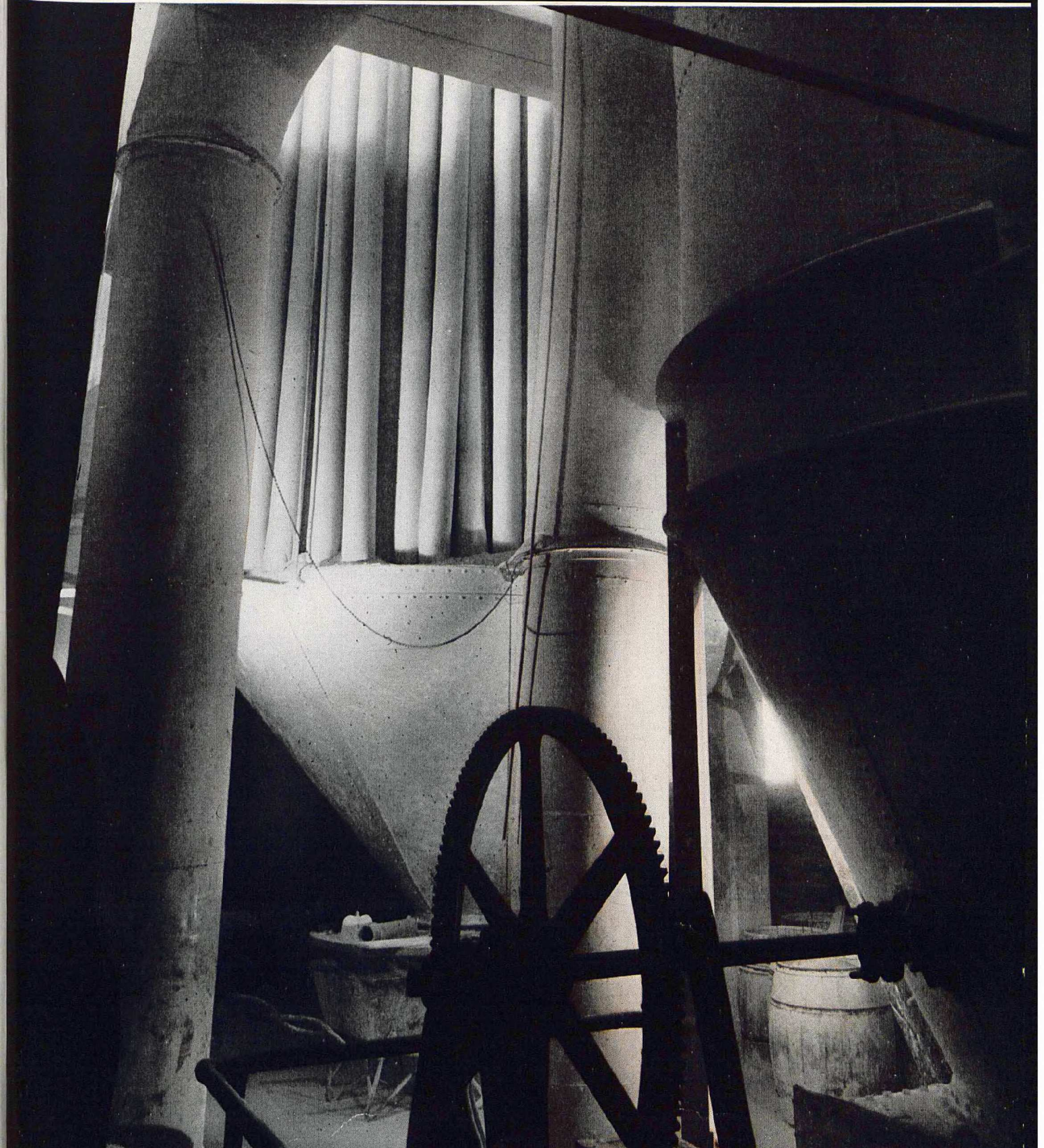


THE DU PONT MAGAZINE

F A L L
1 9 3 2



Remove the "DANGER" sign

Let du Pont Dynamite help you settle that highway fill to your satisfaction . . . and for the safety of the motorist!

"SLOW DOWN" . . . the sign warns the oncoming motorist. A sharp curve? No. A bad depression, bumps and broken pavement, caused by marshy, swampy areas underneath the road-bed.

For years, the problem of settling highway fills was a particularly tough one for highway construction engineers. In recent years, however, a new and efficient means of accelerating fill settlement has been widely adopted throughout the country. Dynamite!

Dynamite blasts out the muck and unstable material in short order—cuts down maintenance costs—removes the danger element and ensures permanent road-bed.

The du Pont Company has been particularly active in its study of fill settlement problems and has developed several methods of using dynamite in work of this nature—methods which adequately meet any fill settlement situation in any section of the country. These methods are fully explained in a new booklet—"Use of Explosives for Settling Highway Fills"—just published by the du Pont Company. Write for your FREE copy. *Please use coupon.*

E. I. DU PONT DE NEMOURS & CO.

Explosives Department

Wilmington

Delaware



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**PLEASE
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DU PONT COMPANY
Explosives Department
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Please mail to address given
"Use of Explosives for Settling
Highway Fills."

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POSITION
OR PROFESSION: _____

PLACE: _____ STATE: _____

D. M.

THE DU PONT MAGAZINE

VOL. XXVI

FALL, 1932

Nos. 10-11

THEY FOUNDED AN INDUSTRY

MANY American chemical companies have been extremely fortunate in their founders. E. I. du Pont, Eugene Grasselli, Henrik Krebs, Franz Roessler and Jacob Hasslachner—such men, to mention only a few, had the vision, ability and character to found business enterprises which, even today, perpetuate their names. These organizations, in many cases begun under individual or partnership auspices, are still influenced to a large degree by the rich heritage of skill and experience which their founders left. The Roessler & Hasslachner Company, one of the most recent organizations to join the du Pont Company, well illustrates the point.

The history of this company goes back to Germany where the free cities of an older day had "masters of the mint" who were responsible for the coinage of their respective districts. The art and science of this occupation were handed down from father to son. Among the mint masters for several generations before the German Federation was effected, none were so widely and favorably known as the Roesslers. In 1871, when the metallurgy of precious metals was rapidly advancing, the Scheide Anstalt of Frankfurt am Main, a pioneer group, absorbed the various Roessler interests and acquired the benefits of their skill as metal refiners and workers. The business grew and soon demanded greater outlets for its metallurgical and chemical products. An export business was established and in 1882,

*Franz Roessler and
Jacob Hasslachner, partners, started
a business that is fifty years old
and still growing*

after American china and glass decorators had begun to use some of the materials, Franz Roessler was sent to the United States to start in Brooklyn the manufacture and sale of products used in these industries.

Two years later Jacob Hasslachner, who was trained in the business department of the Scheide Anstalt, came to this country to represent a number of German chemical exporters. In

1885 Messrs. Roessler and Hasslachner formed a co-partnership, and at once began the construction of a factory at Perth Amboy, New Jersey, for the manufacture of acetone from gray acetate of lime; chloroform from acetone; cyanide of potassium from prussiate of potash, and ceramic colors. In October of that year this plant was opened, the manufacture of liquid bright gold was transferred from Brooklyn to Perth Amboy, and production work was started. As markets were developed for these products, others were added—oxide of tin, metal cyanides, hydrogen peroxide and the like.

The partners thought it best to import materials until such time as enough business could be built up in the United States to justify manufacture here. Most of the agreements with the foreign exporters covered such expectations.

Another business policy soon adopted was that of demonstrating to customers how to use their products. In the 80's consumers of chemicals were very secretive; they became suspicious when any seller made a suggestion, but the R & H plan of servicing was a direct guarantee that no inside information obtained from a customer would be used to his disadvantage. The partners supported this guarantee so well that they established a reputation for integrity and bound their customers to them by ties of common interest. Roessler and Hasslachner were among the first Amer-



C. K. DAVIS, President
The Roessler & Hasslachner Chemical Company

ican chemical groups to associate manufacture, demonstration and sales work, and that policy is continued today.

The character of the resident partners was such as to insure the success of the new venture. Roessler was the skillful painstaking technical director—quiet, direct, and fond of the simple things of life. Hasslacher was the far-seeing merchant—honest, generous, jovial, and eminently fair, and with a widening circle of friends.

In 1889 the partnership was dissolved and the firm incorporated as The Roessler & Hasslacher Chemical Company, but its internal affairs continued along the lines of the friendly partnership. This company opened business at 56 Pine Street, New York, subsequently moving two or three times to larger quarters in the downtown district. The executive offices of the company are now located in the Empire State Building.

Following the plan of continuously improving its processes, the company soon found that sodium could be used in making the double cyanide from prussiate of potash. This gave a material containing more cyanogen at a lower cost, which was especially advantageous since the demand for cyanide in the mining industry was then increasing rapidly. At first the sodium was imported from Europe, where it was made by the electrolytic process of Hamilton Young Castner, but after a short time manufacture by the same process was started in this country at Niagara Falls by the Niagara Electro Chemical Company which was financed by English, German and R & H interests. The Roessler & Hasslacher Chemical Company managed the new concern and also acted as agent in selling its products, among which were metallic sodium, peroxide of sodium and the sodium cyanide.

In the late nineties the domestic market for formaldehyde had so expanded that in 1903, The Roessler & Hasslacher Chemical Company formed the Perth Amboy Chemical Works to manufacture this product.

While the use of formaldehyde in agriculture grew steadily, it also became an important raw material for other industries. It was of especial interest to L. H. Baekeland, inventor of Bakelite, during the early stages of the commercial development of that product. The new company and its successor continued closely associated with Doctor Baekeland in this enterprise until recent years.

The business of the R & H Company was continually expanded to cover the manufacture by it of new products, such as the oxygen-bleaching compounds of the type of sodium peroxide; hydrogen peroxide in its various degrees of strength and of purity; calcium peroxide, magnesium peroxide, zinc peroxide, persulfates, perborates and percarbonates; prussiates, metal cyanides, special anodes, rubber accelerators, solvents (chlorinated and non-chlorinated), caustic soda, chlorine, ammonia and organic ammonia derivatives.

Because of its foreign connections and its merchandising power, prior to the World War, the company was a large factor in the importation of chemicals. At the same time it also sold chemicals of domestic manufacture, some of these agencies having been held for over thirty years. The great stimulus to American production during the war years improved this position.

Jacob Hasslacher was an active, vigorous leader until he became partially incapacitated in 1914. Both he and Mr. Roessler were naturalized

American citizens. They managed the company, but the Scheide Anstalt was the principal owner. In an effort to bring financial control to the United States, the American stockholders in February, 1917, bought from the Germans enough stock of the three companies to insure majority control, but they did not obtain a clear right to it until 1923, when they were also permitted to purchase the foreign-owned stock which had been seized by the alien property custodian. At this time they acquired the stock of the Niagara Electro Chemical Company and the Perth Amboy Chemical Works, and these companies were merged with The Roessler & Hasslacher Chemical Company.

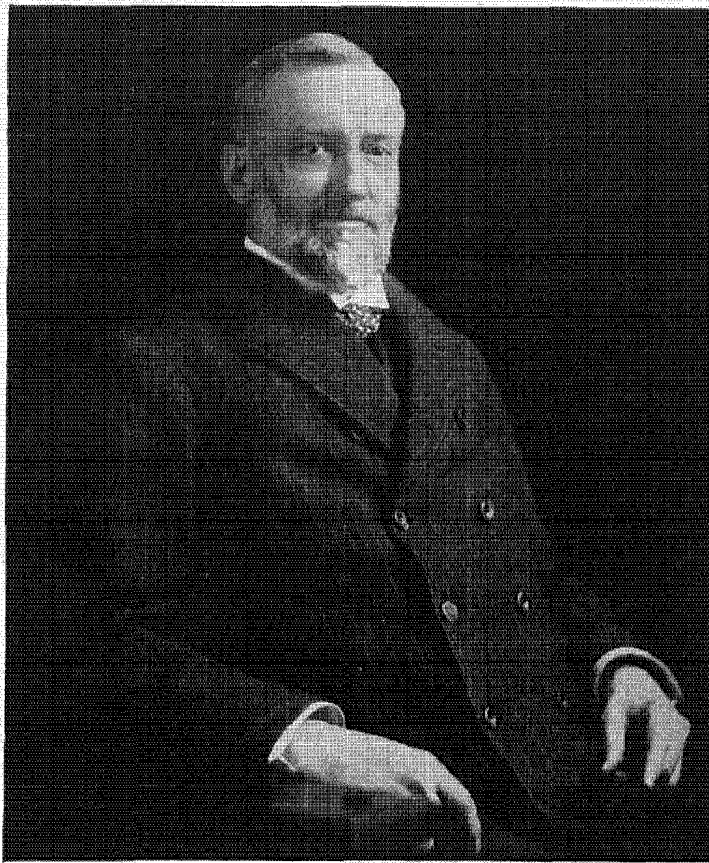
Mr. Hasslacher died in 1921, and five years later his former partner passed away. W. A. Hamann then became president and the company again began a period of increasing activity. In the spring of 1928 he retired to become chairman of the board, Dr. R. H. Carveth became president, and younger men were advanced to positions of greater responsibility. Two years later the ownership of the R & H Chemical Company passed to the du Pont Company, and Dr. Carveth continued as the executive head until his retirement in 1932.

The present officers of the company are: C. K. Davis (formerly president of the Du Pont Viscoloid Company, Inc.), president and general manager; E. A. Rykenboer, vice-president and assistant general manager; Milton

(Continued on page 24)



Looking down upon the plant of the R & H Chemical Company at Niagara Falls, New York.



G. M. Peters, whose inventive genius laid the foundations for The Peters Cartridge Company establishment at Kings Mills, Ohio, where machine-loaded shotshells and rifle cartridges were first produced.

