

THE DUPONT MAGAZINE



MARCH 1939



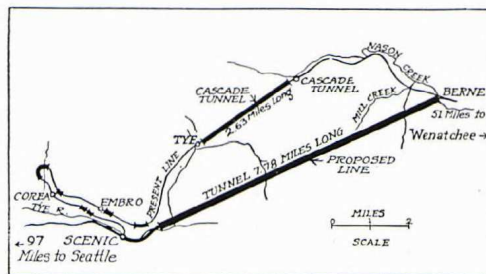
Up the Mountain Sides and through the Snow-Sheds on the Way to the Cascade Tunnel



REG. U.S. PAT. OFF.

GELATIN DYNAMITE

*Was Used Exclusively by A. Guthrie & Co., Inc.,
When Driving America's Longest
Railroad Tunnel in Record Time*



*Showing Routes of the Old and the New
Cascade Tunnels*

IN JANUARY, 1929, the trains of the Great Northern Railway began running through the longest Cascade tunnel, between Scenic and Berne, Washington. The distance between these two points is now ten miles instead of the eighteen miles involving 1,941 degrees of curvature. Passenger trains now save one hour and freight trains three hours by this new route.

Although the tunnel has cost about fifteen million dollars, six miles of snow-sheds, costing the Great Northern five hundred thousand dollars annually to maintain, have been eliminated.

The contractors, A. Guthrie & Co., Inc., of St. Paul, were given only three years in which to drive the 7.78 mile tunnel. In addition to the time element, there were complications such as encountering large volumes of water, a grade of 1.565 per cent, all tangent, and the possibility of drifting operations down grade being brought to a standstill at any time.

These difficulties were overcome by driving a pioneer tunnel from both portals; by working four faces from three main camps; by sinking a 622-foot shaft to subgrade; by using the most modern methods, tools, equipment and materials—especially du Pont gelatin dynamite. By the application of modern engineering methods, skillful supervision of labor and machinery, and the efficiency of du Pont gelatin dynamite, Guthrie & Co. were enabled to break the world's record for tunnel driving three times in spite of the volume of water encountered which often reached 10,000 gallons per minute.

This work is being carried on under the general direction of J. R. W. Davis, chief engineer, with Colonel Frederick Mears in charge for the Great Northern, and J. C. Baxter, vice-president, A. Guthrie & Co., Inc., for the contractors, with W. E. Conroy as general superintendent on the job.

MOTION PICTURE OF CONSTRUCTION OF CASCADE TUNNEL

A cameragraphic record of the driving of America's longest railroad tunnel is ready for exhibition.

Requests are invited from engineering societies, colleges and other organizations desiring to see how explosives and modern methods and equipment have been employed to complete the longest railroad tunnel in America. Address requests for motion picture to Motion Picture Bureau of the Advertising Department.

E. I. DU PONT DE NEMOURS & COMPANY, Incorporated

Explosives Department - - Wilmington, Delaware

The DU PONT MAGAZINE

VOL. XXIII

MARCH, 1929

No. 3

THE PRESIDENT'S ANNUAL REPORT

Notable progress was made in enlarging facilities for the manufacture of products useful in industry

STOCKHOLDERS of E. I. du Pont de Nemours & Company, Inc., recently received copies of the President's annual report which presented a comprehensive review of organization activities during 1928. The following is merely a sketchy résumé of information presumably of interest to readers of this publication:

The du Pont Company's volume of business for the year 1928 was about eleven per cent larger than the previous year, and for the last quarter was sixteen per cent larger than for the same period in 1927. This larger volume reflected greater efficiency in production and distribution.

A substantially larger sales volume was recorded by the departments of the company and by its subsidiary and affiliated companies, with the exception that sales of commercial explosives were slightly less than in 1927, because of unsettled conditions in the coal-mining industry.

Manufacturing facilities were expanded. Additions were made to existing plants, new ones were built or acquired by purchase, and others are under construction.

Plants were established at several places for the manufacture of nitric acid by the ammonia oxidation process.

The Du Pont Rayon Company began operating a new unit near Nashville, Tennessee, and is now building two new plants, one at Richmond and the other at Waynesboro, Virginia, where cellulose acetate rayon will be produced.

The Eastern Alcohol Corporation completed an addition to its property at Deepwater Point, New Jersey, which will also permit of manufacturing glycerin by the fermentation of molasses.

Lazote, Incorporated, is mentioned as adding largely to its manufacturing facilities at Belle, West Virginia, to supply the increased demand for ammonia. By the expansion of this plant the output of methanol will be considerably increased.

We learn also that pyroxylin and rubber-coated goods may soon be produced in Australia at the new plant of

Leathercloth, Ltd., formerly Nobel Chemical Finishes (Australasia), Ltd.

During the year numerous changes were made to simplify and consolidate the corporate organizations in which the du Pont Company is interested. Through the purchase of minority stockholdings the du Pont Company now owns all the capital stock of the Du Pont Viscoloid Company and National Ammonia, Inc., and it has increased its equities in Lazote, Inc., and Canadian Explosives, Ltd.

Particular mention is made of the consolidation with the Grasselli Chemical Company and of organization adjustments incident thereto. The du Pont Company also joined in the formation of the Bayer-Semesan Company, Inc., and the Pittsburgh Safety Glass Company, maintaining a fifty per cent ownership of their capital stock.

Commenting on the year's work, President du Pont says:

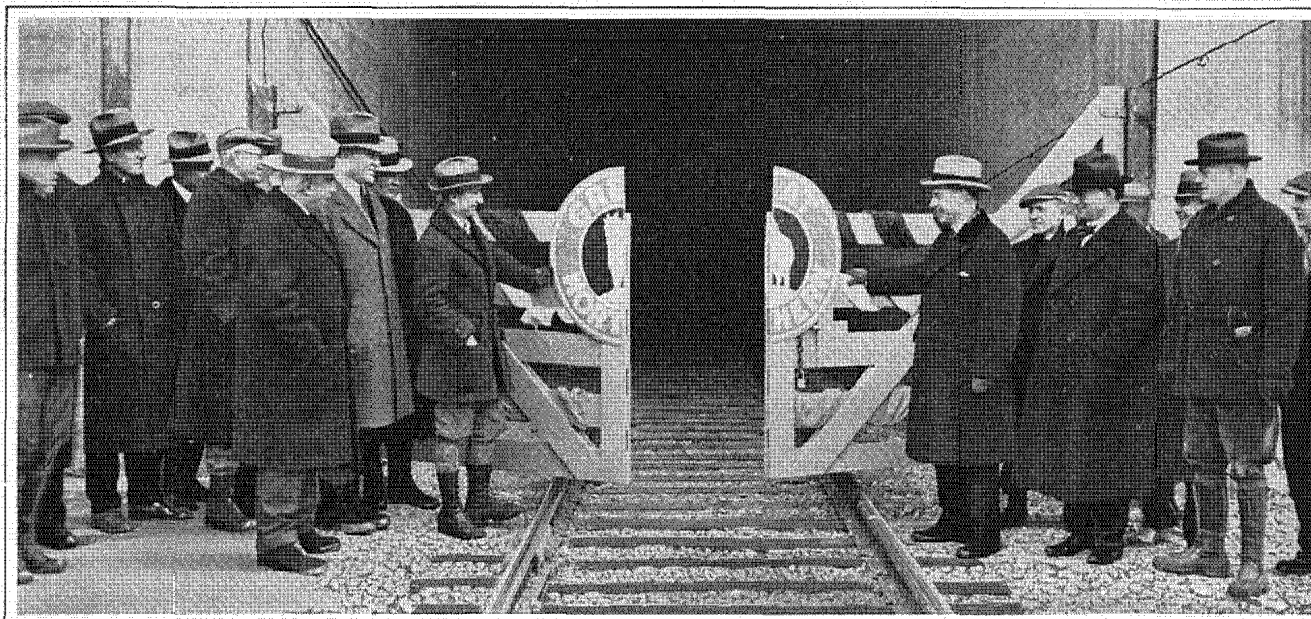
"Your company's continued development of its operations and expansion thereof into new and related lines of chemical manufacture . . . has resulted in a broad diversification of activities, the important effect of which is that peaks and valleys of production and sales are much less pronounced and fluctuations in any one line have little effect on the total volume of business.

"The policy of producing in one department the principal materials used in the manufacturing processes of another has been followed for many years and advantage has been taken of many opportunities for the utilization of the company's organization, experience and equipment for the production of other related products.

"The products of your company now enter into the daily life of the nation as the raw materials from which finished articles are manufactured; as the basic implements for the production of other raw materials, or as the finished products themselves. For example, rayon is the raw material for many fabrics; explosives are the implements for the mining of metals, coal and building materials; Pyralin and Fabrikoid go directly to the consumer as well as into other industries.

"So all along the line the widely diversified products of your company are filling new needs and are linked directly or indirectly with the productive activities of most of the important industries of the country."

The remainder of the report is devoted to the recent revision of capital structure, the status of the company's investments in outside corporations and the usual financial statements of particular interest to stockholders.



Pacific and Atlantic Photos

Officials at the Cascade Tunnel gate-opening ceremony. Those nearest the gate, left to right, are: C. F. Ffolliott, chairman of the board of directors, and H. L. Mundy, president of A. Guthrie & Company; J. H. O'Neill, general manager of the Great Northern, and W. E. Conroy, general superintendent for the contractor. At the right of the track: C. O. Jenks, vice president of the Great Northern in charge of transportation; J. R. W. Davis, chief engineer in charge of tunnel construction, and Frederick Mears, assistant chief engineer

AMERICA'S LONGEST RAILROAD TUNNEL IS COMPLETED

The Great Northern Railway Company has bored through a mountain range to eliminate troublesome grades and expensive snowsheds

THE longest railroad tunnel in America was formally opened when a train of the Great Northern Railway carrying a distinguished group of executives passed through it on January 12. Most of us are familiar with the event, since the dedication and opening ceremonies were broadcast over a coast-to-coast hook-up of radio stations. But some of the history of the project and the details of construction operations may be of interest. From a booklet published in connection with the radio program, the following facts have been taken.

James J. Hill, founder of the Great Northern, in his annual report for 1890, said:

"When the Pacific extension has been completed, your company will have a continuous rail line from Lake Superior, St. Paul and Minneapolis to the Pacific Coast, shorter than any existing transcontinental railway and with lower grades and less curvatures The policy of improving the property, which has given such good results in the past, is still being followed."

As proof that the policy set forth by the founder is still being followed, on Thanksgiving Day, 1925, the directors of the Great Northern authorized the most

extensive improvement project ever undertaken by the company. It involved the construction of the long tunnel piercing the backbone of the Cascade Range, about 100 miles east of Seattle, Washington, the relocation of all but seven miles of the old fifty-mile line between Peshastin and Scenic, the elimination of nearly twelve miles of tunnels and snowsheds and the electrification of seventy-five miles of road between Appleyard—near Wenatchee—and Skykomish. This program is now completed at a cost of \$25,000,000.

When the Pacific extension was begun at Havre in 1890, the outstanding engineering problem consisted of finding the best route across the Cascade Mountains. John F. Stevens, in December, 1889, had discovered Marias Pass, which gave the Great Northern by far the best Rocky Mountain crossing in the United States north of New Mexico, and immediately thereafter James J. Hill assigned the Cascade problem to him. Mr. Hill's instructions were to choose a location far enough north to serve a territory not already reached by any railway and to get as direct a line to Puget Sound as possible, with favorable distance,

grades and curvature. At the end of the season of 1890, Mr. Stevens recommended a route through the pass now used and called in his honor Stevens Pass. The line in 1892 was carried over the summit on a series of switchbacks, but a tunnel 2½ miles long was soon afterwards built and has been in use since 1900.

A notable feature of the Stevens Pass route was the fact that by building a longer tunnel the line could be greatly improved in the future, and attention was called to several possible tunnel sites which could be connected up with the original line. Such an improvement was being thought of in 1916 and 1917 when studies were made of the various possible tunnels, and four ranging from six to seventeen miles in length were seriously considered. The World War intervened at that time and the plan was put aside. In 1921 the subject was revived, location surveys were begun, and the matter received more or less continuous attention until the line just completed was tentatively adopted in the spring of 1925. The tunnel as built is 7.79 miles long; it is absolutely straight from end to end and is on a grade of 1.56 per cent descending from east to west. It cost \$14,000,000.

BUILDING THE LONG TUNNEL

A contract covering the work was entered into with A. Guthrie & Company on November 27, 1925, and two weeks later actual tunneling operations began. The construction program was developed by J. C. Baxter, while the men who carried out the plans were R. F. Hoffmark and W. E. Conroy.

The desire of the railway company to complete the project in three years made it necessary to attack the excavation at several different places, for obviously only a limited amount of man-power and machinery could be brought into action through the east and west portals alone. The long tunnel crosses under the deep valley of Mill Creek at a point about two and one-half miles west of the east

portal. This crossing lent itself to the purpose of opening two additional working faces. From Mill Creek, directly above the projected tunnel line, a shaft was sunk 622 feet to the level of the proposed tunnel, affording an additional face for attack eastward, and another westward, making in all four primary faces from three main camps.

