

The first du Pont powder mill, built in 1802, near Brandywine Creek, Wilmington, by E. I. du Pont de Nemours

The DuPont Magazine

March 1925

TONTINE

The Window Shade Cloth That Washes!



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60 Public & High Schools in Washington, D. C.
Phila. Pub. School System
N. Y. Public School System
University of Michigan
Northwestern University
General Motors Bldg. Detroit
American Radiator Bldg. New York City
The Travelers Insurance Co. Building Hartford, Conn.
The Oliver Building Pittsburgh
The Evening Star Bldg. Washington
The Illinois Life Ins. Bldg. Chicago
The Patterson Building Denver
The Continental Ins. Bldg. San Francisco
Waldorf-Astoria New York City
Bellevue-Stratford Philadelphia
The Traymore Hotel Atlantic City
New Willard Hotel Washington
Windermere Hotel Chicago
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THE
DU PONT
MAGAZINE

DU PONT

Vol. XIX MARCH, 1925 No. 3

The Kinship of du Pont Products

(From an informal after-dinner talk to the members of the du Pont Explosives Department and their guests at a recent banquet held in Wilmington)

By DR. CHARLES M. STINE
Director, Chemical Department
E. I. du Pont de Nemours & Co., Inc.

THIS Company of ours is a great chemical manufacturing concern and I propose to direct your attention to the close relationship which exists between the various branches of the chemical industry which constitute the du Pont Company's lines of manufacture. I think we shall find it interesting to develop this relationship by considering these lines in the light of the fundamental processes involved. Our manufactured products are chemical products manufactured by chemical processes. Therefore, in considering the relationships existing between them, we must deal with chemical relationships. The logical development of the Company's interests, from high explosives into the diversity which characterizes our Company's activities today, is based upon these chemical relationships and has followed lines suggested by the chemistry of the products.

THE du Pont Company manufactures a great many products, and so diverse are they in form, appearance, properties and uses that many people mistakenly think of them as wholly unrelated.

But these products of chemistry are related—intimately; the ties of kinship are in fact much closer than they seem to be. Some of them possessing widely dissimilar characteristics are made from essentially the same raw materials. Others are produced by following the same or nearly the same chemical technique. You will find Dr. Stine's discussion of this subject both interesting and informative.—*The Editor*

Perhaps you would find it interesting to listen for a few minutes to an attempted exposition of the relationships which exist between the explosives industry and artificial silk, Cellophane, dyestuffs, Fabrikoid, Pyralin, and finishes. (In the class of finishes, I include logically paints, varnishes, lacquers and enamels.) The expansion of the Company's activities along these industrial lines is exactly as logical as its gradual development in the explosives business. The relationships in these industries are based not merely upon the identity or close resemblance of the chemical manufacturing processes involved, but in some cases upon the identity of the raw material or intermediate products employed, as well.

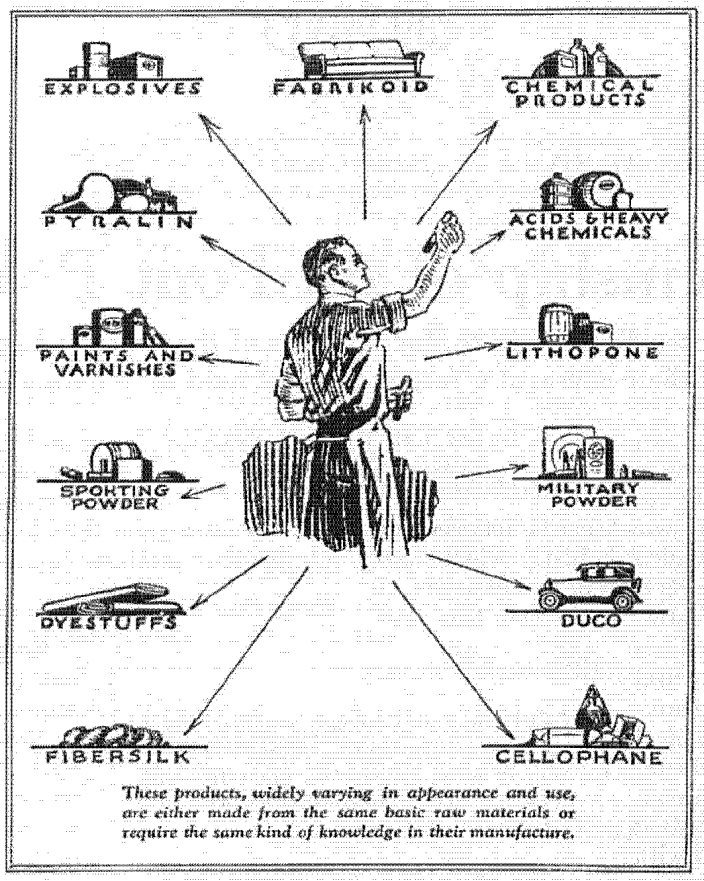
Many Raw Materials Common to Explosives and Dyes

Keep in mind, please, throughout this discussion, some of the important raw materials involved in the manufacture of explosives with which you are all so familiar, namely, cellulose—whether this cellulose is in the physical form of cotton fibre or of wood fibre—sulfuric acid, nitric acid, glycerine, benzene, toluene, xylene, naphthalene, and similar coke oven by-products. You know very well that to make nitroglycerine we bring together under suitable conditions sulfuric acid, nitric acid and glycerine, and similarly to make nitrocellulose, we treat some form of cellulose with these acids. In the same fashion, to make trinitrotoluene or other nitrated aromatic hydrocarbons, such as nitrobenzene or nitroxylene, or nitronaphthalene, we bring together some one of the coke oven by-products such as benzene, toluene, xylene, or naphthalene and sulfuric and nitric acids. You have frequently read and been told, I am sure, that a great many of the intermediates involved in the manufacture of dyes are likewise produced by the treatment of these coke oven by-

products with sulfuric acid or with a mixture of sulfuric and nitric acids.

Same Technique Useful in Diverse Industries

The technique involved in these operations is very similar to or identical with that involved in the manufacture of such materials as nitroglycerine or trinitrotoluene and the like. But there are other acids in addition to sulfuric and nitric acids which can be made to combine with cellulose or with glycerine to produce chemical compounds which, in the eyes of the chemist, are identical in structure with the familiar high explosives. For example, if glycerine is treated with acetic acid under proper conditions, we obtain compounds which are useful in the manufacture of Pyralin, because these glycerine acetates will gelatinize nitrocellulose in very much the same fashion that nitroglycerine gelatinizes nitrocellulose to produce blasting gelatine. Now, by combining various acids with glycerine and other alcohols, we have been able to produce a number of very useful compounds in the Fabrikoid and Pyralin industry because these acid salts of glycerine are characterized by their ability to produce jellies with nitrocellulose of quite different physical properties, *i. e.*, by varying the amount and nature of the glycerine salts mixed with the nitrocellulose, we are able to produce at will plastic jells or solids. The latter, in many cases by the application of heat, can be moulded into desired shapes and articles, or coated on fabric as films. If we add to the foregoing the fact that by varying the method of nitrating cellulose we are enabled to produce cellulose nitrates of varying properties to be mixed with different kinds of gelatinizing materials, we have the basis of Pyralin, artificial leather manufacture, film and nitrocellulose finishes.



These products, widely varying in appearance and use, are either made from the same basic raw materials or require the same kind of knowledge in their manufacture.

Artificial Silk and Cellophane

I have already mentioned the fact that cellulose in the form of cotton or of wood pulp is a very familiar and essential ingredient of high explosives, but, in the same fashion in which salts of glycerine may be formed by treatment of glycerine with acids other than nitric, so we may form compounds of cellulose with various acids. The chemist calls nitrocellulose and nitroglycerine "esters." The word "ester" merely means an organic compound which is a salt, in very much the same sense that sodium sulfate is a salt. These organic salts, or esters, vary in their physical properties with the nature of the materials which are brought together to produce the compound. We can act upon glycerine or other alcohols, and upon cellulose, with nitric, or acetic, or other acids, and obtain widely differing products adapted to form the basis of a large number of the products which our Company manufactures. Cellulose is involved in the manufacture of such products as artificial silk and Cellophane, as well as in Fabrikoid, Pyralin, finishes and explosives.

Oxidation and Reduction

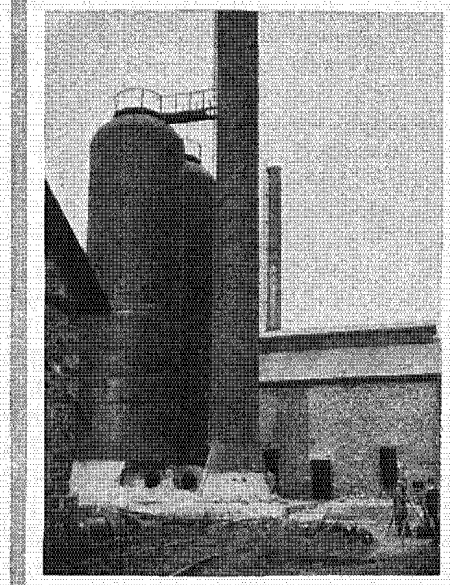
You know, of course, that one of the principal reactions involved in the explosion of dynamite is oxidation of the solids and liquids in the high explosive with the consequent formation of a very large volume of hot gases which produce the rending or heaving effect which does the work. If we add oxygen to a product, we say we oxidize it, and, conversely, if we take oxygen away from it, we say we reduce it. For example, in the manufacture of iron, iron ore, usually in the form of iron oxide, is reduced to metallic iron, and when iron rusts the reverse process occurs; that is, the iron recombines with the oxygen of the air. These two very interesting processes of oxidation and reduction are involved not only in the manufacture of explosives but in the manufacture of dyes, and finishes of various types, and to a considerable extent in the chemistry of all the products manufactured by the Company.

