THE DU PONT MAGAZINE



AUGUST 1929

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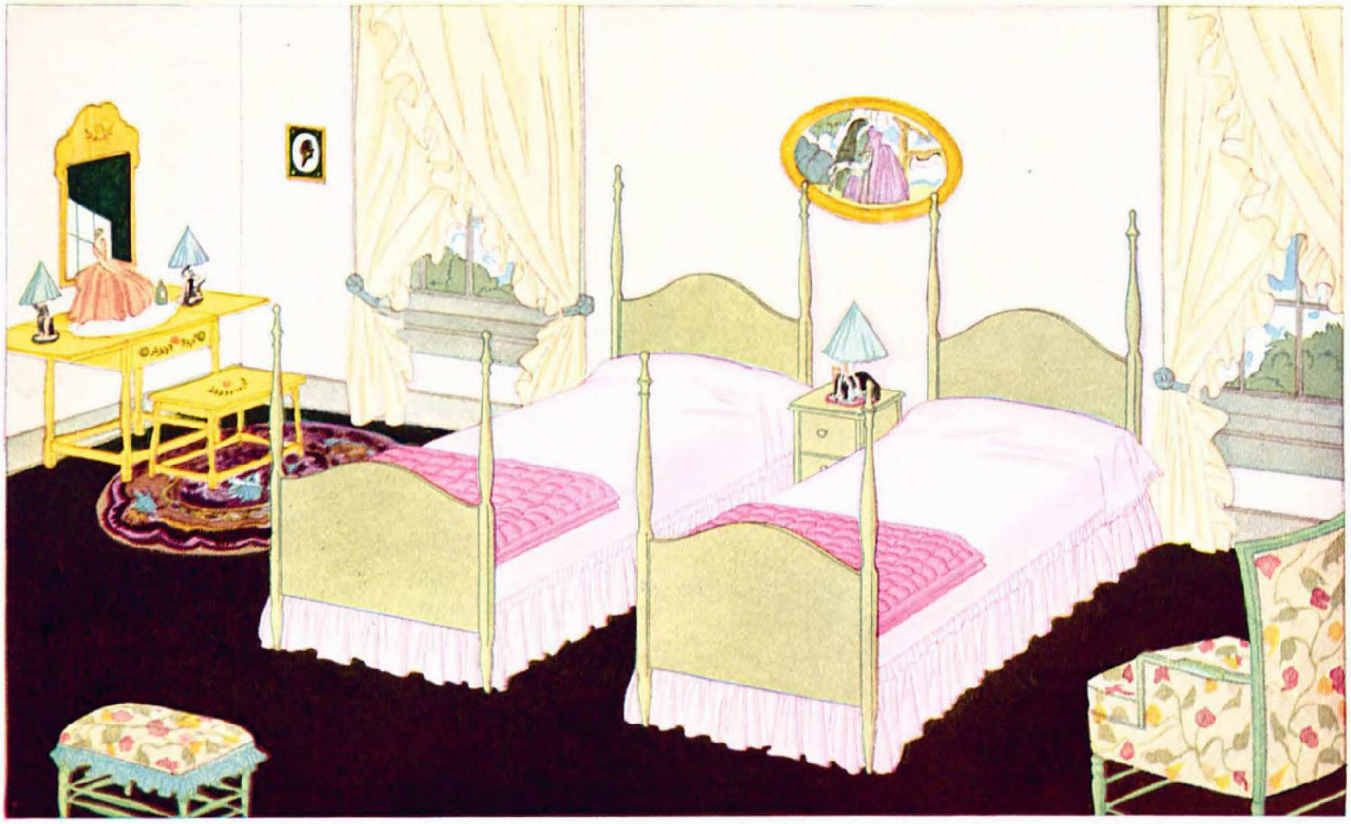

Fresh, Gay Summer Beauty — with DUCO

THE cool, fresh color scheme of this charming bedroom is suggested by Elsie Sloan Farley, noted interior decorator.

"For the beds and nightstand," says Miss Farley, "I have selected Duco Nile Green—lovely against the pink and white stippled wall of du Pont Flat Wall Paint and quite perfect with the deep green of the plain carpet and the chintz of the upholstered chair and stool.

"For the dressing table and bench I used Duco Canary Yellow, with decalcomania transfers in pastel shades. And then, for the mirror and picture frames, Duco Gold. Bedspreads of soft pink with comforters in a soft wine shade... curtains of tea-colored organdie with tie-backs of turquoise blue ... lamp shades and accessories in pastel shades—these completed the color harmony of as lovely a room as I ever planned."

This is but one of the many delightful color schemes that you will find in the new decoration book, "Modern Color Schemes for Your Home," which gives color suggestions for both the exterior and interior. Written by well-known architects and decorators in collaboration with the du Pont Home Decoration Service, it is your authentic guide to charming color effects. Use the coupon for your copy.

DUCO

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The
DU PONT
MAGAZINE

VOL. XXIII AUGUST, 1929 No. 8

THE AGE OF SPEED

In this fast-moving world of ours Industry follows the Shakesperian precept . . .
"'twere well it were done quickly"

ECONOMISTS tell us that the production of wealth is the process of increasing utility, and time is a factor in that. Say what you will about present-day methods, the fact is, the machinery of civilization is geared to go.

Industry is vitally concerned with r. p. m. Bankers strain to secure maximum turnover of funds for investment just as merchants do to move rapidly their stocks of goods. Contractors and builders push through their work projects on time schedules. Railroads pull more freight more miles per day than ever before, and only a few weeks ago transcontinental air-rail service was established to carry passengers from the Atlantic to the Pacific in jig time. Millions of motorists, whether on business or pleasure bent, are "stepping on the gas."

Science and invention have helped greatly to speed up production facilities, but what prompts comment here is the fact that the du Pont Company and its associated organizations are supplying numerous products that accelerate the processes of industry.

Consider explosives, for example. A well-placed charge of black powder or dynamite can accomplish in a split second tasks that would require days and perhaps weeks of labor with hand tools. Industrial America could never have advanced rapidly without the aid of explosives.

Fabrikoid was first developed to take the place of leather for certain uses when that product became scarce and costly. The use of pyroxylin-coated fabrics relieved that situation and also speeded up the manufacture of many articles formerly made of leather.

Ivory, jade, pearl, tortoise-shell and other semi-precious materials used in industry were obtained with great difficulty. The time spent in finding them, plus heavy transportation costs, placed them in the luxury class. Moreover, they were not easy to fabricate. The development of pyroxylin plastics gave to the world materials very like nature's own in appearance, but with better physical properties. Articles made of Pyralin and Viscoloid are now relatively inexpensive. The use of these chemically-made materials has speeded up production.

Time was when all dyestuffs were extracted from natural products. Some of them were transported half way around the earth to market. In India, thirty years ago, nearly a million acres of land were devoted to growing the indigo plant. Tyrian purple was obtained from sea mollusks; scarlet, from a tropical bug. The color industry moved slowly until chemists learned how to make dyestuffs synthetically from coal tar by quicker methods. The du Pont Company manufactures large quantities of organic dyestuffs—products of greatly increased utility.

The silkworm takes its time to produce silk fiber, but transportation agencies work fast to get it to market. Baled silk from the Orient is rushed across the Pacific, loaded in trains that burn the rails from Vancouver to New York City. Meanwhile, rayon is being produced quickly and in great volume in the United States, emphasizing again time-saving economies. Du Pont rayon has stimulated the production of textile fabrics.

Before the development of du Pont Duco, finishing automobile bodies with paint and varnish products required many days' time. Several coats had to be applied. Quick-drying Duco enabled automotive manufacturers to speed up their output. Pyroxylin-type finishes today are standard throughout the industry, because of their great durability and the time saved through their use.

For years the process of vulcanizing rubber has been hastened by adding certain inorganic compounds to the rubber-sulphur mixture. More recently chemists have developed organic compounds which further speed up the process and also yield products with greatly improved physical properties.

Various other products—once obtained by chemically treating raw materials from far-away sources—are now made synthetically in du Pont plants, all of which results in improved products, faster production and quicker deliveries in keeping with the tempo of the times.



Airplane view of the harbor of Callao, Peru, before the present development work was started

THE NEW CALLAO PORT WORKS

Terminal Leguia, a $6,000,000 harbor improvement project, will provide docking facilities for deep-draft vessels. The plan includes extensive breakwaters and concrete piers

By RANDALL CREMER
Vice-President
Frederick Snare Corporation

CONSTRUCTION has already been started on what promises to be the most important modern harbor development on the west coast of South America. This terminal, as planned, represents the latest evidence of the progressive policy of President Agusto B. Leguia of Peru in promoting extensive public works on a basis of maximum advantage to the entire country. The president himself has been the moving spirit in bringing about this great harbor-modernization program which quite properly bears his name.

Callao has the oldest and one of the best harbors on the Pacific side of the southern continent. It is of great importance as a port, serving as it does not only the leading cities of Callao and Lima, but also the rich agricultural country of the coastal plain and valley of the Rimac River, and rich mining country in the interior served by the Central Railroad of Peru. Although not subject to severe storms, this section of the coast, on account of the continuous ground swell, presents many difficulties in discharging vessels by means of lighters. Situated on the mainland and protected from the sea by two small islands, Callao affords one of the few havens for shipping along a coast that is otherwise practically devoid of shelter all the way from Guayaquil to southern Chile.

In 1887 the present port works were constructed by a French company under an exclusive concession, which has since expired, for conducting the business of the port. These works consist of a sea wall in the lee of which is a small system of piers laid out in the form of an "E," built of stone and concrete blocks, so located as to give free access to small ships and lighters. Provision was made for a depth of only 20 feet of water so that larger vessels are obliged to anchor well off shore and handle cargo by means of lighters. (See airplane view of the present port facilities.)

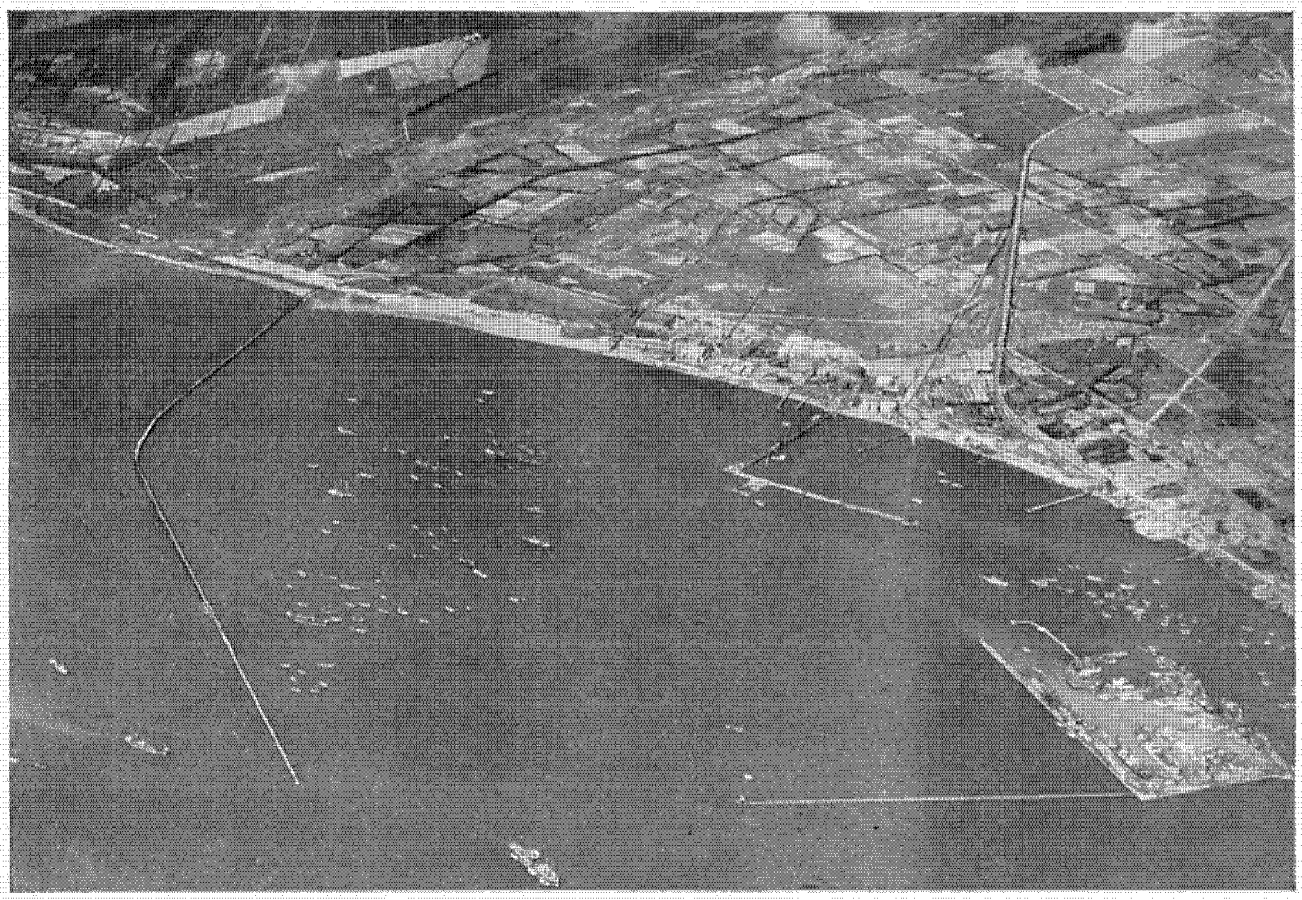
With the prosperity which Peru has enjoyed, it became evident some years ago that the port facilities at Callao were becoming utterly inadequate. In 1914, therefore, after considerable public agitation, a Dutch engineer,

Mr. J. Kraus, was engaged to make a survey and draw up recommendations for the improvement of the port with a view to furnishing facilities for docking large ships. In due time a very comprehensive report was submitted, but on account of the outbreak of the World War nothing was done to carry out the recommendations offered by Kraus. Subsequently, two different sets of plans were offered by American promoters, who agreed to develop the port, provided concessions were granted them to operate the improvements for a period of years. Nothing, however, resulted from these proposals on account of the wish of President Leguia that whatever financial advantage might accrue from the development of a modern port should be for the benefit of the entire country.