DRIVING THE PIONEER TUNNEL

A pioneer tunnel eight feet high by nine feet wide, located 52½ feet south of the main tunnel, was driven eastward from the west portal and westward from the Mill Creek shaft. The crews engaged in this work met on May 1, 1928, the final blast being fired by President Coolidge from Washington. The comparatively small pioneer tunnel could be driven much more rapidly than

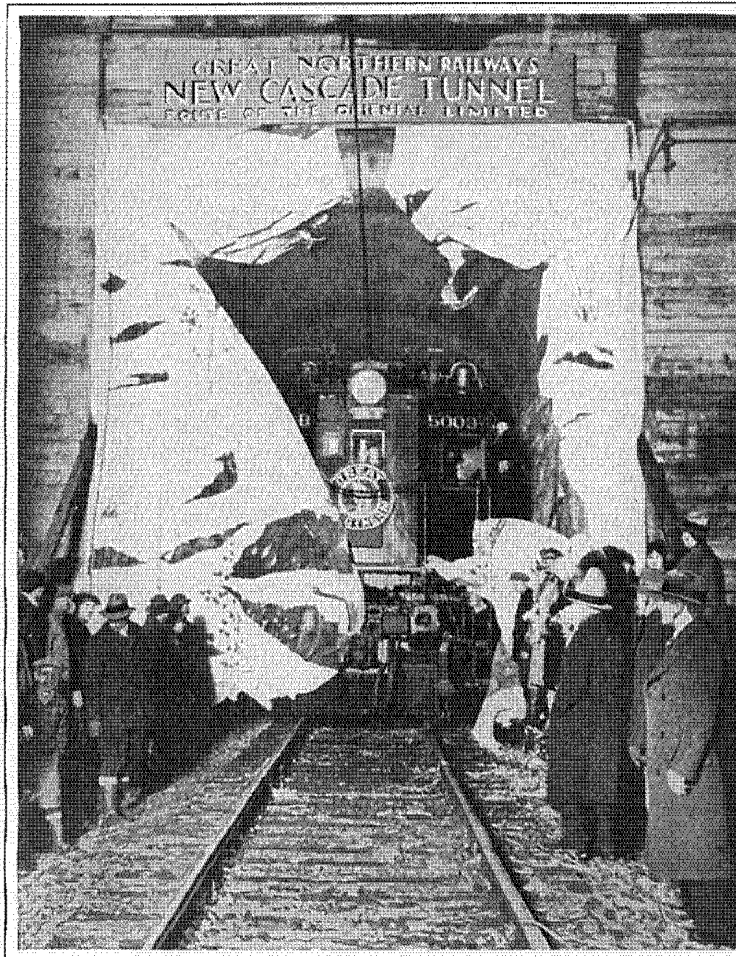
the main tunnel. As it advanced, crosscuts were driven to connect with the route of the main tunnel at intervals of about 1,500 feet. This made accessible as many as eleven working faces simultaneously, and made possible the employment at one time of 1,793 men on the tunneling operations.

Through the pioneer tunnel also were operated the trains carrying workmen and supplies and the rock excavated from the faces reached through the crosscuts. Through it, too, were run pipes which furnished compressed air for driving the drills and shovels, and the electric power lines which operated other machinery and lighted the workings, and through it was forced the air for ventilation. The pioneer tunnel not only served to drain the water from the main tunnel during the period of construction,

but will continue to do so permanently.

WORLD'S RECORD MADE

Practically all the work was done by machinery and skilled workmen. Electricity, compressed air, and dynamite applied with the utmost skill through the most



The Oriental Limited crashed through the paper barrier at the west portal of the tunnel, thus marking the first successful passage of a train over the new route

modern machinery characterized the whole project. (Du Pont gelatin dynamite was used exclusively on the job.) Several world's records for speed in tunneling were made, the tunnel having been completed in about half the length of time previously required for a job of such magnitude. Solid granite was encountered practically throughout, but the tunnel is entirely lined with concrete for positive protection against falling rock.

TYPICAL ROUND AT PIONEER TUNNEL FACE

What took place in one pioneer heading is typical of the activity at all of the many faces. The cycle of the various operations which followed in regular sequence from the moment the drills were started against a new face of rock until they were again ready to drill the succeeding face constituted a round, each round accomplishing an advance of eight feet. Five rounds in twenty-four hours was the objective which was considered a perfect score. This would be a total progress of 1,240 feet in a month. A loss of one minute per round in the pioneer tunnel would mean a delay of forty hours in the completion of the tunnel; so the great problem was to cut down delays. In October, 1926, the drillers progressed 1,157 feet, or 93.3 per cent of a perfect score.

A typical cycle for one round in the pioneer tunnel consumed about four hours and forty minutes in its various parts. For instance, on August 25, 1926, at 7.10 in the morning the shifter threw in the firing switch detonating 195 pounds of 60 per cent gelatin. For twenty-seven minutes approximately 6,000 cubic feet of air per minute were discharged at the face to clear away the gases so the men could return to work. During the following thirty-eight minutes the shift of sixteen men brought up the mucking machine, cleaned up the fly-rock and replaced electric light and compressed air lines. Then for one hour and twenty-two minutes the mucking machine loaded out the round in cars of fifty cubic feet capacity at the rate of three minutes per car.

After the blasted rock was removed, thirty-eight minutes were occupied in taking the mucking machine back to a place of safety and bringing up the drill carriage on which were mounted four drills, each manned by a driller and his helper. The drilling time for 28 holes, which averaged $8\frac{1}{2}$ feet in depth, occupied the next hour and seventeen minutes. During the drilling time a wooden-body, insulated powder car was brought to the face with the exact amount of dynamite and primers required for one round. While some of the drill crew removed the drill carriage, the others loaded the holes,

this operation requiring thirteen minutes. When the holes had been loaded and the leads of the electric blasting caps connected up, the electrician, who was a member of the drifting crew, tested the exploder circuit and the firing circuit separately, after which the shifter, who was the last man to leave the face, connected the exploder circuit to the firing-line. As he retreated in the tunnel he

closed a safety switch in the firing-line about 300 feet from the face, and when he had reached the next crosscut where the locked firing switch was located, he unlocked it and fired the blast at 11.50 a. m., a total elapsed time of four hours and forty minutes.

Following this same general plan of close synchronization, all the other operations at the tunnel went on continuously day and night, including Sundays and holidays, and

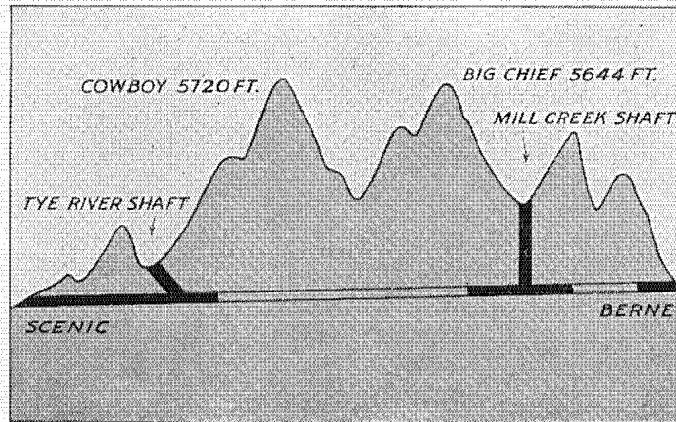
in spite of encountering water reaching at times a flow of 10,000 gallons per minute, not a single 8-hour shift was lost during the entire construction period.

ENGINEERING WORK

Engineering problems were mastered by a staff of the railway's engineers under the personal direction of Colonel Frederick Mears. The work of the engineers was as creditable as that of any group on the whole project. The location center-line, which was carried over the mountains directly above the main tunnel, reached an elevation of 3,500 feet above the west portal, and the mountain sides up which this line had to be carried are very precipitous. Inside the tunnel there was excessive water to contend with, and the terrific pace at which the drilling, blasting and excavating were carried on caused even what little opportunity was given the engineers for a clear view to set points for grade and line to be given reluctantly. Yet so accurately and carefully were the calculations made and the instrument work performed that when the pioneer headings met, 3,000 feet underground and four miles from the west portal, the lines as carried in from the two ends were only seven inches apart, with a difference in elevation of only nine inches, and a difference in calculated and actual distance of only twelve inches. The rock excavated from the tunnel was so used in embankments east from Berne and west from Scenic that not a yard of such material was wasted, and 7.36 miles of line outside the tunnel were straightened.

THE CHUMSTICK LINE

The second phase of the improvement of the Cascade Mountain crossing was the construction of 19.37 miles of



Profile view of the Cascade Tunnel, showing where the Mill Creek and Tye River shafts were dropped

new line on the east slope from Peshastin to a point two miles west of Winton at an approximate cost of \$5,000,000. It is called the Chumstick Line, because for eight miles it follows the scenic Chumstick Valley.

Climbing on a uniform and comparatively easy grade through a rugged mountain country, the Chumstick Line is made up of long stretches of straight track joined by easy curves. It bores twice straight through high rock ridges and cuts across steep hills and over deep ravines and rivers. Construction of the Chumstick Line was begun in July, 1927, and it was placed in operation on October 7, 1928.

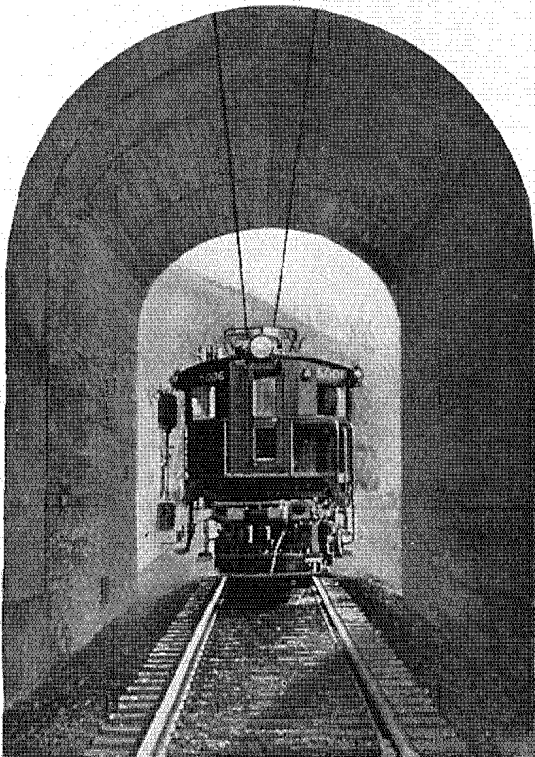
ELECTRIFICATION

The third phase of the improvement project is electrification. When the first train moved through the new 8-mile tunnel on January 12, it was drawn by an electric locomotive, and at the same time the entire 75 miles of line between Appleyard and Skykomish was changed

over to electrical operation. The cost of the electrification, including fourteen electric locomotive units, approximates \$6,000,000. The work was done under the direction of the railway's engineers with Jackson & Moreland consulting. Both Westinghouse and General Electric locomotives are used.

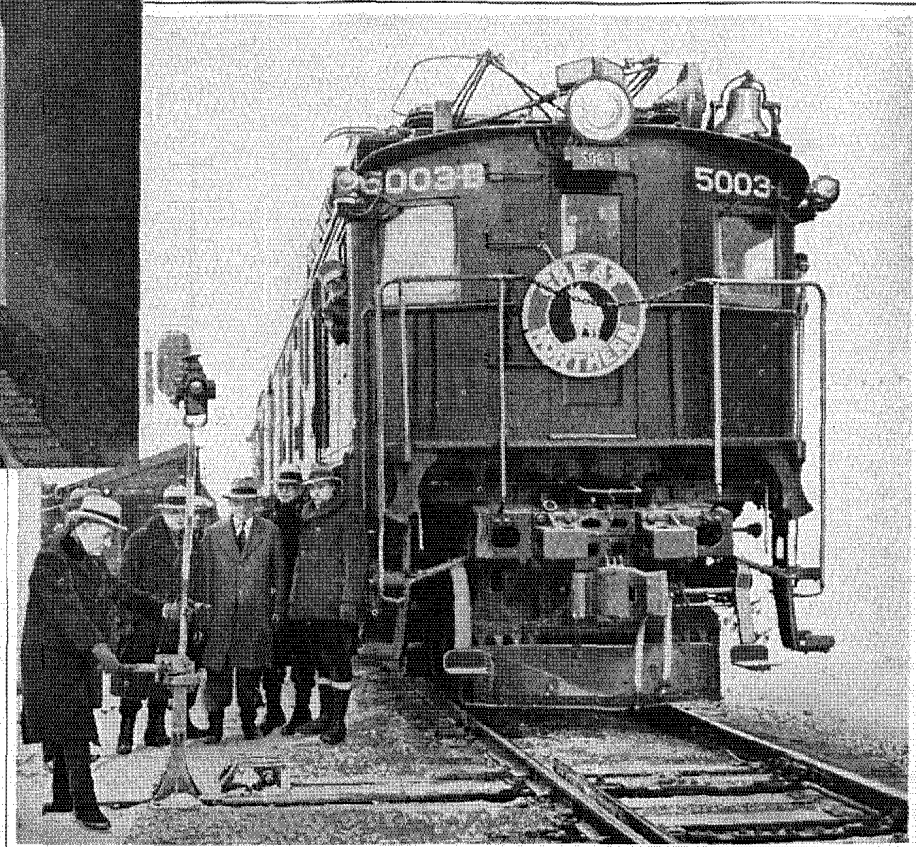
The purpose of the electrification is to afford clean and pleasant train operation through the long tunnel and to avoid the duplication of having both steam and electric motive power on the mountain district, the delays caused thereby, and expense incident thereto. Without electrifying the entire district such duplication would be necessary on account of electric operation of the tunnel and steam operation outside the tunnel. An unusual feature of the Great Northern's electrification is the combination of the alternating and direct current systems. Alternating current is used for transmission from the source of power to the locomotives and direct current is used in the traction motors. The alternating current transmission system has the advantage of minimum power losses, minimum copper requirements, and strong overhead construction at moderate cost. The locomotives themselves carry the transformers and motor-generator sets which change the high tension alternating current to low tension direct current. The type of traction motor which is most rugged in construction, most economical to maintain, and most flexible to operate is thus made available. The combination gives a self-contained locomotive with an unlimited range