If we oxidize, *i. e.*, add oxygen to organic compounds, we are enabled to produce various products which differ tremendously in their properties, although they are formed by precisely the same type of reaction. If we carry out the reverse operation, that is, take oxygen out of compounds such as nitrobenzene or nitrotoluene, for example, we obtain various products exceedingly

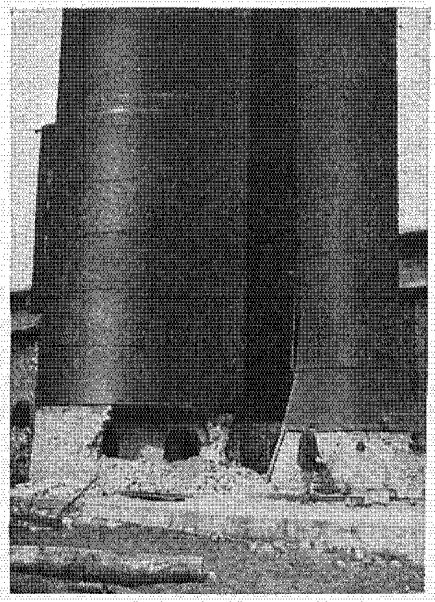
(*Continued on page 15*)

Dynamite Razes Old Furnace Equipment

The pictorial record of a neat job done with du Pont explosives on the property of the Thomas Iron Company at Alburtis, Pennsylvania

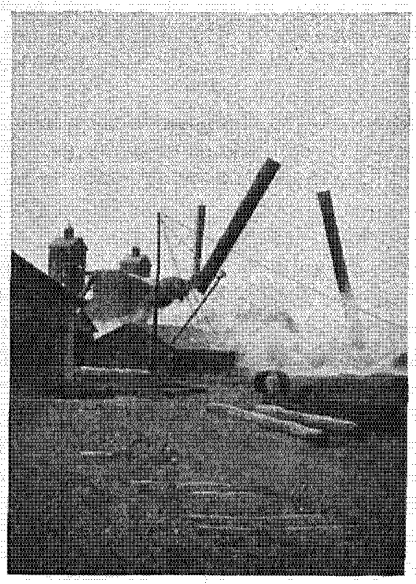


This view shows you the furnace units and the stack that had to come down



Above—Closer up; note that the furnace walls have been broken down on one side. A dynamite charge is being loaded in the stack wall.

Below—C. V. Weaver, du Pont technical representative, had charge of the blasting operations



The cameraman caught this a few seconds after the final shot



A few minutes later the crowd surged up to see the result. Many engineers and contractors interested in blasting work witnessed the operation





... And the moving-picture men also filmed the record of the blast. The photos reproduced here are by courtesy of Mr. L. D. Bradbury, of Reading, Pa.

How They Get That Way

With a new du Pont material that is used purely as a matter of form

By A. H. BERWALD

DESPOTIC as are the arbiters of women's fashions they at least do not show any favoritism. When they set a style it is for all who would be in the vogue, blonde or brunette, short or tall, stout or slender. This is splendidly democratic but it would cause fewer heartaches if it were more practical.

When Paris decreed that ladies must be sylph-like to be stylish, women everywhere accepted the new law as inspired and authoritative. Those who were slender said "How sensible!" Those who were not said "How do we get that way?"

How to get that way was a problem in which the oracles of style took no concern. Their problem was to make fashions, not to re-make women. They simply announced, without suggesting ways and means, "Only the silhouette form is chic—and the 'silhouetter' the better."

Unfortunately, I have never been to Paris, but if its women are correctly pictured in our fashion magazines, I know that they were not confronted with this problem of slenderizing in any such degree as the ladies of New York City or Oshkosh. At any rate, Paris did nothing to solve the problem it had created for the rest of the world. Even American ingenuity did not come to the aid of its women folk very promptly.

Of course, Miss Toostout and Mrs. O'Bese could find plenty of literature on the subject of silhouetting, with suggestions running from what not to eat to how to choose one's ancestors. A most widely observed dictum was to take all one's rolls on the floor and none at the table. Still, the better way, the short, quick, sure way to girlish grace was lacking.

It is said that the first practical suggestion came from a man who had had experience with some of the older methods of training jockeys and athletes. Years ago when a jockey was overweight for an approaching race, a heroic method of reducing his weight quickly was to wrap him from feet to chin in a rubber blanket, to surround this with many other blankets, and let him lie in the warmest place that could be found around the stables. This soon started in the jockey a copious perspiration which could not penetrate the rubber and so bring about a cooling effect by its evaporation. At the same time the rubber would not permit the circulation of air or allow any body heat to escape, so the jockey was in for a persistent stewing which soon accomplished all that Hamlet sighed for when he said "Oh, that this too, too solid flesh would melt, thaw and resolve itself into a dew."

Prize-fighters, runners and other athletes too heavy for the classes they were to contend in, were wrapped or laced into a rubber girdle stretched tight to exclude the air, and were then given a lot of hard road work. It was easy by this means to take off a few pounds a day, the soft, fatty tissues about the abdomen being quickly broken down and eliminated as well as the moisture which was sweated out of the tissues.

In the fall of 1923 this same idea was incorporated into a rubber reducing corset for women, and such a corset, made entirely of rubber, was placed on the market. It was immediately successful. It did the work, and for a time at least women thought it the best reducer since the minus sign was invented. It is said that over 10,000 of these corsets a day were sold when their popularity was at its height.

But the all-rubber corset had several drawbacks. For one thing, the exposed rubber suggested discomfort and a certain coarseness which it is hard for women to accept in an article of such intimate personal use. It was impossible to tailor the all-rubber material so as to give the graceful lines and the form-fitting contours required by correct designing. The direct contact of the rubber was cold and chilling when the garment was put on. It was also so irritating to delicate skins, that many women were obliged to wear fabric vests under the corset itself. The service of these garments was unsatisfactory, because any small rent that was started in the rubber spread quickly and could not be checked. With constant stretching and frequent washing the rubber lost its shapeliness and took on a saggy appearance somewhat resembling an old hot water bag.

Here was a tremendous market waiting to welcome an improved reducing corset. It was fairly evident that such a corset must depend upon rubber for its effectiveness. Beyond that it must have the general feminine appeal in material and design. It must be a graceful garment, refined and attractive. It must be pleasant and non-irritating to the skin. It must be easily cleanable and really durable.

One of the first corset manufacturers to work on this problem tells us that he made his first real step forward by studying an old boot-lining, which was made of rubber with a fabric cemented to one side. He saw that the fabric strengthened the rubber, held it in shape and added greatly to its tailoring qualities, so he began experimenting with fabric and rubber combinations that might be suitable for his purpose.

About the same time various other corset manufacturers were thinking about rubber and fabric combinations and seeking aid in their development. As the rubberizing plant of the Fabrikoid Division at Fairfield, Connecticut—the Fairfield Rubber Works—was splendidly equipped and favorably located to co-operate with them, several of these corset manufacturers came to us almost simultaneously with their problems.

For over 50 years our Fairfield plant had been converting black rubber compounds and heavy cotton fabrics into materials for automobile tops, and other impersonal uses. What a contrast when it started working with creamy white rubber and delicate silks on a product for the intimate wear of the fairer, and, in such matters, more critical sex!

There was much to do before success could be claimed. New ways of purifying, curing and sterilizing the rubber had to be developed by careful research work. There were problems affecting the exact quality, weight and weave of the silks to be used. A special cement and a new process of applying it to combine the silk to both sides of the rubber had to be worked out. And at every stage of the development work finished corsets had to be made up and worn by a sufficiently large group of women so that their efficiency in actual service could be determined.

We finally perfected a line of silk-covered rubber reducing fabrics which the corset manufacturers with whom we were working accepted as bettering all of their expectations both in richness of appearance and in real durability. The finished corsets, which they promptly placed before the trade, produced an avalanche of orders from women who had a pronounced preference for what they recognized as a really genteel garment. Equally pleased with the superior performance and wearing qualities of these corsets, one woman told another about them until shortly the demands for reducing-corset material taxed our manufacturing capacity at the Fairfield plant.

At present we are making at Fairfield, in addition to the silk-covered reducing fabrics, reducing fabrics in which the rubber is covered on one or both sides with attractive weaves of cotton.

There are three principal types of reducing corsets made of du Pont fabrics, all of which are illustrated here. The Reducing Girdle is a garment of about 15 inches average vertical width. It runs from the waistline down and reduces the hips, thighs and waist.

The Brassiere covers the chest and diaphragm and reduces the bust and back.

The Corslet, or Corselette, is a combination of the two garments mentioned, for women who require reduction of the torso generally.

Immediately a woman dons one of these elastic garments, it very noticeably takes the fullness out of that portion of her form which it embraces. This instant result is due to the compressive tension which the rubber exerts upon the surrounded parts, which tension forces flabby and drooping tissues into their proper position and holds them there.