With this in view, the Frederick Snare Corporation, of New York, was invited, during the spring of 1927, to make a new investigation and report, recommending such improvements as were considered necessary and commensurate with the probable future development of the port. On the basis of this report a contract was afterward drawn up with this well-known firm of contracting engineers, providing for the construction of the port works based on their plans as submitted with various modifications suggested by the Government.

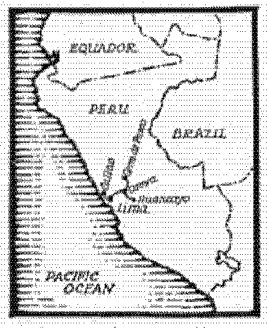
The present plans provide for two long breakwaters converging from a point three kilometers apart on shore toward an entrance 450 feet in width at the outer extremities. A bulkhead approximately 2,000 feet long is to be built inside the basin protected by the breakwaters at a distance of approximately 1,000 feet from shore and parallel thereto. Four parallel piers 100 feet wide by 600 feet long were originally planned to extend into the basin area from the bulkhead. The two center piers have since been increased to a width of 282 feet. On each of the wide piers are to be erected two warehouses to serve as storage as well as customs houses. The two outside piers are to have open docks without buildings and are designed for the handling of heavy materials such as copper and ores, machinery, rails, ties, lumber, and the like.

A channel 37 feet deep and 450 feet wide is to be dredged from deep water in the outer bay through the entrance and in to the center slip between the wide piers. Inside the breakwater entrance the dredging is to be widened to the full width of the bulkhead construction but carried to a depth of only 32 feet outside the limits of the 37-foot channel. The dredged material is all to be placed between the bulkhead and the shore line, the area being enclosed for this purpose to the north and south by dykes of rock dumped in place from trestles.



This view of the harbor was taken March 29, 1929. Note the breakwaters extending out from the shore line

In this way an area of approximately 1500 hectares—equivalent to more than 5¾ square miles—will be reclaimed in the bay and this space made available for railroad yards, store houses, silos and so on.



Showing the general location of the development of Callao Port

A comprehensive system of railroad tracks will connect all piers with the railroad yards on shore, which will form an integral part of the railroad terminal serving both the Central Railroad of Peru and the Empresas Electricas Asociadas. A complete system of concrete roads and streets will also be built on the reclaimed land connecting the piers and bulkheads with the shore and linking them with main highways to the center of Callao and Lima.

Construction of the breakwaters has already been started. For this work it was necessary to build a standard-gauge railroad approximately five miles long to a quarry north of the harbor, crossing the Rimac River with a trestle about 1,000 feet long. Trap rock will be blasted, loaded on cars by means of steam shovels, transported to the site in trainloads and dumped into place in the bay from temporary timber trestles extending out into the water. The type of construction adopted for the breakwater consists of a main core filled in with rock of all sizes from the regular run of the quarry and paved with large pieces of rock placed on the slopes by means of derricks. The crest of the breakwater will be maintained at an elevation about one meter above high water.

The contract price for this work will be approximately six million five hundred thousand dollars, depending to some extent on the actual quantities of materials entering into it.

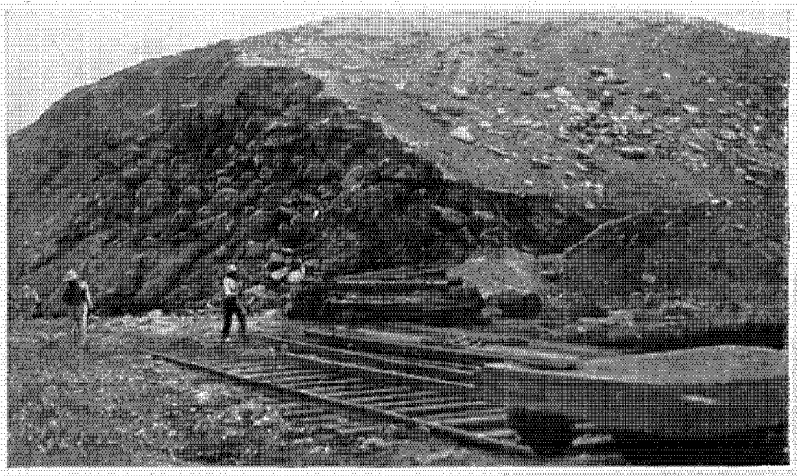
Under the direction of several of their most experienced engineers and superintendents, and with the aid of the most modern mechanical equipment, the contractors expect to complete the entire project by the winter of 1931–32. They plan to complete the two uncovered piers, making them available for use within two years from date. Upwards of 1500 men will be employed on the work.

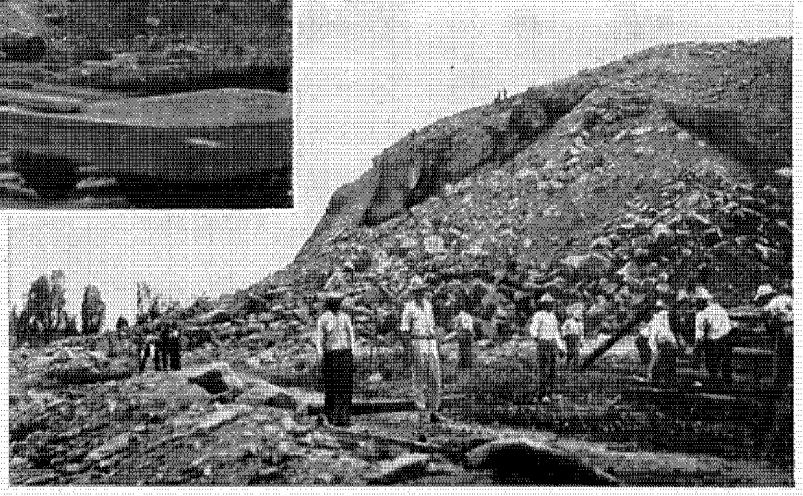
This great development will undoubtedly prove a tremendous boon to the commerce of Peru and to the general development of the country, particularly of the territory adjacent to Lima. The country has embarked on the construction of an extensive highway system, portions of which, such as the main roads between Callao and Lima, have been constructed on a most substantial scale.

The Central Railroad of Peru connects the coast with Oroya on the east slope of the Andes, where are located the smelters of the Cerro de Pasco Copper Company, with an extension running south to Huancayo and other points. The Cerro de Pasco Railroad connects Oroya with the copper mines at Cerro de Pasco and Morococha. In point of altitude above sea level the Central Railroad of Peru is the highest standard-gauge railroad in the world.

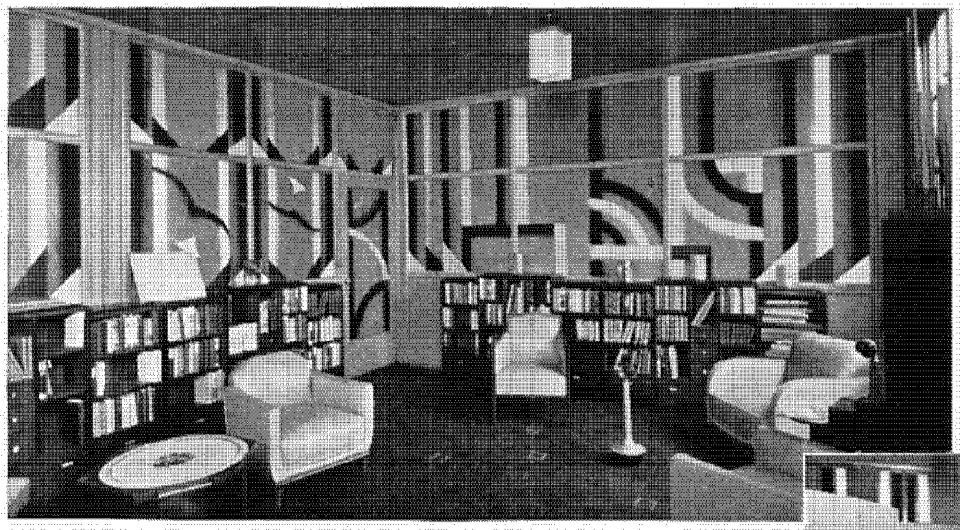
During the term of office of President Leguia, Peru has enjoyed a degree of prosperity never before known in her history. During the past ten years she has developed in a marvelous manner and continued prosperity bids fair to place her in a preeminent position among the countries of South America.

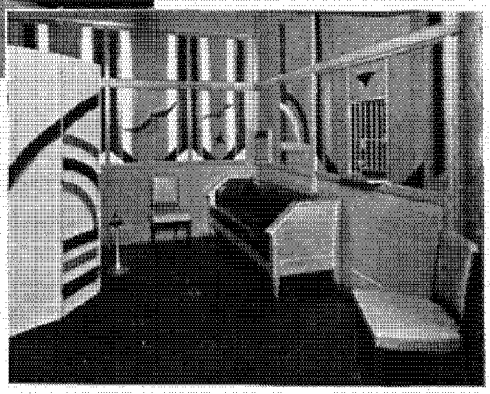
Editor's Note: Work of the kind referred to in this article involves a great deal of rock excavation. Du Pont explosives are being used by the contractor.





Above—Just before a blast that will bring down trap rock to be used in building the breakwaters. Right—After the shot. The rock is transported from the quarry by train to the site of the work, where it is dropped into place in the bay from trestles extending into the water





Reception rooms for the clients of the H. Wolff Estate, New York City, Fabrikoid and Duco are used throughout these rooms to give the striking effect in design and color that is in keeping with the bindings of the books displayed

NEW DECORATIVE ART IN THE BINDERY

Fabrikoid plays an important part in the decoration of a salon moderne in a book bindery

By F. R. Price

THE edition bookbindery has passed from the stage of the small workshop of the hand craftsman to that of the modern industrial manufacturing concern, producing hundreds of thousands of books by machine methods. Modern bookbinding materials, modern methods of production and distribution have brought about a new era in this business.

Manufacturers have turned to the thought and study of style as a means of injecting an appropriate appeal in their products. Fabrikoid and new synthetic materials now permit the creation of new decorative effects to enhance the physical appearance of the book, and new lithographic processes, new styles of typography, help to enhance the decorative character of the pages.

Today, the binding is carefully selected in accordance with the subject and contents of the book itself. The binder has sought the creative-artist to provide the designs appropriate for his editions.

He has also taken cognizance of the fact that good merchandise, well presented, is half sold—a lesson to be learned from the department store merchant and the exclusive fashion goods shop manager. Style in any product must be provided with an attractive setting, else its effectiveness of appeal may be lost.

Realizing that attractive offices or sales rooms are no more out of place in a bindery than in any other merchandising establishment, the executives of the H. Wolff Estate, New York City, have provided a salon moderne for the convenience of their clients. Visitors may discuss editions in these new reception rooms, amid comfortable and modern surroundings.

In creating these interiors no sacrifice has been made to the practical utility of the furnishings, simply for the sake of achieving a display effect. Fabrikoid and Duco are used in this modern interior because of their utility value and because they lend themselves so well to the execution of the decorative ensemble. Incidentally, these same products are used in producing the bookbindings.

The illustrations show the use of the modern geometrical motif in the decorative design of the walls, which also suggests the theme used in creating the design of the new bookbindings. Duco applied by the air-brush method provides the medium for the predominating French blue, silver and black lines and curves making up this wall design and color scheme.

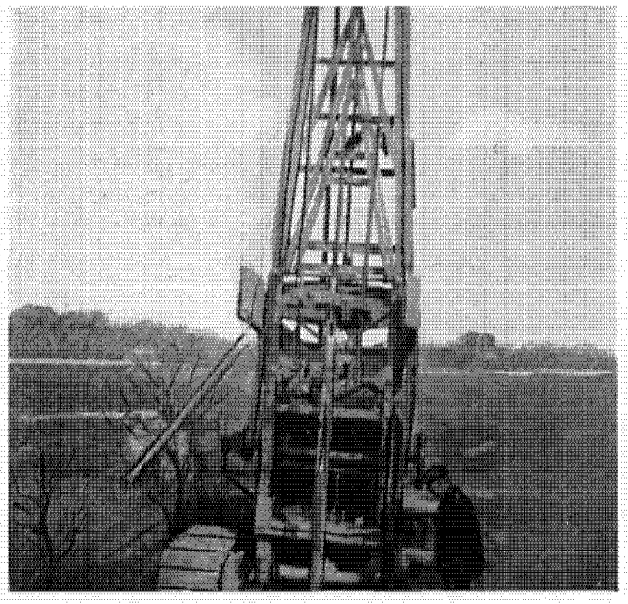
Black Duco-finished book shelves arranged against the walls provide an attractive background for the display of the volumes with their colorful bindings of Fabrikoid. Comfortable chairs, upholstered in silver Fabrikoid, are in keeping with the modern feeling of the room. Convenient tables and accessories, finished in black Duco, are designed for practical utility and comfort.

The salon moderne provides an attractive setting for presenting modern book products and indicates the growing tendency of industry to take advantage of beauty in forms appropriate for merchandising plans.