AMMUNITION BY PETERS A STORY OF PROGRESS

In 1887, The Peters Cartridge Company first produced machine-loaded shotgun shells. Today, its products are well known throughout the world

By F. C. TUTTLE

Vice-President and Treasurer, The Peters Cartridge Company

TWENTY miles north of Cincinnati, on a strip of land between the Little Miami River and the hills at Kings Mills, Ohio, stands The Peters Cartridge Company plant. This enterprise was established forty-five years ago, on what has since become a historic site. Here was the birthplace of machine-loaded shotshells. Here was built the first shot tower used by an American manufacturer of ammunition. More recently Peters has employed that ingenious process of

"Sparkography" to study ammunition performance. Because these events mark progress, it will be interesting to trace briefly the development of this company. The story starts in the early eighties when J. W. King, president of The King Powder Company, induced his son-in-law, G. W. Peters, a Baptist clergyman, to accept the vice-presidency of that company.

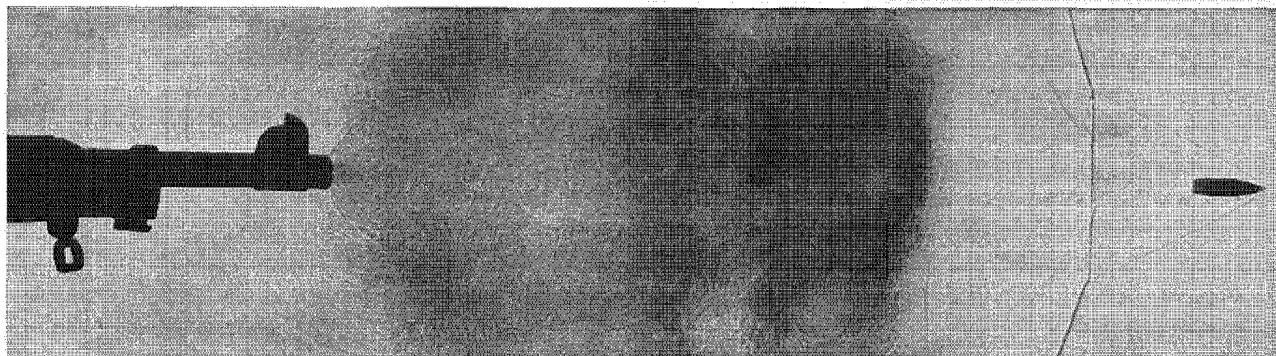
Peters was a natural inventor. Even before going to college he invented

and subsequently sold a ball-bearing axle and a revolving rake reaper. Shortly after going with The King Powder Company, Mr. Peters got the idea of mechanically loading shotgun shells. His first conception of a loading machine was what is known as the endless chain type. But he never used his drawings to build this machine, having decided that wear on the chain links would, in time, impair its usefulness. He therefore abandoned that project and developed the "round-table" machine, which was a success from the start.

The Peters Cartridge Company was organized by G. M. Peters and incorporated January 24, 1887. He was then president of The King Powder Company, having succeeded his father-in-law, who died in 1885. The new venture was well timed, for fixed loaded shotgun ammunition was just coming into the field. The business was started in a small structure located at one end of the present plant area. He requested his brother, O. E. Peters, then a successful merchant at Lancaster, Ohio, to become president and general manager.

As may be supposed, the relationship of the two companies, from the beginning, was very close. G. M. Peters became a director of the new concern. O. E. Peters was also treasurer of the powder company. A. King, nephew of the founder, eventually became works manager for both companies. For some years the powder company owned the real estate and factory buildings occupied by the cartridge company, until they were purchased by the latter. While each operated independently, this inter-relationship continues; the financial control of both companies still remains in the hands of the same people.

The personalities and complementary abilities of the two brothers are worthy of note. "G. M.," as stated before, was the inventive power back of the company. But while his partic-



This "sparkograph" of a bullet in flight was taken at a speed of one millionth of a second. Such pictures reveal much information that could not otherwise be determined. This one was reproduced from unretouched copy.

ular attention was given to mechanical problems, as a director he also kept in close touch with the firm's managerial policies. Mentally keen and widely informed, he had an inspiritive influence upon the company. He had that rare quality of making people—even the humblest employees—feel that he was genuinely interested in their personal problems—and he was. Everybody felt that he had a real friend in G. M. Peters.

O. E. Peters was a man of tireless energy. Quick and brusque in business, he was easily touched by another's mischance or distress; he performed many unobtrusive kindly acts. He was intellectually quick; it was difficult to elaborate on any proposition to him, for he would cut through to the conclusion and give his answer quickly. O. E. Peters, keen business manager, was a tower of strength in all the early struggles of the company.

In spite of the advantage gained by the use of Peters' new automatic machine, severe price competition

soon threatened the company's existence. At the outset, the business was confined to loading shotgun shells. Peters purchased the empty shells, the shot, the felt for the wadding and the powder. Depending for its empty shells upon manufacturers who were also marketing loaded shotgun shells, the company was in an exposed position. By advancing the price of "empties" and cutting the price of their loaded shells, competitors had the young company at their mercy. Peters escaped eventually by acquiring patent rights to manufacture empty shotgun shells.

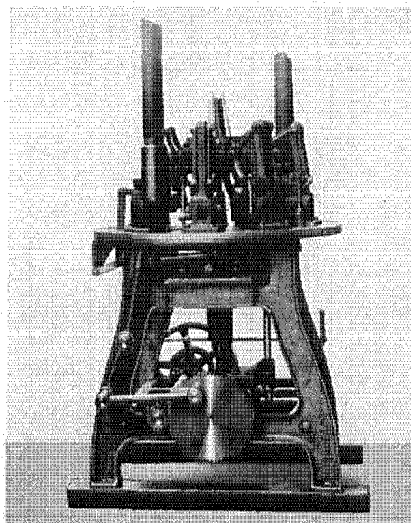
Later, the company began the manufacture of rifle and revolver cartridges, developing a complete line. And to reduce costs the manufacture of component materials was undertaken. It was about this time that the company's first shot tower was erected, in 1895. Peters began making felt, fulminate, primers, wood cases, and paper boxes until the only constituents not made in its own shop were pig lead, rolled brass, powder and paper. Incidentally, Peters also improved the quality of its products, for each article was now made for a specific use.

In the matter of powder, of course, the association with The King Powder Company was not without advantages. Peters entered the ammunition field when black sporting powder was in general use, and smokeless

powder was just beginning to be used in shotgun shells. King developed Peters' semi-smokeless powder which has been used exclusively by The Peters Cartridge Company in its Referee brand of loaded shells and in its semi-smokeless line of rifle and revolver cartridges. With the velocity of standard nitro powders, semi-smokeless has the low breech pressure and is as safe to shoot as the regular black powder, while giving off much less smoke. Peters loading now covers the entire field of smokeless powder for rifle, revolver and shotgun use.

On July 15, 1890, after three and a half years of hard work, the company suffered a great misfortune. Close to the railroad station at Kings Mills and likewise near the Peters factory, two carloads of nitrate of soda were standing on a switch track by a warehouse. About fifty feet away was a freight car containing 400 kegs of black sporting powder. It was sealed, with brakes set, ready for shipment. The train crew made a "running switch" and threw in at high speed two more cars of soda, which rammed the powder car, skidding it along the rails until it crashed into the standing soda cars. A terrific explosion followed, demolishing an empty-shell factory and a shotgun shell loading plant. Fire completed the destruction. But this misfortune merely retarded the company for a time.

This story would be incomplete without paying tribute to the ability



G. M. Peters' first round-table loading machine, the original picture of which still hangs in the company's offices. This machine, in appearance, differs little from the machines now used, although, of course, many improvements have been made.

of A. King, who built the powder plant and was works manager of both companies until his death in 1909. A man of sound judgment, his steadying influence was helpful in solving many difficult factory and business problems. He left the impress of a strong man in all his relationships.

As the Peters Cartridge Company business grew, its plant facilities were extended along the river and railroad and back to the hills, until the whole of the small valley was occupied.

During the World War the plant was greatly expanded. Great Britain and other Allied countries placed large orders with Peters for rifle and revolver cartridges. And after the United States entered the conflict, Peters handled large contracts for our Government. (The chief items produced were the Mark VII British, 45 automatic, 7M/M and 7.65, 30-caliber 1906 U. S. Gov't cartridges.) Rather than put up temporary structures, buildings of cement construction were erected. Following the Armistice, many of the old ones were torn down, the excess equipment for war purposes was dismantled and sold or abandoned, and machinery for commercial production was installed in the new buildings. Few of the old pre-war structures remain.

In ballistic standards and testing equipment, in chemical laboratory work and manufacturing processes, Peters has kept abreast of developments in the industry.

In 1927 the company brought in Dr. Philip P. Quayle, inventor of an electric spark photographing machine, to apply his apparatus to the

study of ammunition performance, and that association was continued until his death in 1931. This process, which Peters exclusively employs, is a most interesting one.

Photographs are taken at the speed of one millionth of a second. So instantaneous is the exposure that not only are shot and bullets caught in flight, but even the gases from an exploding cartridge can be pictured before the bullet has passed the muzzle, and sound waves are visualized!

The process was first used in a determination of the amplitude and period of oscillation of experimental boat-tail bullets, with the aim of eliminating it by improving bullet design. Accurate information from sparkographs permitted the making of successive changes in design which finally led to the complete elimination of oscillation.

From such photographs have been secured valuable data concerning the effect of various factors upon shot patterns—leakage gases, the pressure of wads on the shot column, and so on. The better understanding we have of shotgun patterns and how to improve them has been due entirely to spark photography showing conditions at the muzzle. The truth about "shot-stringing" has been revealed with photographs showing the length of shot strings at various ranges and visualizing clearly the positions of

all pellets of a shotgun load in flight.

Velocity determinations on bullets after their penetration of various objects can be made, and losses of energy by bullets can also be computed. In this manner, from a series of tests, the most efficient bullet for game purposes was selected.

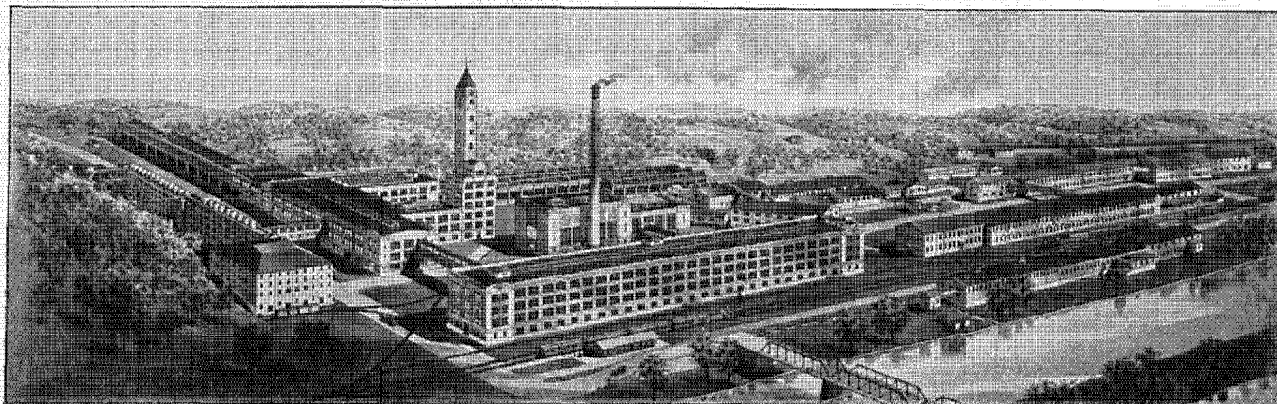
These are some of the uses Peters makes of spark photography. Others are constantly suggesting themselves. C. T. Ervin, chief physicist, is now in charge of this work.

This story may be concluded by saying that Peters' products are today sold throughout the United States and in many foreign countries. They comprise ammunition for every known make of rifle, revolver or shotgun, domestic and foreign. The company does not manufacture firearms. It makes empty and loaded shotgun shells, rifle and revolver cartridges, and components—felt, shot, fulminate, primers, wood cases, paper boxes and the Duvrock Trap and Target. Its main factory and subsidiary buildings, situated on ninety acres of land, have a total floor space of 379,173 square feet.

George G. King is now president of the powder company and also of the cartridge company. The other officers of the latter are: F. C. Tuttle, vice-president and treasurer; Harry L. King, vice-president and works manager, and John Moore Wallace, a grandson of G. M. Peters, is vice-president and secretary.

EDITOR'S NOTE: This is the fourth of a series of articles on the arms and ammunition industry of America. The next will appear in an early issue.

The Peters Cartridge Company was housed in one small building forty-five years ago. This illustration gives you some idea of present-day facilities of the company at Kings Mills





J. ARMSTRONG ROBERTS

PREPARE YOUR CAR FOR WINTER DRIVING

*The du Pont Company manufactures many products which will
protect the automobile against Old Man Winter*

By PAUL SAMPSON

ALMOST everyone who drives a car today can remember, for it wasn't so many years ago, when the family automobile was jacked up in the garage at the beginning of winter, usually just after Thanksgiving Day, the battery removed, most of the air let out of the tires, then covered with

a huge drop cloth. It was not unveiled until late the following spring. In those days everybody thought it something of a miracle that the car should start so easily after having lain idle all winter.

But not so today. It is axiomatic that even the weather isn't what it

used to be. Motorists, with their anti-freeze, car heaters, windshield warmers, cold-weather oil and high-test gasoline, operate their cars from December to April.

But even today some steps are essential to make sure the car which is used will come through the winter as safe and unharmed as the old-timer under the drop cloth.

First, there is the danger of freezing. This can be avoided by using du Pont Anti-Freeze Methanol or its companion product, du Pont Denatured Alcohol Anti-Freeze. Before you put either one into your radiator, the accumulated rust and dirt should be removed. For this purpose, du Pont No. 7 Radiator Cleaner is perfect. It is quick and easy to use, and will thoroughly remove all rust and scale deposits. Then you can rest secure that the entire cooling system is open and clean, allowing free circulation of water with its Anti-Freeze guardian. No matter how much care you have taken to keep your radiator full during the summer, and to guard against overheating, a cross-section view of your engine's cooling system at the end of a summer's driving would probably show it to be badly clogged.