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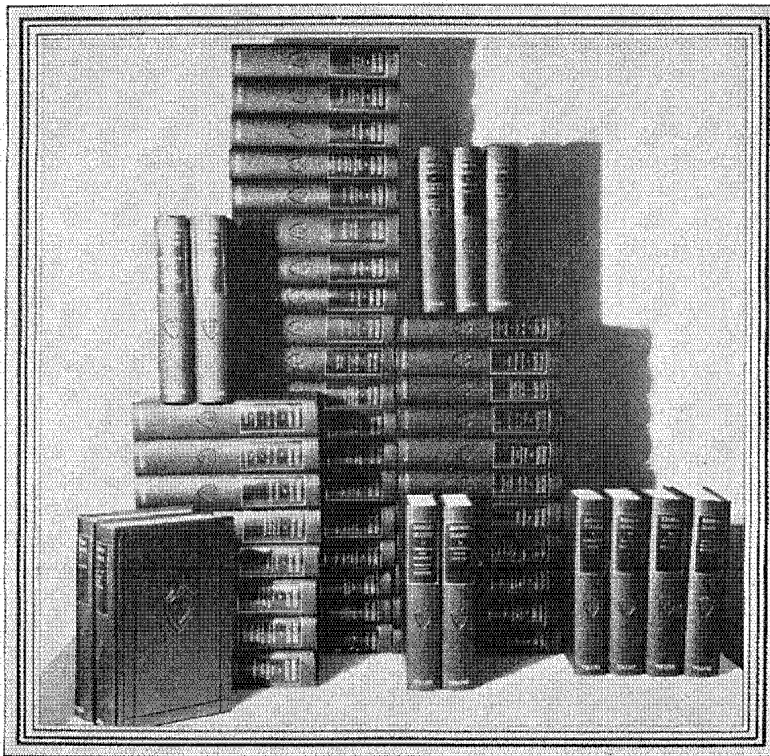


Above—Inside the finished tunnel. It is lined throughout with concrete, even though solid rock was encountered most of the way

Right—Vice President C. O. Jenks throws the switch which permitted the first train to go from the old route to the new one leading through the tunnel



A liberal education is bound up in this group of books, and suggestions for daily fifteen-minute reading assignments are offered



The publisher, P. F. Collier & Son Company, has provided for hard usage for the books by binding them in durable Fabrikoid

THE NEW HARVARD CLASSICS

A memorial edition of this famous Five-Foot Shelf of books has recently been published, in a rich, red Fabrikoid binding

IF we are to get the most out of mind and body in this age of "speed-living," we must direct our efforts properly every minute of the day. Budgeting of time is a sound practice, not only for routine occupations but for our mental and physical relaxations as well. Yet it is not always easy. There is our reading, for example.

No one will take issue with the statement that reading, especially when properly directed, is a necessity for a well-rounded education. But the difficulty lies in selecting from the millions of volumes in existence the really essential ones—those which even the busiest man or woman could read with pleasure and benefit. There are, for example, in the Imperial Library at Paris alone, more than 900,000 volumes. Emerson once calculated that if a man were to read industriously, without plan or direction, from dawn to dusk for sixty years, he would die in the first alcove of this great library.

He writes: "Would that some charitable soul, after losing a great deal of time among the false books and alighting upon a few true ones which made him happy and wise, would name those which have been bridges . . .

By R. A. APPLEGATE

into the heart of sacred cities, into palaces and temples."

Realizing this fundamental need, the P. F. Collier & Son Company asked the late Dr. Charles W. Eliot, for forty years president of Harvard University, to undertake the tremendous task of selecting from the world's literature and assembling in a five-foot shelf of books a well-rounded library which would contain the elements of a most liberal education. In February, 1909, Dr. Eliot accepted the proposal and began his task. The work of selection extended over the better part of twelve months, and, when finally finished, there were assembled fifty volumes of 22,462 pages—418 masterpieces by 302 authors.

In the Five-Foot Shelf all the principal divisions of literature are represented: History, biography and letters, government and politics, science, education, drama, essays, philosophy and religion, prose fiction, voyages and travel, famous prefaces and poetry. Chronologically considered, the series begins with portions of the sacred books of the oldest religions; proceeds with specimens of the literature of Greece and Rome; then makes selections of the literature of the Middle Ages in the Orient, Italy, France,

(Continued on page 16)

THE MODERN NOTE IN MOTORDOM

National motor shows indicate that American manufacturers have sprinkled art moderne with a generous amount of good taste

As this is being written, hundreds of thousands of citizens are viewing the 1929 creations of American and European motor-car manufacturers. The motor shows in leading cities have gradually assumed their places as annual fixtures. In formally presenting new cars to the public, manufacturers have given particular attention this year to three important features, or, as one authority puts it, the "three graces." These are known as line, color and luxury of equipment.

Of particular interest to patrons of the shows was the question as to how the manufacturers would deal with the modern influence, or "art moderne," as it is sometimes called. The problem appears to be settled in practically every offering. In fact, we overheard this remark from a leading artist at the New York show:

"Modern? Of course they are! But only within the well-defined boundaries of good taste and harmony of effect."

A happy coördination of effort has brought us the modern motor car, but by no means are the designers ready to rest on their oars. In fact, practically every car manufacturer is on the lookout for accredited improvements in design and fittings.

The most recent example of this activity is the wide interest shown by coachwork builders and manufacturers in modern upholstery sponsored by the Fabric Development Service of Du Pont Rayon Company, Inc.

These fabrics, fashioned of glowing rayon in combination with wool, linen, cotton or jute, offer a new means for expressing individual tastes in that portion of the motor car where individualism has admittedly been overlooked. When it is realized that today many more prospective car owners inspect the upholstery than lift up the hood, it is evident that the interior exerts a tremendous influence.

And rightfully so. The man or woman who buys an automobile these days demands a degree of comfort and

By T. R. DANTZ

beauty inside the car comparable to that expressed in the modern home.

The manufacturers, realizing this, are showing unusual interest in the new rayon upholstery.

Under the direction of the Fabric Development Service of Du Pont Rayon Company, Inc., great strides have been taken recently in creating new designs and color harmonies, in weaving suitable fabrics and in popularizing a distinctive new adaptation—detachable upholstery.

This latter adaptation has an unusual appeal to car owners, particularly women. By means of a patented device, these coverings, in an endless array of correct colors and designs, can be changed in your own car within three minutes. They afford you an opportunity of completely altering the interior of the car for any occasion. Beautiful designs in combinations of rayon with linen, wool, cotton or jute are available for sports, for the afternoon shopping tour, for formal evening use, for the beach and for many other uses.

Women have long desired a means whereby they could bring more of their own tastes into the interiors of their cars. Investigation proved that popular approval could be obtained for smooth, sturdy, quickly-cleanable upholstery, combining beauty of color with authentic designs. The Fabric Development Service accordingly worked out the problem in conjunction with leading

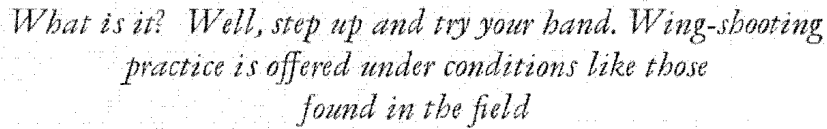
textile mills, and today offers to owners and car builders an entirely new, detachable upholstery, wherein the beauty of the fabrics is enhanced by rich, lustrous rayon.

These coverings were first shown to car owners early in January in the famous Park Avenue Galleries in New York City. Actual installations in private motors were made in the presence of owners. The enthusiastic reception which followed the three-day exhibition is likely to be repeated in other cities, for the Fabric Development Service is sponsoring additional showings.



The interior of a Mercedes-Benz limousine in the New York Auto Show, revealing European interest in the new rayon-wool fabrics for permanent decoration. In the inset—A close-up of the Mercedes-Benz fabric

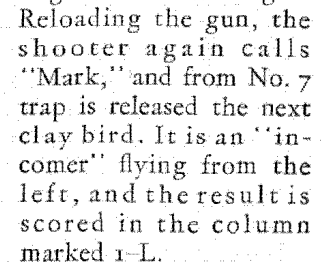
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shot will do no damage to persons or property. In any sport where firearms are used, safety is of course the first and greatest consideration.

The Skeet field layout reproduced here gives a general idea of how the target traps are placed and the shooting positions. And the score card illustration on the opposite page shows how the program is divided into units of twenty-five shots to be fired from the eight shooting stations. Two single shots are fired from each station, and in addition there are four sets of doubles. To round out the twenty-five, each contestant has an optional shot that may be taken from any station he chooses, while he also selects the trap from which the target is to be thrown.

To start the program, both traps are loaded and the first shooter steps to station 1. Placing one shell in his gun, he calls "Mark," and No. 1 trap is released. This gives him a straight-away shot, so-called. The result—"dead" or "lost"—is announced by the referee who should stand somewhere behind shooting position No. 4, and the scorer marks the record on the tally sheet under the heading 1-R, indicating that the target flew to the right.



The shooter now moves to station 2, loads his gun, calls "Mark," and shoots at a target from No. 1 trap as it flies out at quarter. And his next chance is to break one from No. 7 trap — a "quartering in-comer." The same procedure follows at each

station in sequence until the singles program of sixteen shots is completed at No. 8.

8

shoots first at the outgoing "bird" and then at the incomer, and it isn't easy to bring them both down.

Finally, to round out the twenty-five target program, the shooter is given one optional shot. He may take it from any station he may select and also choose the trap from which the target is to be thrown.

In small shoots where the caution and judgment of the group are known factors, it is permissible for a small number of shooters to go around together. This system, however, is not recognized by the rules, but is left to the judgment of those conducting the shoot.

The Skeet shooter uses his favorite shotgun, rather than one of special type, because the ordinary gun is best adapted to breaking targets thrown as they are in Skeet, and also because the gunner wants to improve his skill in the field or on the marsh. One rule of the game prohibits raising the gun to the shoulder until the "bird" has left the trap and is actually in the air; this to develop the "quick-on-the-trigger" technique one must have when shooting game birds.

The chief advantages of this sport are, first, that it offers a series of shots similar to those encountered in actual hunting, and, second, that the shooter may use the same gun he is accustomed to hunt with in the field. If it meets his requirements for hunting, it will serve equally well in bringing down Skeet targets. Any gun bored so open that a clay target at 20 or 25 yards can get through the pattern is too open for ordinary use. Any gun bored so close that an average shooter has difficulty in breaking clay birds with it is too close for him to shoot live birds with. And if any gun is so heavy and cumbersome that the shooter cannot swing it fast enough to score well at Skeet, it is too heavy for him to carry all day in the field. The ideal gun for a man to use at Skeet is his ideal field piece, and vice versa.

In this sport the popular 20-bore can compete on equal terms with the twelve. What the twenty lacks in pattern area it makes up for in the quickness with which it may be handled. The .410 is an interesting arm to try at Skeet, but the shooter will find himself handicapped as he would be if he used it to shoot quail, grouse or woodcock. The

ordinary close-bored duck gun will not be at its best in Skeet, although guns weighing up to eight pounds may be used by those who prefer them, in which case the use of "brush" or "spreader" shells is recommended.

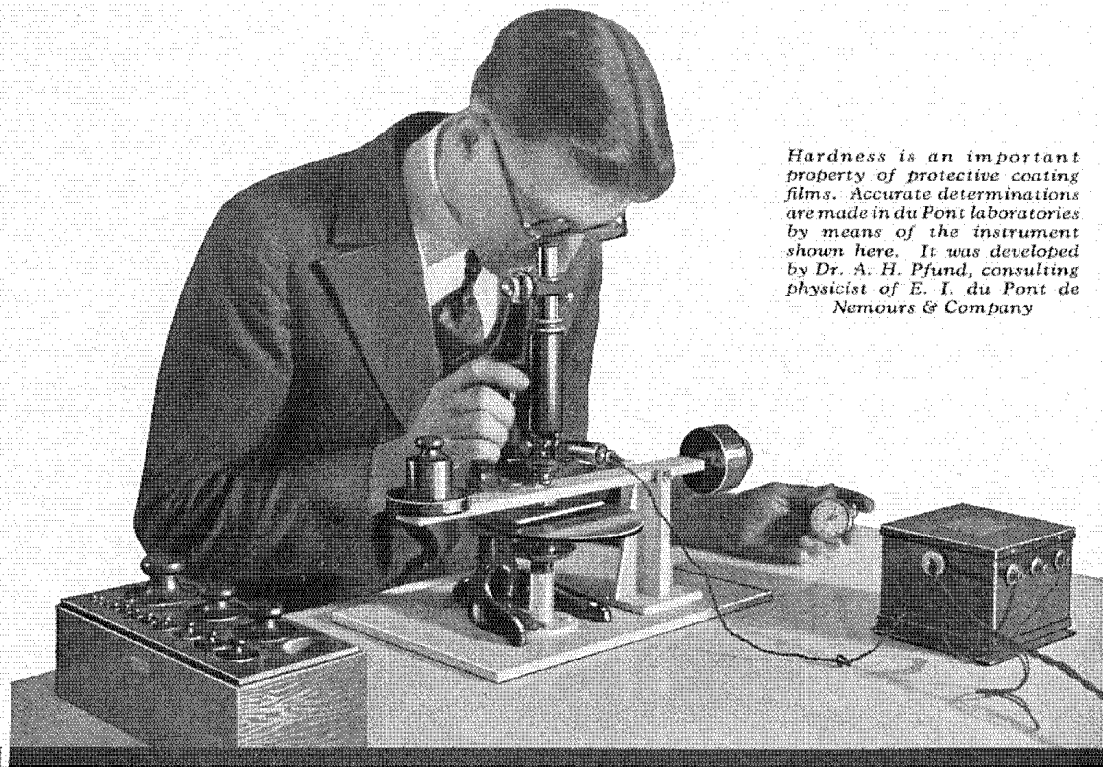
The rules of this sport impose no limitations as to loads. One may use any odd lots of ammunition on hand. Of course, a clay target offers a somewhat smaller mark than a game bird at the same distance. For that reason small shot have an advantage in that they help to fill the pattern. Expert shooters would probably select No. 8 or No. 9 shot, but for practical purposes anything from 4's to 10's will do.

Each year the American sportsman pays more attention to the proper fit of his gun, and the Skeet field is a fine testing ground to determine what is best for his use. If a gun serves him well in practice shooting, he can depend upon it in the woods, fields and marshes. If he is an experienced hunter, he can make a creditable Skeet score and thoroughly enjoy the sport; for it offers a combination of shots as varied as those found in actual hunting conditions. On the Skeet field shooting can be practiced under conditions that approach the ideal.