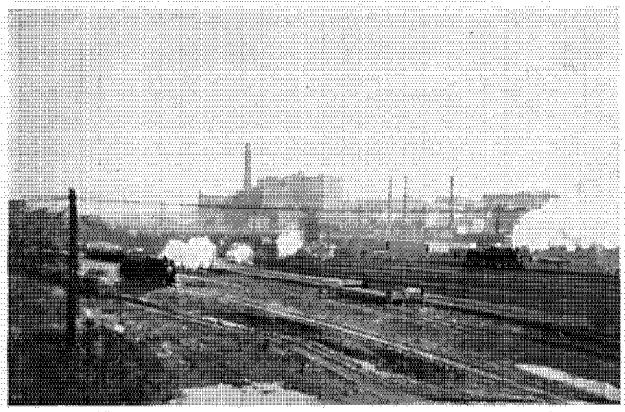
MOVING A MILLION YARDS OF EARTH

How du Pont explosives are helping to remove an earth bank in the middle of the Boston terminal area without interrupting traffic

By K. S. KIMBALL



One of the well drills in operation on the top of the bank. The holes are drilled about twenty-five feet back from the face

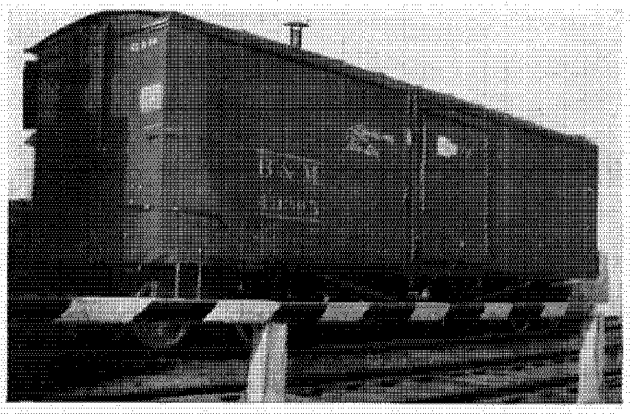


A view of part of the Boston & Maine Railroad Company's freight yard, taken from the top of a nearby hill

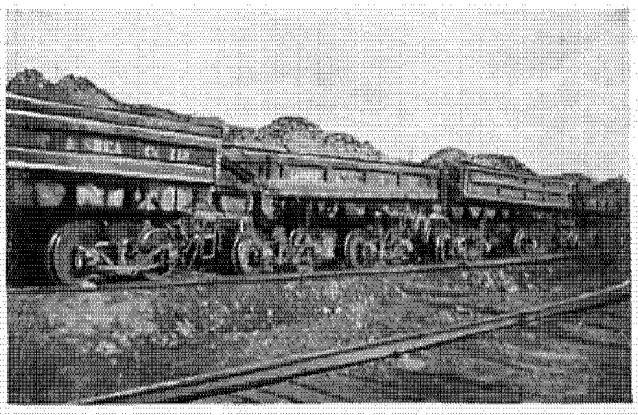
PART of the Boston & Maine Railroad's $71,000,000 expansion program includes the removal of approximately a million yards of earth, consisting of gravel and blue clay, situated in the center of the new terminal area at Boston.

Rock ballasting has been carried on for the past two years, heavier rails have been laid, many new bridges have been built and others strengthened and improved. New equipment has been added, modern stations and an office building have been erected, and last but not least, a new North Station has been built at Boston. That will give you some idea of the work accomplished by a great railroad system which is dedicated to the task of giving Minute-Man service to, from and in New England. Seventy-five per cent of the railroad's through trains have been speeded up and the Boston & Maine now boasts of the fastest train in New England, which makes the run from Boston to Portland, Maine, a distance of 113 miles, in two hours and fifteen minutes.

As previously noted, a million yards of earth lay in the center of the Boston terminal area within a half mile of the new North Station, and the railroad authorities wanted it removed. They needed the space for a new engine house, and they had a good place to use the earth



Because of state and municipal restrictions, explosives are shipped by train to the work each day. The holes are loaded with dynamite taken direct from the supply car on a siding near the bank



Trains of dump cars of twelve-yard capacity carry the material away to the Charles River, where it is dropped beneath one of the drawbridges outside the new North Station in Boston

excavated, inasmuch as there were two drawbridges just outside the station and only one was necessary. These were expensive to maintain and operate, and caused many traffic delays. Railroad engineers claimed that one could be eliminated.

Bids were asked for and the old and well-known organization, Lathrop & Shea Company, of New Haven, Connecticut, was awarded the contract for the removal of the material. Work was begun last fall and will continue until the fall of this year. At the start the contractor found that this material was next to impossible to dig with a shovel. Blasting was not considered at first owing to the proximity of the main line tracks, which were within fifty feet, and over which nearly 400 trains, both passenger and freight, passed daily. This service could not be interrupted.

Finally, however, when explosives were considered, it was decided to use du Pont FF R.R.P., a low-percentage dynamite. This is an old-type explosive, seldom used at the present time. It is a white dope composed of sodium nitrate, sulphur, carbon and nitroglycerin.

Inasmuch as well drills are used for this kind of work, the holes are drilled about twenty-five feet back from the face and on either twenty or twenty-two foot centers. The dynamite is packed in five by twelve inch cartridges for convenience in loading.

The bank averages sixty feet in height and the holes are drilled sixty-five feet in depth. Several hundred pounds of the explosives are loaded into each hole and the charge is primed with du Pont 40 per cent straight dynamite. A nitroglycerin dynamite is used for a primer owing to the insensitiveness of the R.R.P. This dynamite should never be less than 40 per cent strength.

At times ten holes are fired at once. This is the maximum number owing to the proximity of inhabited buildings, signal towers, and other structures housing delicate machinery and instrument boards.

The work will require the consumption of nearly 60,000 pounds of this type of explosive.

Because of very strict rules and regulations laid down

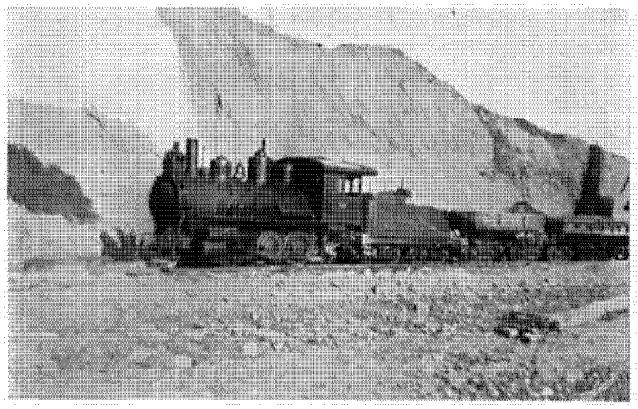
(*Continued on page 11*)



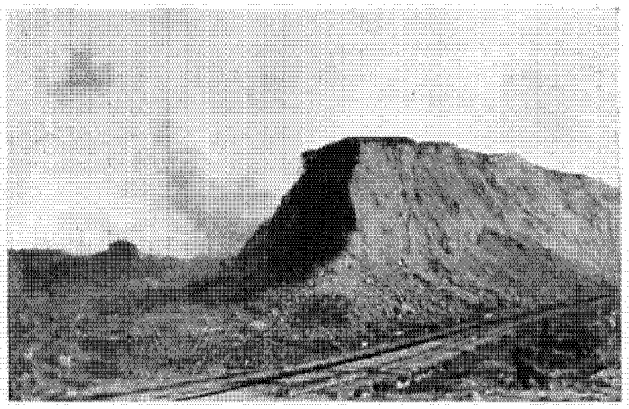
One of the steam shovels digging out the earth after a blast. The contractor uses two of them, each of 2¼-yard capacity



Another well drill at work. Since the material to be excavated averages sixty feet in height, holes are drilled 65 feet deep



A locomotive used by the contractor to haul dump cars from the scene of the excavation to the main line. The engine can easily pull a load of from twenty to fifty filled cars



One end of the sixty-foot bank after many carloads of earth had been blasted, loaded and hauled away to the fill. The contractor still had plenty of work ahead when this picture was taken

SHOES—SANS STAPLES, NAILS OR STITCHES



Dainty, comfortable footwear that has the upper and sole cemented firmly together is now manufactured by the new Compo process

TO those who style and design shoes the perfection of a tackless, stapleless, stitchless soled shoe has long been a dream. Shoe manufacturers and shoe retailers have hoped that some day they could offer for sale a shoe without tacks, staples or thread in the inner or outer sole.

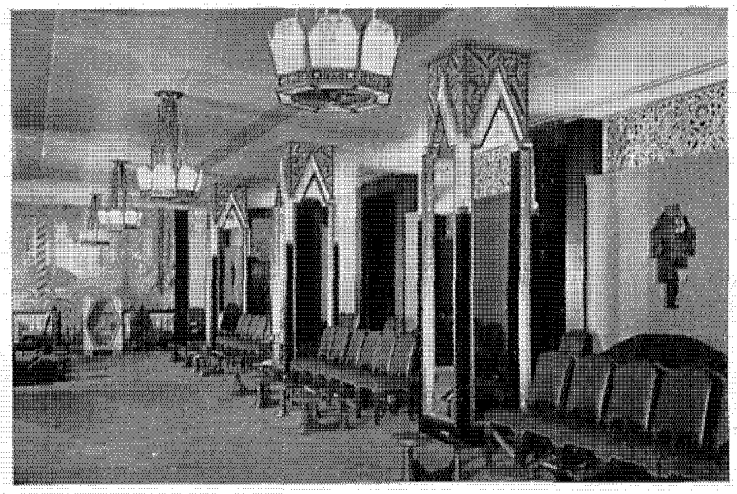
The newly-developed Compo shoe machinery and an adhesive perfected by the du Pont Company have made such a shoe possible.

The Compo process—for that is the name of the new manufacturing method—is radically new. Instead of intricate machinery, such as is necessary where soles are nailed or stitched, the Compo method employs pneumatic pressure to shape and hold the sole in place during the drying of a special waterproof pyroxylin cement with which the sole and upper are permanently held together.

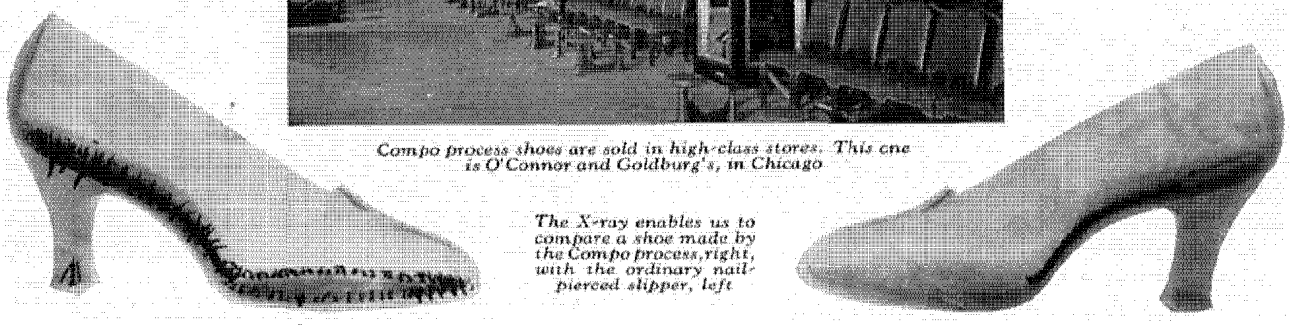
The Compo method eliminates cutting-in the sole to make a channel for stitching and also does away with turning the shoe inside out; at no time is it necessary to remove the shoe from the original last to which it is fitted. An average of six operations is saved, it is claimed.

The result of the Compo process is a beautiful shoe, extremely light, flexible and glove fitting at the heel and over the instep. The absence of metal or thread in the sole provides a smooth inside and outside, giving a molded effect. Compo shoes yield to every movement of the foot and satisfy every requirement of style, comfort and grace.

More than a score of manufacturers are already producing women's footwear by this process. The machines are made by the Compo Shoe Machinery Corporation, 565 Fifth Avenue, New York City. The cement used is a product of the du Pont Company.



Compo process shoes are sold in high-class stores. This one is O'Connor and Goldburg's, in Chicago



The X-ray enables us to compare a shoe made by the Compo process, right, with the ordinary nail-pierced slipper, left

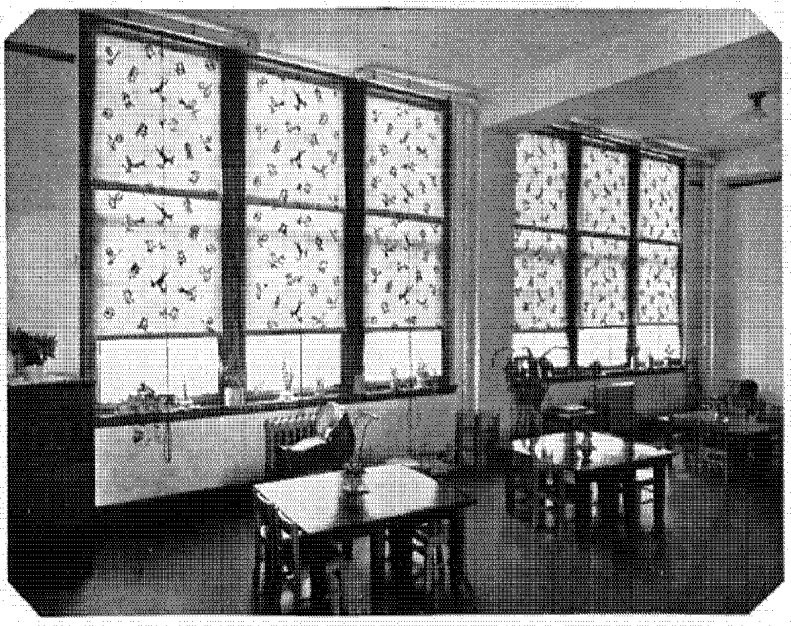
SHADES IN TOYLAND

Philadelphia's sons and daughters of kindergarten age will study in schoolrooms equipped with du Pont Tontine shades

By GEORGE C. COLLIER

Do you remember how Tom Sawyer managed to get his aunt's fence completely whitewashed by making the task appear such fun that the most adept work-avoiders among his acquaintances begged to take a hand in the painting? Mark Twain expressed through his famous juvenile character the underlying theory of the modern kindergarten: make play of learning and it becomes a fascinating game.

This modern conception of preschool or kindergarten education has worked wonders in the development of young children. By combining play with preliminary training, it has removed much of the youngster's fear of that first adventure away from home—school. For what child does not enjoy being with other children under the proper environment, and what child will fear or hate school, if it is really fun—something to look forward to?



Studying in a kindergarten room like this one should be lots of fun to any youngster. Even the window shades are made interesting with familiar story book characters in bright colors

As a direct corollary to this, we see all schoolrooms—particularly in the newer buildings—made more attractive. Kindergarten rooms especially are far more reminiscent of well-equipped nurseries than they are of the old-fashioned schoolroom, a rather grimly serious place. The more attractive the room, the happier, more contented and more receptive the little folks will be. Thus reasons the present-day educator.