The wearer is at once gratefully conscious of this strengthening support and finds in it her first satisfaction with the garment. As a matter of fact, the added physical comfort given by these garments, without the use of any cramping stays whatever, has made their use popular with many slender women who do not require them at all for reducing purposes. Doctors, it is claimed, also recommend them as superior for many purposes to the old-style corsets made with stiff and con-

(*Continued on page 14*)







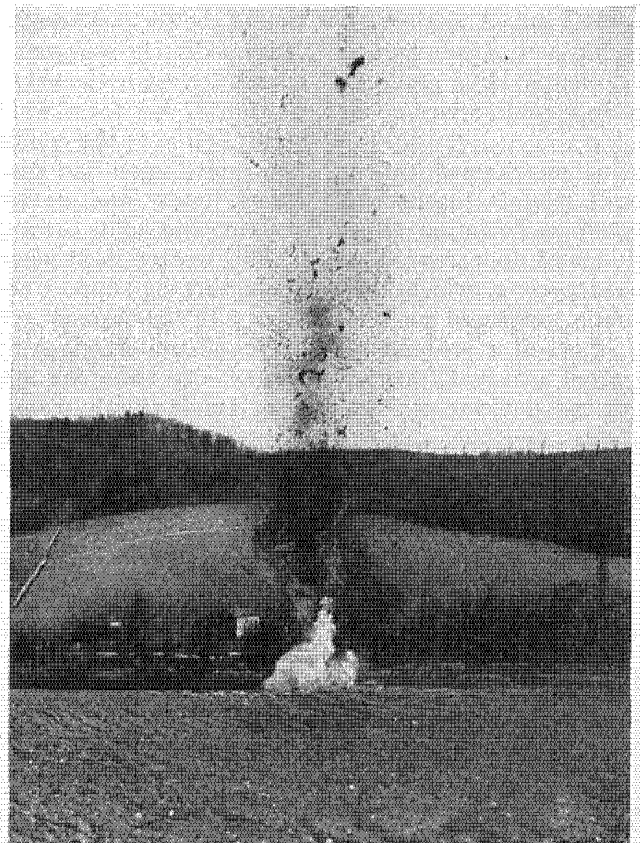
Left to right, the Reducing Brassiere, the Reducing Girdle, and the Reducing Corslet. Photos by Joel Feder; reproduced by courtesy of Standard Corset Company

Dynamiting Golf Links

How some troublesome problems of golf course construction and maintenance have been solved through the use of high explosives

By HELEN E. DAVIS

TIME was when golf courses were few and far between. Golf was a rich man's sport and nobody thought of building links unless a tract of open rolling land with natural hazards was available. Since golf has become everybody's game, however, every city and town, every summer resort and winter resort must have its golf course — or courses. During the last five years dozens of golf courses have been built in this country, some of them in most unpromising locations. Dense woods, rocky meadows and soggy marshes have been transformed into smooth fairways and velvety putting greens in a surprisingly short space of time. Of course, this has not been accomplished without labor and expense, but both have been a good deal lightened by the use of that remarkably efficient modern agent for land clearing and drainage — dynamite.



Du Pont straight dynamite at work on the Bradford (Pa.) Country Club grounds, where three men blasted a drainage ditch 3 feet deep, 10 feet wide and 1200 feet long, and completed the job in less than eleven hours' time

The fine eighteen-hole Mt. Tom Golf course at Holyoke, Massachusetts, completed during the past year, was practically built with dynamite, for the land was wooded, full of rocks both above ground and below, and in need of drainage. To clear the fairways, the trees were first chopped down and then the stumps were blasted out with 40 per cent dynamite. By loading heavily enough, standing trees can be shot out, but this is not recommended by expert blasters as it takes more explosive and makes much more debris to be cleaned up. The stumps can be removed with stump-pullers, but these take out a great deal of dirt along with the stump. Dynamite blows out the stump and its roots fairly free from dirt, thus making the stumps lighter to haul away and easier to burn and at the same time leaving smaller holes to be filled.

After the stumps had been cleared from the Mt. Tom course, the rocks were tackled. Most of the boulders were broken by mudcapping, that is, by firing a charge of dynamite confined with mud on the top of the rock. To break some of the larger ones it was necessary to drill holes into the rock and tamp the explosive in these holes. Getting out rock from under ground was more difficult. Sometimes a shot could be placed underneath the rock to shatter it and blow it out; sometimes drilling from the surface was necessary. The rock blasting "killed two birds" with one shot for the broken stone was later used to fill swampy spots, build tees and bank up streams.

To drain the Mt. Tom links some ditching was required and this also was done with dynamite. In all twelve tons of dynamite were shot in making this course.

About half this quantity of dynamite was used in clearing a tract of land near Seattle, Washington, for a nine-hole course for the Washington Golf Club. Both this club and the Manite Golf Club, of Spokane, purchased cut-over timberland and removed the stumps with du Pont explosives. In smaller quantities dynamite has been employed to clear fairways on many of the country's finest golf courses, and also to blast ditches for drainage and for water hazards, and to subsoil greens and fairways.

Occasionally a green or a fairway, apparently so situated that it ought to drain properly, will remain wet and soggy after every heavy rain. This trouble often can be remedied by subsoiling with dynamite, but a greens committee generally has to be convinced that this is practical. Blowing out stumps and rocks in the process of building a course is one thing, but firing explosives under the carefully nurtured sod of a putting green, they not unnaturally think, is quite another. They see visions of their precious green going up into the air and coming down much disturbed in topography. As a matter of fact, if the blaster knows what he is about, no such upheaval will occur.

In one case where the greens committee decided to risk the experiment this is what happened: A piece of turf was removed from the green and carefully laid aside. Then a vertical hole was bored with a subsoil auger, the auger being withdrawn every six inches to ascertain the character of the soil. At a depth of about 4½ feet an impervious cemented gravel was struck, so tight that no water could penetrate it. Fortunately, this stratum was only about a foot thick and there was sand and open gravel beneath it. If the tight gravel could be broken up, drainage would be established into the sand below. Similar holes were therefore put down on 8-foot centers over the entire green to a depth about midway of the impervious layer, and a half-cartridge of 40 per cent Red Cross Extra Dynamite, primed with an electric blasting cap, was placed in the bottom of each hole. These charges were all connected and fired with a blasting machine. There was a muffled boom and in some places the surface may have been lifted as much as two inches but it immediately subsided without the turf being broken. When the holes had been filled with the borings and the cut turf had been replaced, the green showed no signs of the blast. Underground, however, the cemented gravel had been so thoroughly shattered that thereafter the green dried out in the early spring and remained dry until the following winter. Of course, subsoiling a green or fairway to establish drainage is effective only in case the impervious stratum is relatively thin and there is porous material below it.

A list of some of the other well-known links where clearing and drainage have been accomplished by means of explosives follows:

Prescott Hills Country Club, Plainfield, N. J.
Bradley Beach Country Club, Bradley Beach, N. J.
The Orange Mountain Country Club, West Orange, N. J.
Ocean City Country Club, Ocean City, N. J.
Baltusrol Golf Club, Short Hills, N. J.
The Winged Foot Golf Club, Mamaroneck, N. Y.
Westchester-Biltmore Country Club, Rye, N. Y.
Binghamton Country Club, Binghamton, N. Y.
Maidstone Country Club, Easthampton, N. Y.
The National Links, Southampton, N. Y.
Fresh Meadow Country Club, Jamaica, N. Y.
Essex County Country Club, West Orange, N. J.
Montclair Country Club, Montclair, N. J.
The Green Brook Country Club, Caldwell, N. J.
Plainfield Country Club, Plainfield, N. J.
Asbury Park Golf Club, Asbury Park, N. J.
The Lido Golf Club, Long Beach, N. Y.
Pine Valley Golf Club, Clementon, N. J.
Arlmont Golf Club, Arlington, Mass.
Bradford Country Club, Bradford, Pa.
Carter Country Club, Lebanon, N. H.
Manchester Country Club, Manchester, N. H.
Chatham Country Club, Chatham, Mass.
Northeast Harbor Golf Club, Northeast Harbor, Maine.
Rockville Manor Club of Norbeck, Md.
Scranton Country Club, Scranton, Pa.
Shell Beach Golf Club, Long Beach, Miss.



One of the greens of the Pine Valley Golf Club at Clementon, N. J. High explosives were used in constructing this course



International Newsreel Photo

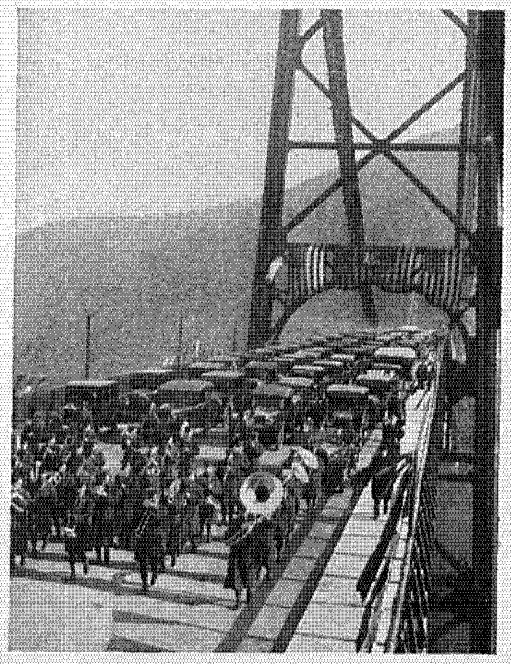
Bear Mountain Bridge and (right) the high retaining walls of the new 18-foot highway cut in the mountainside

Blasting a Road on Bear Mountain

The three-mile approach to the new bridge across the Hudson is cut from solid granite

A FEW miles above Peekskill, New York, is the new Bear Mountain Bridge, opened November 27, 1924. It is the only highway bridge across the Hudson south of Albany. Connecting this bridge with the Albany Post Road is a three-mile highway—"the most important arterial link between Gotham and the Capitol." Building this stretch of road was a notable engineering achievement, second in interest only to the construction of the bridge itself; for it was cut from the 45-degree cheek of Bear Mountain, amid naturally hazardous conditions. Starting at tidewater level about 3½ miles north of Peekskill, the new road has been constructed along the rugged slopes of the Manitou Hills and the south face of Anthony's Nose to the east bridgehead, rising, at its summit, 410 feet above the river.