The car finish is worth a lot of attention, but, unfortunately, seldom gets much. Three or four months' exposure under the summer's sun usually causes the finish to chalk and turn dull. Its beauty is gone, and unless restorative measures are taken, serious damage may result.

The thorough-going car owner will do a complete job on his car. He will wash it. Then he will apply No. 7 Pre-Wax Cleaner to remove the chalked pigment. Now that finish beauty has been restored by cleaning, the next step is to protect it completely against water absorption and winter rains, snow and mud. No. 7 Duco-Wax is the answer. It forms a protective film that is glossy, hard and impervious to the worst assaults which might be made against it by Old Man Winter. Snow and hail slide off its tough hide. Rain cannot penetrate the protective film which seals in the beauty. Dirt of all kinds is wiped off easily with a cloth. And yet, all winter you can have a car of

sparkling beauty. The motorist who takes pride in his auto will give his car finish complete protection by using No. 7 Pre-Wax Cleaner and the No. 7 Duco-Wax.

If, however, there is not time for waxing, No. 7 Duco Polish will do an adequate job. This product removes the unsightly traffic film and restores showroom luster. While it does not provide a film to protect the finish for months, it does revive the original color and beauty. If used at frequent intervals, it will keep the winter-driven automobile new looking.

If you operate a closed car, its top material is undoubtedly Everbright Pontop, made by the Fabrikoid Division of the du Pont Company. Good as it is, constant bombardment by sun, wind, rain and dust has no doubt dulled the luster. And winter might do it serious damage with summer inroads as a start.

If the top is neglected, it may eventually develop leaks, and seepage will rot the inside fabrics. You have, no doubt, seen damp spots on closed car ceilings that indicate a leaky top. If wood has been used in the framework, this may even rot. All this trouble can be avoided by the application of a good top dressing. As the

world's largest manufacturer of top materials, the du Pont Company is well qualified to make the best of all top dressings. It is called No. 7 Auto Top Finish, and will renew the top as completely as though you had sent the material back to the factory to be completely re-processed.

Or, if you drive an open car, you will probably use the top and the side curtains all winter. In this case, you will want to have them thoroughly waterproofed for the winter. The answer to this need is No. 7 Waterproof Dressing. It completely waterproofs the top, and successfully rids it of the dulled, old look. Incidentally, No. 7 Waterproof Dressing is excellent on all out-of-door fabrics, such as awnings, hammocks, leggings, and so on, where waterproofness is desired.

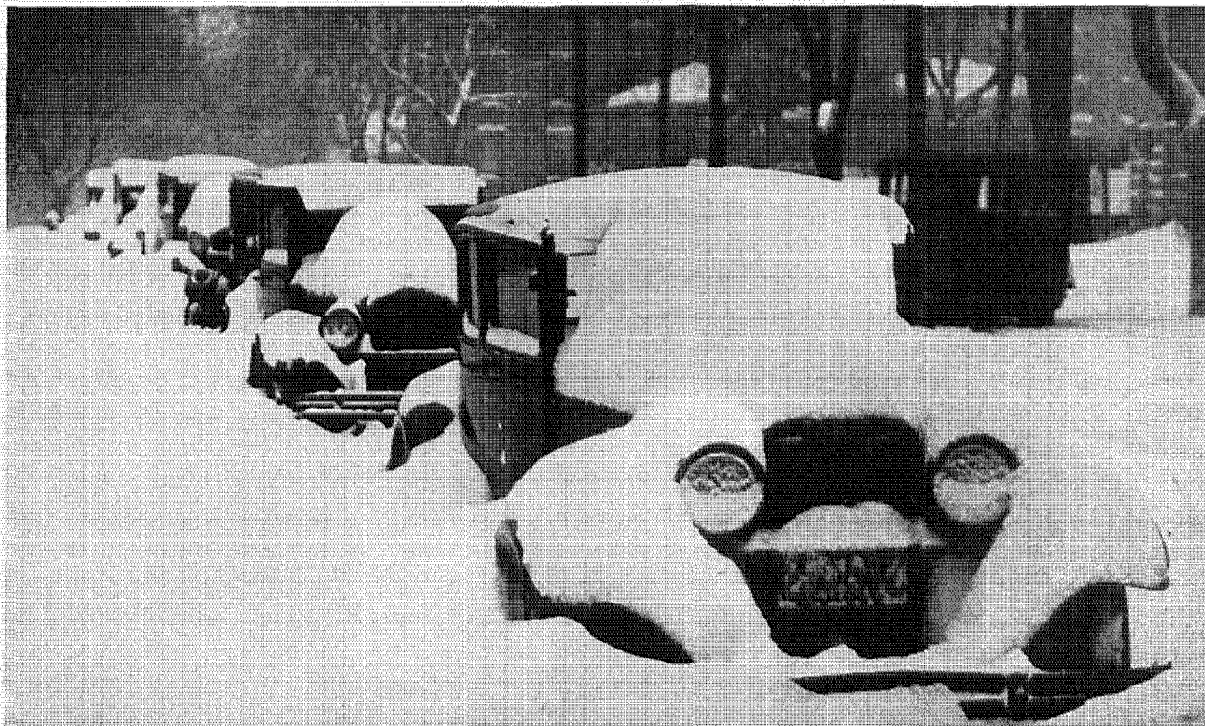
The hazards of parking places and the open road are many, and it is an exceptionally lucky driver who comes through the summer with an unscathed automobile. Fender nicks are a common casualty. These can easily be straightened out, and the unsightly scars removed by the application of No. 7 Touch-up Black, which is obtainable in small cans with small brushes already attached to the cap.

If you wish to do the re-touch job more rapidly, there is the No. 7 Spray Gun, which is operated with the air from your spare tire. A quarter million of these guns are now in use and have delighted their owners with the ease of their operation. It will work on air pressure down to ten pounds, so that the tire cannot be drained flat. The usual range is between ten and sixty pounds.

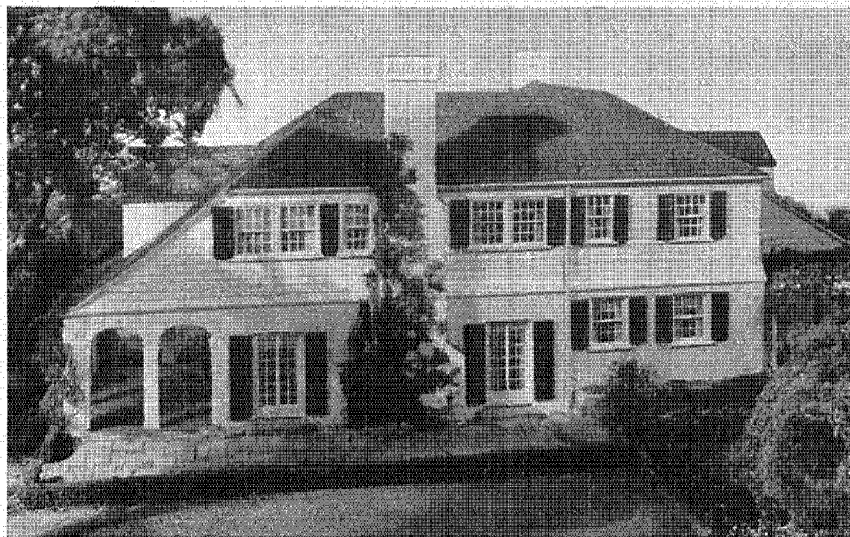
Touching-up is an essential "get-ready-for-the-winter" job, not only from an appearance standpoint, but also because scraped and bumped fenders mean exposed metal, and exposed metal means rust.

Through the use of these items in the No. 7 Line, you have taken care of the cooling system, the finish, all of the fender nicks, and the top. Now, whether the car be an open or closed type you have very effectively sealed the surface against winter and the worst that it can do.

Spring will not mean taking off the drop cloth and rolling the car out into the open, for the No. 7 Line of products will have protected it as completely as though it had been "under wraps" and out of service all through the winter in your garage.



INTERNATIONAL NEWS PHOTO



LITHOPONE A VERSATILE PIGMENT

*It is found in hundreds of products of every-day use as well as
in paints of superior appearance and durability*

By DR. H. H. MORRIS
Manager, Technical Service
Krebs Pigment & Color Corporation

“WHAT is lithopone?” will no doubt be the first question which comes to the mind of many readers of this magazine. The name may be unfamiliar but the products made from this pigment are well known to all. Probably no common material is so often seen and handled, and so infrequently recognized.

Brief mention of the principal uses of lithopone will indicate its close association with every-day activities.

Lithopone is the white pigment used in practically all interior flat white paints. It is widely used in stipple paint, plastic paint, high gloss enamel, traffic paint and quick-drying enamel. In exterior house paints, its use has been found to give finishes superior in appearance and durability to the well-known lead in oil or lead-zinc paints.

The brilliant, white, glossy surface of table oilcloth is produced by spread-

ing a mixture of lithopone and oil on a suitably prepared fabric. (Oilcloth, however, is only one among many types of coated fabrics in which lithopone is used.) Many kinds of wall coverings include it as an ingredient of the coating composition. Imitation leathers for upholstery, book-binding and other uses contain lithopone, colors and fillers bonded by a suitable vehicle. Rubber-coated fabrics for raincoats, dress shields, shower curtains and hospital sheetings are prepared by mixing rubber with lithopone and other ingredients to form a composition which can be applied to a fabric to make it waterproof.

Lithopone also finds extensive use in rubber compounding to produce a great variety of merchandise, ranging from light rubber articles, such as bathing caps and shoes, tea aprons, baby pants, rubber sponges and bath mats, to heavier molded articles such

as tennis-shoe soles, rubber boots, rubber heels, auto tires and rubber flooring material.

The linoleum industry consumes large amounts of lithopone in both the felt-base and inlaid types of floor coverings. Felt-base linoleum consists essentially of lithopone paint suitably tinted and applied in attractive designs to a prepared felt base. The inlaid type carries lithopone with other pigments and fillers, bonded together by an oxidized linseed oil cement and pressed on to a fabric backing.

Smaller amounts of lithopone are consumed in such articles as white shoe cleaners, shoe polishes, leather finishes which yield the popular white and colored leathers; molded casein plastics, artificial stone, gasket and valve packing, cosmetics and fancy candles. It also serves as a lubricant for pressing and drawing steel.

A comparatively new use is being developed in the paper industry. There is an increasing demand for thin, lightweight paper which is opaque enough to prevent printing from being visible through the paper. Lithopone is incorporated with the paper pulp, adding greatly to its opacity when fabricated into thin sheets. It is also used in preparing coated paper and cardboard of the types used in illustrated catalogs or the heavier stock required for candy boxes and fancy containers.

Lithopone has been used for some time in the silk printing industry to whiten portions of designs where colors have been removed by bleaching. It is now used successfully in inks which print white directly on the cloth. The pigment is so fine that it impregnates the cloth deeply yet leaves it with a soft, attractive feel.

By this time the reader has discovered that lithopone is an old friend, appearing in many disguises, but the question still remains, “What is lithopone?”

This material is a manufactured product consisting of approximately seventy per cent barium sulphate and thirty per cent zinc sulphide. In appearance it is a fine, brilliant, white powder, having a specific gravity of 4.3. By means of slight but carefully controlled changes in the manufacturing process, lithopone of various

physical and chemical properties can be produced.

These variations are of particular importance to the paint manufacturer, since they affect the oil absorption of the pigment and its action with various paint vehicles. Some types are designed to yield thick paint. Some are intended for thin paint. Certain grades are chemically inert and will not react with paint vehicles, even those having a high acid number. Other grades do react, yielding the thick, puffy paint desired for certain uses.

In addition, lithopones have been developed to meet particular needs. For instance, enamels require a pigment of very fine particle size, one that will give good flow, leveling and high gloss to the enamel film. Lithopones having these properties are now obtainable.

One of the outstanding improvements made in lithopone some years ago, the result of research work, was the development of light stability.

Prior to 1921 this pigment had the disagreeable trait of turning gray when exposed to sunlight, a fault that has since been completely corrected. In addition, modern high-grade lithopones may safely be used with lead pigments or lead driers without fear of darkening, due to chemical reaction. In a word, they can be mixed with basic carbonate white lead, sublimed white lead, chrome yellows or lead driers with-

In the packing room at the Newport plant. Close inspection of the bags on the truck will disclose the name of a famous brand of lithopone—Ponolith

out danger of forming any dark-colored lead sulphide.

Many pigment users are not aware of these important improvements in lithopone and still hesitate to use it in exterior paint or mixed with lead pigments. Such restrictions only serve to set up artificial limits on formulations.

Now that high-grade lithopones retain their color when exposed to sunlight, they can be used in exterior paints with advantage.

Lithopone exterior paints have been developed which are superior in both appearance and durability to the older types of lead in oil or lead and zinc paints. These paints have the ease of working under the brush, which is demanded by the painter. They have the moderate cost demanded by the contractor, and the long life and fine appearance demanded by the home owner.

The recognition of these outstanding advantages has resulted in the widespread and rapidly-increasing adoption of properly formulated lithopone paints for exterior work. Only one factor retards their even wider use and that is an old prejudice against lithopone. Still fresh in the minds of many painters is the recollection that the lithopone of a decade or more ago was not light stable, and that the first lithopone exterior paints developed were not entirely satisfactory from the durability standpoint.

These faults were as clearly recognized by paint technologists as by practical painters. Development work was continued so successfully that lithopone paints with exceptionally good properties are now available.