The accompanying illustration portrays a room in one of Philadelphia's newest public schools. It doesn't take more than a glance to realize that a group of three-to-five-year-olds would enjoy school hours in such pleasant surroundings.

This room, which fortunately is becoming more and more typical in the newer schools, has one unique feature, for which Mr. Edward Merchant, business manager of the Philadelphia Board of Education, should be given credit. Even the usually prosaic window shades have been made interesting to the youngster. A closer study would show them to be studded with those familiar and fascinating nursery characters—cock robin, the performing donkey, the circus clown, an Indian chief and all the rest.

This shade is one of the six patterns of figured du Pont Tontine, the Toyland pattern, primarily designed for the child's bedroom or nursery. When Mr. Merchant saw it he quickly realized its possibilities for the kindergarten. He reasoned that the child could be made to feel far more at home by seeing these familiar story book characters. He tried out his theory in a newly-built school, and has since ordered similar shades to be placed in other Philadelphia school buildings as they are completed.

Figured Tontine, like its companion product, Tontine in solid colors, is ideal for school use. It can be washed time and again with soap, water and a brush. It is impervious to rain, snow or moisture, and its pyroxylin-impregnated surface is so sturdy that it survives years of use, and even abuse, without damage.

The design of this Toyland pattern is executed in red and blue—a color combination most appealing to children—on a background of soft ecru. This pattern, which is well distributed so as to be easily recognizable by the child, will not fade and cannot be washed off.

Thus figured Tontine not only adds to the attractiveness of kindergarten rooms, but it is practical as well. A sample and further information regarding figured Tontine, as well as Tontine in solid colors and corded effects, may be obtained by writing to the Fabrikoid Division of the du Pont Company at Newburgh, New York.



"FROSTED FOODS" AND CELLOPHANE

A quick-freezing process is the outstanding development in marketing foodstuffs

By L. B. STEELE
from an interview with Mr. Clarence Birdseye
Vice President, General Foods Company, Gloucester, Mass.

YEARS AGO when cold storage first made it possible to ship meat, fish, fruit and other perishables to far distant points, a new chapter was written in the history of foodstuff distribution.

A new and even more interesting chapter has been written recently with the introduction of frosted foods, made possible by the Birdseye quick-freezing process, named for its inventor. This remarkable process was perfected by Mr. Clarence Birdseye primarily to meet the need in the fish industry for shipping greater quantities of fillets to inland points. It is now possible to serve delicious haddock steaks in Texas homes because of the excellent keeping qualities of fish frozen this way.

The Birdseye process freezes fish at a temperature of fifty degrees Fahrenheit below zero so quickly that the large ice crystals, which destroy the minute cell walls and release natural juices, have no time to form.

Haddock and other species of fish, when caught off New England, are rapidly brought in to the docks in trawlers. Immediately the fish are steaked or filleted, all inedible portions being removed. Then the two fillets or tenderloins from each fish—all clean, white meat—are wrapped in moisture-proof Cellophane, which was selected as a most satisfactory wrapper after exhaustive tests in the General Seafoods laboratories. The fillets are packed in ten-pound display cartons and frozen solid. When these cartons are packed in insulated corrugated containers, they can be shipped to points seven days away without further refrigeration, or held in storage indefinitely.

It has been proved that a fillet frozen by the Birdseye method can be thawed, cooked and served months afterward and be literally as fresh and full of natural juices and flavor as at the time of catch. Think of it!

Rabbit meat, also Cellophane-wrapped, has already been distributed quick-frozen in New York City, and it may be that some day meat packers will sell "frosted" chops and steaks from slot machines in drug stores. Then, too, strawberries, peas, carrots and other fruits and vegetables might be frosted for use in off seasons.

After witnessing this quick-freezing process in operation at the plant of the General Foods Company at Gloucester, Massachusetts, I feel that it represents a revolutionary development with limitless possibilities—a development that will ultimately affect every home, table and taste.



The sparkling Cellophane wrap makes meats, fruits and vegetables attractive and it keeps them fresh after the quick-freezing process

THIRTY-FOUR YEARS OF PROGRESS AT THE REPAUNO WORKS

Manufacturing facilities have been greatly expanded. The du Pont establishment in New Jersey is today the world's largest dynamite plant

By ARTHUR LA MOTTE
Manager, Technical Section
Explosives Department

SOMEWHERE between 1880 and 1881, Lammot du Pont laid out and built a dynamite plant on the New Jersey shore of the Delaware River at a point about opposite Chester, Pennsylvania. The nearest station on the railroad was called "Repaupo," probably an Indian name, but Mr. du Pont named the dynamite plant "Repauno" because it was easier to pronounce.

This plant was not originally owned exclusively by the du Pont Company, but jointly by the du Pont Company, the Laflin and Rand Powder Company, the Hazard Powder Company and Lammot du Pont as an individual, and the name of the company was the Repauno Chemical Company.

In 1895 this company decided to get out a booklet describing its products and the uses to which they were adapted. George A. Wolf, a publisher of Wilmington, was engaged to print the booklet and after a visit to the plant and a perusal of the engineer's map, he made the drawing reproduced on the next page. Flying machines were not thought of seriously in those days and this was called a bird's-eye view. It was surprisingly accurate, showing all of the 33 buildings standing at that time.



Lammot du Pont (1831—1884) president of the Repauno Chemical Company and founder of the du Pont high explosives industry

In 1929 a commercial aeroplane photographer was employed to make a real bird's-eye view of the Repauno plant from a point in the air as near as possible to the hypothetical position from which Mr. Wolf's bird's-eye view was made 33 years before. The late Mr. Hamlet of Denmark once remarked to his mother, "Look here upon this picture and on this." The same remark might be appropriate to the two views of Repauno which appear on pages 12 and 13.

Unquestionably, the plant has changed; it has expanded and filled out. From 640 acres it has grown to 1,800 acres, and from 33 buildings to more than 1,200. From four different types of dynamite originally manufactured, its production has diversified into thirteen types, and it is interesting to note that not a single high explosive now made at Repauno is the same as any made in 1895. Permissibles were not thought of then, ammonia dynamites were in their infancy, and ammonia gelatins were in disrepute. Straight dynamite constituted normally over 90 per cent of the output, but not the "straight" of today, for low-freezing dynamites had only been dreamed of then, not created.

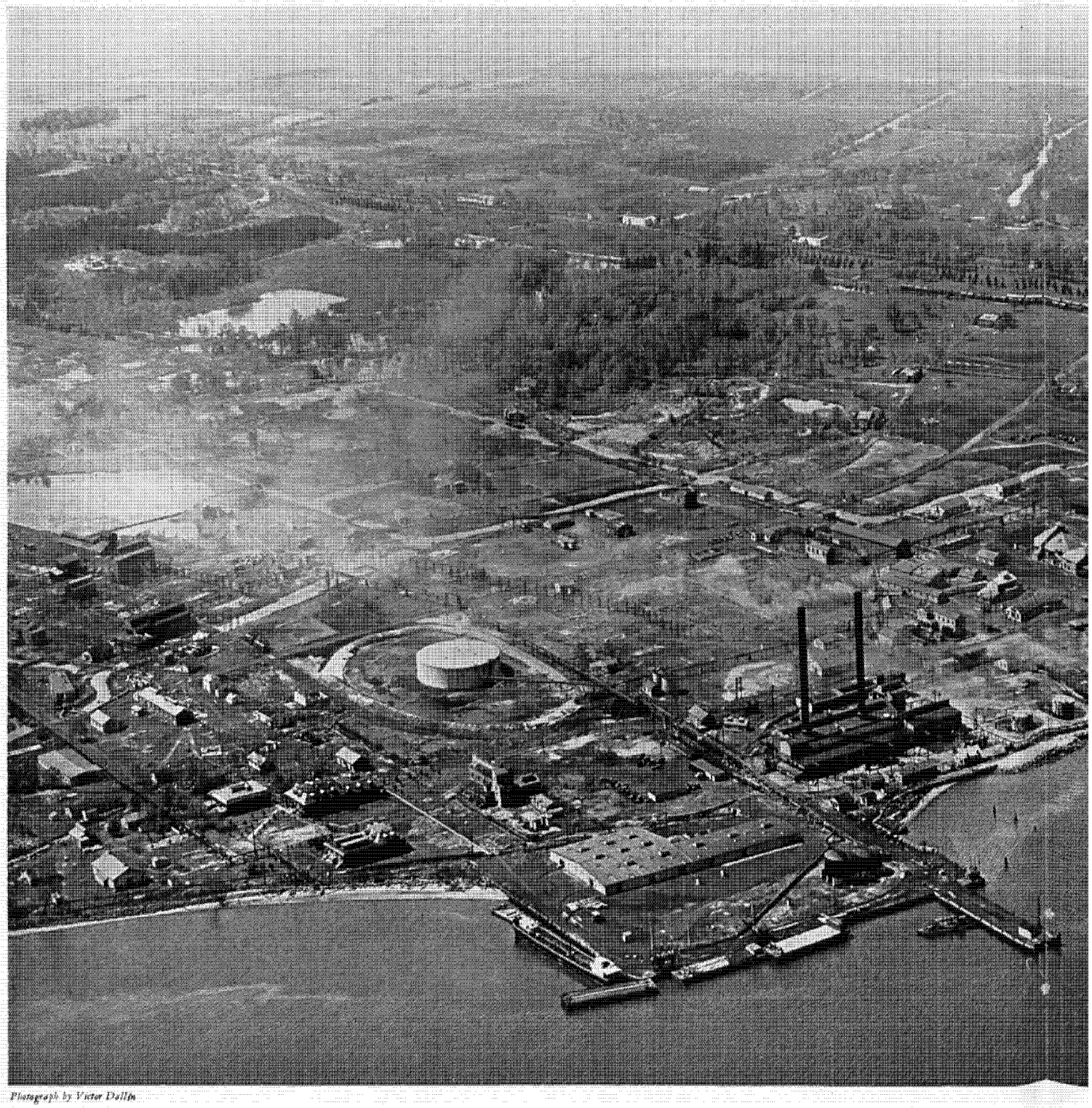
From about 150 men in 1895, of whom only six were on the salary roll, the plant force has now increased to 600 workmen and 40 executives, not counting 37 chemists at the Eastern Laboratory, which is situated on the Repauno plant but is under the direction of the Chemical Division and not the Manufacturing Division of the du Pont Explosives Department.

In 1895 there was no telephone on the plant and there were no electric lights, the only method of transmitting power being by means of compressed air. Today there are 295 telephones and the power plant uses, on an average, 1,450,000 kilowatt hours of electricity per month.

In 1895 the average daily output of dynamite at Repauno was about 30,000 pounds, and it was not until 1897 that, under stress of urgent orders, one day's production exceeded 40,000 pounds. In June, 1927, the plant actually produced 368,700 pounds in one day, which is the record for this plant and for any dynamite plant in the world. Even at the present time, when the southern consumers of du Pont dynamite are supplied from this company's new plant near Birmingham, Alabama, the daily production at Repauno runs well over 200,000 pounds.

What is responsible for the phenomenal growth of this plant, which, by the way, is only one of the nine dynamite plants owned and operated by the du Pont Company? Two facts are mainly responsible. First, the men in charge have, day by day, diligently and conscientiously made the best dynamite they knew how to make. Second, throughout the entire existence of the plant, research has been carried on unceasingly to improve formulas and manufacturing processes.