Building this 18-foot highway was a mammoth task. The road was accessible only at its eastern end. Construction operations started at the Roa Hook Road in May, 1923. The formation encountered was almost entirely granite, in ledges and large boulders. Over seventy per cent of the material removed had to be drilled and blasted, and practically all of the work was done with du Pont explosives.



International Newsreel Photo

The day the bridge was formally opened

The bore holes varied in depth from 4 to 20 feet. The deeper ones were sprung with three or four sticks of 1¼ x 8-inch du Pont 40 per cent gelatin dynamite. The customary charge for the holes of average depth was five or six sticks of du Pont 60 per cent gelatin, primed with a No. 6 electric blasting cap.

The most difficult part of the work was building a 5000-foot section directly above the New York Central railroad tracks, with elevations varying from 175 to 410 feet, and with slopes from roadbed to tracks, in most places, greater than 45 degrees. At such places the south side of the road is carried on retaining walls of dry and rubble masonry, from 10 to 55 feet above the surface of the ground, with foundations going down to solid rock.

(*Continued on page 12*)

Manufacturer-Dealer Coöperation

How the du Pont Company has demonstrated the qualities of Duco Clear Finish to furniture dealers and their customers

By MATT DENNING

WITH the morning paper propped against the bubbling percolator, the head of the house was very successfully doing four things at once—reading the paper, talking to his wife, eating his breakfast and listening for the whistle of the 8.15.

"Here's something interesting," he exlaimed between bites of toast. "Smith's furniture store advertises a finish that will stand almost anything. . . . .Called Duco. . . . .Must be the same stuff I have on my car. They're giving a demonstration, so if you're in town today, better look it up."

Ruefully his better half surveyed the dining table. It was an expensive piece, not many years old, and yet too unsightly to retain much longer. There were white rings where hot dishes had been inadvertently placed on the finish. Spots told where liquids had been spilled. Scratches showed where carelessly handled tableware had injured the delicate surface. On the buffet were "printed" marks from heavy objects. On the other pieces were scratched and scuffed places, or the finish had checked and cracked. Obviously, it was time to buy new furniture for the room.

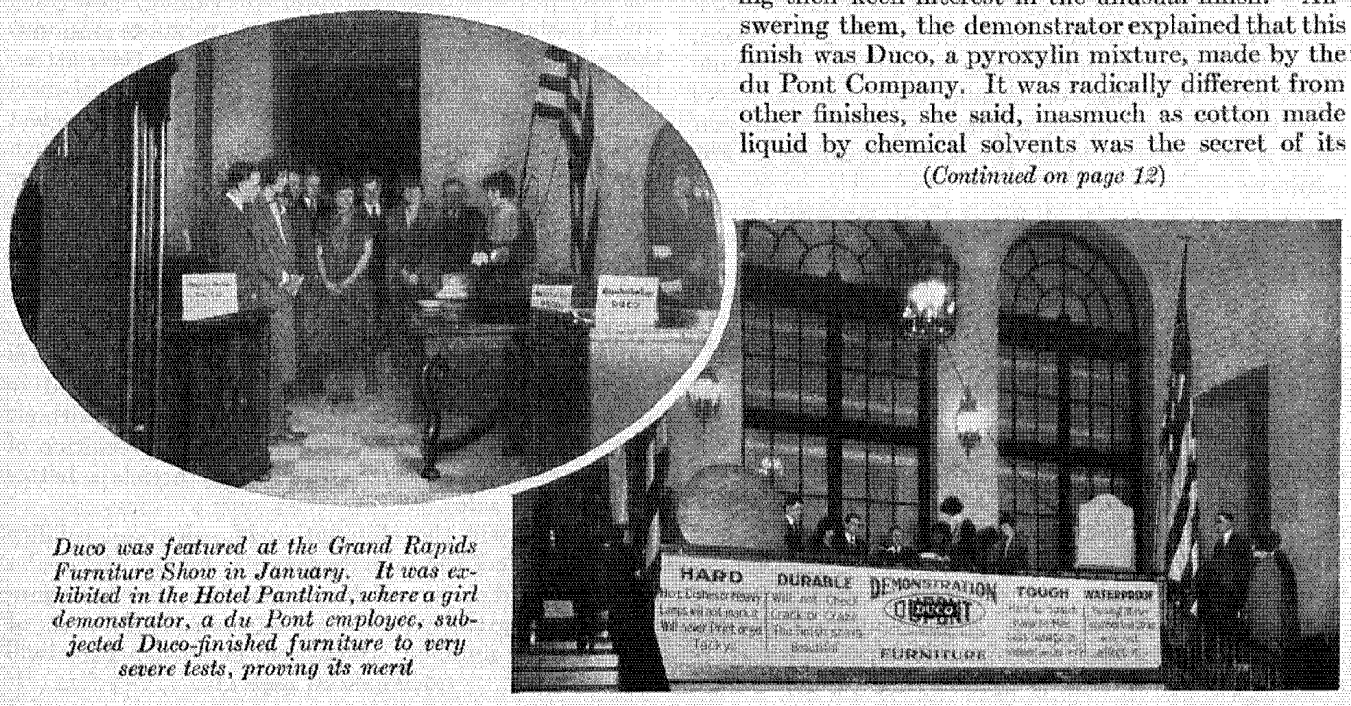
Later that day she entered Smith's store. As she walked down the aisle a group of interested people caught her eye. Coming closer, she noticed a girl in the center of the group leaning over a beautiful and expensive dining-room table, nonchalantly pouring boiling, steaming water over its gleaming, lustrous surface, while the women onlookers were plainly amazed. But the girl demonstrator wiped up the water and showed that the scalding liquid had not injured the transparent finish in the least.

Then, with ordinary soap, water and a cloth the girl quickly cleaned the whole table, showing how this simple treatment restored the original sheen. On an adjoining stand a jar of water was kept boiling and bubbling by means of an electric hot point. From this jar the girl demonstrator filled a bowl. The china became very hot to the touch but it was placed on the delicate-looking finish and allowed to remain. Answering a question from the interested and growing group around her, the girl moved the bowl, showing how the finish withstood the combined heat and weight. Housewives who knew the havoc wrought on their own furniture by heated vessels looked at one another in surprise.

On the buffet nearby, an artificial pond had been made with banks of putty. In the center of the pool of water rested a large piece of ice. Through the water could be seen the finish on the top of the piece, unmarred by this harsh treatment. The demonstrator explained that this ice water had already been on the finish for six days.

While she worked, the women asked questions, showing their keen interest in the unusual finish. Answering them, the demonstrator explained that this finish was Duco, a pyroxylin mixture, made by the du Pont Company. It was radically different from other finishes, she said, inasmuch as cotton made liquid by chemical solvents was the secret of its

(*Continued on page 12*)



Duco was featured at the Grand Rapids Furniture Show in January. It was exhibited in the Hotel Pantlind, where a girl demonstrator, a du Pont employee, subjected Duco-finished furniture to very severe tests, proving its merit

Branded, Specified Loads Are Best

This is the viewpoint of a well-known sportsman whose opinion was published recently in a prominent mid-western magazine

THE retail merchant suffers first and suffers most when radical changes in methods of doing business are introduced, and when unsuccessful merchandising experiments are tried out. The retail merchant suffers first and suffers most when long-established systems and methods of merchandising are disturbed, when standards are abolished, making possible conditions which encourage local price-cutting and defeat the aims of all legitimate dealers seeking to build business on a permanent foundation. Jobbers and wholesalers also suffer under such conditions, but as they usually have a better forecast of the trend of affairs, they are able to "get out from under" more speedily than is possible for the retail merchant.

To no line of merchandise do these remarks apply with greater force than to shotgun shells, which are handled by approximately 100,000 retail dealers over the country, and by them distributed to more than 10,000,000 shotgun users. Because of the wide sale of shells and number of merchants and consumers affected, a discussion of the effect of "unbranded and unspecified shotgun loads" upon the ammunition industry is timely.

"ABOLISH all price standards by removing from shotgun shells the powder and shot quantity specifications—abolish quality standards by denying to merchants, jobbers and sportsmen a knowledge of the kind of powder in the shells, and a chaotic price-cutting condition will follow which, eventually, will be ruinous to the entire industry."

