	Finish for interior metal work
C	—	Light Gray	Finish for machinery
D	—	Bright Green	Finish for machinery guards
E	—	Black	Finish for oil tanks
F	—	Dark Green	Cold Water Pipes
G	—	Blue	Gas Pipes
H	—	Yellow	Comp. Air Pipes
I	—	Black, with Vermilion couplings and valves	Acid Pipes
J	—	Brown	Live Steam Pipes (usually covered)
K	—	Maroon	Exhaust Steam Pipes
L	—	Buff	Heating Pipes and Coils
M	—	Black with Yellow fittings	Switch Boxes and Conduits
N	—	White	Ventilating Ducts
O	—	Vermilion	Fire Equipment
P	—	Yellow	Sand Pails
Q	—	Red	Sprinkler System
R	—	Gray	Finish for doors
S	—	Dark Green	Handmark for doors
T	—	Vermilion	Elevator Gates
U	—	Mill White, Eggshell	Walls and Ceilings
V	—	Dark Green	Dado
W	—	Dark Gray	Cement Floors

While repeated attempts have been made by various engineering societies to arrive at a standard system for the identification of piping in all industries, owing to

the diversity of conditions met, it has not been possible thus far to reach a definite conclusion. (A suggested system is included in the chart below.) Undoubtedly in the near future a system will be perfected that will be applicable to the majority of industrial plants, and will greatly simplify the matter of piping identification.

The value in painting pipe lines various shades lies in the safety element in case of trouble. It is very easy to turn off the wrong valve or make a mistake whereby some one is injured or the plant damaged. Color identification of piping guards against this possibility. It may also be desirable to indicate the direction of the flow of liquids in certain lines by painting arrows on the pipe at regular intervals.

Painting machinery guards a bright color, such as bright green, will serve to make them conspicuous and their absence immediately noted. Operators frequently are tempted to take guards off machines on the plea that they interfere with maximum production, or are slightly in the way. A prominent color will advertise their removal and the employee will hesitate to disconnect a guard so treated.

There are good reasons for the choice of certain colors and products for the surfaces involved. Chief among these are the durability and suitability of the color suggested. For instance, Color "K" for "Exhaust Steam Lines" is a maroon that will withstand relatively high temperatures. If one were to put some other color on such a surface, it might be only a short time until the shade had faded and the paint worn out, because of its unsuitability for the purpose intended.

From the foregoing, one can readily see the value of such a system in the upkeep of industrial plants. It facilitates the ordering of material and guards against the use of the wrong product for the surface to be finished. The individual in charge of the painting simply requisitions a certain quantity of Color "N," if he wishes to refinish some part of the fire equipment. The purchasing department orders that quantity of material from the manufacturer by the same code. When received, it is sure to be the right product for the purpose.

On request, the du Pont Company will be glad to work out such a standardization chart for *your* plant and furnish a sufficient number of copies for the guidance of those interested. These charts can be framed and hung on the wall for ready reference.

(The foregoing is a portion of Chapter 22 of a 200-page book entitled "Principles and Practices of Up-keep Painting," which will shortly be off the press. You should have a copy for reference purposes. Sent free to plant executives who request it on their company stationery, mentioning the Du Pont Magazine. Extra copies, \$2.00 each.)

Pyralin Sheeting—Builder of Fortunes

Continued from page 11

boring and polishing bone and horn and wood was equally serviceable in fabricating with Pyralin at a saving in time and money and with less waste.

He packed a sample line of Pyralin-handled knives and went out on the road, anxious to know if they would sell. To his delight, dealer after dealer liked these new knives and ordered a trial assortment. Before he completed his trip, re-orders began to come in to the factory from dealers who had sold out the trial assortment and wanted more knives of the new type. So he discontinued using the other materials and specialized on Pyralin handles. Five years later this manufacturer was a wealthy man. Pyralin helped put him on the high road to prosperity.

Only a few years ago button manufacturers were using horn, metal, and vegetable ivory. The trade was clamoring for something new. One manufacturer risked investing \$1,000 for additional machinery to produce Pyralin buttons. It was a good investment; the buttons sold well and moreover the greater ease of fabricating Pyralin enabled him to make a larger profit. Other manufacturers saw his samples, grasped the idea and quickly added Pyralin buttons to their lines. Almost overnight a thriving industry grew up. Since then, more than a million dollars' worth of Pyralin has been made into buttons in a single year.

In many other instances Pyralin has helped build up big businesses from small beginnings. Pyralin is used in making more than 5,000 articles or parts of articles. Each year brings out some new use. No one can foretell the range of its uses, nor the limits of its business-building possibilities a year from now—five years from now—or later.

A Seasonable Suggestion

In its field experiments in clearing land with explosives the College of Agriculture of the University of Wisconsin has studied the effect of soil moisture on the economic efficiency of stump blasting. Results show that it costs about fifty per cent more to remove stumps with dynamite during the dry part of the summer than in early spring or late fall when the soil is wet, other conditions being the same. Stumping under wet conditions saves dynamite, detonators and labor. The advantage of blasting in the spring or fall, or at some other wet period of the year, may amount to \$20 an acre where there are one hundred stumps or more to the acre to be removed.

There are many times during the year when cultivated areas are too wet to work in. During such wet spells stumping operations can be carried on with profit and under most advantageous circumstances. Explosives dealers who are seeking for a timely approach to encourage farm trade will find in these facts a message well worth passing on to their customers.

E. I. DU PONT DE NEMOURS & Co., INC., WILMINGTON, DELAWARE

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