VIEWS OF REPAUNO—THE WORLD'S LARGE



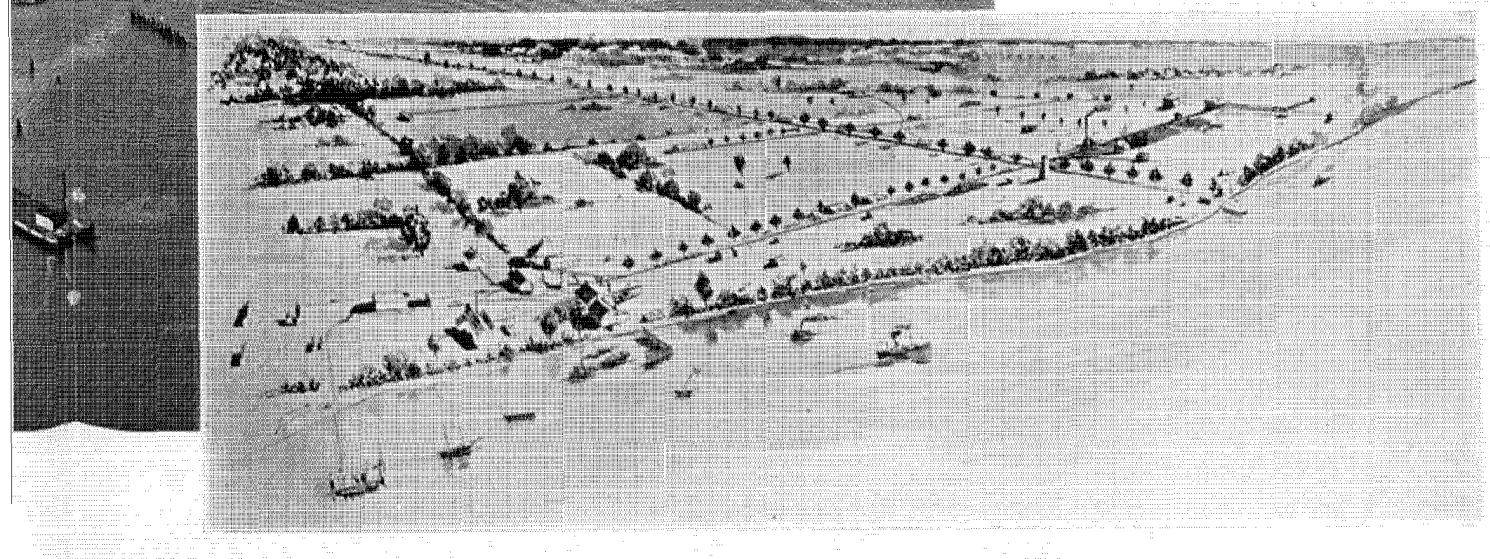
Photograph by Victor Dallin

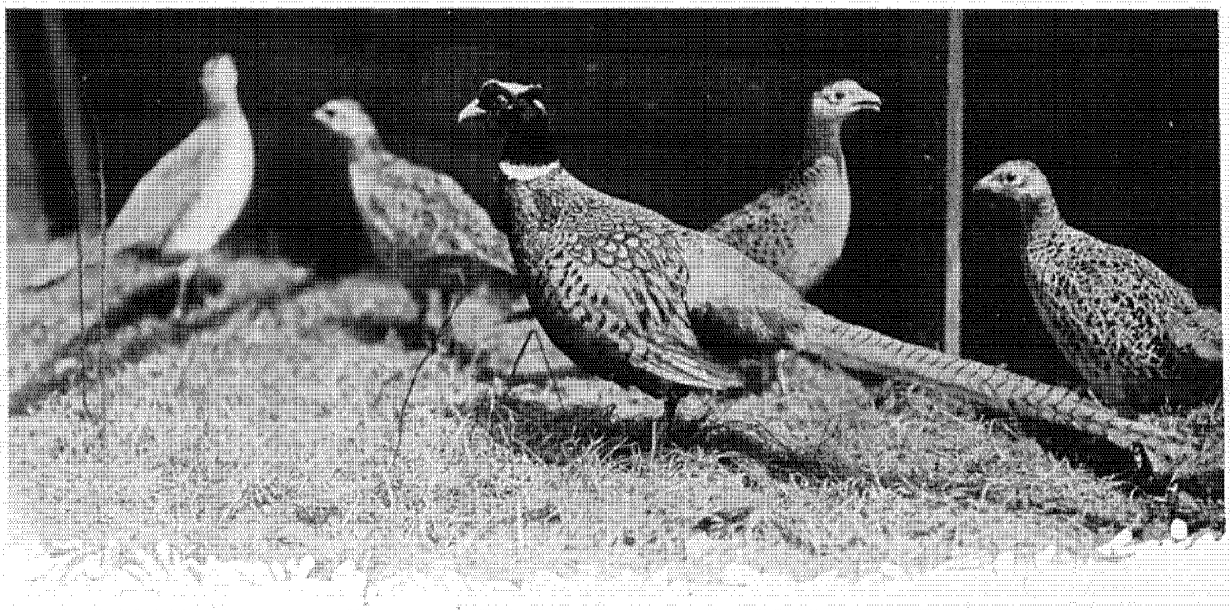
RGEST DYNAMITE PLANT—1929 VERSUS 1895



Visualizing 1929 versus 1895. At the left is an aeroplane view of the Repauno plant near Gibbstown, New Jersey, as reproduced from a photograph recently taken. Below, for comparison, is a "bird's-eye view," showing the same location as it appeared thirty-four years ago. With the exception of the soda storehouse—the largest structure showing in the smaller picture and one easily identified by its odd-shaped roof and cupola—all of the old-time landmarks have disappeared. Even the boat landing has been changed to another location, and the same is true of the power plant, which is now one of the most conspicuous buildings along the waterfront. Farther down the river may be seen the new ammonia oxidation plant for the manufacture of nitric acid. Formerly, this acid was produced in the group of buildings at the extreme right by chemically treating nitrate of soda. Now the acid is merely concentrated there. As you look toward the circular tank, you will notice nearby one building with many dormers. That is the headquarters of the Eastern Laboratory. Altogether there are more than 1,200 buildings located within the 1,800-acre plant area, which extends even beyond the limits of this picture. Repauno is the world's largest dynamite plant

From a drawing by George A. Wolf





"The Sultan of the Flock." One of the best cock pheasants in his harem at the Carney's Point Game Farm

THE CARNEY'S POINT GAME FARM

Some further facts about the experimental farm within the du Pont Company's smokeless powder plant area in New Jersey

By J. H. OTTERSON

MICHELET, the French historian and ornithologist, long ago said: "If it were not for birds no human being could live upon the earth, for the insects upon which birds live would destroy all vegetation."

And many years after, according to Forbush: "An acquaintance with useful birds on a farm is as important to the farmer as is a knowledge of the insect pests which attack his crops . . . . . Were the natural enemies of forest insects annihilated, every tree in our woodlands would be threatened with destruction, and man would be powerless to prevent it."

These assertions are not the wild dreams of sentimentalists, but are rather the conclusions of trained scientists based upon a great accumulation of information acquired only by painstaking and tedious investigation.



Rearing coop in which pheasant chicks are housed with their foster mothers. The coops are about 20 yards apart in a 15-acre field, surrounded by a high vermin-proof fence

Our song birds are perhaps the most beneficial to the human race, due to the fact that they subsist almost entirely upon insect life; but this usefulness also extends to our game birds, including grouse, quail, pheasant and turkey. From the moral and esthetic points of view, as well as from purely utilitarian reasons, to say nothing of the pleasure game birds afford to thousands who take part in that oldest known form of sport—hunting, it behooves us all to interest ourselves in assuring an adequate supply of birds, all species, for this and succeeding generations. No form of life is more interesting to man, and few, if any, are more beneficial to his welfare.

During the early part of last year, an experimental game farm was established at the Carney's Point smokeless powder plant of the du Pont Company at Penns Grove, New Jersey. This project was developed in order to decide definitely whether or not it is practical to utilize manufacturing plant areas, containing much waste land, for the useful purpose of materially increasing the game supply on such areas and in the territory immediately surrounding them. Two methods of game raising are employed here—first, a modified "Euston" system of safeguarding the nests of the native game—in this case ring-necked pheasants and quail—by a systematic control of predatory animals and birds, and

second, the *hand rearing* of ring-necked pheasants and bobwhite quail. At the present time, in the section of the plant devoted to artificial rearing, there are about twenty acres enclosed by permanent and semi-permanent vermin-proof fences. About one hundred pheasant hens and some thirty pheasant cocks were carried through the winter as breeding stock, and these birds have provided us with between 5,000 and 6,000 pheasant eggs for incubation last spring.



An example of protective coloration. How many of the four-weeks' old pheasant chicks can you distinguish in this picture? For the correct number in this group, see page 16

Apparently our efforts with artificial raising of pheasants on this area are satisfactory, for we have at the present time some 800 pheasant chicks in our rearing fields. We have distributed several thousand eggs to interested sportsmen in states as far west as Indiana and as far south as Mississippi with, of course, the heaviest distribution in New Jersey and Delaware. This is in addition to a large number of eggs we have returned to the New Jersey State Game Commission for incubation at the state game farms.

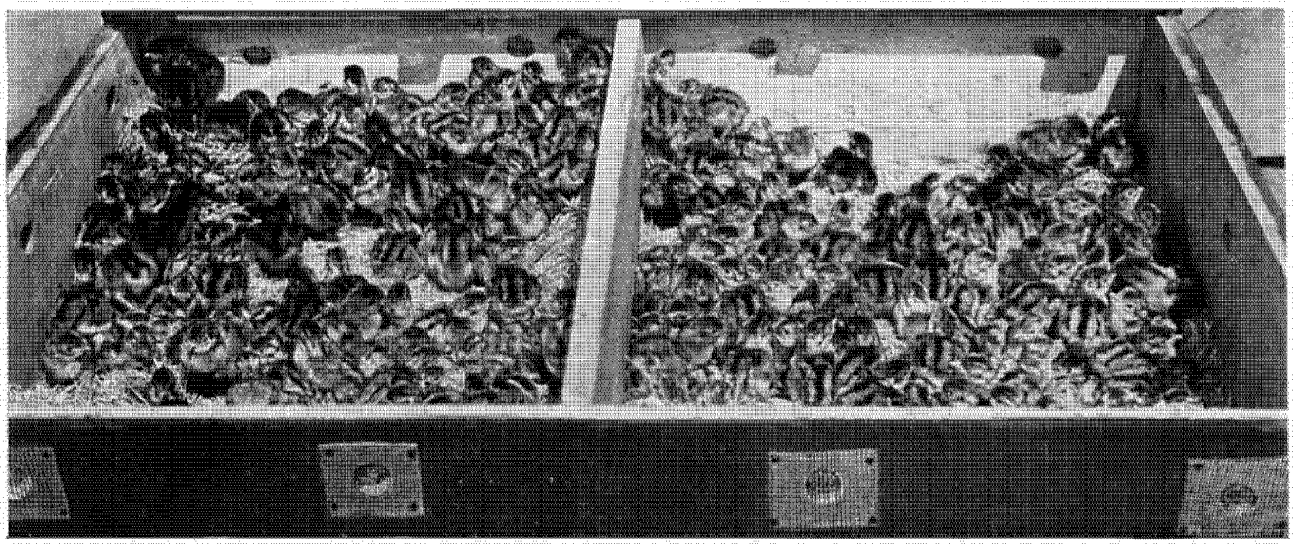
We have a fine flock of bobwhite quail chicks, that wonderful little game bird of song and story. May his cheery whistle continue to sound over the great territory of his range in our country! Dignified and very shy, bobwhites are rather harder to propagate under artificial conditions than are pheasants. Perhaps the best method of increasing quail, after all, is by giving more careful attention to native stock in the wild, assuring them of an abundance of food by proper methods, and insuring their safety by a rigid system of predatory control.

It is our intention to extend our activities in this control work and by providing, wherever necessary, an adequate food supply, to gradually develop the entire 1,800 acres of the smokeless powder plant into a game sanctuary in the fullest sense of the word. It has been demonstrated many times that the overflow of game from a properly administered sanctuary materially increases the number of game birds in the surrounding country. As our bird production at Carney's Point increases after a year or two of effort, it is expected that this same plan will be put into operation in other company plants in different states wherever there is a considerable acreage of land not used for manufacturing purposes, provided the areas offer suitable conditions as regards food and cover. We expect to maintain the breeding and rearing yards at Carney's Point as a central production point, so that we may have available a stock of breeding birds for any other plant areas that are adapted to this work.

Many of our adult birds that have been liberated in this area continue to return to their former homes in our open yards to feed and mingle with others of their kind, and they are probably bringing back with them entirely wild game birds, thus insuring against too close breeding, which might occur in small flocks of breeding birds.

Recently a few species of migratory birds have been added to the experimental pens. Canada geese, mallard

(*Continued on page 20*)



Two hundred day-old pheasant chicks in a brooder box. The entire bottom of the box consists of a galvanized iron water tank filled with hot water, with an excelsior covering to protect the chicks' feet. As soon as the birds are hatched, they are taken from under the hen and placed in this box for about twenty-four hours to dry and gain strength

The
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Vol. XXIII AUGUST, 1929 No. 8

THE FUR TRADERS

ROMANCE has always centered around the lives of those who have broken away from the haunts of civilization to work in frontier districts. Early in the nineteenth century when settlers from the Atlantic seaboard moved westward to occupy the territory west of the Mississippi, and particularly the Northwest regions, the fur traders led the vanguard in the march of civilization.

Many readers of this publication know that within the working area of the du Pont Company's explosives plant in the State of Washington, buildings reminiscent of the pioneer days still stand to mark the location of Fort Nesqually, built by the Hudson's Bay Company in 1833.

Du Pont history also records that John Jacob Astor was negotiating for gunpowder from the Brandywine mills as early as 1810. So there is at least a background for showing as the cover illustration this month a picture of the fur trader by Frank Schoonover. It is a typical scene within one of the trading posts of the Hudson's Bay Company in Canada where pelts are still exchanged for supplies and provisions, and the processes of civilization are still under way.

MOVING A MILLION YARDS OF EARTH

(Continued from page 7)

by the Commonwealth of Massachusetts and the City of Boston regarding the use, storage and transportation of explosives, the securing of permits and the like, shipments are made by rail from nearby magazines to the work.

The cars, thanks to the railroad's coöperation, are placed on a siding near the bank and the explosives are loaded direct from them into the holes. Not any of this material is allowed to remain on the work over night; each pound must be used the day of delivery.

The blasts are planned not to throw out the earth but merely to loosen and shake it up severely so that digging with the steam shovels can be done more easily. The contractor is using two large Bucyrus-Erie shovels, both with 2¼-yard bucket capacity.

The excavated material is loaded into twelve-yard dump cars and hauled away in trains of twenty to fifty cars. It is dumped into the Charles River underneath the railroad tracks just outside the new North Station.

Many thousands of dollars have been spent yearly by the railroad in maintaining this trestle at the mouth of the Charles River. Thousands of piles have been driven and now this work will be eliminated by the earth fill. The drawbridge, including eight tracks over the west end of the river, will be filled in and the number of tracks increased considerably. Reinforced concrete culverts will take care of the watercourse.

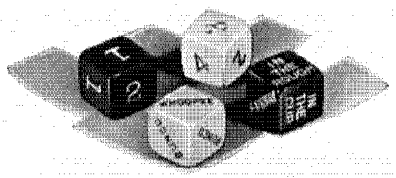
Steamer traffic will enter and leave through the east end of the river, train schedules will seldom be interrupted, the railroad will advance toward minimum operation costs, and the thousands of commuters entering this great terminal every morning and leaving it each night will have improved train service.

After observing more than one hundred railroads, large and small, including the country's earliest and most modern lines, the Boston & Maine Railroad is unifying and modernizing every detail of its management and operation.

"WHOOPEE" AND "GOLF" DICE

WHETHER your ball falls in the rough or bounds along the fairway, whether it buries itself in a bunker, drops in a water hazard, or gives you that grand and glorious feeling that comes with a "hole in one" is all preordained by fate when you play the new game, "Golf" dice.

Of course it appeals most strongly to the golfer, for a complete game can be conducted with an actual count of strokes for the match.



Pyralin in clear red and ivory is used in making these dice

After providing for the lovers of this famous form of outdoor sport, the manufacturers developed another game called "Whoopee." Scientific skill is said to be an important factor in this game although, as its name indicates, it is designed to provide hilarious fun at bridge parties, picnics and the like.

Since dice games have been played for more than nineteen centuries—they are mentioned as one of the favorite forms of amusement among the Romans—the popularity of these new games is assured, especially so because they introduce novel and interesting features.