Let us consider the question of the standards which have governed the ammunition industry for generations, and which were founded upon sound and economic principles. Catalogs of ammunition manufacturers show that the amount of powder and shot in shotgun shells is the basis on which prices are established. For instance:

3	dram	1	oz.	loads	list	at	a	certain	price	
3	"	1⅛	"	"	"	"	"	higher	"	
3¼	"	1⅛	"	"	"	"	"	still	higher	price
3½	"	1¼	"	"	"	"	"	"	"	"

and as we go under the 3-dram 1-oz. loads we find that the list prices of shells decline.

Now, then, we know that merchants, jobbers and sportsmen all buy shells on a standard *price* basis which is determined by the amount of powder and shot the shells contain. So long as known and standard powders are loaded in branded, specified shells, merchants, jobbers and sportsmen also buy shells on a standard *quality* basis.

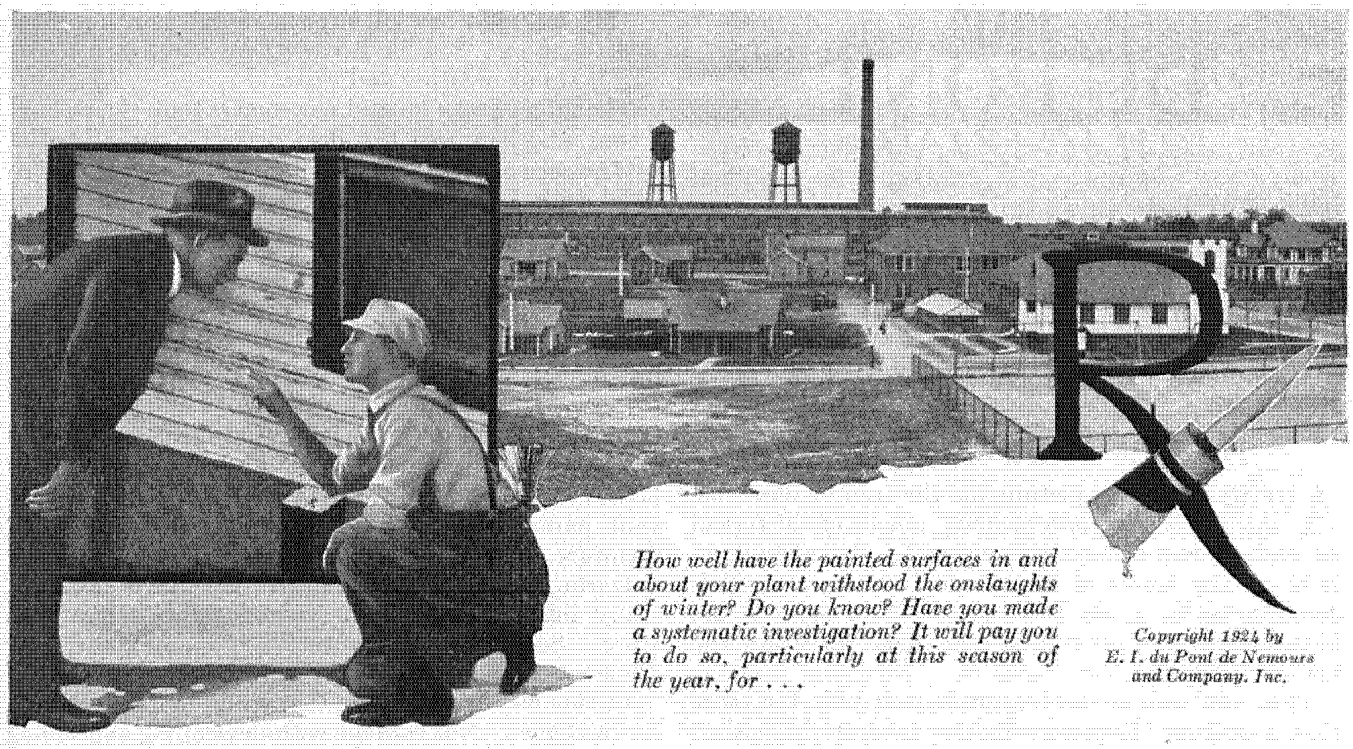
Abolish all price standards by removing from shotgun shells the powder and shot quantity specifications — abolish quality standards by denying to merchants, jobbers and sportsmen a knowledge of the kind of powder in the shells, and a chaotic price-cutting condition will follow which eventually will be ruinous to the entire industry.

Then price—not quality—will prevail. The standard of ammunition quality will be lowered. A duck load put out by one manufacturer will not be the same as the duck load put out by another manufacturer. One merchant will sell one make of duck load for $1.25 per box. His competitor across the street will sell the duck loads of another manufacturer for $1.05 per box. What's the answer? Where does the first merchant get off? In the eyes of the sportsman he is a "hold-up" artist. Shells are just shells. Price and quality standards have disappeared. The sportsman wants to save that 20 cents per box. Maybe he remembers the good old days when the manufacturers catered to the trade, and told them all about their shells, the kind and amount of powder and the size and amount of shot they contained, and he marvels at the changed way of doing business and wonders what it is all about.

With price and quality standards abolished and a chaotic price-cutting condition prevailing, how long would jobbers and dealers continue to promote ammunition sales? No doubt they would soon turn their attention to more profitable and satisfactory items of merchandise; and it cannot be denied that their neglect would greatly reduce the sales of shotgun shells. With price and quality standards abolished, with mystery and uncertainty surrounding shotgun loads, skilled sportsmen would resort to hand-loading, or more likely, they would become disgusted with the entire situation and take up some other form of recreation or sport. We must not lose sight of the fact that shooting is a luxury and an expensive pastime, and that shotgun users will not submit to being herded like sheep and forced to use unknown, unspecified and unbranded loads without a protest. In no sport is there a higher appreciation of quality, and in no sport is the quality article a better stimulator of sales.

And how will the elimination of price and quality standards affect the manufacturers? Jobber and dealer good-will, and consumer demand built up by the manufacturers at great expenditures of money and years of effort will be nullified. Shells will be shells. Price will

(*Continued on page 13*)



How well have the painted surfaces in and about your plant withstood the onslaughts of winter? Do you know? Have you made a systematic investigation? It will pay you to do so, particularly at this season of the year, for . . .

Copyright 1924 by E. I. du Pont de Nemours and Company, Inc.

This Is Paint Inspection Time

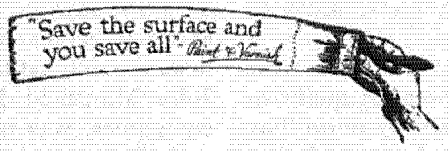
Do the job thoroughly now, in early spring; we'll help if you say the word

By R. C. SHEELER

AN industrial plant, like an automobile, suffers most and depreciates more rapidly during the winter season than at any other time of the year. Exposure to cold, rain, snow, ice and wind works havoc with wood, metal or concrete surfaces, if they are not protected with a coat of good paint.

A careful examination of your plant and equipment, inside and outside, will bring to light the ill effects resulting from the rigors of a severe winter season. In making this inspection there are a number of conditions to watch for. These will vary with the type of plant, the severity of the past winter, the nature of the surface, and so on. Here are a few suggestions that may help you:

On wood surfaces make note of sections where the paint has worn out, peeled, cracked, chalked excessively, alligatored, or become "dead" or "lifeless." These are the surfaces where the paint should be renewed. On metal surfaces, note particularly the spots showing rust and corrosion. These are "diseased" places in the surface coating that should be entirely removed by cleaning out and wire brushing. A touch-up coat of Kromate Metal Primer should be applied next, and then the correct finishing coat. Surfaces where the paint has peeled, cracked, or worn out should be cleaned down thoroughly and repainted.



After the inspection has been made, the most important part of the work is still to be done. It is not enough to inspect and make a note of the surfaces needing paint. The real job is to determine the particular requirements of each surface and to prescribe the proper type of paint to be applied on each one. The choice of the type of paint to use on each surface is of the utmost importance, for, unless the paint used is made especially for each surface, the probabilities are that much of it will fail to serve adequately. In this way your paint costs are increased and at the same time rot and rust are permitted to carry on their destructive work.

Here is where du Pont Prescription Paint Service is invaluable. Permit us to make the inspection with you. Then, based upon our knowledge regarding the needs of the surface and the types of paints best suited for those needs, we can make our recommendations accordingly. This eliminates guesswork and will be a big saving to you in the long run. Write for full information to any of the Paint and Varnish offices listed on the inside back cover of this magazine.

THE
DU PONT
MAGAZINE
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E. R. MANCHESTER.....*Editor*
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Vol. XIX MARCH, 1925 No. 3

The First du Pont Powder Mill

ALTHOUGH the picture on the front cover this month is not spectacular, much of historical interest centers around this old mill. It was built in 1802 on the banks of Brandywine Creek, near Wilmington, by E. I. du Pont de Nemours and was the birthplace of the great industry that still bears the founder's name.

This mill was an active production unit for more than a century. Explorers and fur traders who pushed back the frontier lines, and the settlers who followed them, used the powder made in this and other mills on the Brandywine. It was an important source of supply for our Government in all its wars during the nineteenth century. Its output helped to build many American railroads, canals and highways, and to open and operate thousands of ore mines, coal mines and quarries. Du Pont powders made in the Brandywine mills for sporting, industrial, military and naval uses have served the nation well.

Two years ago these mills were shut down and the equipment removed, but the part they played in the nation's development is something worthy of remembrance.