The sport of Skeet is easy enough to give the beginner pleasure and valuable practice. It is difficult enough to give the veteran hunter a thorough test of his skill. If you want to go gunning the year round, without regard for game laws or closed seasons, take up Skeet. It is the sport for all shotgun shooters. It holds a fascination that has no equal in other forms of target shooting. And it gives an abundance of real sport and useful training in wing shooting. No wonder this game is constantly increasing in popularity.

NOTE: A booklet entitled "Skeet—The All-Season Sport for Shotgun Shooters" may be obtained by writing either to E. I. du Pont de Nemours & Company, Inc., Room 3056, Wilmington, Delaware, or to the National Sportsman, 108 Massachusetts Avenue, Boston, Massachusetts. The data for this article were obtained from this booklet, excerpts from which are published here by permission.

Club	✓	OFFICIAL										Date		March 1, 1929			
Town	✓	SKEET															
State	✓	SCORE CARD															
		FOR ONE & DOUBLE BEEF MOUNTAIN LIGATION															
		SINGLES										DOUBLES				OPT.	
Names		1	2	3	4	5	6	7	8	9	10	1	2	3	4	TOTAL	
		L	R	L	R	L	R	L	R	L	R	L	R	L	R		
BIL		1	1	0	1	0	1	0	1	1	0	1	1	0	1	1	18
JAM		0	1	1	0	1	0	1	0	1	0	0	1	1	1	0	16
WALTER		1	1	0	1	0	1	0	1	1	0	1	0	1	1	0	16
PINKIE		1	0	1	1	0	1	1	1	1	0	1	1	0	1	1	19
GEORGE		0	1	0	0	0	1	0	1	0	0	1	0	1	1	1	15
ED		1	0	1	1	1	0	0	1	0	1	0	1	0	1	1	15
HOWARD		0	1	0	1	1	1	0	1	1	0	1	0	1	0	1	15



Hardness is an important property of protective coating films. Accurate determinations are made in du Pont laboratories by means of the instrument shown here. It was developed by Dr. A. H. Pfund, consulting physicist of E. I. du Pont de Nemours & Company

HOW HARD IS A ROCK?

Or, if you please, how hard is a paint, varnish or Duco film? Through the use of the Pfund hardness tester accurate determinations are made possible

“**H**ARD as a rock” is an expression one hears frequently. But how hard is a rock? What do we mean by “hard?” We usually mean that the material, as we come in contact with it, is easy or difficult to mar when we touch it with the finger-nail, the hand, the clothing or some other object. If we sit in a chair that sticks to our clothes, we probably say a great many things, but among them we say the finish is soft—too soft to be practical.

But what the consumer wants are materials, particularly protective coatings, that are hard enough to resist ordinary usage. Practical tests duplicating this are not very satisfactory. Comparison to be of any value must always be made with a standard product, for no two people grade hardness alike. What is needed is a test that will grade a product in definite terms now or next year.

In searching for such a test for protective coatings, almost every field was entered. Something over twenty-five tests in the paint, varnish, asphalt, plastic, mineral and metallurgical fields failed to reveal a satisfactory method for evaluating this property in thin protective coating films. So the problem was laid before Dr. A. H. Pfund, associate professor of Physics at the Johns Hopkins

By D. V. GREGORY
Central Technical Laboratory

University and a member of the consulting staff of this company. To aid him a series of varnishes were selected,

varying in definite degrees of hardness as the practical paint and varnish man would grade them.

It is interesting to follow some of the steps in the development of a satisfactory test. The practical man grades hardness by examining the films with his thumb-nail. The first attempt to produce a test consisted in placing a pen point so that the curved portion of the back end simulated a thumb-nail when pressed against a varnish film. With this crude device it was found that curved marks could be produced varying in length with the hardness of the film. After a number of modifications had been tried with partial success, an improved device was developed. A steel ball bearing, instead of the pen, was forced into the film. The softer the film the greater the distance the ball would go. This distance was measured by examining the opposite side of the film, which was on glass, and observing the size of the circle of contact between the ball and the film. This method, of course, could not be used on opaque products or with opaque backgrounds. Later on this difficulty was overcome

(Continued on page 23)

A PIONEER MANUFACTURER ADOPTS DUCO FINISH

*And, in so doing, takes another forward step
in the production of high-grade,
"Blue Ribbon" steel beds*

By RICHARD N. SCHWAB



IN 1883, the founders of the Southern Spring Bed Company began to manufacture beds, springs and mattresses in a small plant at Atlanta, Georgia. The dark clouds of reconstruction days had barely lifted when they invested their first \$20,000 to blaze a new trail in industry. They set their faces toward the sunrise of progress and never looked back, and their courage and vision have been well rewarded by the success of the enterprise.

Today, this company is the largest and oldest manufacturer of beds, springs and mattresses south of the Ohio River, and has attained a position of unusual prominence. Its "Blue Ribbon" products are sold in practically every state in the Union and in a number of foreign countries, including Central and South America. A 500 per cent gain in assets and a 600 per cent increase in sales, all in a single decade, indicate the progressive spirit of the house.

This company was a pioneer in manufacturing beds of sufficient charm to find ready acceptance in the best homes. Year after year new models, many of them reminiscent of the finest work of the old masters of Early American, English and Continental design, have been added. This modern bedroom equipment is far removed from the severe and awkward-looking iron beds of other days; experienced craftsmen now reproduce, with startling fidelity, the natural graining of the most costly woods.

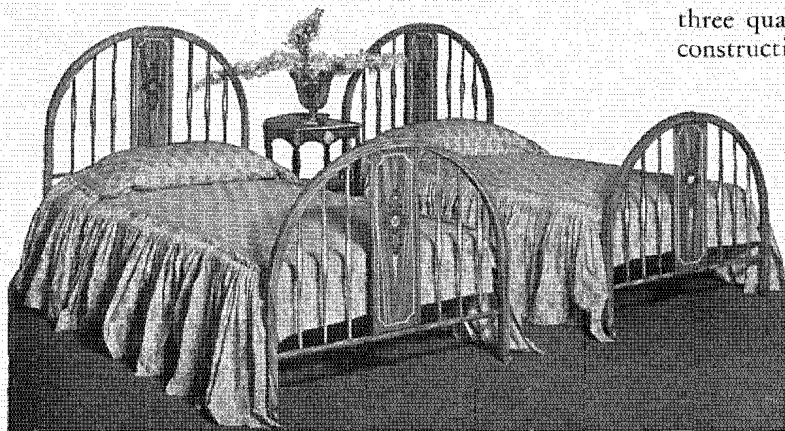
All 1929 Blue Ribbon beds will be finished in du Pont Duco—another forward step. This finish was chosen as standard for factory production because of its recognized merit from both a quality and service standpoint. The refreshing beauty, ease of cleaning, and moisture-proof property of Duco increase its practicability for the home owner. Its hardness and toughness add to its durability. Because Duco dries by evaporation and not by oxidation, it is virtually stable, chemically, within a short time after application; and the film remains intact and retains its characteristic smooth, lustrous surface throughout years of service. Extremes of cold or heat—as when the windows of a bedroom are suddenly opened or closed—do not adversely affect it.

To assure customers that genuine Duco has been used, each Blue Ribbon bed is identified with a Duco seal and a green tag.

The company manufactures five grades of Blue Ribbon steel coil bed springs, including the famous Duo-flex 99-coil spring and the Superb 140-coil spring. There is also a line of lower-price springs of both the coil and the "wishbone," or link type, affording a complete price range. All Blue Ribbon springs are identified by a band of gold coils across them, by the trade-mark and the manufacturer's guarantee of satisfaction.

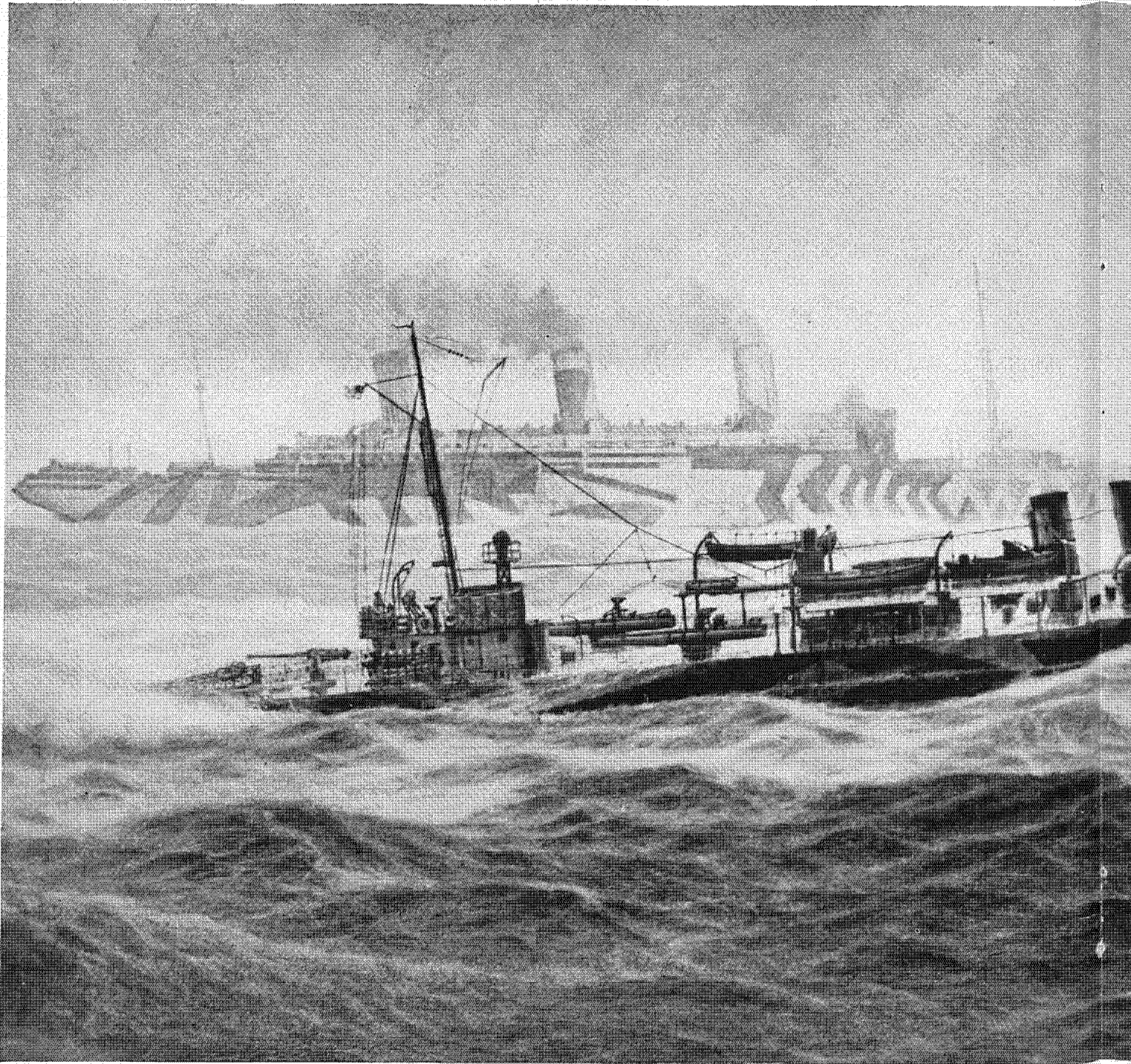
Included in the line of Blue Ribbon mattresses are three qualities made of felt and one with inner-spring construction. And a less expensive line is made in addition to the Red Cross mattress, which for forty years has been the standard bed equipment for the finest homes in the South.

Incidentally, the company, since its inception, has been owned and managed by the members of one family. The sons of the founder, now in active charge of the plant, are upholding the best business traditions of their forefathers. They regard the building of fine bedroom equipment as a trusteeship. In adopting Duco finish for the most complete and attractive line of steel beds the company has ever offered to the public, they are continuing to keep pace with progress.