Independent investigators have reached identical conclusions as to the best formulation for them. The pigment combination should be lithopone, thirty-five per cent leaded zinc,

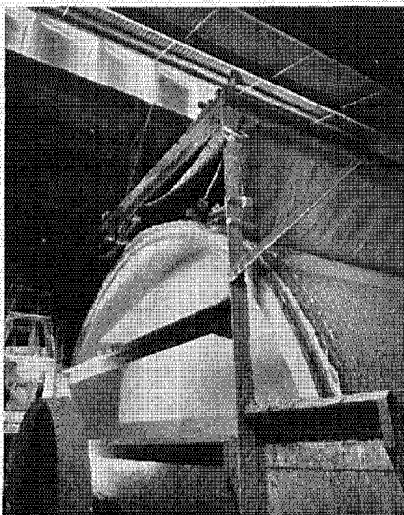


and inert in the approximate ratio of 40-45-15. The vehicle should be refined linseed oil with a lead-manganese drier and thinner.

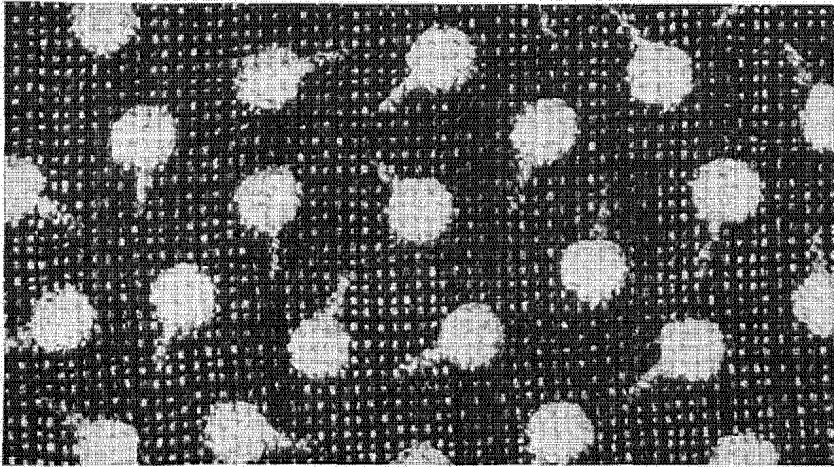
Any doubts concerning the relative merits of lithopone exterior paints would be quickly dispelled by a visit to any of the paint-testing farms situated in various parts of the country. At these points hundreds of finishes undergo tests on thousands of panels. Invariably the lithopone paints stand out because of their clear whiteness as against the dull, grayish white of the older type paints. It is a peculiarity of whites that most all of them look white until a whiter white is placed nearby for comparison. That is why many persons fail to note the inferior color of a lead in oil or lead and zinc paint after it has been exposed for a year or more. If a lithopone paint were placed nearby for comparison, the lead paint would be at once recognized as having a gray color instead of white.

Lithopone exterior paints appeal strongly to the home owner, because of the savings associated with their use. The low initial cost of these paints coupled with their exceptional durability reduces up-keep painting expense to a minimum.

The Krebs Pigment & Color Corporation has been closely associated with the development of lithopone and its adaptation to these modern uses. Readers desiring additional information may address inquiries to the company office, 256 Vanderpool Street, Newark, New Jersey.



One stage of manufacturing lithopone at the Newport, Delaware, plant. This view shows part of a huge mechanical filter and drier, said to be the largest unit of its kind in the world



Reproducing a sample of genuine wool challie from a photo-print showing a ten times' enlargement of the fabric construction

COTTON CLOTH CAN BE WOOL-FINISHED

By a special process at the Bellman-Brook Bleachery, cotton fabrics are made wool-like in appearance, feel and wear

BY WALTER ELSAESSER

KING COTTON extends his dominion!

A sensationally new addition to the family of cloths has been born. By an interesting new process, cotton piece goods and yarns can be treated chemically to simulate woolens. This is another triumph of chemical science—a discovery that puts on the market a new material which may be as significant in its economic effects as was rayon. There is this difference between them. Rayon came from the laboratory into the world as a man-made fiber of silk-like appearance and with properties all its own. Wool-finished cotton is, as the name implies, a natural fiber from the Sunny South, but so transformed that it possesses wool-like characteristics of the fleece taken from sheep. One was chemically created, the other, chemically improved.

There are many "napped" cotton fabrics such as cotton flannels, but

this is entirely a surface effect obtained by brushing up the cotton fibers after the cloth is woven—a mechanical process. These napped fabrics, at their best, are cheap in appearance and the brushed surface, through wear and washing, will "pill up"—that is, form nodules of matted fiber—and rapidly wear off, thus weakening the fabric and spoiling its appearance.

In the new wool-processed cloth,

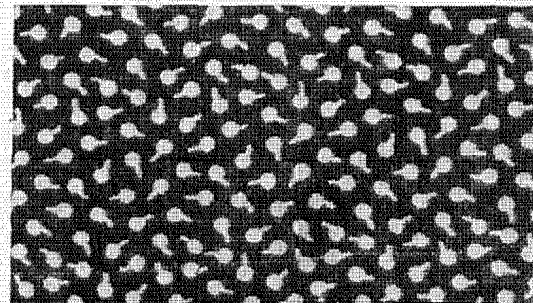
Here is a sample of wool-finished cotton cloth of the same weight as the genuine wool challie and with the same pattern reproduced actual size. A better impression of the texture will be obtained from the enlargement on the opposite page

the yarn itself, or the piece goods, is chemically treated so that the cotton fibers take on a permanent curl, precisely after the manner of natural wool. These curly fibers do not come loose from the yarn, nor will they "pill up" in the cloth. No amount of wear or washing will change this characteristic as produced chemically, both as to finish and color.

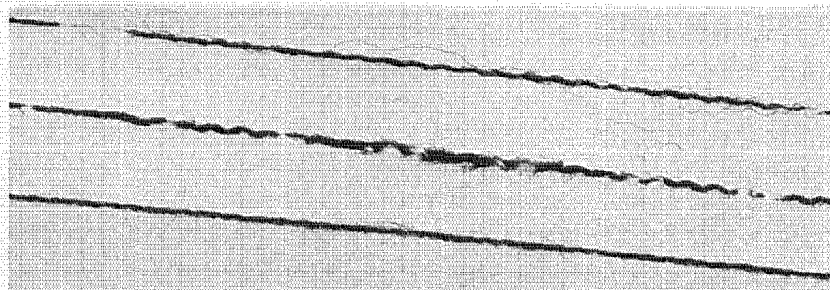
The process by which this amazing transformation is accomplished is a patented one. It was developed by Bellman-Brook Bleachery in conjunction with one of the oldest textile-finishing establishments in Switzerland. In giving cotton cloth or yarn its woolly appearance and other physical properties a number of du Pont chemicals are used. This process is, therefore, the result of both textile and chemical experience accumulated for more than one hundred years.

The woolly characteristic of this yarn gives the cloth a soft challie or wool-like hand and is all the more wool-like in appearance because of the dull luster imparted to the cloth in the finishing process.

The wool finish does more than just make the cloth look and feel like wool. A comparison of wool-finished cottons with woolens of the same weight and construction is interesting because it brings into focus these advantages:



A photomicrograph of three threads. At the top, real wool; center, wool-finished cotton; bottom, cotton. Note the curly fibrous structure of the wool-finished thread.



Warmth—The curly fibers form an insulator the same way wool fibers do.

Resistance to wear—The springy nature of the curly fibers insures additional wearing qualities.

Washability—Wool-finished cottons retain fully the washable qualities of cotton fabrics.

Comfort—These processed cottons are more comfortable to wear; they are not scratchy next to the skin, and they possess the desirable qualities of wool without its weight. This lightness of weight, combined with serviceability and warmth, is what makes these fabrics in many respects more desirable than wool. All of which is to say they are highly practical garment fabrics.

Price—Of course, we need hardly mention that these new fabrics, made from cotton yarn, are very inexpensive as compared with similar woolens.

In these times when price-cutting has lost its punch, dress manufacturers and retailers, above everything else, want things that are expressive of new ideas and styles—new products that will attract customer attention and lure the hoarded dollar back into circulation. And this cloth meets that requirement supremely well. It comes at a time when rough effects in materials are in full vogue. The patterns selected carry out the rough weave idea by emphasizing this popular effect.

It is interesting to note the mer-

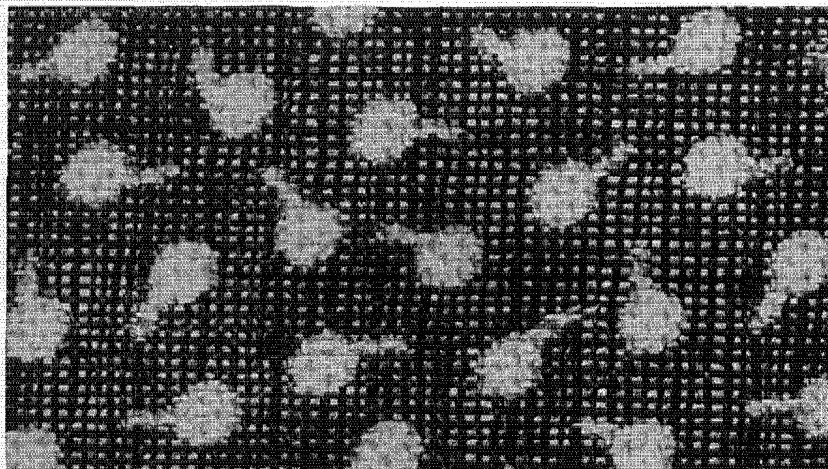
chandising value and economic possibilities of these new fabrics. They provide the retailer with a volume item in cotton and cotton dresses for fall and winter when such goods normally move slowly. This point alone is of first importance to the entire cotton textile industry for, by the same token, it gives the cotton dress manufacturer a chance to maintain volume production in his normally dull season.

Clearly, the introduction of these wool-finished fabrics will have a tendency to prolong the market demand for cotton goods in the garment industry, so that there will be less seasonal variation. The peaks and valleys from now on should be less conspicuous on production and sales charts, and that of course means a long chain of benefits extending all the way from the Southern cotton plantation to the ultimate consumer. In transforming cotton cloth to make it suitable for fall and winter use, Chemistry has not only enthroned King Cotton more securely, but has also added a new vigor to industry and trade by extending the usefulness

of this fiber in regions where only wool was believed to be practicable.

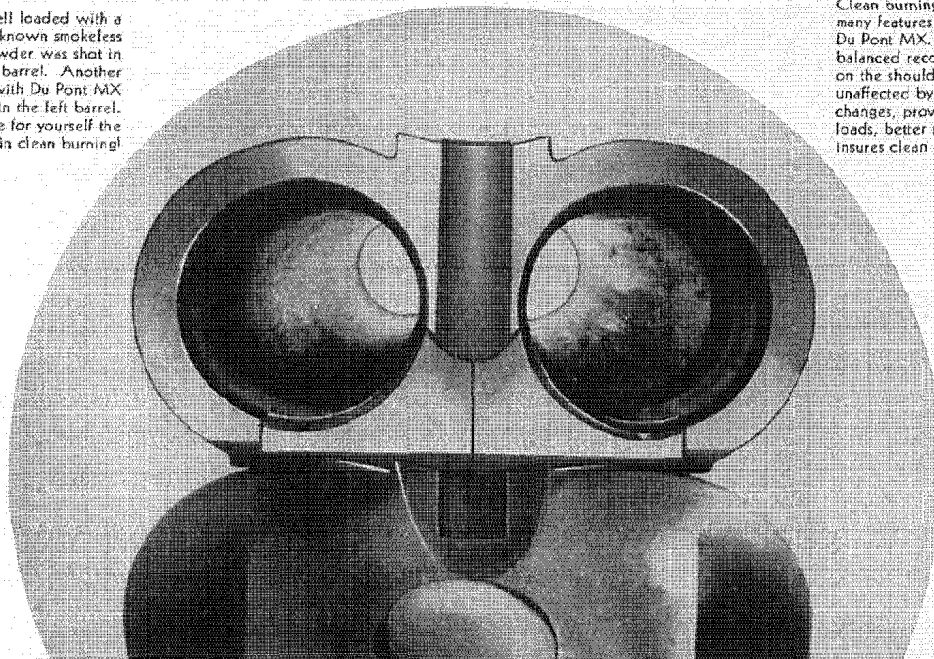
Economically, the development of these fabrics comes at a most opportune time, when lean purses are not opened to buy luxury goods. Most of the consumer's money, at least that spent in any quantities, is for the less expensive commodities. The public is able to buy these practical, inexpensive fabrics—or garments made from them—at prices little higher than is currently asked for cottons. Shoppers, however, obtain added value, because these fabrics have the style, appearance and wearing qualities of goods commanding a much higher price.

This wool-processed cloth can be made into misses' and women's dresses for every-day, shopping and house-wear, girls' school dresses, and small boys' school and play suits. The colors are fast to washing, sun and perspiration. The Bellman-Brook Bleachery invites correspondence with those who may desire more information about these materials. The address is Fairview, New Jersey.



Now compare this picture of the wool-finished cotton fabric with the one showing genuine wool challis. Note the similarity of texture.

A shell loaded with a well-known smokeless shotgun powder was shot in the right barrel. Another loaded with Du Pont MX was shot in the left barrel. See for yourself the difference in clean burning!



Clean burning is just one of many features of the new Du Pont MX. Because of its balanced recoil it is easy on the shoulder. It is unaffected by atmospheric changes, provides uniform loads, better patterns and insures clean breaks.

A NEW STAR IN THE SHOOTING WORLD

BELIEVE it or not, the announcement of a new powder creates immediate interest in bug, debutante and sportsman circles. Each group wants to know, Is this for us? What will it taste like? Will it suit my complexion? Will it shoot better? The answer to the last question is that it certainly shoots better. No wonder that the patiently-waiting sportsman greeted the news of the new smokeless shotgun powder, Du Pont MX, with exclamations of "Merry Xmas," because the glad tidings came as a very pleasant surprise. While the initials MX mean Merry Xmas to many of us, to the technical staff of the Smokeless Powder Department they also signify the many experiments required for the development of a better shotgun powder. Du Pont MX is a better powder and it is definitely better in five particulars—super-clean burning, balanced recoil, ballistic stability, uniform ignition and better patterns.