Du Pont Pyralin rod stock is used extensively in the manufacture of games such as "Put and Take," dice and dominoes. It has been selected by the Ivorycraft Company of Long Island City, New York, as the material from which "Golf" and "Whoopee" dice are made.

THE ANSWER

There are eleven four weeks' old pheasant chicks included in the group shown on page fifteen.

LUGGAGE TO THE FORE

Beauty and practicability, high quality and reasonable prices are features of modern trunks and suitcases

By F. E. Niering

"EVERYTHING is changing," remarked an architect of the old school the other day. "Our architecture has changed, our interior decoration has changed, and our mode and standards of living have changed. I don't know what the world is coming to!" This is not an unusual comment, as the reader will realize, for people in every walk of life are saying the same thing.

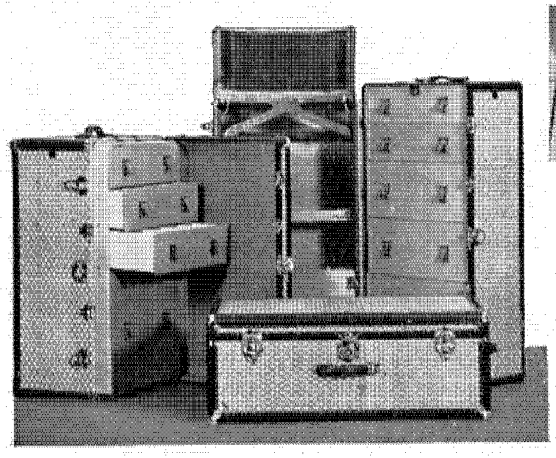
Business, too, has changed, is changing and will continue to change. New manufacturing methods, new attitudes of mind, new ideas of merchandising and new products all contribute to make this world of ours a better and more thrilling place in which to live.

Certainly we would not be content to ride in one of the first automobiles with its noisy motor and with wheels that never felt the soothing check of good springs and shock absorbers. Nor would we care to tell our friends that we travel with an old cowhide trunk that has three trays which only a strong man can remove. Of course we prefer the newer luggage with many conveniences built into it—a wardrobe trunk that is easy to open and of a size and weight exactly suited to our requirements. Our small hand-luggage has to be light and easy to carry; above all, it must be good-looking. Most luggage manufacturers' products are attractive, but it remained for the larger retail establishments to make them distinctively individual to their particular stores.

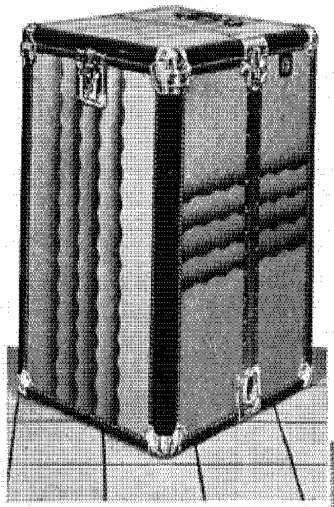
Large department and specialty stores, anticipating the increased demand for stylish goods, have put themselves in position to capitalize this vogue by employing buyers, stylists and merchandise specialists who have exceptionally good taste. Nowadays, luggage buyers are not only shrewd observers of quality and price but they also have the ability to recognize merchandise with an eye appeal. Their old buying maxims of quality first, price second and appearance last have given way to the newer and more logical standards of beauty and practicability first, quality second and price last. You wouldn't buy a suit made of the finest hand-woven homespun fabric, if the color and pattern were garish and the cut and shape ill-fitting. You would, undoubtedly, sacrifice quality to obtain a better fitting and more tasteful garment. Styling, then, is a more important factor than quality.

It is not intended to leave the impression that quality must be sacrificed to procure more attractive articles. On the contrary,

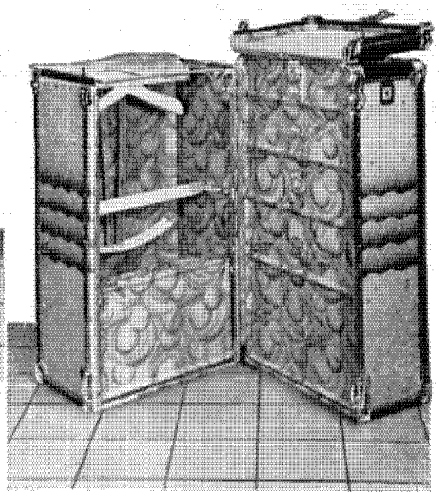
(Continued on page 21)



Below—A Fabrikoid-covered and lined trunk, with outside covering of brown and white French check grain, and brown and white Hartex grain lining. It was made especially for Saks, Fifth Avenue, New York, by the Hartmann Trunk Company



Above—The modernistic design of this trunk covering is in keeping with the up-to-date treatment of the interior



Above — A modern, beautifully designed trunk, covered and lined with tan and brown Fabrikoid, made by the Wheary Trunk Company for B. Altman & Company, New York City



The Gardner-Holdt (top) and Cargille (bottom) body tubes for measuring the viscosity of varnish. Test samples can be inserted in front of the standards, the whole rack inverted and the rates at which the air bubbles rise in the tubes are compared

"THIS PAINT IS TOO THICK"

Wherein the writers describe the type of control equipment used in du Pont laboratories to determine the viscosity of paint and varnish products. Each one must have just the right consistency

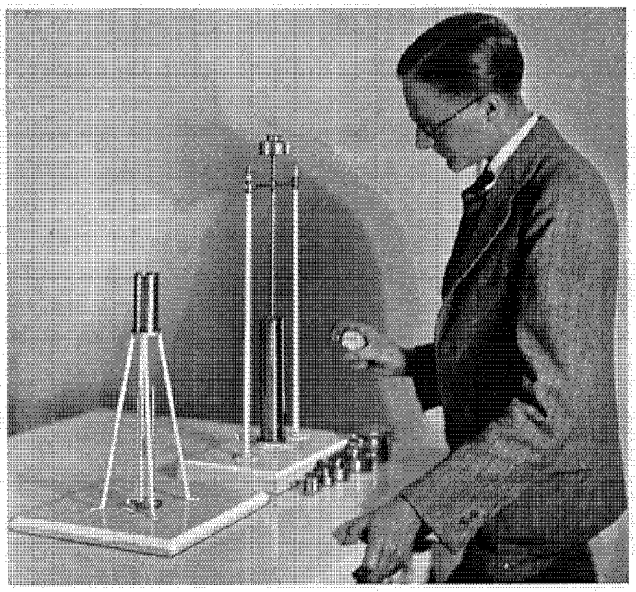
By D. V. GREGORY *and* K. C. LAMPERT
Central Technical Laboratory

"IT'S too thick," said the painter. "It won't brush out." Yet he would have been angry indeed if the paint had been so thin that it ran down his sleeve when he painted the ceiling. And so paint must be neither too thin nor too thick; it must have just the right consistency to brush easily, flow together to eliminate brush marks, and yield a film that will dry rapidly to a hard, impervious film of just the sheen desired. To supply a product of just the right consistency requires careful control.

For varnish, the control equipment consists of two series of tubes, about four inches long and one-half inch in diameter, filled with liquids of different viscosities which serve as standards. One series of twenty tubes, known as the Gardner-Holdt set, covers the viscosity or "body" for the ordinary range of varnishes. The viscosity is determined by inverting the standard tube and a similar tube filled with the product to be tested and by watching the bubble of air, which is left between the top of the liquid and the cork, rise from the bottom to the top of the tube. By trial the standard is found which will match the material being tested. This method is fast but lacks sensitivity. It is accurate only to around ten per cent. The second series, called the Cargille tubes, is used for materials which are so viscous that it takes several minutes for the bubble in the heaviest tube to rise from the bottom to the top.

For paints and other pigmented products, of course, the above method cannot be used. For these a small brass cylinder about one and one-half inches in diameter and four inches high is used, the top being open and the bottom closed except for a small opening in the center one-tenth of an inch in diameter. This instrument, called the viscosity cup, is filled and the time determined for 50 cubic centimeters of paint to flow out through the hole in the bottom. This hole, of course, must be made very exact in size. This method is quite satisfactory except for very heavy paints or for paints which possess false body. These disadvantages are sometimes circumvented by using cups with larger holes in the bottom, but even so they are not always satisfactory. This method is also unsatisfactory for the reason that paint is a plastic material and therefore does not follow the laws of pure viscous flow. This point will be discussed farther along.

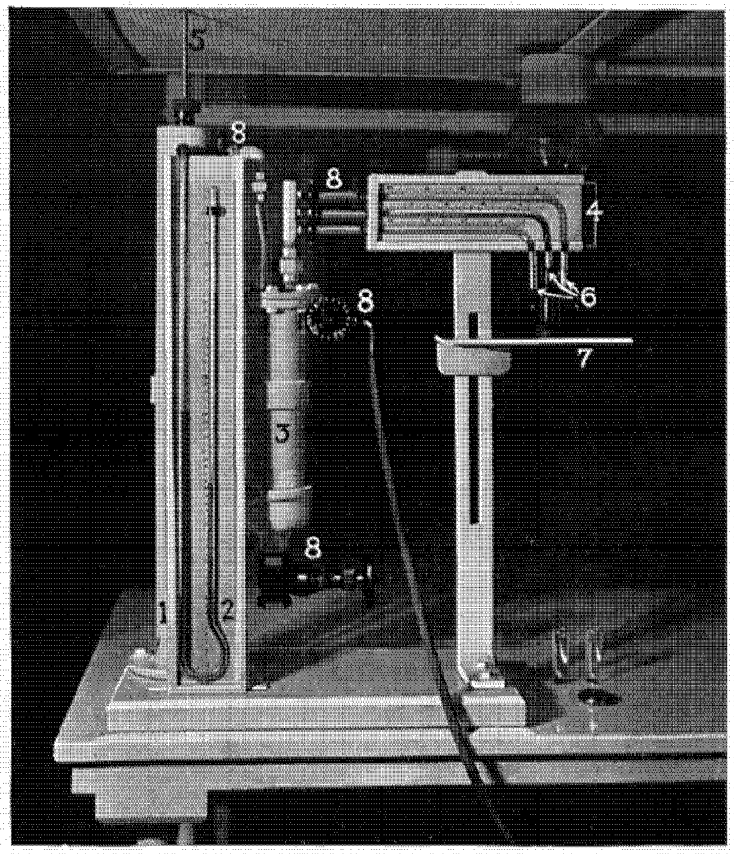
For very heavy paints and for pastes another device has been constructed. This is called the Gardner-Parks Mobilometer. It consists of a brass tube about nine inches high and one and one-half inches in diameter. The tube is filled with the paint to a mark three-quarters of an inch from the top, and a small perforated brass disc on the end of a rod is forced through the paint under a definite weight. Either the weight necessary to force the plunger down in a definite period of time is determined or



At the left is a viscosity cup with a 50 cubic centimeter graduate underneath. The mobilometer is at the right, with a weight on top of the plunger. The operator is timing its descent

the time is taken for a specified weight. The perforated disc contains fifty holes one-sixteenth of an inch in diameter. This method is quite satisfactory, although it requires a considerable amount of material and is rather slow.

None of these methods, however, offers the possibility of a satisfactory universal method for testing both clear and pigmented products. So a device was developed to take care of all types of products. This instrument is called a Modified Bingham Plastometer, the basic factors being originally suggested by Professor E. C. Bingham of Lafayette College, a member of the consulting staff of this company. The Plastometer is simply a device for forcing a material through a small tube under a definite pressure and measuring the time necessary. The disadvantages of the ordinary laboratory instruments of this type have been their cost, their complicated nature and the time necessary to make the tests. This modified instrument, as will be seen in the accompanying illustration, consists of four general parts. At the extreme left is the pressure regulator, next to it a manometer, then a ballast tank and catch-all, and finally, three glass tubes for the product to flow through. The material is drawn through these tubes by a vacuum pump rather than pushed through under pressure as ordinarily done. This permits its use in almost any laboratory, as vacuum pumps are available practically everywhere. The operation of the instrument consists in starting the vacuum pump, adjusting the pressure by means of a regulator, and inserting the container for the material under the end of one of the glass tubes so that the material will be drawn through the tube. The time for it to move definite distances in this tube is then determined.

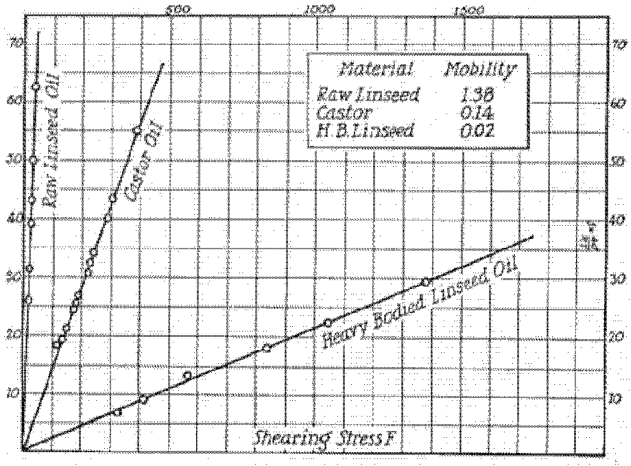


The Modified Bingham Plastometer consists of (1) Pressure Regulator, (2) Manometer, (3) Solvent Trap and Catch-all, (4) Instrument Board, (5) Air-intake Rod, (6) Capillary Tubes .05, .10 and .20 centimeters in diameter and calibrated along their length in centimeters, (7) Sample rest, and (8) Valves. The rate of flow of a paint entering at 6 and flowing through one of the tubes in 4 is measured with a stop watch. The force applied is adjusted by 1 and measured by 2. The paint and solvent are caught in 3 which also serves as a ballast tank

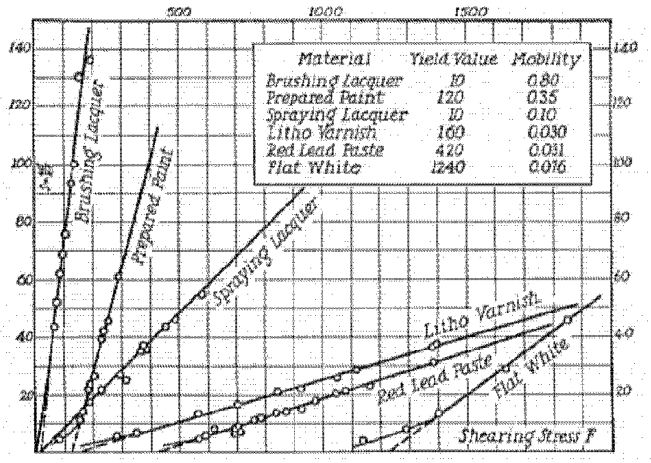
The pressure regulator consists of a hollow tube in a column of mercury. The tube is raised through the mercury until the pressure as shown by the manometer reaches the point desired. Air then enters through the hollow tube, keeping the pressure in the system at this point. For plant control purposes it is only necessary to determine the length of time for the material to flow a definite distance in one of the tubes. These tubes, by the way, are of three different diameters so that by selecting the proper tube, products of different consistencies can be drawn through them in a minimum of time. For research work where it is necessary to know some of the characteristics of the product, either several tubes, several pressures or several distances are necessary in order to obtain what the physicist calls a pressure-flow curve.