The pleasing design of these twin beds is enhanced by the beauty of their finish and the decorative touch in the panels

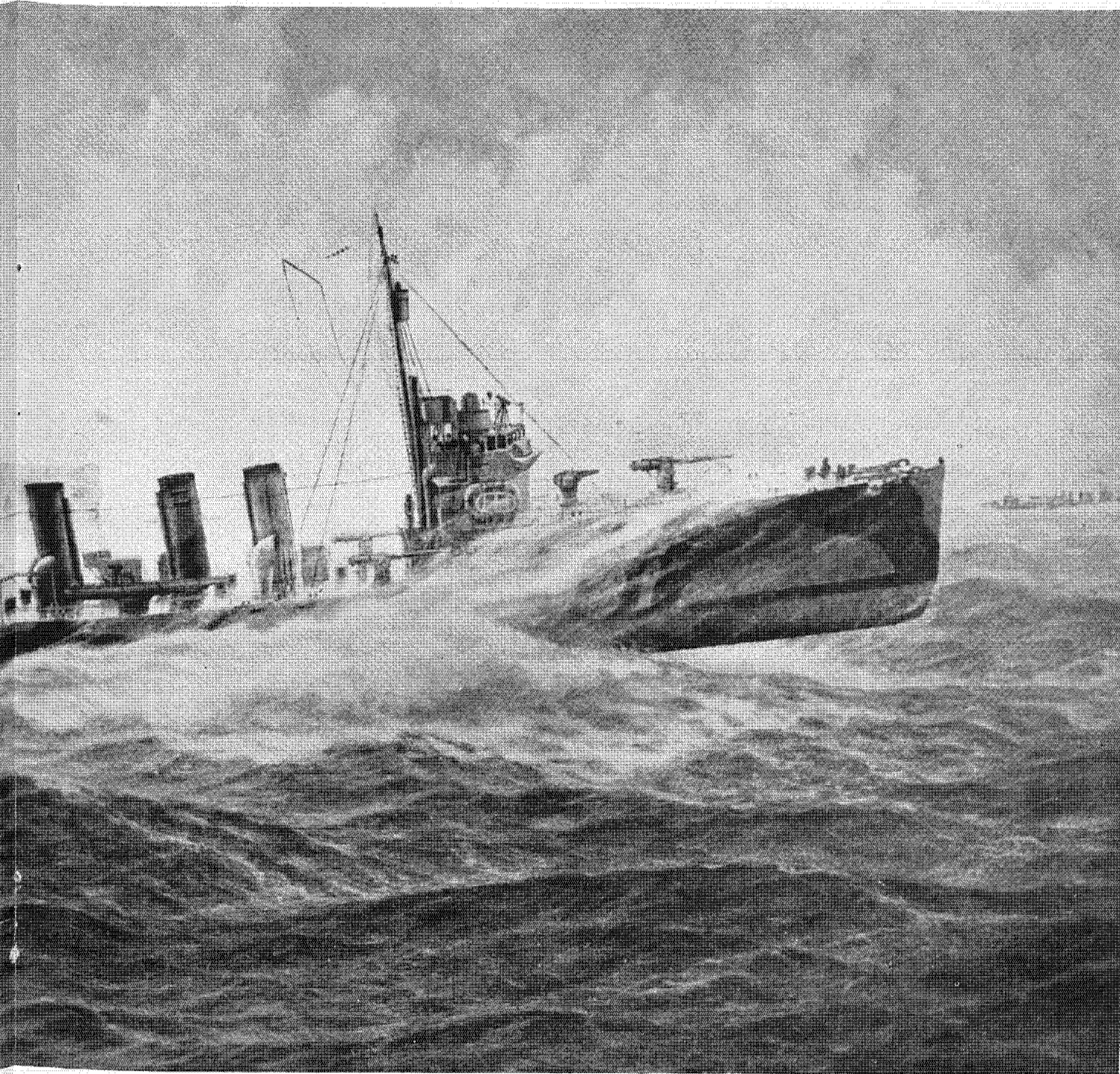
A FAST ESCORT ON CONVOY



Ledger Photo Service

THE *Leviathan*, greatest of the war-time troop transports, plowing through rough, slate-colored waters; an overhanging sky denoting a typical dull day in the war zone; small, swift United States destroyers zigzagging about the great craft in search of submarines—this is the scene of *A Fast Convoy*, second of a series of World War paintings which the du Pont Company is donating to the United States Naval Historical Foundation. This canvas will become a part of the Foundation's permanent loan to the United States Naval Academy at Annapolis, Maryland. The original painting was executed by Commander Burnell Poole, United States Naval Reserve, who has been commissioned by the du Pont

Y DUTY IN THE WAR ZONE



Company to depict some of the operations of the United States Navy during the late war. The business of escorting the *Leviathan* safely across the Atlantic was particularly difficult because of the speed of the great liner. Due to the zigzag course taken by the destroyers in performing their "shadow" duty, it was necessary for them to make 25 or 26 knots an hour in order to keep pace with the ship making 23 knots an hour. The thrilling sight of the smaller boats rolling and pitching violently on the rough sea as they endeavored to keep their position in the convoy is the subject of the picture. The destroyer *U.S.S. Allen* and several others are shown in Commander Poole's realistic painting.



Part of a crowd in a paint store watching the Duco decorator finish vases and household articles

STYLE ENTERS THE PAINT STORE

The progressive dealer is modernizing his establishment so that it will appeal to a new and discriminating class of trade

THE paint store of a few years ago was little more than a warehouse.

Cans were piled high up to the ceiling, dripping oil barrels and turpentine containers were in the way, and window displays consisted of a few piles of cans often covered with dust and letter files. In some cases, the salesmen wore overalls, chewed tobacco or smoked a pipe. There are still many stores like this, but they are fast becoming obsolete and in time may vanish altogether.

Many of the principles of display and store arrangement that have proved effective in the department and chain stores are finding their place in paint merchandising. The paint store of the present caters to the women and is becoming a shopping center. New ideas in home decorating and new ways in which the housewife can decorate her rooms are constantly being brought out. Salesmen are now able to give authoritative advice on color schemes and home decoration.

More and more style has been entering into the paint business. The vogue for color and the popularity of home decorating have greatly increased the number of paint customers. To cater to this new and profitable class of trade, progressive dealers have modernized their stores. Some can be said to rank with the high-class specialty stores in attractiveness. Modern fronts have been built, the interiors redecorated and fixtures arranged so that they will make a pleasing display. Open tables of seasonal paint specialties are now used in the same way that chain stores attract customers by displaying merchandise.

By R. A. HARDY

For several years du Pont advertising has been emphasizing the service of the local paint dealer. The advice—"Consult the du Pont dealer," has been a prominent part of every one of the advertisements. This has made du Pont dealers realize the importance of maintaining well-kept, attractive stores and of giving real service to customers.

There has been a notable change in paint store merchandising during the past two years. The dealer realizes that many products are competing for a share of the consumer's dollar. His first step in getting his share for paints is to make his store more attractive.

The importance of women customers is also being generally recognized. For instance, they are now buying bridge prizes in the paint store. The problem of what to give for a prize is being solved by the unique method of decorating various useful articles with Duco. In this way many distinctive prizes are made at far less expense than if they were purchased in a gift shop. This is only one example of how new customers are being brought into the paint store.

Visit the du Pont dealer in your neighborhood. You will get intelligent assistance in selecting the right paint and varnish for the surface and reliable advice on how the products should be applied. In addition, you will obtain new suggestions on the latest color schemes and plans in interior and exterior home decoration. From the neighborhood paint store of today, you will receive ideas which you would have never expected from it a few years ago.

DEFEATS DUST AND DIRT

A Philadelphia printing concern manufactures envelopes of transparent Pyralin sheeting and employs the material for many other interesting uses

WHO hasn't, at some time or other, been annoyed by dust and dirt accumulating on records and memoranda that must be kept exposed for easy reference? Just that difficulty arose some years ago in a business office, and the problem of overcoming it was put up to the Williams & Marcus Company, which operates a large printing and manufacturing plant in the city of Philadelphia.

Experiments followed. Eventually the company designed and built machines to make from transparent Pyralin sheeting envelopes or record holders like those shown in the accompanying illustration. Thus far they have been produced in sizes ranging from two by two inches to fifteen by twenty inches. One special form accommodates tabbed cards. When a sheet or card is placed in its holder, both sides are fully legible and there is positive protection from dust and dirt.

Soon another use was developed. A large public utility company needed holders for blueprints of wiring diagrams to be fastened on switchboards. Pyralin envelopes of the size required were fabricated and another problem was solved. Since then the Williams & Marcus Company has found many applications for transparent Pyralin sheeting. For example, narrow slides are made to shield name cards displayed on directory boards of apartment houses and office buildings. Holders are made to carry drivers' licenses, and road maps, time-tables

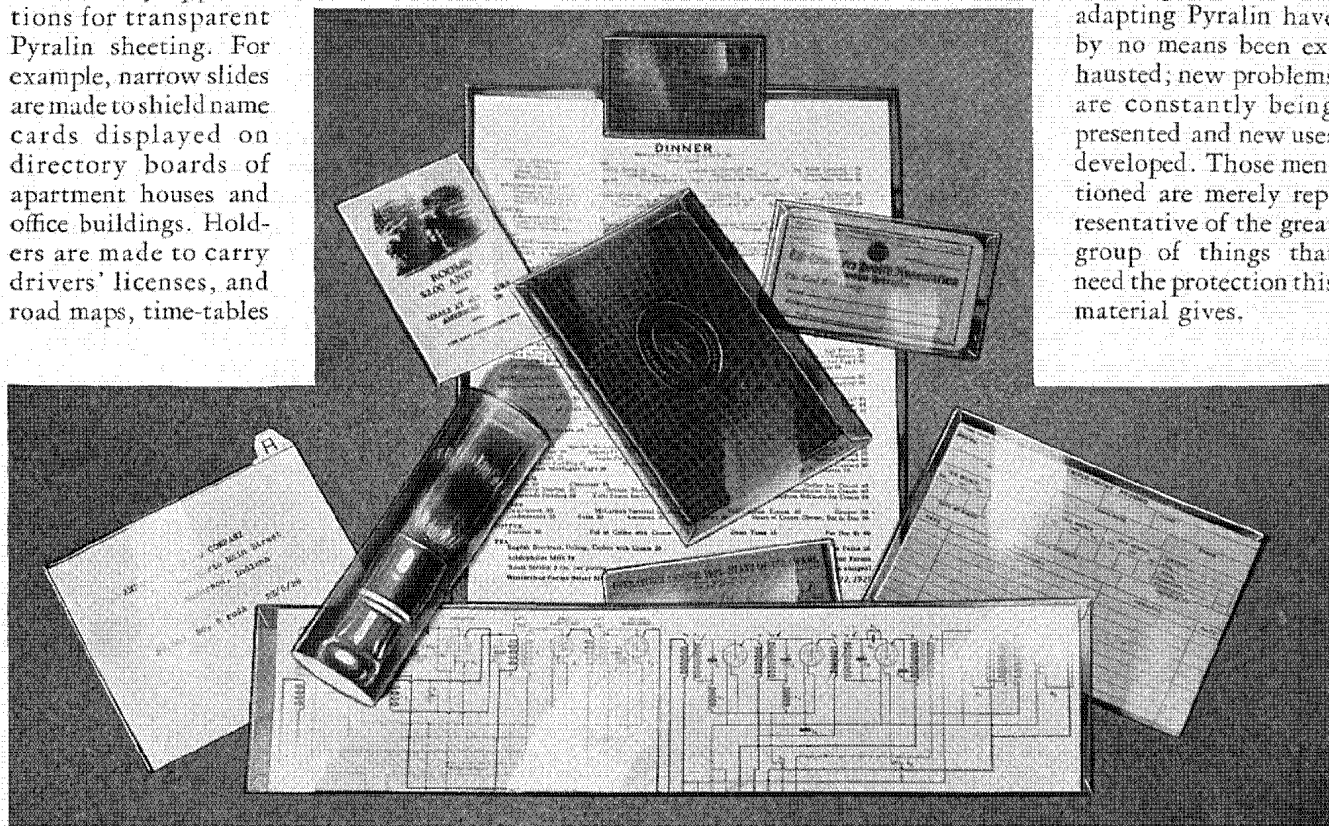
or commutation tickets can be shielded from soiling in Pyralin envelopes. Moreover, since the material can be printed, it is extensively used for advertising purposes.

The company is also equipped to make Pyralin into tubular or cylindrical forms. Note in the picture below the display carton which was developed for a line of high-priced shaving brushes. It shows the brush perfectly, even enhances its appearance, but there is no possibility of contamination from flying dust or inquisitive fingers.

Another application: When the Williams & Marcus Company began to build—or shall we say print?—airplane novelties, more weight was needed on the front edge of the wings, and no material that would obscure the printed message would do. A narrow strip of transparent Pyralin cemented in place met the requirement perfectly, and the material is now flying on every Willmarco plane.

This company is also producing some beautiful counter and window displays on sheet Pyralin by means of the Willmar color process, which employs a silk screen. Oil colors are used, so that brilliant effects are obtained, without any danger of the colors fading from sunlight.

The possibilities of adapting Pyralin have by no means been exhausted; new problems are constantly being presented and new uses developed. Those mentioned are merely representative of the great group of things that need the protection this material gives.



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E. R. MANCHESTER *Editor*

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Vol. XXIII

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No. 3

THE COVER ILLUSTRATION

SYMBOLIC of present-day civilization are the massive structures of steel, concrete and stone that lift their heads high above the city streets. In daytime they house thousands of busy workers. At night their luminous towers bring to mind the enchanted cities rubbed into existence by the aid of Aladdin's lamp. But they are real. The skyscraper is typically American, a monument to our nation's architects, engineers and builders. The cover illustration is a tribute to their work.

A NEW SERVICE ORGANIZATION

AN agricultural extension section of the Explosives Department of the du Pont Company was formed a short time ago, with Larry F. Livingston as manager.

Mr. Livingston is said to have served more years as land-clearing specialist than any other man in the United States. He was graduated from the University of Washington in engineering in 1916, and the following year had charge of land-clearing work in Wisconsin. During 1919-1920 he centered his activities in Marinette County, and from 1921 to 1926 specialized in the same work in the Upper Peninsula of Michigan. For the past two years he has been head of the agricultural engineering extension work of the Michigan State College. At the same time he has served as chairman of the extension committee of the American Society of Agricultural Engineers.

Through the new section Mr. Livingston now offers assistance to farmers in solving problems connected with the use of explosives in land clearing. His headquarters are at Wilmington, Delaware.

ANNOUNCEMENT has recently been made that the Du Pont Cellophane Company has purchased the business of Capes-Viscose, Inc., manufacturers of cellulose caps for sealing bottles. This change will make available to Capes-Viscose customers the manufacturing facilities of the Cellophane Company and its staff of chemists and technical men.

A more extended reference to the products that will be manufactured will appear in a subsequent number.

THE NEW HARVARD CLASSICS

(Continued from page 6)

Scandinavia, Ireland, England, Germany and the Latin Church; includes a considerable representation of the literature of the Renaissance in Italy, France, Germany, England, Scotland and Spain, and, arriving at modern times, embraces selections derived from Italy, three centuries of France, two centuries of Germany, three centuries of England, and something more than a century of the United States.

With each set of Classics there is an elaborate alphabetical index volume containing 76,000 references to subjects mentioned in the collection; also a complete chronological index and a first-line index of worth-while poems and songs.

In the fiftieth volume Dr. Eliot, out of his wide experience as a teacher, presents eleven reading courses. In these he explains the purpose and plan of each course and gives an exact list of titles in the order in which the works should be read. Another feature of this wonderful educational compilation is the "Daily Reading Guide," which is a suggested plan for a whole year of specific fifteen-minute assignments—one for each day.