Thoroughness has always been the keynote in all research work conducted by the du Pont Company's technical department, and thorough testing has always been the motto of the manufacturing staff and techni-

Du Pont MX is the result of a cooperative effort to assist in the development of improved shotshell ammunition

By R. G. WOODBRIDGE

cians before presenting a new product to the public.

There is no better way to tell you about the superior ballistic properties of this smokeless shotgun powder than to take you behind the scenes and explain in as non-technical terms as possible the severe tests to which the new powder has been subjected.

Du Pont MX is non-hygroscopic—that is, unaffected by atmospheric moisture—and it is not affected by changes in atmospheric temperature. It is ballistically stable. To the shooter that means that the powder can be depended upon at all times.

Everybody is familiar with dry ice or frozen carbon dioxide. Think of storing loaded shotshells forty-eight hours in a box, surrounded by dry ice. Then without warming up the shells, which the thermometer showed to be

at -22° F., or even taking the least bit of chill off, expect the powder to function in a shotgun as well, or substantially as well, as if the shells had been stored in a room at a nice comfortable temperature. The proverbial fish frozen in the ice did not wiggle until the ice was melted and he had some freedom of action. Nothing is expected of the frozen traveler until he has been thawed out by the fireside. But Du Pont MX does not lose its ardor at sub-zero temperatures. It may be too cold to go shooting perhaps, but Du Pont MX, even at 22° below, is ready. It still retains its power, its punch. That may not interest you, if you live in Arizona, but it's good news to sportsmen who live in Maine, Alaska or other summer resorts.

Now the shooter in Arizona or in any other hot, dry climate does not particularly care how well Du Pont MX will shoot in the cold, cold North. He knows that his climate is just as hard on powder as cold weather—and in some respects harder. So, to find out how Du Pont MX would stand up under hot weather, our technical men stored shells loaded with it in a magazine maintained

at 122° F. for twelve weeks. Not one make of shells, but six. As in the cold test, these were factory-loaded shells from five of the most important ammunition companies in the United States and from one in Canada.

All six makes of shells performed satisfactorily after four, eight and twelve weeks of storage under this torrid heat. It was a most severe test for any powder and any shotshell; for heat as well as cold affects the primer as well as the powder.

Any powder that will pass these tests of freezing frost and torrid heat must be good. Yes, good, but not good enough. Cold and heat are enemies of smokeless powder but its worst enemy is moisture. That may surprise many readers, but it is true. World War experience furnishes the background for this statement. The du Pont Company made more than one billion pounds of smokeless cannon powder for the use of the Allies and ourselves. A good powder, yes, but it was produced on a formula adopted by the United States Government in 1899, and it absorbed too much moisture. At the request of the U. S. Army Ordnance Department, the du Pont Company in 1919 began the study of a less hygroscopic smokeless powder for big guns and this led to the development in 1923 of an improved composition which has been adopted as standard in a large number of guns.

For many years du Pont has been continuously studying how to make cannon, rifle and shotgun powders less hygroscopic without sacrificing chemical stability, uniformity and other essential properties. All this accumulated experience has resulted in the development of a non-hygroscopic "multi-base" shotgun powder, Du Pont MX. And here are the tests to prove its merits in that respect.

Two lots of your favorite make of shells for trapshooting, loaded with this powder and 1¼ ounces of No. 7½ shot, were stored eight weeks at a temperature of 86° F. In one case twenty per cent relative humidity was maintained and in the other, ninety per cent. Both the condition of the powder and its performance are indicated in the following tabulation:

Six makes of shells, the same powder—Du Pont MX—the same result in

Manufacturer of Shells	1	2	3	4	5	6
Velocity after 8 weeks at 20 per cent R. H.	861	828	849	839	833	858
Velocity after 8 weeks at 90 per cent R. H.	860	823	838	823	816	835
Difference in velocity in feet per second	1	5	11	16	17	23
Percentage of moisture in powder after 8 weeks at 20 per cent R. H.	0.28	0.30	0.25	0.30	0.25	0.28
Percentage of moisture in powder after 8 weeks at 90 per cent R. H.	0.42	0.50	0.48	0.55	0.48	0.40
Difference in Moisture in per cent.	0.14	0.20	0.23	0.25	0.23	0.12
(All moisture figures are in fractions of 1 per cent)						

all shells — little or no change in velocity, and only 0.12 to 0.25 per cent change in moisture content of the powder. The same test, if applied to other good powders of the non-hygroscopic type, would have shown a difference in velocity of about thirty-two to seventy-two feet per second and a change in moisture of about 0.80 per cent to 1.80 per cent. (Some of the shells used in this test got the breaks; don't rate them as you would your golf scores. They are all good—very good—if shot again, the shells might change their order.)

And now some tests which the sportsman will want to make for himself. Adults will readily comprehend what is meant by the term "super-clean." Your motor engine purrs sweetest when it is clean. You never worry about carbon until "knocking" starts or a valve sticks. Most smokeless powders leave a certain amount of residue and unburned powder grains in the gun barrel. The portion that usually causes the most trouble is nothing more than those unburned powder grains that didn't have a chance to burn up completely in the three or four thousandths of a second it took from the time you pulled the

trigger until the shot sped out of the barrel. A lot of residue and partially burned powder grains are blown out of the shotgun barrel by the succeeding shots, but since it was probably pointed upwards while you shot and during reloading, some of the residue jostled back into the delicate action of your gun, there to accumulate and cause the mechanism to stick sooner or later.

One of the accompanying illustrations visualizes the result of a test made with a double-barrel shotgun at the Burnside Laboratory. A shell loaded with a well-known smokeless shotgun powder was shot in the right barrel. Another loaded with Du Pont MX was shot in the left barrel. The left barrel is super-clean, due to the complete combustion of Du Pont MX. The other one is dirty with carbon residue and particles of unburned powder. We expected a clean-burning powder, but the result was a super-clean burning powder, which is not only a new product but one made by a new process.

The sportsman will want to convince himself about the recoil. Users of Du Pont MX tell us that the recoil is softer and easier on the shoulder than others; that it is a "balanced recoil." One thing is certain, it will be found uniform whether the shells are stored in a cold, damp garage or in a house where the atmosphere is dry and warm.

If you are a trapshooter, you will want to try Du Pont MX. Trapshooters in large numbers are switching to it because of its uniform velocity, uniform ignition and uniformly hard-hitting characteristics. Du Pont MX powder is fast and clean, its recoil balanced and uniform. Once shot—always shot. Few shooters, after trying it, will want to go back to the powder they formerly used.

Entered for the first time at the Grand American Handicap, Vandalia, Ohio, Du Pont MX scored the greatest record ever made by a new smokeless powder. A. E. Sheffield, 1932 G. A. H. winner, was one of many shooters who used MX



NEW FRESHNESS INSURANCE FOR COFFEE

CENTURIES ago when the priests of an Arabian monastery stumbled by chance on the secret of the coffee berry, they unlocked a most cunning package. Nature was almost too clever for them, for she hid the fragrant coffee bean in a flavor-tight triple wrap.

But men are clever, too! They discovered coffee loses its freshness a very short time after being roasted, and in the course of years attempted to preserve that "roaster freshness" through many different types of packages. With the introduction of Moistureproof Cellophane they found a splendid solution to this problem. Today, they are sealing many brands of coffee in this new flavor-tight wrapping which is made from exactly the same basic substance as the original coffee berry coverings, Nature's purest cellulose.

This interesting use as an overwrap for coffee cartons and bags is one of the latest developments of Cellophane. Actual tests have definitely proved

*Du Pont Cellophane
now brings to good coffee a modern
method of "sealing in" its
freshness and flavor*

By PAUL A. DILLMAN

that it does preserve the freshness and flavor of fine coffees for weeks, far beyond the actual turnover period in the retail store.

Ever since the housewife began serving coffee, she has had freshness in mind when she bought it and when she prepared it; first by grinding it in the home, then by having it ground at the time of purchase, and now pre-ground in various types of convenient protective containers.

In introducing the new Cellophane-wrapped package, coffee merchants found this unit had definite sales advantages over other types of containers. The woman of today is con-

scious as never before that Moistureproof Cellophane means freshness. She has learned this not only through widespread du Pont advertising but also through an even greater amount of publicity by the present users of Cellophane, who are stressing the benefits of this modern wrap in protecting the freshness of their products. Finally, she has seen Moistureproof Cellophane demonstrate its efficiency in preserving freshness in cakes, candies, cigarettes and many similar products she buys protected this way. All this is hastening her acceptance of Cellophane-wrapped coffee.

The housewife also appreciates the clean, sanitary appearance which Cellophane gives to coffee cartons and bags. Because of her interest in health and sanitation, she values Cellophane highly as a protection against dust, dirt and handling. She is depending upon it more and more as a guarantee of getting full value for her money, particularly on food items like coffee where freshness is such a vital factor.

In the illustration you see how four leading roasters have taken advantage of Moistureproof Cellophane to assure coffee freshness for their brands.

Tea, also, is being wrapped in Moistureproof Cellophane, for here again it renders a valuable service in preserving flavor. It protects the tea against absorbing moisture and foreign odors, so ruinous to its original strength and flavor.

From present indications many other progressive organizations marketing coffee and tea will soon be taking advantage of this new type of flavor insurance. It will enable them to bring your favorite brand right into your own home and in the finest possible condition.

Original freshness and flavor are safe in these Cellophane-wrapped cartons marketed by the Harrit & Hewitt Co., The Woolson Spice Co., Swanson Brothers and John H. Wilkins Co.



WHEN THE THERMOMETER FLIRTS WITH FREEZING

It's time to see old "Doc Anti-Freeze" about fixing up your car for winter driving

By R. H. COLEMAN

WHAT with cold winds wandering around and marking time, waiting their chance to whistle down the streets and incidentally reminding us to turn up coat collars, put on winter overcoats and shake up the furnace fire, we feel the urge to mention something about the health and welfare of that automobile of yours.

Somehow or other, chilly weather is not friendly to automobiles—sort of stiffens them up with crank-case rheumatism, pesters them with battery grippe and, worst of all, lays them low with radiator colic.

One thing though, if old "Doc Anti-Freeze" is just put on the job early enough, he can knock that nerve-wracking disease known as radiator colic into the well-known cocked hat. This affliction may—and often does—reach the serious stage where the radiator finally gives up the ghost, freezes and busts. But it's easy to prevent that if you'll only use the right medicine before the trouble gets started.

Old "Doc Anti-Freeze" has a real two-gun tonic for radiator ills. It is sold under the name of Du Pont

Anti-Freeze Methanol, and it is a good product, like all the others du Pont makes.

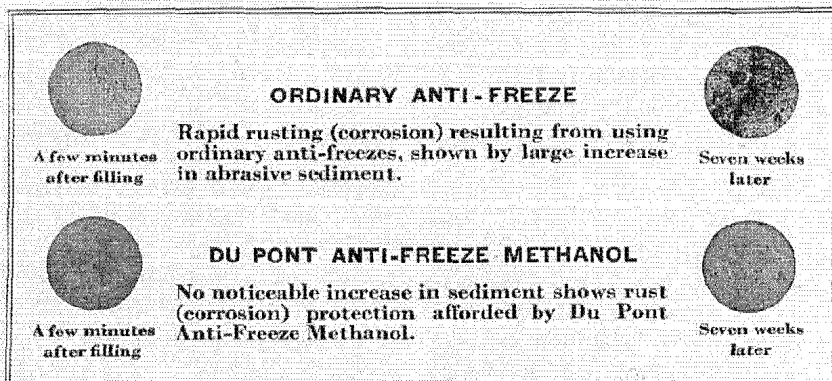
In case you're curious about this potent anti-freeze, it is made from du Pont pure, synthetic methanol. This basic material results from a rather awe-inspiring process employing high pressure and heat. (If you're not chemically minded, skip to the next paragraph while we tell the others how it's made.) Hydrogen and carbon monoxide obtained from coke and steam are blended in proper proportions and subjected to enormous pressure (equal to that of the Empire State Building on its base) and to a temperature which is plenty hot in any language. These gases, in the presence of a suitable catalyst, flash off as pure methanol—the liquid used in compounding Du Pont Anti-Freeze Methanol. And there you have it.

But what's more important to you and your car, this anti-freeze is inexpensive to buy and use, and it lasts a long time; it doesn't evaporate or boil away quickly. Another thing, in case you're particular, it really has a mild and not unpleasant odor.



And it prevents corrosion, too; even retards corrosion resulting from the use of plain water. To prove this, our technical staff got together, from friends and acquaintances who could still afford a car, two groups of assorted automobiles. First, they cleaned and flushed the radiators until they were free from all traces of rust. Then they filled those in one group with water and sufficient ordinary anti-freeze to protect them to 10° F. The others, more lucky, were filled with enough water and Du Pont Anti-Freeze Methanol to protect them also to 10° F. After seven weeks of running over the highways these two groups of cars were corralled again, and you should have seen the difference between the radiator liquids taken from them. Since you weren't there, we took some photos that are reproduced on this page; they tell the story.

You'll do well to protect your radiator with this Du Pont Anti-Freeze Methanol. More folks used it last year than ever before, and they're coming back for more. It's colored purple for easy identification. Ask for it at your garage or service station—you'll be glad some frosty night when you watch the other boys trying to get their old limousines under way.



These photomicrographs show the results of a seven-week test of the corrosive action on engines and radiators of widely sold, low-priced anti-freezes compared with Du Pont Anti-Freeze Methanol

THE DU PONT MAGAZINE

Published and copyrighted by
E. I. DU PONT DE NEMOURS & CO., INC.
WILMINGTON, DELAWARE, U. S. A.

Subscription, \$1.00 the year
E. R. MANCHESTER, Editor
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VOL. XXVI FALL, 1932 Nos. 10-11

INDUSTRY'S "PIPE ORGAN"

AN ancient writer of oracles gave us this word picture: "The mills of the gods grind slowly, but they grind exceeding small." And it brings to mind the last stage in manufacturing a product described elsewhere in this number. Before lithopone is packaged for shipment, it has to be reduced to an extremely fine powder, and the mills do grind "exceeding small" to obtain the required texture.