Some of these curves are shown in diagrams accompanying this article. The shearing stress applied is noted across the bottom of the graph and the rate of flow along the side. Two diagrams are shown, one for purely viscous materials and the other for the plastics. The graphs illustrate very simply the difference between viscous and plastic materials. With those of a purely viscous type the slightest pressure applied causes the material to move so that all the curves go through the zero point. With plastics, a certain amount of pressure is necessary before the material starts to move. This pressure is called the "yield value," and these values are shown by dotted lines which intersect the lower edge of the graphs. From these graphs two figures can be obtained which define the consistency of the product, the yield value, as mentioned above, and the mobility or ease of flow. Mobility is obtained by determining the slope of the curves. Using these two factors, it is possible to determine whether or not a product will have good brushing properties.

All this may seem rather complicated and theoretical, but the method used—that is, the rate of flow through a capillary tube—is the most generally accepted one for determining viscosity. By means of the modified instrument



A pressure-flow graph determined by the Plastometer, showing results from representative purely viscous products. Note that all curves pass through zero; in other words, only an infinitesimal pressure is required to start the movement of these materials



A pressure-flow curve illustrating plastic products, the class in which practically all paints fall. Note that some pressure is required to start the movement. The yield value represents the intercept with the horizontal axis and the mobility or ease of flow the slope of the curves

described, this fundamentally correct method has been modified to the point where it can be used in everyday control of the quality of paint and varnish products. The instrument will handle materials ranging in consistency from raw linseed oil up to as much as 80 per cent of white lead in oil. The measurements for control purposes can be made in less than a minute and in most cases in about twenty seconds. The results obtained can be expressed in absolute units. The cleaning operation requires even less time, for a suitable solvent is simply drawn through the tube and into the catch-all. The amount of material required is very small.

The provision of a precision instrument such as this, of course, does not necessarily guarantee the quality of a product. Formerly if a paint was thick, the user felt that the quality was good; in fact, some people still think so. This does not necessarily hold. For example, a thick, heavy paint might contain a relatively large proportion of inert material and therefore be worthless, although its appearance in the can would be excellent; or the paint might be loaded up with some agents giving to it a false body which breaks down on stirring. The only way to be sure of good quality in paint is to buy the products of a reputable manufacturer who has painstakingly determined how to make the best quality and who cannot afford to jeopardize the reputation he has built up by national advertising.

And there is a point in buying paint of a consistency ready to use. Only by this means can a paint be applied as the manufacturer has found best, to yield a film which will flow out smoothly and which will dry quickly to a hard, impervious and durable coat of the right gloss.

THE CARNEY'S POINT GAME FARM

(Continued from page 15)

ducks and wood ducks are now swimming around in a small artificial pond that is supplied from a well formerly used for manufacturing purposes. These birds are provided with about five acres of meadow land for range and they get much of their living from the vegetation. Migratory waterfowl are probably the easiest of all species of game birds to raise to maturity. They seem to possess a certain immunity to many of the diseases to which pheasants, grouse and quail are rather susceptible.

Insuring the Future Game Supply

Game protection in this country has passed through three stages and has been influenced and guided by three successive motives. The first of these was a selfish one. Sportsmen wished to lessen the killing of game in order that a sufficient number might be left alive to furnish abundant sport for themselves. The second motive was sentimental, where large and ever-increasing numbers of people were interested in wild life protection because these living creatures are beautiful to look at and ought to be preserved so that we and our successors may have the pleasure of seeing them. The third motive for protection is economic and considers wild game as an asset possessing a tangible value to the community and consequently well worth preserving, with the further thought that they have been given to us in trust to hold for posterity. This view holds that money and time expended in preserving game from destruction is in the nature of an insurance premium. Of these three motives the third is constantly gaining strength.

HOLLYWOOD BEACH COATS

Fabrikoid finds another use in decorating these brilliantly-colored garments

TRULY du Pont Fabrikoid is the material of a thousand uses. It clothes the books we read, covers and adorns our motor cars, travels around the world on a wardrobe trunk — in fact, adapts itself readily and ideally to a veritable host of products, large or small, ornamental or strictly utilitarian.

Perhaps if you were fortunate enough to enjoy a winter sojourn at one of the southern bathing resorts, you discovered for yourself still another way in which Fabrikoid is used. Or, if you plan a trip to the Maine coast soon, you may see it vividly displayed at Old Orchard, for the vogue of brilliantly-colored beach coats, trimmed with contrasting floral designs of Fabrikoid, has come northward with the sun.



Flannel, felt and Fabrikoid combine to make these charming and colorful beach coats

These garments, three of which are shown in the illustration, are known as Hollywood Beach Coats. Although they gained their first popularity as a beach jacket for use after bathing, they are equally charming for sport wear or for informal street attire. They are loosely tailored of flannel, in attractive pastel shades, and are bound at the edges and collars with contrasting felt. This material also serves for the leaves and stems of the gaily-colored Fabrikoid flowers which are air-brushed and embossed to contrast with the fabric of the coat, and then appliqued to the under material with gold thread.

The appliqued flowers were designed and produced by Walcutt Brothers Company, 141 East 25th Street, New York City, for Hudson Bonnaz Works, Inc., 306 West 37th Street, New York, manufacturers of the Hollywood Beach Coats.

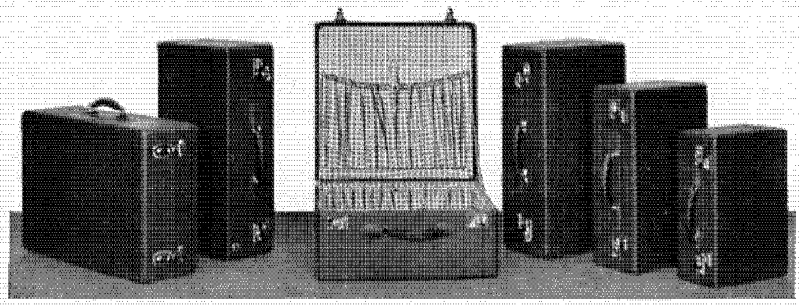
LUGGAGE TO THE FORE

(*Continued from page 17*)

our new raw materials are invariably of better quality than those used in bygone years. The new Fabrikoid trunk-lining materials, for example, are extremely practical, because they are washable, wear-resisting and vermin-proof, besides being modern in color and design.

View again the illustrations presented with this article. Perhaps you may wish to compare the pieces shown with the luggage you now possess. Do they not have an appeal that makes you want to replace or replenish your present equipment?

Truly these articles are extraordinary. When they were conceived and built, the factors given particular attention were appearance, practicability and quality. The colors, of course, cannot be reproduced here, but if you could see them you would like the charming subtle tones employed. These pieces are of light-weight construction and are equipped with conveniently-placed handles so that they may be moved easily. Their lightness reduces or eliminates excess baggage charges. Every piece shown is covered with du Pont Fabrikoid. The trunk exteriors are covered with a pyroxylin-impregnated duck which has been adopted as the standard on most all of the better grades, and the linings are made of Fabrikoid and gingham.



Smart luggage covered with plain green, blue or brown Fabrikoid in Dice-3 grain with gingham linings in colors to match. The pieces are made by the United Auto Trunk Company, New York City

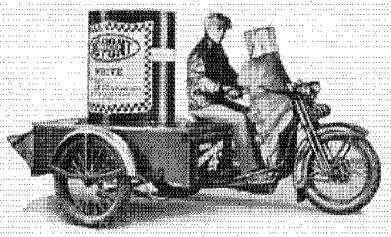
More surprising, perhaps, is the fact that this smart luggage with its many new features can be purchased at prices which are not higher than those of the regular run.

The accompanying illustrations feature luggage built by the Hartmann Trunk Company, Racine, Wisconsin, for Saks, Fifth Avenue; a Wheary trunk built at Racine, Wisconsin, for B. Altman & Company, New York City, and luggage by the United Auto Trunk Company, New York City.

THE SPORT OF A THOUSAND JOYS

Du Pont Pyralin adds to the comfort and safety of the modern motorcycle

By Paul H. Collins



DURING the past quarter of a century the Harley-Davidson Motor Company has been manufacturing motorcycles. Each year has seen the addition or refinement of some feature until today transportation by motorcycle is like traveling on the famous "magic carpet."

For this company sells more than motorcycles today. To purchasers of pleasure vehicles it sells the great outdoors, fishing, hunting, camping, trips to interesting or historical spots, an easy method of transportation to and from work or a convenient and inexpensive way to whisk the family away for a breath of fresh air. To the commercial user it sells economy of operation and upkeep, low first cost, ease of handling in traffic, speedy deliveries and no parking problems. To the police departments of our states and cities, many of which maintain fleets of Harley-Davidsons, the valuable features are speed, mechanical reliability, power and comfort to the rider through long hours of use.

Many of the steps which mark the transformation of the motorcycle from a bicycle with a noisy, unreliable motor to the present purring, powerful, dependable machine have been due to the foresight and genius of this company's engineers. Today, Harley-Davidson motorcycles have a generator, storage battery, high-frequency horn, du Pont Pyralin windshield, two bullet headlights, standard tail-light, ignition and light switch panel with a built-in ammeter, parking light, alemite fittings, balloon tires and a specially designed four-tube muffler in addition to the latest developments in motor, transmission, spring equipment, frame and brakes.

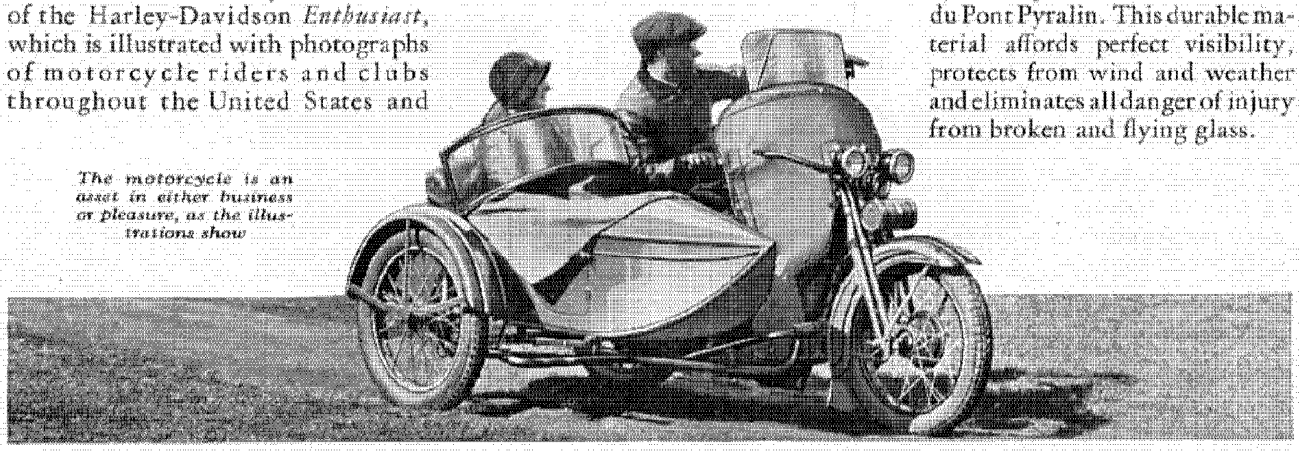
The popularity of this form of transportation all over the world is indicated by a recent issue of the Harley-Davidson *Enthusiast*, which is illustrated with photographs of motorcycle riders and clubs throughout the United States and many foreign countries, including Japan, Africa, Australia, New Zealand, Chile, Germany, Austria, France, Czechoslovakia, Canada and Holland.

The Harley-Davidson line consists of two single-cylinder models and six twin-cylinder models varying from the 21 cubic inch cylinder displacement of the smaller single to the 74 cubic inch displacement of the largest twin. In addition to these motorcycle models the company manufactures a complete line of side cars for passengers and light deliveries.

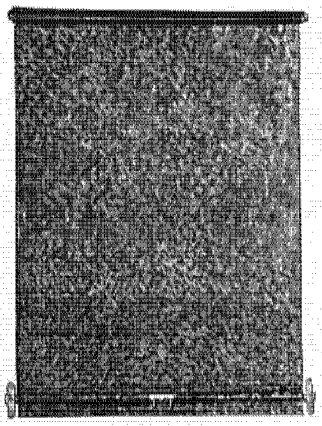
In this connection it is interesting to note that rapidly increasing sales in the light-delivery or package-truck field are eliminating the former seasonable variation in the demand for motorcycles. According to the most recent Harley-Davidson reports, ninety different lines of business now use these package trucks. Nine standard body styles are manufactured, including a battery service truck, tire service truck, standard open-type body, dyers and cleaners service truck, newspaper delivery truck and four types of package delivery trucks. These various types of delivery trucks are mounted on the side car as shown in the small illustration. Besides the nine standard models a wide variety of special models are manufactured.