Manufacturer-Dealer Coöperation

(*Continued from page 9*)

strength. Because of the nature of the finish, it could not check or crack with age. It was the hardest, toughest, most durable finish yet evolved. Duco was waterproof, heatproof, and hard to scratch or scuff. It did not print, and in hot weather it could not get sticky. Panels finished for years were passed from hand to hand to show how lightly time dealt with this unusual material.

Our friend of the breakfast table had been an interested auditor and observer. She asked:

"Is this anything like the Duco they use so much on automobiles?"

"Yes," the demonstrator answered. "It is made from similar basic materials and has similar wearing qualities. Duco is now used as the standard finish by more than twenty of the leading automobile manufacturers."

"My husband has Duco on his car," her inquisitor told the group, "and he swears there's nothing like the way it stands weather and wear."

The group broke up and newcomers took their place. Those who had seen the demonstration were invited by the salesmen to look at suites for every room, finished with Duco. They pointed out how the transparency of the finish glorified the grain of the wood—emphasizing that here was durable beauty protected by the hardest, toughest finish procurable.

It was not difficult to sell Duco-finished furniture. The woman whose dining-room furniture was passé because the finish had "gone bad" bought a suite with the "armor-plate finish." A newlywed couple — remembering the experience of their parents—decided to have Duco-finished furniture from cellar to garret. Worried housewives, perpetually and unavailingly alert to prevent harm to the delicate finish on their cherished furniture, readily appreciated the advantages of Duco.

During the week the demonstration was in progress, many hundreds of people visited Smith's furniture store. Some bought furniture and many more were made excellent future prospects.

In this way the du Pont Company coöperated with its customers. Not content with developing and selling an unusual finish, it also assumed the burden of educating furniture dealers and the furniture-buying public. The girl demonstrator traveling from city to city, and from store to store, quickly convinced the public that a new era in furniture finishes had arrived—a day when furniture became something more than mere furniture, for Duco finish made the pieces articles of utility for today and cherished heirlooms for tomorrow.

Blasting a Road on Bear Mountain

(*Continued from page 8*)

Before work was started on the wall sections, the railroad tracks had to be protected by placing two, and sometimes three, lines of barriers to prevent the material blasted from falling on the tracks. These barriers consisted of a network of steel cables which were reinforced with heavy woven wire fencing and logs.

All construction operations above the tracks were carried on under the supervision of engineers of the railroad. The amount of powder used and the number of holes fired in a shot were regulated by railroad inspectors. By close coöperation of the railroad engineers with the contractor, the work was finished without accidents or damage.

This highway was built for the Bear Mountain Hudson River Bridge Company, and will be operated as a toll road in connection with the bridge. The Terry & Tench Company, Inc. was the contractor for the bridge and road and carried on the work until June, 1924, when it was succeeded by the Tench Construction Company. John Mansfield Belknap, resident engineer for both companies, was in charge of the location of the road and all engineering details during its construction.

Expanding the Market for du Pont Tontine

NO du Pont product can be considered as more of a necessity for widespread, general use than du Pont Tontine window shade cloth. There is a place for it in almost every room in every dwelling house, business building or public institution of any kind. Installed there, it is constantly seen and frequently handled, an *active* part of the environment which continually impresses itself upon the notice of people.

Touching the lives of so many people—at home, at work, at school and elsewhere—and having some qualities that are startingly new and important in a window shade cloth, the du Pont Company has already received through Tontine much favorable publicity. But, heretofore, it has not attempted to increase this publicity through its own national advertising because of limited facilities fo supplying the rapidly growing, self-generated demand for the product.

With increased manufacturing facilities, the Fabrikoid Division can now safely broadcast the merits of Tontine to all the people, and the first advertisement they will read in national magazines is reproduced on a cover page of this number.

A very complete book on Tontine advertising and cooperative selling plans has already been sent to leading window-shade dealers in every city. Although this book had been out only a few days when this was written, enough dealers have applied for the du Pont Tontine franchise to more than double its distribution in retail stores. One paragraph from the announcement made by the Fabrikoid Division to prospective dealers is worth quoting:

> "Our company recognizes in Tontine one of the most important products commercially that du Pont has ever developed. It is entitled, on its merits alone, to the preference of all thinking people. We propose that all thinking people shall be continually informed of its merits and that they shall have opportunity to obtain it from reputable and progressive dealers in every locality. Dealers who measure up to our standards and obtain our franchise for the sale of Tontine will have a product which they can sell at a profit in ever-increasing volume. Wherever sold it will do them credit and add to their prestige."

From now on you will be noticing advertisements on du Pont Tontine window shade cloth in the leading national magazines. If they convince you that this beauty-keeping, long-lasting shade cloth is desirable for your own use, or if you are interested as a dealer in handling Tontine, we trust you will get in touch with our sole distributor for this product, The Ordinator Company, Inc., 229 East 41st Street, New York City.

Branded, Specified Loads Are Best

(*Continued from page 10*)

be the governing factor. Quality will suffer, because all refinements would disappear in the race to produce powder and shells to sell at the lowest possible figure.

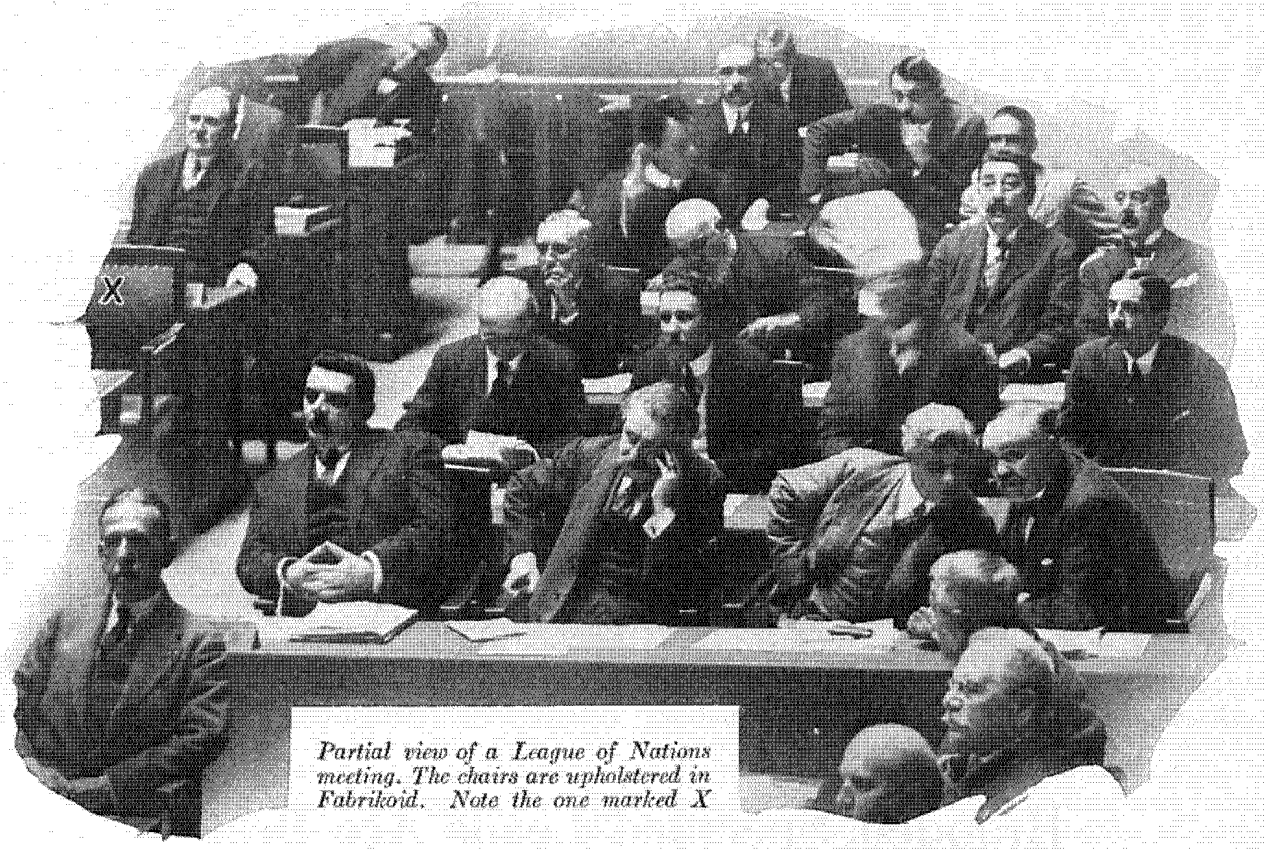
When the American ammunition market forgets "quality" and becomes a "price" market, then it will become attractive to foreign ammunition manufacturers, who will flood the country with "cheap shells" that are "cheap." American ideals of ammunition quality and American methods of selling shotgun shells have been strong factors in forestalling European competition up to the present time. Will American ammunition manufacturers deliberately play into the hands of their foreign competitors by abandoning price and quality standards and methods of doing business which have been successful for generations? Should they do so, the introduction of foreign shells into this market would not be a difficult matter.

With ammunition price and quality standards abolished, local merchants would lose much trade, as many farmers and sportsmen would naturally buy their shells by mail, just as they now buy close to $450,000,000 worth of other merchandise, a large part of which could readily be sold by local dealers. The average sportsman is a good customer, and an asset to any merchant. Sportsmen buy good merchandise, pay good prices for it and usually there is a good profit for the merchant in the sale. Jobbers and dealers who cannot see in unbranded and unspecified loads the danger of encouraging mail buying of shells and other merchandise by sportsmen and farmers are surely not farsighted.