Pictured on the front cover you see some interesting equipment which is located on the third floor of the plant of the Krebs Pigment & Color Corporation at Newport, Delaware. The milling operation is situated on the ground floor where, with the aid of an air-flotation process, the product is lifted to the top of the building. In other words, while the lithopone is being reduced to a powder of fine texture, an air current, passing over the grinding rollers in an enclosed system, picks up and carries off the finest particles to the bag collectors shown in the illustration. The coarser material falls back and is reground until it, too, is ready to float and be carried away in a current of air to the "pipe organ."

In this closed system considerable air pressure is built up, and it must find an outlet. It does, through the cylindrical tubes of cotton cloth, which act as a filter to let out the air, at the same time retaining the lithopone of very fine particle size.

TREE REJUVENATION

IN view of the continued dry weather in many parts of the country and the fact that many orchardists are using dynamite for tree rejuvenation, explosives experts point out that certain methods should be followed in this work so as to get the best results.

"Soil in old orchards frequently becomes hard and impervious," says the agricultural explosives expert of the Institute of Makers of Explosives. "Fruit trees have often been planted where the soil has not been properly prepared, and where only a thin layer of permeable soil exists. In all of these cases, the growth and productivity of the tree are retarded and frequently to the degree that production is unprofitable. Some method of loosening the soil is obviously necessary. The use of explosives, even when trees have reached full growth, is not only practical but is the recognized method of rejuvenating and improving old orchards.

"In using dynamite for this purpose, care must be taken not to damage live roots. The ground must be dry and charges must be placed at a depth regulated by the nature and condition of the soil. The best way of doing this work is to place very light charges in the soil around the trees, as far out as the end of the limbs. Charges should never be placed closer to the tree trunk than six feet. The correct growing-tree blast will have little visible surface effect. Nearly all of its execution will be confined to a depth two feet or four feet under ground or deeper."

In very poor soils, it is advisable to dig out the holes after blasting, he states. Manure and fertilizer may then be placed in these holes to good advantage.

PROGRESS

ACCIDENTS to children from playing with blasting caps were reduced 53½ per cent during the first six months of 1932 as compared to a similar period in 1931, according to another report from the same source. A campaign to reduce such accidents

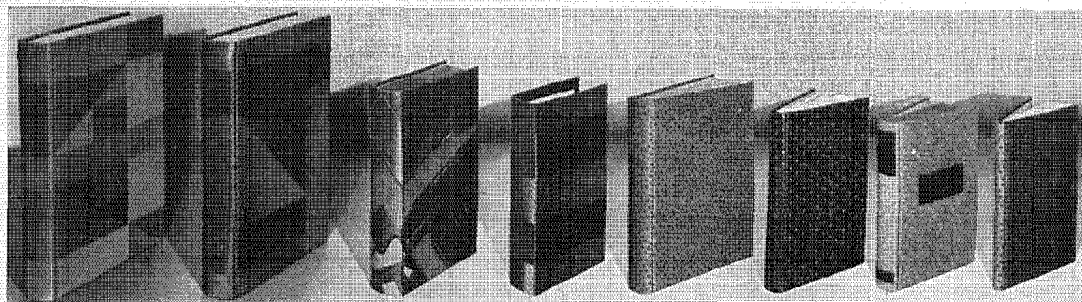
has been conducted by the explosives manufacturers during the past six years, as readers of this publication know. This campaign has been participated in by school authorities in every state of the Union, the Bureau of Mines, Federal Health Service, and Department of Agriculture in Washington; the Boy Scouts, Girl Scouts, and safety organizations in various states. Accidents occur when children find blasting caps which have been left carelessly lying about after blasting operations.

The explosives manufacturers at this time are broadcasting appeals to teachers and parents, asking them to warn children of the dangers of playing with blasting caps, which contain a powerful explosive, and may cause injuries which unfit a child for useful work in later life.

SAGE ADVICE TO HUNTERS

WHAT follows is not original. We read it in the *American Field*, whose editors saw it in some publication issued or sponsored by the Province of Alberta, Canada. No matter who first gave expression to the ideas, they are thoroughly sane, sound and timely:

1. Remember, the farmer is your best friend.
2. Ask permission to hunt on his land. He will usually meet you half way.
3. Put up his bars and close his gates.
4. Crawl through, over or under his fences, without breaking them down.
5. Don't destroy or injure his chickens and cattle, or let your dog worry them.
6. Put out your camp fire and protect his property and your hunting ground.
7. Never in sport endanger human life.
8. Never kill wantonly, needlessly or brutally.
9. Obey the laws, work for better laws and uphold the law-enforcing authorities.
10. Respect the rights and feelings of farmers and property owners.
11. Always leave seed birds and game in coverts.
12. Never be a game hog.
13. Discourage in every way the taking of game for commercial purposes.
14. Be a gentleman."



Left to right, the first four books show Fabrikoid in the new refractory finish; the others reveal new lacquered prints in dainty floral and conventional patterns—bindings that are truly "bookish" in charm, feel and appearance

MODERN BOOKS AND BINDINGS

DURING the early summer period the du Pont Fabrikoid Division held an exhibit, "Modern Books and Their Bindings," in the reception room adjoining the company's New York offices in the Empire State Building. The object was to show cover designers, publishers, bookbinders, school executives and book trades people in general a major portion of all titles that are being bound in Fabrikoid, and to acquaint these people with some new and interesting lacquered fabric materials.

This exhibit contained over 2,000 volumes, representing the works of one hundred leading publishers. Included in it were subscription sets, medical books, law books, technical books, dictionaries, encyclopedias, directories, atlases, indexes, cook and recipe books, fiction, religious books, hymnals, juveniles, school and college text-books; pocket classics, library books, college annuals, catalogs, blank books, loose-leaf devices, diaries, albums and memorandum books. It was a varied collection.

The trend in cover materials is decidedly toward those that have interesting textures and are novel in character—those that lend themselves to unusual and distinctive treatments in color and design. This was indicated clearly by the comments of scores of publishers and designers who attended the display.

Book lovers, while primarily interested in text matter, are inclined to avoid books with drab and unattractive covers; they prefer those with color, variety of texture and design.

Bookbinding is an ancient art. In

Some high lights on an interesting exhibit which was held in the world's tallest building

By R. A. APPLGATE

2000 B. C. history was recorded on clay tablets. Later came papyrus rolls, skins and paper books. Since then craftsmen have continually searched for new mediums of expression, new materials to raise the art of bookbinding to ever higher levels.

Today, the publisher is still seeking new materials of unusual texture and design to bind modern books. Also, under present conditions, consumers demand that the publisher shall deliver maximum value. So he endeavors to furnish the best ink, thread, binding board, workmanship and cover material that can be obtained. He looks for products that are durable, sanitary, unaffected by

changing weather conditions, immune from the attacks of insects and vermin and that will retain their beauty through years of service.

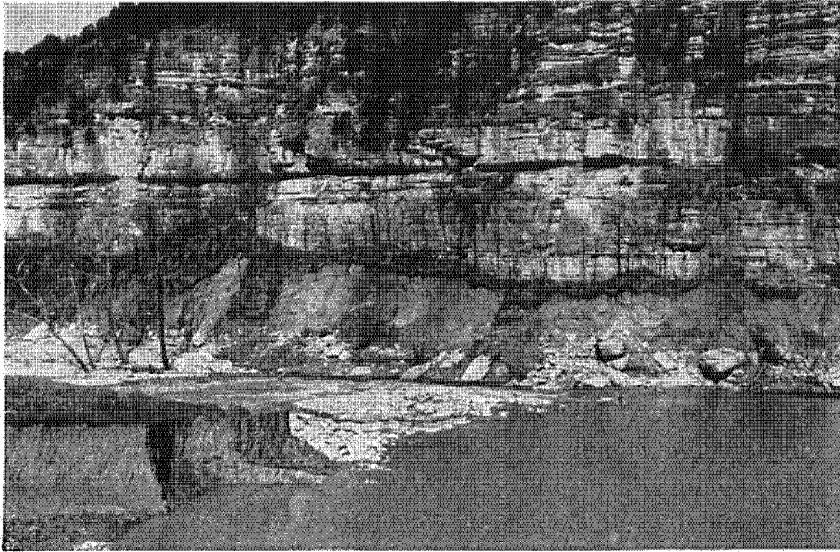
Modern methods of manufacturing books involve automatic machines of many types which require material that can be supplied in the roll. And it must have definite characteristics so that it can be used successfully in the machine. Certain qualities of Fabrikoid have been developed and improved for the express purpose of bookbinding. Many methods of decoration have been developed whereby designs can be successfully applied to the material in the bindery. Du Pont Fabrikoid and du Pont Lacquered Fabrics, for example, will take gold or ink stamping, embossing, foil stamping, printing, air brushing, screen stenciling, top rolling and lithography.

Leading artists today believe that a bookbinding material should be selected with an eye to its relation to the particular title of the book on which it is used. The Publishers' Service Bureau of the Fabrikoid Division has been working for some time with leading book designers to perfect new binding materials that are distinctive and unusual and that are also better from the standpoint of appearance and feel. Some of these new effects are illustrated here.

Among the leading book-cover designers who had special exhibits of their work on display were J. V. Nickelsen, Clarence P. Hornung, J. Clemens Grotter, Samuel Bernard Schaeffer, F. L. Amberger, Dorothy Waugh, W. Helmer and Ernest Reichl.

A general view of the Modern Book Exhibit held in the spacious reception room adjoining the du Pont Company's offices in the Empire State Building





A view of the rock obstruction washed into the channel by high water. The ditch site is just beyond the silt bank at the left.

ANOTHER DIX DAM JOB

Du Pont dynamite helped to build the first dam. Nature formed the second—and it had to be removed, which is the story here*

By E. H. HIMROD

AN interesting example of efficiency and economy in the use of explosives for ditch excavation is shown in the project recently carried out for the Kentucky Utilities Company at its plant on the Dix River, near Burgin, Kentucky.

The dam and the large lake it has formed are in the center of one of the most scenic sections of the Appalachian region, a mecca for tourists, campers and fishermen. The river below the dam rushes through a gorge, its vertical walls towering hundreds of feet above the water level, giving an aspect of rugged

grandeur seldom found in this part of the country. The generating station located there is capable of supplying the power requirements for most of eastern and central Kentucky, as far west as Louisville.

During the last high-water period, the lake overflow down the spillway washed a large quantity of broken rock into the river channel, blocking it with a natural dam to a point where the power head was reduced eight feet, and seriously affecting the power capacity of the plant.

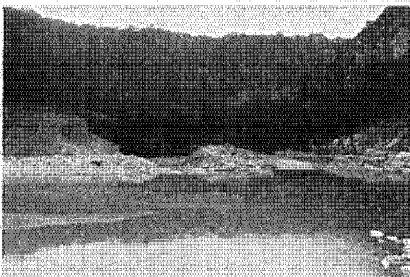
To remove this obstruction by dredge or other mechanical means

would have been prohibitive, due to the difficulty of bringing such equipment to the location. The management then called on the du Pont Company for assistance, and one of its representatives, accompanied by a member of the Technical Section, inspected the place, laid out the work, and specified the labor and explosive requirements. A week later the work was completed with enough water flowing through a by-pass channel to reduce the back head to its normal level.

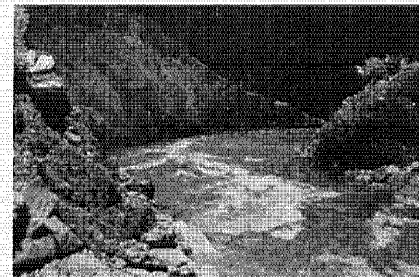
As the illustrations show, the ditch was blasted through the silt deposit extending along one bank of the river. Holes were punched by hand to a depth of seven feet in three rows, spaced $2\frac{1}{2}$ by $4\frac{1}{2}$ feet. Each hole was loaded with $6\frac{1}{2}$ cartridges of 60 per cent straight dynamite, $1\frac{1}{2}$ by 8-inch size. At first a detonator was placed in each hole, but this proved unnecessary, so the remaining holes were fired by propagation.

After blasting, the ditch was found to be ten feet deep and fifteen feet wide at the top. In addition to the material actually thrown out by the shot, the bottom and banks were so loosened that the ensuing flow of water readily washed the excavation out, so that the total material moved was 3,000 cubic yards. Punching the holes and loading the dynamite required three days' time.

The total bill for labor and materials was \$283.48, or 9.44 cents per cubic yard of material removed, which is a small fraction of what the cost would have been if other means had been employed.



Left—Looking downstream toward the completed ditch, the opening of which is shown at left center.



Right—A rush of water, following the blast, carried away large quantities of excavated material.

*SEE DU PONT MAGAZINE, JUNE, 1925

WAHNETAH NECKWEAR... A NEW LINE

*Acele yarn enters into the manufacture of a great many quality fabrics,
among which are tie materials of unusual beauty and charm*

By B. G. CHAMBERS



IN introducing a line of fall neckwear in fabrics made of Acele yarn, the Wahnetah Silk Company reviews the progress of American silk manufacture during the past half century.

The new ties, of which one design is shown, feature stripes, plaids and checks in new and interesting color combinations.

Such romance as is attached to the name of the Indian maiden "Wahnetah" has been interpreted by this firm in the successful sale of quality fabrics for the past forty years.

Indian lore in a realistic way pictures to us the Early American period with its native traditions, ideas and customs, becoming more picturesque when viewed in the perspective.

Symbolizing for us what is perhaps the nearest approach to a truly American fashion origin, it takes on an added interest. There is here a suggestion of sturdiness in texture, combined with native beauty and richness of color, which carries an appeal to the sense of harmony, all of which, with the proper treatment, form an æsthetic background for an American style in wearing apparel.