For those who seek selected, concentrated and worth-while knowledge, the Harvard Classics completely fulfill the desire. They are a permanent investment and a cherished addition to any library. The publishers, knowing that these books contain imperishable writings—a set to be kept for generations—selected for the new memorial edition the permanent and beautiful binding material—du Pont Fabrikoid in a rich, red levant grain. Thousands of sets have formerly been bound in green Fabrikoid.

Today, there are over 250,000 sets of Harvard Classics on the library shelves of American homes, bringing pleasure, satisfaction, enjoyment and entertainment to their owners. Additional information about these books may be had by writing to P. F. Collier & Son Company, 250 Park Avenue, New York City.

THE MODERN NOTE IN MOTORDOM

(Continued from page 7)

Authentic in design, of proved wearability, and strictly modern, these upholstery fabrics are awakening new interest in the interiors of motor cars. Enthusiasm for them has permeated the motor-car industry. They have been shown in the New York Auto Salon, in the National Auto Show and are now undergoing thorough tests in several leading motor-car factories.

To motor-car manufacturers, dealers, auto upholsterers and trimmers, and to coachwork builders, a cordial invitation is extended to write for additional information about this new du Pont service. Expert advice on the adaptation of the fabrics for detachable covering will be rendered without obligation. Address all inquiries to the Fabric Development Service, Du Pont Rayon Company, Inc., 2 Park Avenue, New York City.



John David

CELLOPHANE ENTERS THE HABERDASHERY FIELD

Numerous articles of men's merchandise are wrapped in this transparent material for sale in a famous chain of stores

By JOHN DAVID, President, John David, Inc.

As told to B. C. ROBBINS

WELL known to millions of men in the metropolitan New York area and likewise to those in the men's furnishings field throughout the nation is the up-to-date chain of shops of John David, Inc., located at important points in the city. Probably before you read this, another shop, which is expected to rank as the largest and most attractive in the United States, if not the world, will have been opened at the corner of Fifth Avenue and 43d Street. It will be outstanding in appointments, fittings and arrangements.

Always noted as a pioneer of important improvements in merchandising methods, it was only natural that John David should be among the first to realize the advantages of transparent Cellophane as a package wrap for haberdashery. And to find out what prompted him to specify this material, I interviewed him.

Mr. David has learned a lot about selling clothes, shirts or ties in his quarter century of experience in this highly competitive district, and he had some very interesting things to say about it.

"The average man is in a hurry, making last-moment purchases," he remarked. "This applies particularly to requisites for evening wear. He may have remembered when leaving in the morning that his laundry had not arrived, and he needs a shirt or a collar. He rushes to his favorite shop for an evening shirt and purchases one or two, which he promptly has sent home. And to his chagrin and disappointment, he finds them soiled and fingermarked, as he is about ready to don them before going out that night.

"We had tried in many ways to obviate this difficulty

in our shops *without success*, until we conceived the idea of having our manufacturer wrap the dress shirts made for us in Cellophane, direct upon their coming from the laundry. This preserves cleanliness, and the absolute transparency of Cellophane shows the pattern and fabric to the greatest advantage. It appeals very strongly to the consumer when the salesman explains that the shirts have been untouched by other hands since leaving the laundry, thus assuring spotlessness.

"In fact, Cellophane-wrapped dress shirts appeal so strongly to our patrons that we are taking all white articles, such as sweaters, the more expensive soft whiteshirts, pajamas, silk dressing robes and athletic shorts, and are having them wrapped also in Cellophane coverings.

"Another type of merchandise which we wrap in Cellophane for protection is leather goods. Our pigskin wallets, cigarette cases, flask covers and similar articles soil and become greasy, showing the marks very clearly upon the slightest exposure to dust and handling of any nature. Cellophane, of course, eliminates this and adds decidedly to the sales value of the particular object.

"While it adds slightly to our expense, we feel that we are more than repaid by the satisfaction given to our customers.

"One instance that comes to mind is that of a customer remarking upon the pleasing appearance of a shirt packaged in Cellophane. The clerk agreed with him, saying, 'Yes, it is a nice pattern.' Whereupon the customer replied, 'Of course it is a nice pattern, or I wouldn't be buying it, but what I was really referring to was this transparent paper you are using to cover it.'"



A salesman shows a Cellophane-wrapped shirt to an interested customer in one of the John David shops

THE BABY CARRIAGE DEVELOPS THROUGH THE YEARS

From the crude baskets of the ancients to the colorful, restful coaches of today is a big step. The F. A. Whitney Carriage Company has helped make it

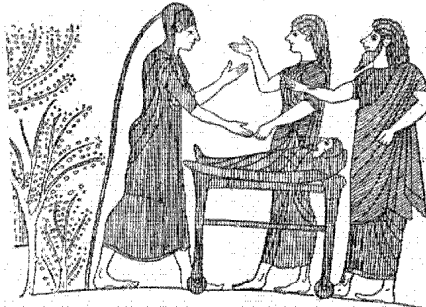
By BERTRAM H. HAYES

FOR thousands of years the problem of how to carry a baby has confronted the mothers of the world. The custom of conveyance began when a child was carried, frequently for a long distance, on his mother's back. Then a simple means of holding him on was devised—a shawl worn round the mother's shoulders and so folded that the baby could sit inside it. Later grass sacks, rough hand-made baskets and receptacles of bark came into use.

Careful research reveals no use of the baby carriage by the Egyptians, Greeks or Romans. But apparently as far back as the sixth century B. C., the idea of moving a child on wheels had occurred to some one, for we find a painting on an Etruscan vase in the Louvre representing the infant Hermes, messenger of the gods, lying on a small table equipped with miniature wheels apparently in the form of rollers.

Methods of carrying children have differed little in various countries. The babies of ancient Egypt, when too young to walk, were taken out in shawls worn in front, in back or at the side by their mothers or nurses—a custom still retained by the Arabs. An Ethiopian child rode in a basket fastened to his mother's back by a band that passed over her forehead. And the Japanese infant looked at the world from the back of an older brother or sister. The babies of Peru were carried about strapped in cradles like those of Indian papooses.

As time went on, other means of conveying children presented themselves. Wandering tribes of North American Indians found it expedient, in making long journeys, to fasten a papoose to a board at the end of two poles which, attached to the sides of a packhorse, dragged on the ground—a carriage without wheels. Eskimo mothers found that the opening at the top of their high, wide-mouthed seal-skin boots afforded a cozy and convenient place in which



From a painting on an Etruscan vase in the Louvre. The date is 600 B. C.

to tuck a child. In Switzerland women balanced their babies in cradles on their heads, and often walked along knitting industriously. In the Sabine hills of Italy one and sometimes two babies were carried in the same manner in a wicker basket.

In Colonial days in this country the baby carriage seems to have had no part. The first one appeared here in the middle of the nineteenth century, and created a sensation as it was rolled down the streets of New York City.

It is a far cry from the early crude methods of conveyance to the carriages first manufactured in 1858 by the F. A. Whitney Carriage Company. And the contrast is much greater in the commodious coaches of today.

Three generations of craftsmen have fashioned carriages in the plant of the Whitney Company at Leominster, Massachusetts. With skill born of experience, these mechanics, reed and wood workers, and the upholsterers and finishers have developed products of comfort and beauty from the heavy coaches and carts of 1858.

The designers of Whitney carriages have been and are artists; there is a line, a touch—something undefinable—that puts their work beyond copyists. It has been said that a coach created by Whitney has the same distinction as a gown designed by Poiret or Worth.

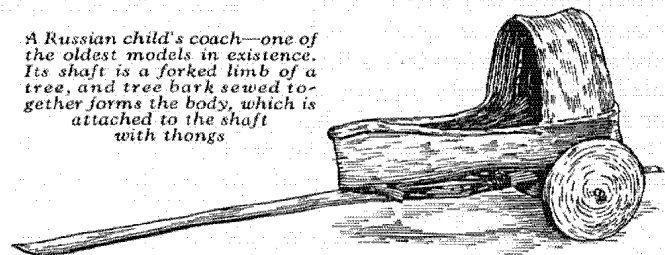
Reed, fiber and wood bodies have "carried" more than three million "Whitney babies"—infants who owe a measure of their good health and success to their daily airings. And two and a half million mothers have carried lighter burdens, for the manufacturer has had them, as well as the children, in mind in producing coaches noted for their light weight and ease of operation.

Baby carriages are often roughly used and subjected to changeable temperature. For this reason the greatest



An African baby on his mother's back

A Russian child's coach—one of the oldest models in existence. Its shaft is a forked limb of a tree, and tree bark sewed together forms the body, which is attached to the shaft with thongs



One of the first coaches made by the F. A. Whitney Company. Most of the work was done by hand, as there was little machinery then in use



An up-to-date model of a Whitney carriage, embodying all the conveniences and refinements that have been developed through seventy years of experience

manufacturing problem has been to find a suitable finish for them—something that would be pleasing to the eye and also be serviceable. The introduction of color and combinations of color caused manufacturers many difficulties, but with the adoption of du Pont Duco, the Whitney

Company has been able to put before the public its entire coach line in fashionable shades. With an improved aluminum and nickel chassis, a body that is comfortable, safe and stylish, and a durable Duco finish, the Whitney carriage of today is the last word in coach refinement.

PYRALIN GOES FISHING

And, in the form of brightly colored bait lures, takes the place of wooden minnows in helping the angler make his catch

As spring approaches, the followers of Izaak Walton begin to get out their fishing tackle and look forward with longing to their first trip of the season. To many of us fishing is an enjoyable sport, and Al. Foss of Cleveland, Ohio, has added something to the pleasure of it.

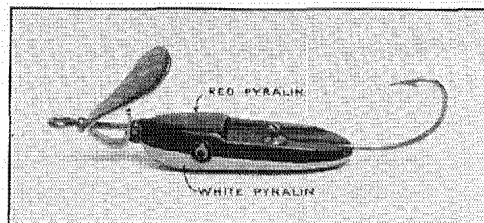
In 1916, Mr. Foss placed on the market two artificial fish lures consisting of a metal spinner and a metal body to which was attached a strip of pigskin. When drawn through the water, these lures resembled somewhat the actions of live minnows.

Although they were better imitations than any others previously made, anglers who saw them displayed in the showcases of the tackle dealers paid little attention to them because they did not look as much like live fish as the gaudily painted wooden minnows. So Mr. Foss looked for a better material from which to make his lures; he selected du Pont Pyralin for the bodies.

The new Al. Foss pork rind minnows are much more attractive than the older wooden ones. And they will also last much longer, for their brilliant colors and polished surfaces are almost indestructible, since Pyralin

is extremely durable. This is an important consideration, for lures are often thrown against rocks and other objects while casting.

Moisture, of course, affected the wooden lures, but those made of Pyralin are impervious to water. Their striking solid colors are a great improvement over those usually put on the wooden surfaces of other types of lures.



The striking colors of the Al. Foss minnow make an attractive combination

These Pyralin products are doubtless well known to many readers of this magazine, for they have been increasingly popular in the past few years. Mr. Foss' business has had a steady growth, and he has recently completed the construction of a new factory and office building in order to supply the demand for his lures.

BETTER PAINT SELLING

The Save the Surface Campaign sponsors a new training course to develop better selling in the paint and varnish industry

A WOMAN was shopping in a paint store. She wanted a suitable wall finish but was in doubt as to the kind to use. The salesman—neat, courteous and intelligent—found out the approximate area of the walls, the present condition of the surfaces, the amount of light the room received, the customer's preference of color, gloss, and the like.

Satisfied that he understood the problem which confronted her, he recommended du Pont Interior Gloss. The salesman also explained the preparation of the surface and the proper application of the material. The customer immediately felt that he was interested in her decorative problem, that his advice was sound.

"If you have a moment, I'd like you to see our unusual display of Duco-finished articles which members of the Women's Club in town have done."

The customer looked at the attractive display and glanced through a Duco booklet which the salesman gave her. Before leaving the store, she bought a can each of Duco Jade Green, Brown and Mandarin Red to finish a waste paper basket, a table lamp and a sewing box respectively. Originally she contemplated buying only a wall finish but the salesman's initiative caused her to remember some articles at home which she could finish with Duco.

To the salesman this was simply one sale among many in a busy day. The customer, however, was much interested in what had taken place because she was one of a corps of investigators sent out early last year by the Business Training Corporation to make a national field survey for the Save the Surface Campaign. As one of the trained personnel who shopped in all types of retail paint and varnish stores, she submitted reports as to how she was received; how her requests were met; how products were exhibited; how questions were answered, and what methods were used to close the sale. On a special rating scale provided for that purpose, both the establishment and the salesmen were given a grade.

By B. A. WILSON

The survey required eight months to complete, and representative communities, large and small, in every section of the country were canvassed. The investigation had one purpose: to get first-hand information on what ideas and methods are proving most successful; how steady trade was built, and how new business was solicited and gained. In no sense was the purpose of the survey a critical one. On the contrary, it was undertaken in order to find out facts which later would prove of value in planning more effective sales methods and procedures.

After surveying retail selling methods, the investigators undertook to interview representative master painters in all parts of the country. A record was kept of what painters said and did in trying to get contracts; how they checked up paint requirements on a job, and how they advised the prospective customer. In addition, the methods of wholesale salesmen of representative manufacturing and jobbing firms were reported completely, and several score sales executives of manufacturing and wholesale paint and varnish companies were interviewed.

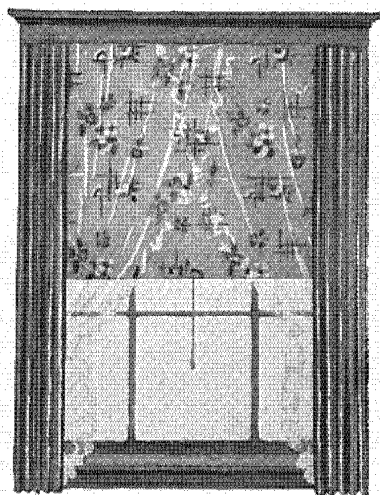
When all the information had been compiled and analyzed, it was organized into a series of three practical sales training courses: "Retail Selling of Paint and Varnish," "Selling Painting and Decorating" and "Selling Paint and Varnish."