It is a fundamental fact that a greater volume of sales will be produced with a reasonable variety or range of stock than with a few restricted numbers. The reason is plain. "Many men have many minds." Many customers have many ideas and opinions. They want what they want. The merchant who caters to his patrons increases his business and profits at the expense of the merchant who does not do so. Since shooting is an expensive pastime, merchants must expect to cater to the peculiarities and wants of their sportsmen customers. Otherwise, they cannot expect to hold their trade.

It is believed that the manufacturer, jobber and dealer will realize the danger of unbranded and unspecified ammunition, because it will disturb the existing satisfactory and economically sound order of things and will bring about conditions that will be unsatisfactory, and possibly ruinous to the industry.

Fabrikoid Backs Up the League of Nations



Partial view of a League of Nations meeting. The chairs are upholstered in Fabrikoid. Note the one marked X

YOU are looking at a small group of the diplomats who were assembled at the last meeting of the League of Nations, at Geneva, in September, 1924.

M. Herriot and his colleagues are seen deep-seated and comfortable as well as interested. They are evidently getting plenty of support for whatever world policies they are advocating from the Fabrikoid cushions and backs of their chairs, for in the hall of the League of Nations Fabrikoid plays an important part in the upholstery of the furniture, and one can truly say that on it, at least by proxy, rests the peace of the world.

The photograph reproduced here was sent to us by Negocitas, S. A., Fabrikoid agents for Switzerland, whose enterprise as a distributor of this product has brought it into the widest use throughout Switzerland for many purposes.

How They Get That Way

(Continued from page 5)

stricting steel or whalebone supports which are in themselves objectionable.

But to go back to the woman who had donned the corset for the purpose of slenderizing. Following the mechanical or drawing-together effect of the rubber, the physiological action starts which actually reduces the parts which are corseted. The rubber insulation keeps the tissues subjected to a combination of heat, pressure and gentle massage that breaks down the soft fat cells and keeps the skin moist with perspiration as long as there is any excess moisture to be drawn from the tissues. It is claimed that the wearing of one of these reducing girdles will decrease the hip measurement as much as three inches in ten days. Obstinate cases, of course, take longer.

Reducing garments made of du Pont fabrics are easily kept fresh and clean by thorough rinsing in suds and drying in the air. They should not be ironed, or hung on hot radiators to dry. The silk fabrics which strengthen and protect the rubber are usually of flesh tints, making garments that are stylish, correct and appealing. Laces are provided so that the corsets can be adjusted to the slenderizing form of the wearer.

These reducing corsets, designed and sized for all figures, are sold in all the leading women's shops in this country and throughout the world. Their popularity in Paris itself is noteworthy, where it is claimed they are meeting with a brisk sale in the half-dozen largest stores in the French metropolis.

The Kinship of du Pont Products

(*Continued from page 2*)

different in their properties but formed by precisely this same type of reduction reaction. Perhaps a few examples of these products, which, by the way, are all Company products, although they are made in different sections of the Company, would be interesting to you. If we nitrate benzene and then take oxygen out of the compound, that is, reduce it, we obtain aniline—one of the very important dye intermediates. Aniline is also the intermediate from which we produce diphenylamine and tetryl, both intimately connected with the explosives industry. Similarly, we can nitrate toluene, xylene and naphthalene, and then reduce the nitro bodies, thus obtaining very important dye intermediates, as well as intermediates useful for the manufacture of flotation oils and useful in the manufacture of compounds which accelerate the sulfur cure of rubber, that is, the so-called vulcanization accelerators, and scores of other products too numerous to mention here.

Finishes

I think you would be interested in a brief discussion of finishes. We are all proud of "Duco" and quite familiar with the name. Duco is a type of finish which hardens or sets to a hard, elastic, weatherproof film by elimination of a solvent which rapidly evaporates, that is, passes off into the air. Paint or varnish sets to a hard film not only by the evaporation of volatile solvents such as turpentine and similar volatile liquids, but also by certain chemical reactions involving a combination of the oxygen of the air with drying oils in the paint or varnish, such as linseed oil. These "drying oils" receive their name by virtue of their ability to combine with oxygen and form hard, elastic, dry films. There is also present in many finishes a gum or resin such as rosin or some one of the fossil resins. The fossil resins differ from rosin in that they are believed to have been formed by the fossilizing of vegetable resins somewhat similar to rosin. Now the chemist has found that if he applies his knowledge of the treatment of glycerine and similar alcohols with sulfuric acid or nitric acid or other acids to the treatment of rosin or other resins, he is able to alter in a very desirable fashion the properties of the finished paint or varnish films by the esterification, or to use a word that we are more familiar with, by the formation of acid salts of these resins.

Associated with paints and pigments are heavy chemicals. You probably know that the manufacture of alum involves the manufacture in large quantities, of low cost sulfuric acid for the preparation of aluminum sulfate. In connection with the manufacture of alum, what is known as "color-makers' aluminum hydrate" is also prepared. This aluminum hydrate serves as an ingredient in the preparation of various pigments. The manufacture of lithopone involves such materials as barium sulfate and zinc. The manufacture of other pigments involves various acids such as sulfuric, acetic, hydrochloric, and nitric, as well as various inorganic materials from which these pigments are prepared. There are quite a number of colors on the market in the so-called "lake" class. A lake usually consists of some organic dyestuff precipitated upon some inorganic material such as barium sulfate, for example. I think the foregoing is sufficient to illustrate the connections which may and do exist between the paint and pigment business and the dye and heavy chemical business. It may be added that there are certain intermediates used in the preparation of dyes which are also used in the preparation of pigments for the paint and varnish trade, and some of the technique involved in the preparation of these is identical with some of the technique involved in the preparation of certain classes of dyes.

Characteristics of Finishes

It may be interesting to mention a few of the properties of these finishes which determine their usefulness. These are their adhesion to the surface to which they are applied as protective coatings, their toughness, their flexibility, their surface hardness, and, of course, their durability, *i. e.*, their length of life. It would lead us into too long a discussion to attempt to point out at this time just how these properties depend upon this or that chemical product or type of reaction, and you will have to take my word for it that the technique involved in the development of many of these new and useful types of lacquer, paint and varnish bears the closest relation to the technique and to the chemical reactions which I have already mentioned.

New Finishes

Your Company has developed other quite new and very useful finishes in addition to Duco. These developments have taken place in the last year or two. You have not yet heard very much about them and a great many of them you perhaps will never hear mentioned by name, but they will be used in improving the various types of wood and metal finish which this Company manufactures, and some of these improvements are very marked.

Oxidation of Films

In the manufacture of dynamite we produce dynamites of different velocities by varying the formula, but we are so accustomed to talking about "the velocity of detonation" that we sometimes lose sight of the fact that what we are dealing with is after all a very rapid chemical reaction which we attempt to alter by increasing or decreasing the rate at which the reaction goes, as well as by changing the nature of the finished products of the reaction. Similarly, in the drying of paints and varnishes and similar finishes, we attempt to con-

trol the rate of combination of certain of the ingredients with the oxygen of the air to the end that we may get a quick-drying, hard and durable film.

Control of Deterioration

There is another and very important control of oxidation which we attempt to exercise, namely, to prevent the type of failure of films brought about by the action of the oxygen of the air on the oxidizable ingredients of the film. This combination between oxygen and the constituents of a film can be accelerated or retarded with the result that longer or shorter-lived products are produced. In a sense, a paint or varnish or an artificial leather film rusts just the same way that iron or steel rusts; that is, some of the materials combine with oxygen, and the products of this combination are very undesirable. Both light and moisture affect the rates at which these reactions go. It follows, therefore, that we study not only the nature of the reactions but the conditions which affect the rates of the reactions.

Photographic Film

The manufacture of photographic film is closely related to the manufacture of Fabrikoid, Pyralin, lacquers and certain types of finish, such as Duco, for example. Much the same kind of attention is being given to such products as Duco and similar finishes, artificial silk and Cellophane, paints and varnishes. The same technique, and in fact, quite a number of the same experimental results have been useful in the development of high explosives, dyes, Fabrikoid, finishes, Pyralin, film and so on.

Ammonia and Nitric Acid from the Air

One of the essential raw materials in connection with the manufacture of Fabrikoid, Pyralin, lacquers, photographic film, explosives and certain of the ingredients of paints and varnishes, is nitric acid. You all know that nitric acid is made by the treatment with sulfuric acid of sodium nitrate brought from South America. You all know equally well that it is possible to make nitric acid from the nitrogen of the air, and water. So far as we know, there are no great deposits of sodium nitrate on the North American continent and the West Coast of South America may at times be inconveniently far away when it is considered as a source of all our nitric acid. It has seemed advisable, therefore, to embark upon the manufacture of nitric acid from the nitrogen of the air, and water. Of course, other considerations are involved in this decision, in addition to the long haul involved in bringing sodium nitrate from Chile. The method which this Company has elected to adopt in its fixation of atmospheric nitrogen involves the manufacture of ammonia as a preliminary step in the manufacture of nitric acid. I am sure that it occurs to you at once that ammonium nitrate and ammonium sulfate, as well as other ammonia compounds, are very useful products, but it is perhaps not equally obvious that the technique involved in the manufacture of nitric acid from ammonia, and of ammonia in its turn from the nitrogen of the air by combining it with hydrogen, is a technique that is useful in connection with other Company processes. Furthermore, there are very useful and interesting by-products of the manufacture of ammonia and nitric acid by the process which this Company has elected to adopt. I shall not attempt to enumerate them but they are ingredients of quite a number of the Company's products.