The Wahnetah Silk Company has catered to many branches of industry using textiles. The various types of raw material found to be most adaptable to the production of a finished product in which utility and beauty

were equally important factors have always been adopted.

Realizing that neckties furnish the high lights in men's wear, its stylists were alert to the fact that good taste demands a measure of conservatism, fashion rightness and beauty. The styling of Wahnetah tie fabrics has received merited commendation for the study given the elements, entering into their production and sale.

While the development of its tie silk department has been accomplished during a period of less than two years, the company has assumed a leading position and the qualities

of its products have become well known throughout the country.

The line of tie fabrics Wahnetah is now bringing before the public embodies the use of Acele yarn, which has definitely taken its place among the five leading fibers for textile manufacture.

The material has excellent wearing value. Neckwear made from it may be tied to present the correct appearance, and the weaves, colors and patterns in which it is being offered are a guarantee of its successful promotion in the field of moderately-priced, high-class merchandise.



There are neckties of many patterns and hues, for individual preferences vary widely, but stripes are expected to be popular this fall

Right—Rayon Ratine, a tweed effect in vertical chevron design, made of Du Pont Rayon. Cushing-Feinberg, Inc.

Left—Heavy sheer, resembling light-weight woolen, made of Du Pont Rayon and spun rayon. Cushing-Feinberg, Inc.

FABRIC
IS PRIME
IN FASHION

Right, above—Curly Crepe. This is a heavy, very crinkly fabric composed of Du Pont Rayon and cotton, a product of the Cohn-Hall-Mark Company

Left, above—Rayon Ratine in classic chevron design, by Cushing-Feinberg, Inc.
Bottom—Bahama Satin, crinkly and rough, with reversible crepe back; a rayon-cotton mixture by D. I. & C. H. Stern, Inc.

It may have been the new, straighter silhouette. It may have been the conservative trend in dress fashions for fall and winter that compelled greater emphasis on interesting fabrics. Whatever the reason, manufacturers have realized that this fall there is room for more variety in fabrics and have gone to work with a vengeance on new weaves and textures to create renewed style interest.

The results have been eminently worthwhile; sufficiently so, in fact, to give a new slant to the fashion picture. Because of the wealth and variety of new materials, designers can afford to permit the fabric to dominate the garment. The lines of dresses become simpler and interest centers on the cloth.

The emphasis on texture tends to increase public consciousness of fabric quality and design, and should prove

And Du Pont Rayon, because of its beauty and adaptability, has a leading place in the new dress materials

BY E. C. HARRINGTON

a healthful remedy for a market flooded by cheap merchandise.

From the mass of new weaves and textures for autumn certain ones have become distinctively important. These consist largely of extremes in various aspects, such as extremes of dullness and brilliance, of roughness and satiny smoothness, of depth and sheeriness.

In the matter of luster the popularity of the chalk finish is by no means exhausted. The chalk fabrics that are handsome in dark shades will be used again for fall. Dullness

that is not actually chalky, but is still very dull, is achieved in many ways. In the rough crepes, for instance, the very roughness of the surface breaks up the luster effectively. In the sheer fabrics the vogue is toward high-twist varieties, resembling woolens. This twist produces a dull, grainy appearance. In velvets, new, dull rayon yarns and uncut pile effects give mat-surface cloths a refreshingly new semblance.

The re-entry of satin as an important fall fabric indicates that, although dull fabrics are important, extreme luster will supply an interesting note of contrast. For example, many of the new fall dresses show woolens combined with satin. For evening wear the supremacy of dull crepe has been challenged by many new interpretations of brilliant satin.

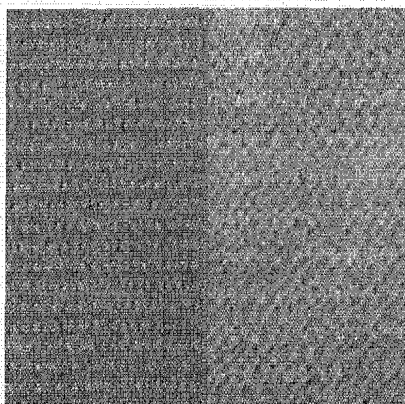
The trend in weight for the past

few years has been toward lighter woollens . . . and heavier silks and rayons. This season's rayon and silk materials embody both of these trends.

Semi-sheer fabrics, modeled after semi-sheer woollens, are perhaps the lightest in weight we have had in some time for autumn daytime wear. Although much lighter than flat crepe, many of them are perfectly opaque, and have none of the summery, fluttery appearance generally associated with sheer textiles. This type of sheerness preserves the charm of autumn cloths, but is cool and comfortable for wear under coats in a steam-heated existence. These new materials are thick, dull and perfect for the first fall dress.

Most of the new sheers have interesting weave notes, such as tiny raised honeycomb and waffle effects, fine côte de cheval ribs and horizontal cords. Possibly the most popular of these fabrics is a fine grainy-surfaced, high-twist sheer, often made of rayon, and called the "Sable" weave because its surface seems powdered with grains of sand.

The heavy rough crepes are at the other extreme and some of them are heavier than any we have had in years. Rayon has been the leading fiber in the development of heavier, duller, rougher crepes. In particular, there are rayon versions with bold crinkles such as Schiaparelli has sponsored which subscribe to increased weight. Especially lovely are two such crepes of Du Pont Rayon with



All rayon, blistered satin, with horizontal satin stripes. The face of the fabric is shown at the left side of the illustration, while at the right may be seen the crepe back. The material is made of Du Pont Rayon by Cushing-Feinberg, Inc.

fine self-colored horizontal stripes running through them. These are called the "Great Bahama" and the "Little Bahama."

In general the roughness of these crepes is more marked than those shown last spring. In some instances the crinkle is emphasized almost to the point of a blistery effect. All sorts of crinkles are shown, long vertical ones of crepon effect, squared and horizontal band effects. Plainer but nevertheless as rough as they come is "Crepe Breton," which is an all-over rough crepe of Du Pont Rayon.

Satins as well as crepes have gone rough. Frequently they have two surfaces which are used interchangeably for the body or trimming of the dress as desired. One surface is a rough crepe and the other a rough satin.

Sometimes both the crepe and the satin show crepon effects. This reversible idea permits the contrast of lusters which is so much emphasized in the new dresses.

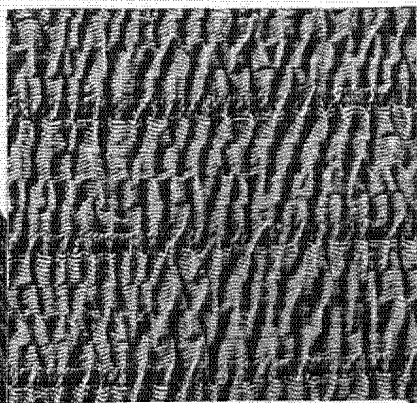
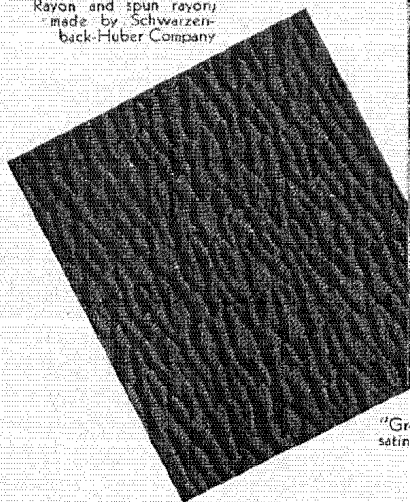
The newest outgrowths of the rough vogue are blistered and matelassé effects. The latter are still scarce but gaining in importance. Some reproduce the long vertical crinkles of crepon in design; others are more fanciful and elaborate for formal evening wear.

Too much cannot be said about the new velvets. They are as numerous in their variations as they have ever been—in shirred, fur, dull, broché and crushed effects. Their number is a reflection of the great choice and richness of the season's dress materials, and of the recurrent favor for rayon velvets, especially those of the transparent type.

Velvets are tremendously popular this season for bridge and luncheon frocks, dinner dresses, evening gowns, day and evening wraps in all lengths, hats, negligées in a bewildering variety. Some of the very luxurious negligées serve a double purpose. They can be worn in the boudoir or as hostess gowns for informal entertaining. Sometimes two velvets, such as dull and lustrous, are combined in one costume.

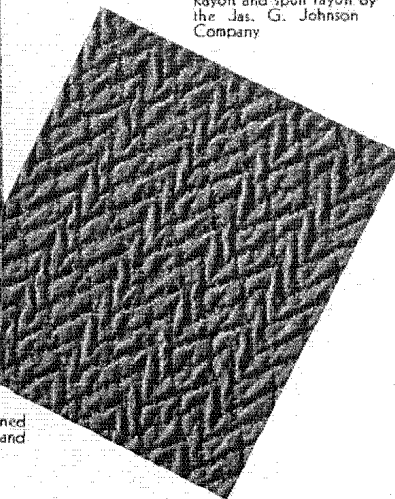
All of the fabrics illustrated on these pages were developed by Du Pont Rayon Company, Inc., in conjunction with leading fabric manufacturers in New York City.

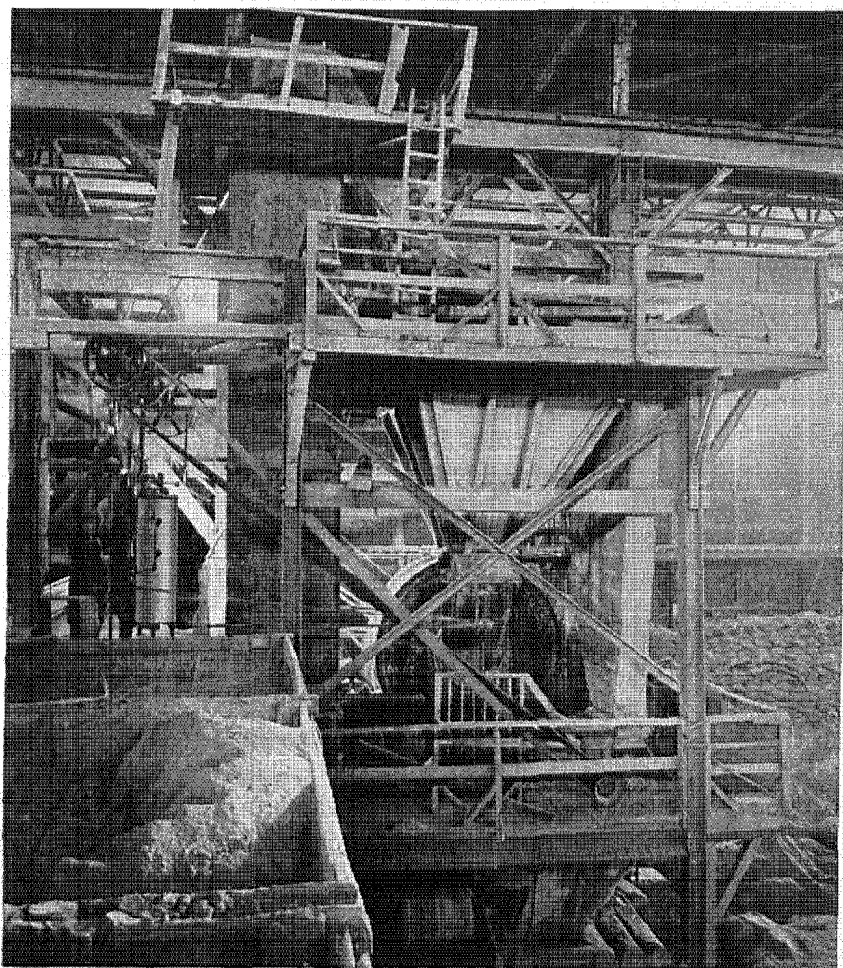
"Crepe Breton," a heavy, very crinkly crepe of Du Pont Rayon and spun rayon, made by Schwarzenbach-Huber Company



"Great Bahama" is a very rough, crinkly crepe with a self-toned satin stripe running horizontally; made of Du Pont Rayon and cotton by Cohn-Hall-Marx Company

Matelassé effect in chevron design; made of Du Pont Rayon and spun rayon by the Jas. G. Johnson Company





Typical mixing operation in a fertilizer plant. The dry material, left foreground, is conveyed by elevator to the mixer. At the left side note the measuring tank for the urea-ammonia solution.

UREA-AMMONIA SOLUTION

*A new du Pont product for the fertilizer industry
has much to recommend its use*

By F. W. PARKER

Chemical Division, Ammonia Department

APPROXIMATELY three-fourths of the fixed nitrogen consumed in the United States is used as fertilizer, the amount varying from 200,000 to 325,000 tons of nitrogen in recent years. Of this amount, two-thirds is marketed in complete fertilizers—those containing the three principal plant foods, nitrogen, phosphoric acid and potash. The nitrogenous materials used in making them are grouped into two major classes: inorganic, such as ammonium sulphate and nitrate of soda, and organic, such as cottonseed meal, tankage, and

urea. Most complete fertilizers contain both inorganic and organic sources of nitrogen.

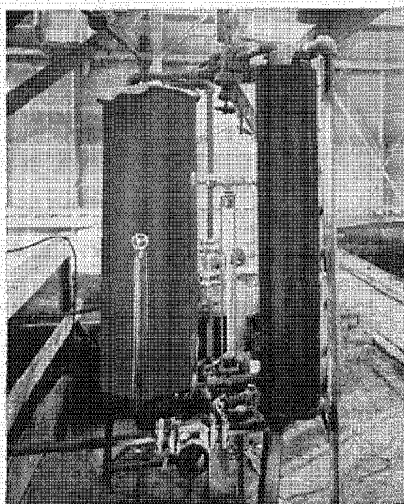
In 1926, tank cars suitable for handling anhydrous ammonia were developed by the du Pont Company in cooperation with the U. S. Bureau of Explosives. This development made possible greatly lowered prices for ammonia with consequent use of anhydrous ammonia by fertilizer manufacturers. The company has now developed a urea-ammonia solution for their use. For the past two years, this solution has been used exten-

sively in small-scale experimental work in the du Pont fertilizer laboratory at Wilmington, and during the past year, experimental tank cars of the solution have been tested in a number of fertilizer plants. In these factory-scale tests, varying quantities of the solution have been employed in the manufacture of many kinds of fertilizer with excellent results.