The purpose of the first course is to improve over-the-counter paint salesmanship and to insure better service to customers. Ideas for making sales and building up business will be studied from hundreds of first-hand sources.

Newer, more efficient methods must be adopted if the demands of discriminating buyers are to be met. For that reason, those who value sound information and practical guidance are enrolling in the course. It is open to all men in the paint, varnish and allied industries. Enrollment blanks may be obtained from the headquarters of the Save the Surface Campaign, 18 East 41st Street, New York City.



More and more paints and varnishes are being purchased by women. The progressive merchant makes the store an attractive place in which to trade



A figured Tontine shade with pleated Fabrikoid side-drapes

FIGURED WINDOW SHADES OF WASHABLE TONTINE

*They fill a long-felt need for color and add a
final touch to the decorative scheme
of any room*

By MOUNCEY FERGUSON

IT is safe to assume that many a housewife in the past few years, in planning how to make her home more attractive, has looked at her window shades and said: "I wonder why they have to be so negative, so plain."

The trend toward more color for interiors has been growing rapidly, as is evidenced by almost every article of house-furnishing you see today. The kitchen, for instance, which used to be nothing but a dull, drab room, has blossomed out in all the hues of the rainbow, with colored cabinets, colored refrigerators and even colored stoves. Even bathrooms are now made colorful.

It was only natural, therefore, that women should want window shades to play a part in their decorative schemes, and that they should be interested in shades with designs in colors. But heretofore they have had to go without them, hoping that somebody would do something about it.

Now someone has done something about it. To be specific, the Fabrikoid Division of the du Pont Company is offering Tontine figured shades in six attractive patterns—Meadow Brook, Mikado, Amerique, Trinidad, Surrey, and Toyland for the children's room.

Each design consists of a combination of three colors on a soft ecru background. Furthermore, the patterns are on one side of the shade only, which means that while they are part of the decorative scheme inside a particular room, they do not conflict with the uniformity of

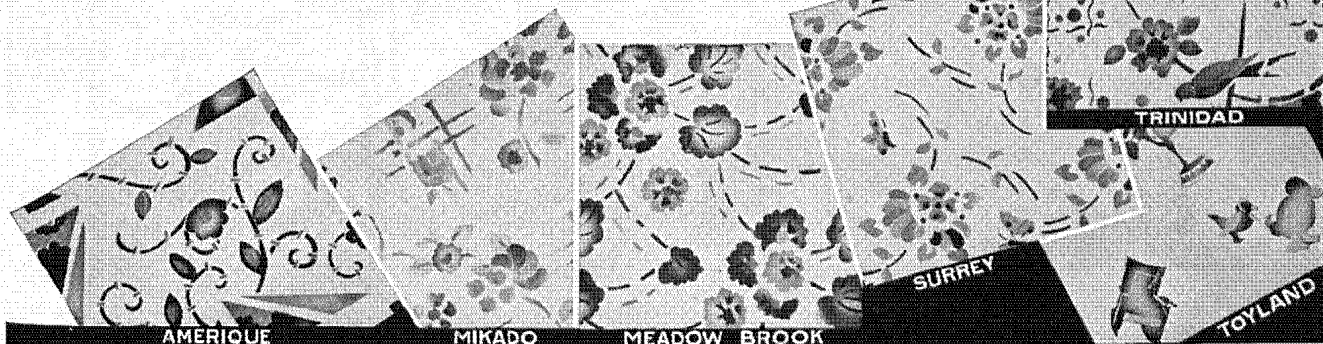
appearance so necessary to the exterior of the house.

Again, while these figured shades beautify the windows by making decorative what was once purely utilitarian, they also make it possible to obtain most interesting windows with less elaborate and fewer drapes or hangings.

Like plain Tontine, these new figured shades are waterproof; rain will not damage or disfigure them. They are washable, too, and can be restored, when soiled, to sparkling newness with soap, water and a brush. Sunlight will not steal the color from them, and they will not pinhole, crack or fray. In other words, they are regular window shades with all the necessary snap and body, and are obtainable in widths up to 54 inches.

If you are interested in learning more about the decorative possibilities of Tontine figured shades, write to E. I. du Pont de Nemours & Company, Inc., Tontine Department, Newburgh, New York, for a new booklet which reproduces the six attractive designs in colors, and also pictures six interesting treatments which are suggested for windows employing Tontine figured shades.

An advertisement in four colors featuring these new shades appears on the back cover of this number.



COLONIAL LOCK-JOINT CHAIRS

This line of furniture—constructed to last a lifetime—is fittingly finished in Duco to withstand the wear and tear of service

YOUR own school days are not so far behind that you have forgotten the tricks you played on teacher in part payment for the times she kept you in at recess. Certainly you will recall the time when you squared the account by pulling out the rungs of her desk chair, so that when she sat down, the rickety old thing gave way and she fell to the floor. Gee, wasn't she embarrassed and angry!

You probably remember that incident every time you sit in a rocking chair with a loose rung that creaks and clicks as you rock back and forth. It's annoying, too, because you have the feeling that the chair may pull the same old trick on you.

A prominent southern manufacturer—the Colonial Furniture Company of High Point, North Carolina—has eliminated the chance of such a misfortune happening either to you or your children's school teacher. This company, realizing the importance of establishing its business and of continuing it on a firm basis, has endeavored to design and construct furniture that is first of all so strong and sturdy that it will give continuous satisfaction through years of service. To do this it employs a patented lock-joint construction. Instead of hastily gluing important joints, the craftsmen use a much safer means known as the mortise and tenon lock joint. For instance, a chair

By J. M. KAVANAUGH

leg is about to be fitted into its socket in a rocker. A steel split rivet is first driven into the end of the leg. When the leg is forced into the rocker this rivet spreads and the points, with a fish-hook action, sink into the rocker—holding the leg securely in place. This vise-like grip "never lets go" and prevents arms, legs, posts, rails and stretchers from becoming loose and squeaking. These rivets bear the same relation to the structural members of the chair as steel reinforcement does to concrete.

Particular attention is given to the artistic designing of pieces that will readily lend themselves to the requirements of interior decoration and personal tastes. Every woman is naturally proud of her home and will appreciate the valuable assistance that good furniture can give her in the working out of a decorative scheme in accord with the dictates of fashion. Colonial-built chairs have justly been called a boon to interior decoration because of their dignity, beauty of design and finish.

All chairs are constructed of Canadian birch wood and are finished with Duco. Birch is used because of its stiffness, hardness and strength. It is superior to the average hardwood in toughness and its texture is even—the grain being fine and close. The outstanding quality of birch, however, is its adaptability to superior finishing. With



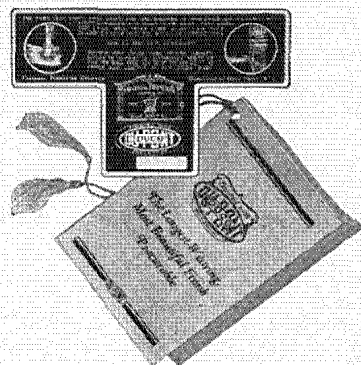
A group of chairs selected from more than a hundred available designs made by the Colonial Furniture Company

proper staining and the use of the Duco system of finishing, it is possible to produce a mahogany finish so nearly like that of genuine mahogany that only an expert can tell one from the other. The rich brown tones of American walnut are also beautifully reproduced on this wood. Even in the natural wood—with its own rich coloring beneath the sheen of the Duco finish—birch is unusually pleasing.

The outstanding qualities of this furniture offer an unusual appeal to the dealer as well as to those interested in the purchase of new furnishings. In its endeavor to build a superior product, the Colonial Furniture Company adopted Duco finish as a fitting complement to fine construction features. Its velvety sheen added to the natural beauty of the wood and its imperviousness to wear and tear mean longer life and enduring beauty.

In addition to the loosening of the rungs in the ordinary wooden chair, perhaps the greatest disappointment to the housewife is the unsightly printing of the finish—particularly in hot weather. Duco does not print, get sticky or turn white from body heat and perspiration. This finish is hard to mar and is not easily scratched or scuffed from handling in the warehouse or in every-day service in the home. The scratching of chair finishes by buttons has been

another source of grave disappointment to furniture owners and the cause of frequent refinishing. Because of its inherent toughness, Duco has practically eliminated this hazard. All one has to do in order to clean a Duco-finished Colonial chair is to rub it with a damp cloth and then polish with a soft, dry cloth to bring out the luster of the finish and show to advantage the natural tones of the wood.



A Duco seal and tag identify each piece of Colonial furniture sold

The Colonial Furniture Company makes a chair for every nook and corner of a room. The line includes a varied selection of chairs and tables fashioned to insure the utmost in comfort and utility, whether in the home, in a church, tea room, restaurant, hotel or club. After years of specializing in the making of Windsor and Colonial-type chairs, the company now has a selection of over a hundred designs to offer. In addition, the line also includes upholstered chairs and custom-built furniture that can be made up in various styles.

To assure the public that Colonial chairs are finished in Duco, the company identifies every piece by means of a seal and tag which are illustrated on this page. Certainly that evidences the company's good faith and pride in its craftsmanship and is the insurance of lasting satisfaction to the ultimate purchaser.

HOW HARD IS A ROCK?

(Continued from page 10)

by replacing the steel ball with a cylinder of clear crystalline quartz, ground to a hemisphere at one end, so that it was possible to examine films by looking down through the cylinder and observing the circle of contact between the hemisphere and the film.

The present device, as illustrated, consists of a platform to hold the plate which is coated with the film to be tested. Above it is a brass arm suspended by a pivot at one end and counterbalanced by a weight. On this arm at the center is a cylinder of clear quartz about one-half inch long and one-fourth inch in diameter. By placing weights in position on the arm, the hemispherical end of the quartz is forced into the film. The diameter of the circle of contact is observed by means of a microscope, equipped with a micrometer eye-piece which is accurate to one-thousandth of a millimeter. Light from a 6-volt lamp is reflected down through the cylinder to illuminate the film and to facilitate reading.

To illustrate the use of the instrument, hardness determinations of four different products are shown in the following tabulation, after test periods of 6 hours, 24 hours, 48 hours and one week. The figures in the columns represent the weight in grams necessary to produce a

circle of contact four-tenths of a millimeter in diameter.

	6 hrs	24 hrs.	48 hrs.	1 week
Prepared Paint.....	-1	-1	-1	5
Spar Varnish.....	-1	14	17	23
Rubbing Varnish.....	-1	132	440	650
Brush Duco.....	98	292	480	980

The above data show that this instrument can be used for satisfactorily evaluating the hardness of varied types of protective coatings. Incidentally, you will note how quickly Brush Duco hardens as compared to other products.

The development of the Pfund hardness tester marked a forward step in applying scientific knowledge to the problems of the paint and varnish industry. Instruments of this kind are used daily at the Experimental Station near Wilmington, and also at the Central Technical Laboratory in Philadelphia. They are indispensable in making comparative tests both in the development of new products and in maintaining the high standards of existing products. Other units of laboratory apparatus for testing the properties of paint films will be discussed in a subsequent number of this magazine.

AMERICA'S LONGEST RAILROAD TUNNEL

(Continued from page 5)

of speed capable of developing full capacity at any speed without waste of power.

Power is obtained from the Puget Sound Power & Light Company and comes from three general sources: first, the power company's system on the West Coast; second, Lake Chelan, and third, Tumwater Canyon. These sources are all connected up and give unusual assurance of continuity of supply. Two transmission lines are used to protect against interruption of power supply through accident to one of the lines.

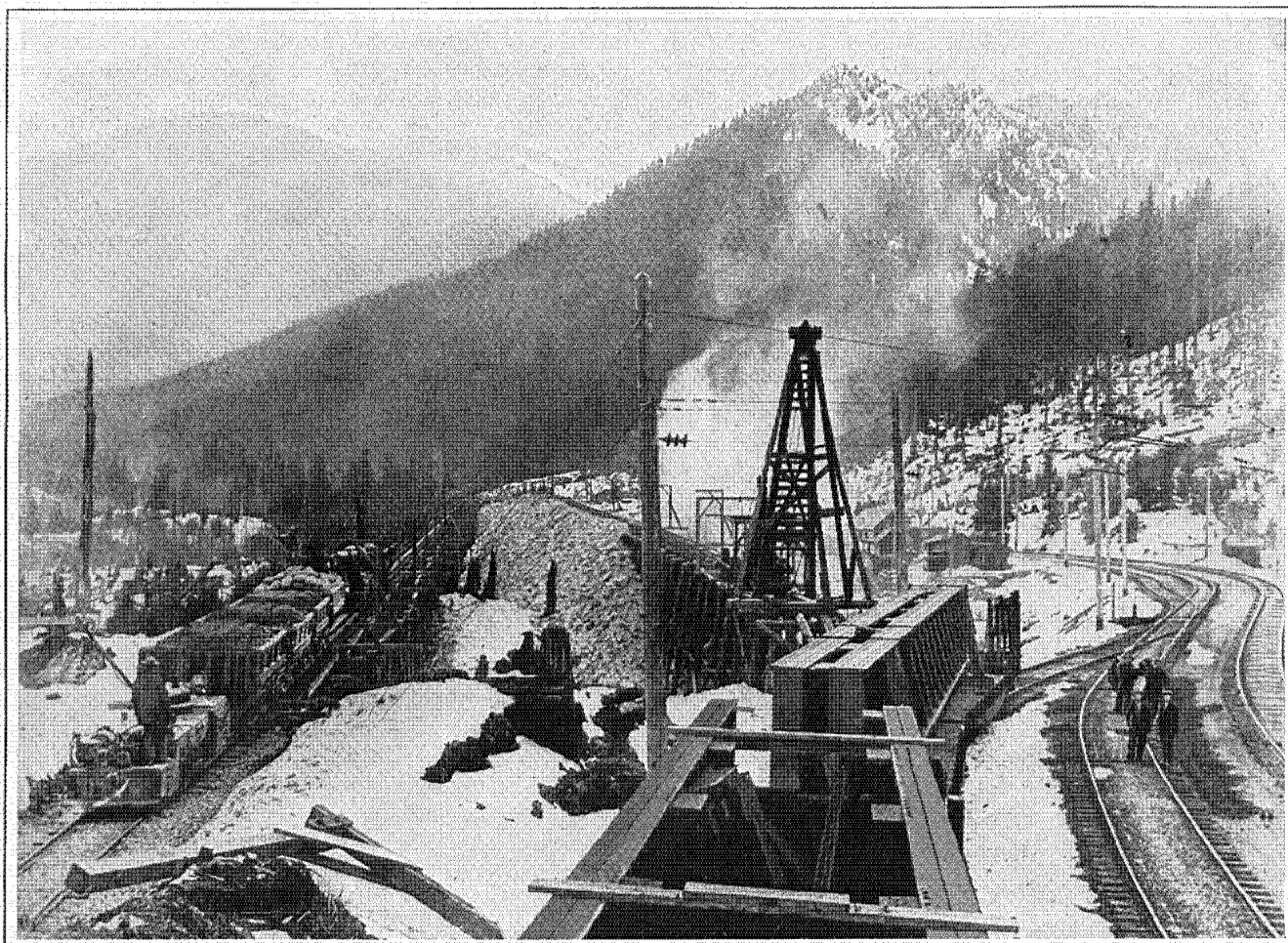
SIGNIFICANCE OF IMPROVEMENTS

The completion of the new tunnel and of thirty-four miles of easy, high-speed track replacing forty-three miles of steep and winding mountain line, together with the electrification of 75 miles of road, marks a great step forward in bringing the West Coast closer to the East. These improvements eliminate from operation the problems incident to crossing a mountain barrier, and will expedite the flow of commerce and contribute to the

comfort of travelers, as well as save time. Trains will cover the distance between Seattle and Spokane on shorter schedules than ever before.