Accessory dealers, bakeries, banks, clothing stores, collectors, contractors, dairies, dry cleaners, florists, ice companies, laundries, newspapers, plumbers, public utilities, shoe repair shops and tailors are among the commercial users. The speed with which deliveries can be made, ease of parking, quick starting and stopping and the opportunity for unique advertising are some of the advantages of this type of equipment.

On stormy days the driver and passenger are protected by transparent windshields of du Pont Pyralin. This durable material affords perfect visibility, protects from wind and weather and eliminates all danger of injury from broken and flying glass.

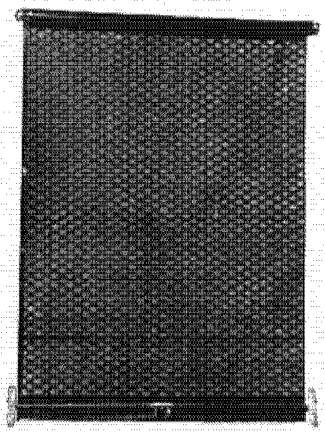


The motorcycle is an asset in either business or pleasure, as the illustrations show



SERVICEABLE CAR CURTAINS

Du Pont Fabrikoid adds new beauty and durability to modern furnishings for railroad coaches, dining cars and club cars



ONLY the best materials and most skillful workmanship enter into the railroad equipment of today. That applies to the rolling stock in general and to passenger cars in particular. It matters not whether the cars are routed over short suburban lines or are used in transcontinental service, they must be built to withstand rough treatment and assaults of time and weather.

And the interiors are constructed as sturdily as the exteriors. All fixtures must be attractive and must give maximum service. Considering that thousands of passengers are carried daily, it is easy to understand why car furnishings are subjected to unusually hard usage.

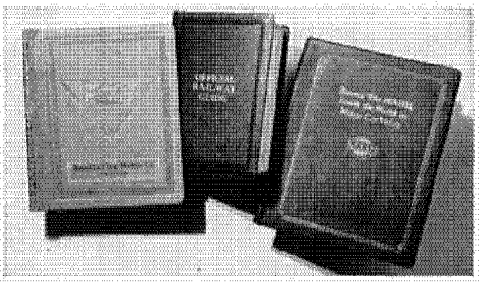
A comparatively recent development in railroad cars is the use of pyroxylin-coated window curtains of genuine du Pont Fabrikoid. Made from the same basic ingredients as the famous du Pont Duco, this material is well suited for the purpose, for it is waterproof, sanitary and exceptionally durable. It wears long and well and keeps its good looks. Finger marks and other soil resulting from exposure and constant use can be quickly and easily washed off with soap and water. When the car windows are open these curtains defy the elements. They cannot be harmed by driving winds, rain, snow or heat and are most practical and economical for use in coaches, dining cars and club cars. They may be obtained in several beautiful colors and designs.

For further particulars, write to the following curtain manufacturers: National Lock Washer Company, Newark, New Jersey; Railway Curtain Company, 3352 West Grand Avenue, Chicago, Illinois; Adams and Westlake, Elkhart, Indiana, and the Morton Manufacturing Company, 5105 West Lake Street, Chicago, Illinois.

CATALOGS THAT SAY "ATTENTION"

THE catalog of yesterday has undergone a complete metamorphosis. No longer are torn and thumb-marked pages strewn untidily about busy desks or stuffed unceremoniously into convenient pigeon holes. The age of the smart, well-dressed catalog is here—and here to stay.

Loose-leaf catalogs are "silent salesmen" of recognized prestige. New pages quoting changes in prices and illustrating merchandise precede the trained salesman, tie up with his personal visit, and break down sales resistance by enabling the salesman to talk to the purchaser about a product or change in its price, that is familiar to them both.



Fabrikoid-covered binders such as these find a permanent home on the desks of the nation's executives

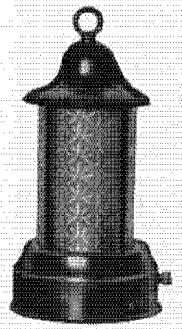
And the catalog's call is a permanent one. It stays with the ultimate purchaser for many months, continually pounding home the story of the product it represents.

Many leading manufacturers use Fabrikoid-covered binders, for their beauty is an incentive to preserve the catalog indefinitely. Individuality is expressed in each binder by an appropriate design incorporating the name, trademark or other marks of identification peculiar to the contents of the catalog. And the waterproof, durable, washable qualities of Fabrikoid assure their preservation.

Catalog covers that say "Attention" have been made by the Barrett Bindery Company of Chicago since 1867. These binders are made in numerous styles, including the Multiple Binder, for holding periodicals; the Emerson Binder, for photographs, catalog sheets, and so on; the Expanding-Post Binder, Hinged Covers, Zip-Grip Binder and others.

An attractive new folder presenting the complete Barrett line of binders may be had by writing to the manufacturer at 1328 Monroe Street, Chicago, Illinois.

OF INTEREST TO RADIO FANS



The Lite-Tenna is an aerial and reading lamp

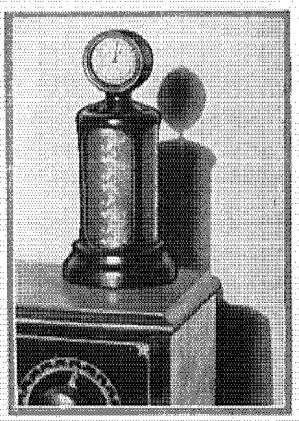
AN attractive reading lamp, an accurate timepiece and an efficient aerial, all in one, is the latest word in radio accessories—the Lite-Tenna Klok.

Taken individually, its elements are most interesting. The lamp, an adaptation of a Colonial lantern, furnishes ample illumination for reading.

The antenna is operated through an ordinary insulated extension cord connected with a light or wall socket, and it works perfectly whether the electric light is turned on or off. A wire from the antenna post on the Lite-Tenna Klok to the aerial post in the radio set is the only other connection required. By using this type of antenna it is not necessary to install an outdoor aerial or lightning arrester.

The clock is a guaranteed unit equipped with a double dial made up of two concentric disks. One of them, covering the entire face of the clock, shows the hour and minute markings, and is stationary. The other, of smaller diameter and occupying the central area, shows twelve time divisions covering half the earth's surface—from Berlin, Germany, in the East to the Hawaiian Islands in the West—and this smaller dial moves with the hour hand. Since time readings by minutes are the same in all zones, one can determine instantly the exact time in any one of them, for each zone name points to the correct hour in that zone.

In setting the clock, the hour hand is moved to cover the name of the zone in which the individual may be located. Then the hands are set in the usual way. The time in the other eleven zones is now plainly indicated. A glance at the clock, a turn of the radio dial and feature programs from distant stations come in on time, right to the minute.



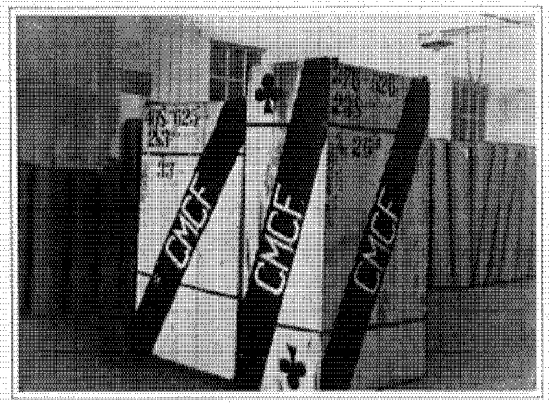
The Lite-Tenna Klok combines a lamp, aerial and clock in an attractive radio accessory

The Aerial Insulator Company of Green Bay, Wisconsin, manufactures the Lite-Tenna Klok and also the Lite-Tenna, which combines the aerial and reading lamp features but does not include the clock. The shades for these accessories are made of acetate, which was selected because of its lustrous surface, its rugged serviceability and the beautiful illumination it gives.

CLUBS ARE TRUMPS

A SHIPMENT of Ventube, the flexible tubing for use in auxiliary mine ventilation, was recently made by the Rubber Products Section of the du Pont Company at Fairfield, Connecticut, to Matadi, Belgian Congo; and it was of interest not only because of the long distance involved but also because of the unique markings that had to be made on the packing cases.

The consignee's instructions, after covering the type and structure of the boxes to be used, were insistent that each case be marked diagonally across each side and top with a broad green stripe and with the initials CMCF. In addition, it was required that an ace of clubs in black be painted on the side of each box. The reason for all this becomes clear when you consider that shipments consigned to the Congo have to be specially marked for identification. On account of the illiteracy of the native carriers in that part of the world, it is necessary to resort to the pictorial method of labeling shipments consigned to different operations.



Sixteen hundred feet of Ventube all ready for the journey from Connecticut to the Belgian Congo

The shipment consisted of 1,600 feet of Ventube. It was forwarded by Jules Monnier of Lille, France, for the Compagnie Miniere du Congo Français, located at Matadi. The cases were routed by way of Bordeaux, where they were transshipped to Brazzaville, in French Equatorial Africa, and from there transshipped again to Matadi, the final destination.

While du Pont Ventube is used in all parts of the world for improving air conditions in underground workings, this shipment to the Congo possibly traveled the greatest distance from the factory.

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

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Chemicals for leather, textile, paper, paint, rubber, battery, glass, sheet, tin plate, steel and petroleum manufacturers. Chemically pure acids, electrolyte (storage battery acid), filter alum, spray products for fruit trees, vegetables and flowers. Grasselli odorless plant food for lawns and gardens, silicate of soda, soldering fluxes, zinc, zinc chloride.

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Birmingham, Ala., 2000 First Avenue, North
Boston, Mass., 80 Federal Street
Brooklyn, N. Y., 152 Morgan Avenue
Charlotte, N. C., 930 W. Morehead Street
Chicago, Ill., 2101 Canalport Avenue
Cincinnati, Ohio, 305 Walnut Street
Cleveland, Ohio, 629 Euclid Avenue
Detroit, Mich., 1530 E. Hancock Avenue
Los Angeles, Calif.
Dry Colors & Pigments, 2034 Bay Street
Chemicals, 363 New High Street
Milwaukee, Wis., 715 South Canal Street
Newark, N. J., 256 Vanderpool Street
New Haven, Conn., 46 River Street
New Orleans, La., 527 Canal Street
New York, N. Y.
District Sales Office, 347 Madison Avenue
Export Office, 347 Madison Avenue
Paterson, N. J., 6 Waite Street
Philadelphia, Pa., 3500 Gray's Ferry Road
Pittsburgh, Pa., 307 Fifth Avenue
San Francisco, Calif.
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Anhydrous ammonia in car lots.

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Anhydrous ammonia in cylinders. Aqua ammonia in drums.

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Parlin, N. J.
San Francisco, Calif., 351 California Street

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Boston, Mass., Little Building
80 Boylston Street
Chicago, Ill., Conway Building
Clark and Washington Streets
Philadelphia, Pa., Liberty Trust Building
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San Francisco, Calif., 351 California Street

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Chicago, Ill., 7 So. Dearborn Street
New York, N. Y., 8 Thomas Street
Philadelphia, Pa., 126 S. Front Street
Providence, R. I., 709 Hospital Trust Bldg.
San Francisco, Calif., 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

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

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Cleveland, Ohio, 1221 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 Building
Joplin, Mo., 816 Joplin Nat'l Bank Building
Juneau, Alaska, Room 503 Goldstein Bldg.
Kansas City, Mo., 210 Scarritt-Arcade Bldg.
Miami, Florida, 120 N. E. First Street
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420 Lexington Avenue
Pittsburgh, Pa., Clark Building
Seventh Street and Liberty Avenue
Portland, Ore., American Bank Building
Pottsville, Pa., 516 Schuylkill Trust Company Building
St. Louis, Mo., 17th Floor, Arcade Building
San Francisco, Calif., 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., Brooks Building

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

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

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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., 351 California Street
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A complete line of paint and varnish products for all home and industrial uses.

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Chicago, Ill., North American Building
San Francisco, Calif., 745 Mission Street

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Toys, rattles, infant sets, hair ornaments.

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



What will the 1930 Models show?

THE moving finger of progress again writes motor car history. New models grace the stage. New features claim the spotlight of attention.

What are these features? Mechanical improvements? Yes. Body lines? Somewhat changed. Colors? Here the light is strongest, brightest.

As you see them remember that you can capture 1930 beauty for your own car. These same Duco colors are available to your Authorized Duco Refinisher. He applies them in the same way they are applied at the factories. The cost is always moderate. The finish on your car is probably in such condition that the new Duco colors can be applied directly over the present finish, combining with it in one hard, enduring film. Then—your car is reborn—smart, lustrous, modern.

The Authorized Duco Refinisher commands the style research of the du Pont Color Advisory Service. He will show you color schemes created by experts—or you can select your own harmonies. Perhaps among the combinations shown above there is a color scheme that appeals to you.

Does Your Car Need Complete Duco Refinishing or Just "Touch-up"?

Perhaps weather and sun have begun to destroy the finish of your car. Then your car needs complete refinishing with Duco. This means that the old finish is removed and that an entirely new surface is built up from the bare metal. Refinished at the Authorized Duco Station, an automobile comes back as though fresh from the factory, for factory methods have been followed and factory materials used.

When your car is only marred here and there — just a door or fender damaged, perhaps — remember that inexpensive "touch-up" service by the Authorized Duco Station will banish all blemishes.

The Remarkable du Pont Process

To insure results, the Duco Refinisher follows a scientific method. The du Pont Process was created by du Pont chemists, working with the engineers of leading car manufacturers (every operation of the Process is standardized). Each Authorized Duco Station is subject to constant du Pont supervision. Only du Pont materials are used.

Authorized Duco Stations Give You Complete Refinishing Service

In addition to automobile refinishing, the Authorized Duco Station will give you an estimate on any refinishing service you require—for furniture, fixtures, equipment—almost anything that should be protected or beautified. Look up the Duco Authorized Refinisher in your community. E. I. du Pont de Nemours & Company, Incorporated, General Motors Bldg., Detroit, Michigan.



The du Pont Duco Authorized Refinishing Station sign is displayed by more than 2200 shops throughout the country. Only at these shops can you be sure that your work will be done by the du Pont Process and that you are getting genuine Duco materials and service.

Authorized DUCO REFINISHERS

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