Community of Interests in New Development

If *you* were busied with the chemical developments of our Company, you would be astonished to find that, almost daily, processes and products which are investigated for one line of the Company's business become of equal interest in two or three, or in some cases, more, of the industrial departments. It has happened at times that a process or a product developed for a specific industrial department has in the end proved of greater value to another department not originally interested in the work. The essential unity of the chemical work, on the results of which this Company's various industrial departments rest, is such that it is quite impossible to say that a given process or a given product will be developed for one department and will certainly not be interesting elsewhere in the Company. I have been engaged in chemical work with our Company for nearly twenty years, and I still find frequent occasion for surprise and remark because of the unexpectedly diverse lines of interest which a given piece of work develops.

Orderly Diversity of Manufactured Products

It would be possible to multiply examples almost indefinitely which would serve to illustrate the closeness of the relationship which exists between the various lines of manufactured products which constitute the du Pont Company's business. I hope that in this necessarily very brief and high-spot consideration of our Company's activities I may have succeeded in getting across to you the closeness of this relationship. Be assured that the diversity of the Company's products grows out of no haphazard development, but grows out of the fact that your managing committees and directors have the breadth of vision, the perspective, the ability to appreciate such relationships as these I have been attempting to enumerate for you. This has resulted in the desirable diversity which characterizes your Company's products. If, to sound business management and a high order of executive ability, it shall be possible to add alert, far-sighted and ingenious technical development, this closely knit combination of industries, constituting the Company, must continue to merit the satisfaction and pride which is engendered in us by that most significant phrase, "*Our* Company."

DU PONT

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

General Executive Offices

WILMINGTON DELAWARE

All Inquiries Regarding du Pont Products Should be Addressed to the Company—the Nearest Office

ACIDS AND HEAVY CHEMICALS

Acids, alums and miscellaneous heavy chemical products.

Philadelphia, Pa.
35th & Gray's Ferry Rd.
Newark, N. J., 256 Vanderpool St.

CELLOPHANE

Du Pont Cellophane Company, Inc.
Buffalo, N. Y.
New York, N. Y., 40 W. 40th St.

CHEMICAL PRODUCTS

Bronze powders, ether, collodion, household cement, leather belting cements, Duco pyroxylin lacquers and enamels, split and patent leather solutions and other pyroxylin preparations and solvents.

Parlin, N. J.
Chicago, Ill., 2100 Elston Ave.
Flint, Mich.
San Francisco, Calif., 569 Mission St.

DYESTUFFS

Dyestuffs and dyestuff intermediates.

Boston, Mass., 274 Franklin St.
Charlotte, N. C., 232 W. First St.
Chicago, Ill., 1114 Union Trust Bldg.
New York, N. Y., 8 Thomas St.
Philadelphia, Pa., 126 S. Front St.
Providence, R. I.
709 Hospital Trust Bldg.
San Francisco, Calif., 569 Mission St.
Bombay, India
Exchange Bldg., Ballard Estate
P. O. Box No. 1010
Kobe, Japan
No. 88 Nakamachi-Dori
P. O. Box No. 384
Shanghai, China
Robert Dollar Bldg.
3 Canton Rd., P. O. Box No. 393

EXPLOSIVES

Explosives for all industrial, agricultural, military and sporting uses.

Birmingham, Ala.
601 Brown-Marx Bldg.
Boston, Mass., Harvey Building
Chauncey & Bedford Sts.
Buffalo, N. Y., Prudential Bldg.
Chicago, Ill., 1814 McCormick Bldg.
Denver, Colo., 406 Ideal Bldg.
Duluth, Minn., Hartley Bldg.
742 E. Superior St.
El Paso, Tex., 410 Mills Bldg.
Huntington, W. Va.
Robson-Prichard Bldg.
Joplin, Mo., 816 Joplin Nat'l Bank Bldg.
Kansas City, Mo., 225 Scarritt Bldg.
Miami, Florida, Converse Bldg.
105 First St., Southeast
Mexico City, Mex.
Edificio de La Mutua, 406
New York, N. Y., 120 Broadway
Pittsburgh, Pa., Fulton Bldg.
Portland, Ore.
Northwestern National Bank Bldg.
St. Louis, Mo.
17th Floor, Arcade Bldg.
San Francisco, Calif., 569 Mission St.
Seattle, Wash.
Hoge Bldg., 2d Ave. & Cherry St.
Scranton, Pa., 710 Traders Bank Bldg.
Spokane, Wash.
721–22 Old National Bank Bldg.
Riverside Ave. & Stevens St.
Springfield, Ill., 716 Reisch Bldg.

FABRIKOID AND RUBBER FABRICS

Fabrikoid for automobile tops, body covering and upholstery; bookbinding, furniture, luggage, novelties, etc. Pontop for auto tops and curtains. Tontine shade cloth. Ventube for mine ventilation.

Newburgh, N. Y.
San Francisco, Calif., 569 Mission St.

FIBERSILK

Du Pont Fibersilk Company, Inc.
P. O. Station B, Buffalo, N. Y.
New York, N. Y., 132 Madison Ave.
Old Hickory, Tenn.
Reading, Pa., 21 N. 6th St.

EVERDUR METAL No. 50

An easily workable corrosion-resistant alloy of copper and silicon.

Du Pont Engineering Company
Wilmington, Del.

LITHOPONE, DRY COLORS & PIGMENTS

Products for paint, ink, oilcloth, linoleum, rubber and other industries.

Boston, Mass., Everett Station 49
Chicago, Ill., 2100 Elston Ave.
Newark, N. J., 256 Vanderpool St.
Philadelphia, Pa.
3500 Gray's Ferry Rd.

PAINTS AND VARNISHES

A complete line of paint and varnish products for all home and industrial uses.

Boston, Mass., Everett Station 49
Chicago, Ill., 2100 Elston Ave.
Newark, N. J., 256 Vanderpool St.
New York, N. Y., 21 E. 40th St
Philadelphia, Pa.
35th & Gray's Ferry Rd.

PYRALIN

Ivory Pyralin, Shell Pyralin, and Amber Pyralin toiletware. Novelty and transparent sheeting, rods, tubes and beading. Also Cleanable Collars.

Boston, Mass. Harvey Bldg.
52 Chauncey St.
Chicago, Ill., North American Bldg.
New York, N. Y., 21 E. 40th St.
San Francisco, Calif., 569 Mission St.

When you are in Atlantic City, New Jersey,
Visit the Du Pont Products Exhibit, at 1121 Boardwalk



The Ides of March

YOU need not beware the Ides of March, with their sulky gusts, and the patter of distant hail.

Ride blithely through the storm, your DUCO finished car richly gleaming in the murk . . . long months of ice and snow behind it, and the silvered gleam of spring just around the corner.

Genuine DUCO on your car makes it come up smiling through all temperatures and weathers. The hottest summer sun blazing on its surface will not cause it to crack or check. Sand and mud, or the alkali of the desert spaces, may be removed without a mark.

Ordinary washing, with the occasional use of Duco Polish No. 7, will keep your car looking its best through many seasons.

E. I. DU PONT DE NEMOURS & CO., Inc.
Chemical Products Division
PARLIN, N. J. FLINT, MICH.
Canadian Distributors: Flint Varnish & Color Works, Toronto

DUPONT DUCO
REG U S PAT OFF

New Cars

The following manufacturers are using Genuine Duco as standard on all models:

Buick	Maxwell
Chevrolet	Meteor
Chrysler	Moon
Gardner	Nash
Hupmobile	Oakland
Jewett	Oldsmobile
Marmon	Premier Taxicabs

The manufacturers below are using Duco on some models:

Cadillac (all standard models and obtainable on all custom models)
Chandler (standard)
Cleveland (optional, all models)
Franklin (optional, all models)
Kissel (standard on nine models)
Lexington (optional, all models)
Rollin (standard on Coach)

Duco Polish, No. 7

We now have ready for distribution a polish for Duco-finished automobiles. Full information will be given to interested jobbers and dealers.

Refinishing

Genuine Duco dries almost instantly. It cannot be hand-brushed but must be applied by a spray gun. In refinishing cars, care must be taken to remove the paint down to the metal, as only then will Genuine Duco have its characteristic durability. Duco automobile refinishing stations are being established rapidly everywhere. Name of nearest authorized refinishing station on request. Schools are equipped to provide instructions in application or supply properly trained men.

Other Uses

Genuine Duco is adaptable to almost any product requiring a lasting finish in color. Due to its quick-drying qualities, it saves materially in finishing time, storage space and investment in finished product. Demonstration on request of any manufacturer. It is being successfully used on:

Automobile Bodies
Truck Bodies
Automobile Accessories
Wood Furniture
Metal Furniture
Office Equipment
Pens, Pencils, etc.
Washing Machines
Lamps
Handles for Tools,
Brooms, Brushes, etc.
Novelties Toys
Electric Parts Piano Actions
Locomotives
Railroad and Street Railway
Rolling Stock
Umbrella and Cane Handles
Radio Cabinets, Radio Parts
Gasoline and Oil Pumps
Bath Fixtures and Accessories
Medicine Cabinets, etc.
Toilet Seats
Typewriters
Vacuum Cleaners