While these savings and advantages over a period of years will repay the cost and carrying charges of the improvements, the public as well has a vital and immediate interest in these and all similar improvements in the nation's transportation facilities. Such improvements constitute an elemental achievement that fixes shorter distances and lower grades, and these in turn set up new standards of performance, resulting in benefit to all who are affected by the advancement of transcontinental transportation.

Completion of this magnificent threefold improvement project is a source of the greatest satisfaction to the directors and officers of the railway company, because it brings the Cascade Mountain district up to the standard of operating efficiency on the other divisions and realizes a cherished ideal of James J. Hill, in whose mind the Great Northern Railway, as it is today, was conceived.



A scene near the west portal of the tunnel, showing the old and new routes of the Great Northern



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

General Executive Offices, WILMINGTON, DELAWARE

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

ACIDS, HEAVY CHEMICALS

Acids, alums and miscellaneous heavy chemical products.

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

AMMONIA

Aqua and Anhydrous

Lazote, Incorporated
Wilmington, Del., Du Pont Building
National Ammonia Company, Inc.

Cylinders and Drums

New York, N. Y., 81 Fulton Street
Philadelphia, Pa., Frankford P. O.
St. Louis, Mo., 3600 Broadway

CHEMICAL PRODUCTS AUTOMOTIVE FINISHES

*Duco for the Automotive Industry.
No. 7 Duco Polish, No. 7 Auto Top Finish,
No. 7 Nickel Polish, No. 7 Touch-up Black.*

Chicago, Ill., 2100 Elston Avenue
Detroit, Mich., General Motors Building
Flint, Mich.
Parlin, N. J.
San Francisco, Calif., Balfour Building
351 California Street

INDUSTRIAL FINISHES

*Bronze powders, collodion, Household Cement,
leather belting cements, Duco, Split and patent
leather solutions, pyroxylin preparations and
solvents and a complete line of finishing materials
for all industrial purposes.*

Boston, Mass., Everett Station 49
Chicago, Ill., 2100 Elston Avenue
Parlin, N. J.
San Francisco, Calif., Balfour Building
351 California Street

CELLOPHANE

Du Pont Cellophane Company, Inc.
*Cellophane—Sheets and rolls. Cellulose caps and
bands (formerly Capes-Viscose, Inc.). Visking
Cello-Tubing (Visking Casings).*

New York, N. Y., 2 Park Avenue
Boston, Mass., Little Building
80 Boylston Street
Chicago, Ill., State Bank Building
120 South LaSalle Street
San Francisco, Calif., Balfour Building
351 California Street

DYESTUFFS

*Dyestuffs and dyestuff intermediates.
Rubber chemicals.*

Boston, Mass., 274 Franklin Street
Charlotte, N. C., 232 W. First Street
Chicago, Ill., 1114 Union Trust Building
New York, N. Y., 8 Thomas Street
Philadelphia, Pa., 126 S. Front Street
Providence, R. I., 709 Hospital Trust Bldg.
San Francisco, Calif., Balfour Building
351 California Street
Bombay, India, Jacob Sassoon Building
Rampart Row, P. O. Box No. 1010
Kobe, Japan, No. 83 Kyomachi
P. O. Box No. 384
Hankow, China, No. 23 Tung Ting Road
Shanghai, China, Robert Dollar Building
3 Canton Road, P. O. Box No. 393
Tientsin, China, 52 Taku Road

SEED DISINFECTANTS

Bayer-Semesan Company, Inc.
New York, N. Y., 105 Hudson Street

MOTION PICTURE FILM

Positive and Negative.

Du Pont-Pathé Film
Manufacturing Corp.
New York City, 35 West 45th Street
Hollywood, Calif., 1056 N. Cahuenga Avenue

EXPLOSIVES

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

Birmingham, Ala., 601 Brown-Marx Bldg.
Bluefield, W. Va.
Boston, Mass., Room 404 Charles Chauncy
Building, 38 Chauncy Street
Chicago, Ill., 1814 McCormick Building
Cleveland, Ohio, Guardian Building
Denver, Colo., Midland Savings Building
17th Street and Glenarm Place
Duluth, Minn., Hartley Building
742 E. Superior Street
Huntington, W. Va., Suite 1004 Union Bank
and Trust Company Building
Joplin, Mo., 816 Joplin Nat'l Bank Building
Juneau, Alaska, Room 503 Goldstein Bldg.
Kansas City, Mo., 210 Scarritt-Arcade Bldg.
Miami, Florida, 305 Clark Building
343 S. W. North River Drive
New York, N. Y., Graybar Building
420 Lexington Avenue
Pittsburgh, Pa., Clark Building
Seventh Street and Liberty Avenue
Portland, Ore., American Bank Building
Pottsville, Pa.
St. Louis, Mo., 17th Floor, Arcade Building
San Francisco, Calif., Suite 403 Balfour Bldg.
351 California Street
Seattle, Wash., Hoge Building
2d Avenue and Cherry Street
Scranton, Pa., 710 Traders Bank Building
Spokane, Wash., 721-22 Old Nat'l Bank Bldg.
Riverside Avenue and Stevens Street
Springfield, Ill., 716 Reisch Building
Wilkes-Barre, Pa.
728 Second National Bank Building

FABRIKOID

*Fabrikoid for auto and furniture upholstery; auto
topping, bookbinding, luggage, novelties, etc.
Tontine Washable Window Shade Cloth.*

Chicago, Ill.
Fabrikoid Office, 840 No. Michigan Ave.
Tontine Office, 1411 So. Michigan Ave.
Detroit, Mich., 5-236 General Motors Bldg.
Newburgh, N. Y.
New York, N. Y., 21 East 40th Street
San Francisco, Calif., Balfour Building
351 California Street

RUBBER PRODUCTS

*Pontop for auto tops and curtains. Raincoat
fabrics, Rug Anchor, Ventube for mine ventila-
tion. All kinds of rubberproofing.*

Chicago, Ill., 840 No. Michigan Avenue
Detroit, Mich., 5-236 General Motors Bldg.
Fairfield, Conn.
New York, N. Y., 21 East 40th Street
San Francisco, Calif., Balfour Building
351 California Street

RAYON

Du Pont Rayon Company, Inc.
New York, N. Y., 2 Park Avenue
Buffalo, N. Y., P. O. Station B
Greensboro, N. C.
708 Jefferson-Standard Building
Greenville, S. C., 408 Woodside Building
Old Hickory, Davidson Co., Tenn.
Philadelphia, Pa.
1209 Land Title Building
Providence, R. I., 941 Hospital Trust Bldg.
Reading, Pa., 31 N. 6th Street
San Francisco, Calif., Balfour Building
351 California Street
Mexico City, Mexico, Edificio Cidosa
Uruguay 55, Cuarto 218

LITHOPONE, DRY COLORS AND PIGMENTS

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

Boston, Mass., Everett Station 49
Chicago, Ill., 2100 Elston Avenue
Cleveland, Ohio, 1724 Union Trust Building
Los Angeles, Calif., 2034 Bay Street
Newark, N. J., 256 Vanderpool Street
Philadelphia, Pa., 3500 Gray's Ferry Road
Portland, Oregon, 15th and Johnson Streets
San Francisco, Calif., 274 Brannan Street
Seattle, Wash., 1518 First Avenue, South

PAINTS, VARNISHES, DUCO (FOR HOME USE)

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

Boston, Mass., Everett Station 49
Brooklyn, N. Y.
Building No. 26, Bush Terminal
Chicago, Ill., 2100 Elston Avenue
New York, N. Y., 21 E. 40th Street
Philadelphia, Pa., Public Ledger Building
Independence Square
San Francisco, Calif., Balfour Building
351 California Street

PYRALIN, LUCITE AND VISCOLOID

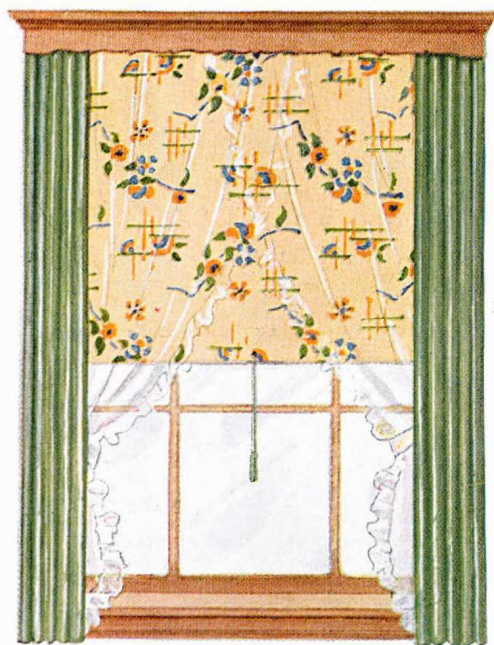
*Pyralin toileware and the new Lucite boudoir
accessories. Novelty and transparent sheeting,
rods, tubes and beading. Also Cleanable
Collars.*

Du Pont Viscoloid Company, Inc.
New York, N. Y., 330 Fifth Avenue
Pyralin and Lucite—Arlington, N. J.
Viscoloid—Leominster, Mass.
Boston, Mass., Room 404 Charles Chauncy
Building, 38 Chauncy Street
Chicago, Ill., North American Building
San Francisco, Calif., 745 Mission Street

PYROXYLIN TOYS AND NOVELTIES

Pacific Novelty Division
Toys, rattles, infant sets, hair ornaments.
New York, N. Y., 330 Fifth Avenue

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



MIKADO
DESIGN

Now in Figured Designs

Tontine washable window shades

take on added smartness

Du Pont develops special all-over patterns to give your home new brightness... new color harmony

FOLLOWING the definite style trend toward more colorful home decoration, the du Pont Company has recently developed and now offers to homemakers these lovely new figured window shades in Tontine. Now, for the first time, you may purchase washable Tontine figured window shades which will complete any desired decorative scheme.

These Tontine shades are figured on one side only, the other side being plain. This allows you to complete a colorful decorative scheme inside, without affecting the uniform appearance of the outside.

An occasional washing allows the home equipped with Tontine to enjoy clean shades always. For Tontine window shades wash *clean*. A scrubbing with soap and water immediately restores their original beauty.

Tontine window shades do not fade, crack, pinhole or fray. Pyroxylin, the same basic substance used in making the famous du Pont Duco, gives them resistance to sun, rain and rough handling.

You can get Tontine window shades in a wide range of lovely colors, in the

new figured designs, in widths up to 54 inches, or plain, or in the corded effect so extremely popular. For best results—also ask for Tontine Rollers.

A Sample Tontine Figured Shade for \$2.50

To convince you of the beauty of these new figured Tontine washable window shades we will make you a special offer



All Tontine shades, figured or plain, can be washed clean—freed from every trace of dust and stain with soap, water and a brush.



TONTINE

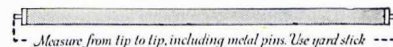
THE WASHABLE WINDOW SHADE

of one Tontine shade in any of the above illustrated designs at \$2.50—*any width up to 40 inches*. This offer is special and for a limited time only (closes June 1st)—to acquaint you with the merits of Tontine shades. We are offering this sample shade at considerably below the regular retail price. We therefore can send only one shade to each home.

Take measurements according to the instructions below. Enclose \$2.50 (cash or check) and mail the coupon to us today.

Follow these details carefully

Take shade down from brackets and measure exact width tip to tip including metal pins at each end of roller. (See diagram.) Measure also length of shade unrolled. Specify which pattern wanted: Mikado, Amerique, Trinidad, Toyland. Fill out coupon fully. Enclose \$2.50.



E. I. DU PONT DE NEMOURS & CO., Inc.
100 Du Pont Avenue, Newburgh, N. Y. D. M. — Mar.
Canadian subscribers: address coupon; Canadian Fabrikoid Limited,
New Toronto, Ont., Canada.

This Coupon not good for a Shade over 40 inches wide. This coupon not good after June 1st, 1929.

Herewith \$2.50. Please send me complete TONTINE Figured Shade inches wide, tip to tip, and inches long (shade unrolled).

Mikado ☐ Amerique ☐ Trinidad ☐ Toyland ☐

Name.....

Address.....