The new product is essentially a solution of crude urea in aqueous ammonia. The total ammonia content is fifty-five per cent. Two-thirds of the ammonia is inorganic, mostly uncombined, or free ammonia as in ordinary aqua ammonia. One-third of the ammonia is present as urea, an organic compound that is one of the most important fertilizer constituents of farm manure. Unlike other fertilizer materials, the solution is a source of both inorganic and organic nitrogen and these are present in about the ratio in which they are found in many complete fertilizers.

Due to its content of free ammonia, the solution has a pressure of approximately thirty pounds at ordinary temperatures. It is shipped in steel tank cars of 11,000 gallons capacity. Most of the large and many small fertilizer plants are equipped to use the solution, for it can be handled in the same equipment as anhydrous or, when it is properly diluted, as aqua ammonia.

When received at the plant, the solution may be used as shipped or it may be diluted with a small amount of water in order to reduce the pressure at which it is handled. The accompanying illustrations indicate the method of measuring and using the solution. The liquid flows into the measuring tank shown at the left in the picture above. This tank is carefully calibrated and is fitted with a gauge glass so the operator can deliver a given volume or weight of solution into the fertilizer mixer. In practice, the mixer is charged with superphosphate; the operator then



A "close-up" view of a measuring tank, from which the urea-ammonia solution is piped directly to the mixing machine.

opens the valve at the measuring tank and introduces the urea-ammonia solution while the mixer is being rotated. The injection is completed in about thirty seconds. The tank is again filled and the operation repeated. The usual operating cycle is two minutes and the fertilizer charge is one or two tons. Potash salts and other materials may be added to the superphosphate either before, after, or during the treatment with urea-ammonia solution.

As soon as the solution is introduced into the mixer, the free or inorganic ammonia reacts with the superphosphate to form ammonium phosphate, ammonium sulphate, dicalcium phosphate and, when large quantities of ammonia are introduced, some tricalcium phosphate. The urea in the solution is precipitated in the fertilizer in such a finely-divided state and is so intimately mixed with the other constituents that its presence cannot be detected microscopically, but can readily be shown by chemical analysis. Experiments have shown that this method of introducing urea is better than introducing solid urea and ammonia separately, for it gives more intimate mixing, prevents segregation and reduces the tendency of the fertilizer to absorb moisture from the air. Since the urea does not react with the superphosphate, the fertilizer manufacturer can add fifty per cent more total ammonia by means of this solution than he could with anhydrous ammonia. It has been a common practice to add thirty pounds

of anhydrous ammonia to make a ton of 4-10-4 fertilizer. Using the new solution, the manufacturer will add a total of forty-five pounds of ammonia, thirty pounds being inorganic and reacting with the superphosphate in the same manner as anhydrous ammonia. The other fifteen pounds in the form of urea will replace some of the more expensive and less available organic sources of nitrogen.

Urea-ammonia solution is superior to anhydrous ammonia and other basic ammoniates in that, per unit of ammonia added to the fertilizer, it produces the smallest increase in temperature during the mixing operation. A high temperature is generally objectionable, because it tends to decrease the rate of ammonia absorption and to make phosphoric acid unavailable.

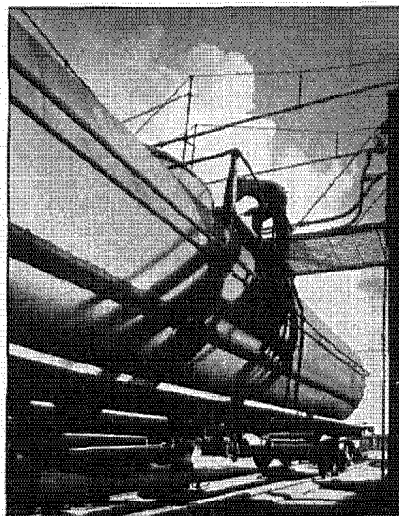
Factory-scale tests have shown that up to 100 pounds, or in some formulas 120 pounds, of the solution can be used per ton of fertilizer. The fertilizer cures quickly and the treatment materially reduces caking in storage. The finished product is dry, but not excessively dusty and is in excellent condition for use in fertilizer-distributing machinery. The "conditioning" action of the solution is just as great as that of anhydrous ammonia and is superior to that of aqua ammonia. In some cases, the fertilizer has been shipped in less than a week after mixing and in very good condition.

The final test for any material used in fertilizer is its availability to important farm crops. The high agricultural value of the inorganic ammonia in urea-ammonia solution is well established. It has the same availability as ammonium sulphate, but is superior in that it does not tend to

increase the acidity of soils rapidly as ammonium sulphate does.

Urea is generally recognized as an excellent source of nitrogen for all crops. Its high fertilizer value as a constituent of farm manure was known before synthetic urea was used as a fertilizer. The latter, however, has been extensively used in experiments by the United States Department of Agriculture and several State Agricultural Experiment Stations. Results have shown that urea is superior to other organic sources of ammonia and is an exceptionally good source of nitrogen for tobacco, potatoes and many truck crops. Urea is not readily leached from the soil by heavy rains; in this respect it is superior to nitrate sources of nitrogen. On being mixed with the soil, the urea soon decomposes to ammonium compounds and these in turn are gradually oxidized by soil bacteria to nitrates. The plant can absorb the urea as such or as the ammonium compound first formed, or it may absorb the nitrogen as the nitrate. Unlike ammonium sulphate, urea does not cause a marked increase in soil acidity, although it is somewhat acidic in its action.

As a new fertilizer material urea-ammonia solution has much to recommend its use. Its high concentration and physical properties make for low handling costs. The inorganic ammonia makes it excellent for "conditioning" fertilizers. It is a source of organic and inorganic nitrogen of high agricultural value.



Urea-ammonia solution is produced at Belle, West Virginia, and is transported to market in du Pont tank-cars of the type shown here.

THEY FOUNDED AN INDUSTRY

(Continued from page 2)

Kutz, vice-president and director of sales; Colby Dill, vice-president and secretary, and Albert Frankel, vice-president and treasurer.

The R & H Chemical Company now has plants at Niagara Falls, New York; Perth Amboy, New Jersey; El Monte, California, and St. Albans, West Virginia. Branch offices and warehouses are located in principal market centers.

The Niagara Falls plant grew out of the demand for sodium, which was used for years chiefly as a raw material for manufacture into alloys, cyanides and peroxides. The use of sodium has spread, and today it is extensively used in the organic industries. R & H cyanide is one of the key chemicals in the steel-treating, electroplating and fumigation industries, and sodium peroxide is widely used in the bleaching industry. At Niagara are also produced hydrogen peroxide, widely used for textile

bleaching; sodium perborate, used for fixing vat colors and in dental and other proprietary preparations; metallic cyanides, also used in electroplating; methyl chloride and methylene chloride, refrigerants; trichlorethylene, tetrachlorethane and chloroform, solvents; liquid chlorine; caustic soda; and some other products.

At Perth Amboy is centered the manufacture of materials required for the ceramic, glass and rubber industries. Here, also, is made formaldehyde, extensively used in the manufacture of synthetic resins, in agriculture, and in other industries. Other plants at Perth Amboy manufacture organic and inorganic materials of smaller market volume.

The Pacific R & H Chemical Corporation, a subsidiary, operates the plant at El Monte, California. Here is produced reclaimed rubber, and liquid hydrocyanic acid for the fumigation of citrus trees.

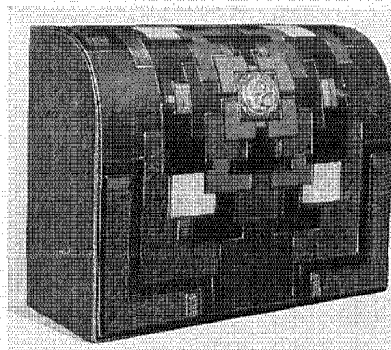
As an important adjunct to its manufacture of chemical specialties, R & H maintains a number of service divisions to coöperate with customers in the application of these products. Steel treating, electroplating, fumigation, bleaching, solvent use, refrigeration, ceramic decoration—in every large field of operation which R & H actively serves, there is a trained personnel to give customer assistance.

Thus, The Roessler & Hasslacher Chemical Company combines the three functions of a well-arranged chemical industry: to manufacture quality products; to merchandise these products in fair channels, and to coöperate continuously with customers in improving their use of these products. If Franz Roessler and Jacob Hasslacher could view the company they founded, they would see that it is still carrying on the same sound policies which they adopted fifty years ago.

WHAT'S NEW IN FABKOTE?

GOLFERS' Chip-In's—A new medium of exchange—new to golfers but not new to poker fans. It is designed to eliminate the necessity of transferring small change to your golf clothes each time you play. One hundred of these miniature chips, in four colors, come neatly packed in a small Fabkote snap-button box, which is $3\frac{3}{4}$ by $2\frac{1}{4}$ by 1 inch high, so that it can be slipped easily in a pants' pocket, sweater, or in the ball-pocket of your golf bag.

Utility Book-Ends—These are not

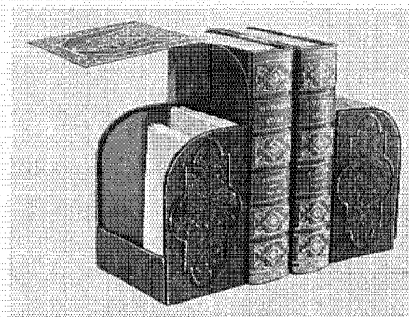


just the usual type of ornamental book-ends; they serve another worthwhile purpose. Their covers drop back and disclose numerous slots and compartments for stationery, postcards, stamps, clips, pens, and those little incidentals for which one is forever ransacking the whole house. The lining is a beautiful moiré effect, while the outside is in a rich, dignified reproduction of hand-rolling in green, brown and bronze. Both the

lining and the covering material are Fabkote.

Executives' Cellarette—No matter what platform you support on election day this novel office utility is bound to win your vote. The Executives' Cellarette is sturdily built, lined and covered with Fabkote. The outside cover is finished in a smart, embossed geometric design in six colors.

All of these articles are manufactured by Leathertone, Inc., 1825 East 18th Street, Cleveland, Ohio.



SAVE DOLLARS

on your anti-freeze bill this winter with



DU PONT ANTI-FREEZE
REG. U. S. PAT. OFF.

METHANOL

NO CORROSION

*HERE IS PROOF

WHEN you protect your fleet—or your personal car—with du Pont Anti-Freeze Methanol you prevent corrosion* in engines and radiators. That's one profitable dollar-saving. Six other reasons why you should use du Pont Anti-Freeze are:

- 1—It is economical to buy and use.
- 2—It does not readily boil off.
- 3—It has no unpleasant odor.
- 4—It gives complete radiator protection at low cost.
- 5—It maintains cooling plant efficiency.
- 6—It is colored purple for your protection and identification.

These photomicrographs show the results of a seven-week test of the corrosive action on engines and radiators of widely sold, low-priced anti-freezes compared with du Pont Anti-Freeze Methanol.



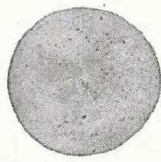
A few minutes
after filling

ORDINARY ANTI-FREEZE

Rapid rusting (corrosion) resulting from using ordinary anti-freeze, shown by large increase in abrasive sediment.



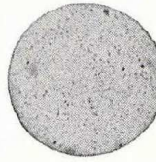
Seven weeks
later



A few minutes
after filling

DU PONT ANTI-FREEZE METHANOL

No noticeable increase in sediment shows rust (corrosion) protection afforded by du Pont Anti-Freeze Methanol.



Seven weeks
later

**GET PRICES AND DATA FROM YOUR
DEALER OR MAIL THE COUPON**

E. I. DU PONT DE NEMOURS & CO., Inc.
Ammonia Dept., Wilmington, Delaware

Gentlemen: Please send me prices and information on
du Pont Anti-Freeze Methanol immediately.

Name.....

Address.....

City.....State.....

D. M.

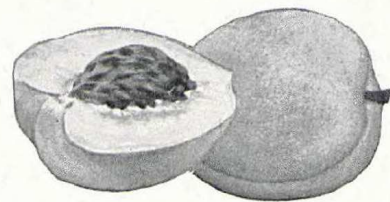
DU PONT
REG. U. S. PAT. OFF.

ANTI-FREEZE METHANOL

E. I. DU PONT DE NEMOURS & CO.
Ammonia Department, Wilmington, Del.

The "Elberta" has a peach of a wrap . . .
but Nature's best packages
are outclassed by

Cellophane



At an Eastern Agricultural College the Professor of Pomology says: "The Elberta Peach is a standard in respect to the way its skin resists bruising to the best advantage."



NATURE packed the peach in a snug-fitting, fuzzy jacket, and then gave it a rosy blush to make the peach-package tempting.

Nature never made a wrap as crystal clear as Cellophane. But Cellophane not only lets you SEE—it protects against dirt and handling, and it preserves *full flavor and freshness*.

When you see a product advertised as "sealed in Cellophane," you know that the maker has taken extra care to give you full value and quality.



Tea-time will be that much pleasanter because Cellophane *saves flavor* for your tea cup. You can prove this all over again when you taste a slice of fruit-cake, or nibble at some glacé fruit, or munch some crisp nuts—all of them *fresh* from a Cellophane wrap.

Cellophane for home use is available at leading stationery and chain stores. Du Pont Cellophane Co., Inc., Empire State Building, New York City.



SEE WHAT YOU BUY
SEALED AND PROTECTED IN



Cellophane
MADE ONLY BY DU PONT*

Cellophane is the registered trade-mark of the Du Pont Cellophane Company, Inc., to designate its cellulose films.

*In Canada the trade-mark Cellophane identifies the same products manufactured exclusively by Canadian Industries Limited.