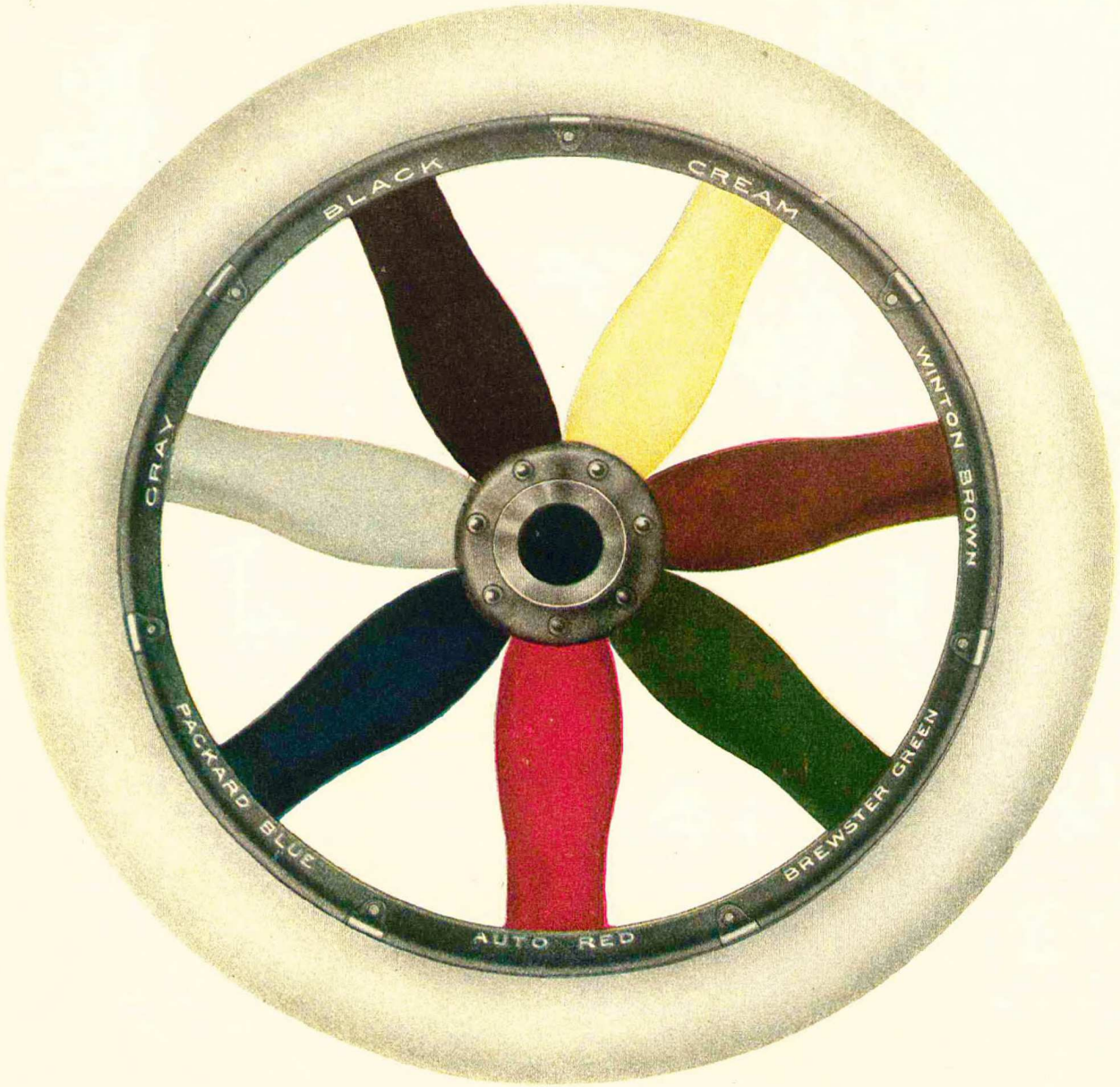
DUPONT MAGAZINE

Vol. 8 April 1918 No. 4





DECREASED production of motor cars suggests the necessity of making the old car do another season. No reason why it should *look* old, though. Harrisons Vitrolac Auto Finishes give a gloss and sheen that will make folks say, "So you've got a new car!"

Six beautiful colors, with black and white, give a range of selection for conservative limousine or snappy speedster. They give a factory finish to the used car, no matter how rusty and dusty, prolonging its life and adding much to its resale value.

Colors of the Finishes and undercoats are shown in the new descriptive folder with complete directions for applying. A copy sent on request. Just ask for the Vitrolac Auto Finish card and state who will do the work.

CARRIAGE AND AUTO FINISHERS

We are receiving many inquiries from car owners for names of finishers who use Vitrolac Auto Enamels. Send your name to us and it will be registered for reference when we learn of such work in your vicinity.

HARRISON WORKS

Owned and Operated by

E. I. DU PONT DE NEMOURS & CO.

WILMINGTON, DELAWARE

Philadelphia · New York · Boston · Chicago · Minneapolis · Kansas City

DU PONT MAGAZINE

Published Monthly by E. I. du Pont de Nemours & Company

J. H. SQUIRES, Managing Editor — STANLEY F. WITHE, Associate Editor

Volume VIII — WILMINGTON, DELAWARE, APRIL 1918 — Number 4

Perfecting Organizations for Home Defense

C. H. Sherrill, Adjutant General, State of New York

IT is expedient that every State organize a Home Guard for the defense of its citizens' lives and property during the period of the war, and these guards should be organized promptly. Sooner or later there will have gone abroad all of our Regular Army, our National Guard Army and our National Army, and then the organization of the Home Guards in the different states will become absolutely necessary. But that situation should be met in advance without waiting until the absolute necessity for such guards will cause undue haste in their recruiting, training and equipment.



C. H. SHERRILL
Adjutant General

In New York State we had no choice but to act promptly, because our State Constitution absolutely requires the Government to maintain at all times, within the State, a force of at least ten thousand armed and trained men. When the Federal Government drafted our National Guard troops, and also discharged them from the State service, the State lacked the men required by its Constitution. Since September 1st we have recruited, officered, assembled and equipped a force of about sixteen thousand men. With but few exceptions, all of our officers were trained in our National Guard, and the officers in almost every unit of the new Guard had received their training in that same unit of the old National Guard. For this reason they had every incentive to carry on in the best fashion, traditions of the old organization, something which we consider highly important, because our old regiments have been renumbered since entering the Federal service, thus making it doubly necessary for their old numerals to be preserved at home, during the days that our old National Guard are earning laurels for them abroad. For example, if we did not recruit a new 69th Regiment in its old armory at home that numeral would be non-existent until the end of the war, because our old 69th men now form part of the 165th United States Regiment.

New York State today confronts not only the same local problem as every other state, namely, that of safeguarding the lives and property of its citizens during the absence of its National Guard, its volunteers to the Federal Army and its conscripted soldiers, but also New York has the added responsibility of guarding its railways and waterways, over which the entire United States is sending to the great port of New York large quantities of supplies for shipment abroad to our soldiers and our Allies.

It is the belief of the writer that the guarding of this country during the absence of our regular troops abroad, is a problem which can be settled in no other way than by arranging a close co-operation for that purpose between our militia and our railways—the militia providing the force, and the railways the mobility for that force. To facilitate the mobilization of battalions and regiments, careful attention must be given to the railroad communications available. It was only after careful study of the railroad and waterway communications in our State and after consulting with the Railway War Board of the

TERMS: Subscription 50 cents the year; $1.00 foreign. Circulation 250,000. Advertising rates on application. All correspondence with regard to either copy, advertising or addresses should be addressed to Du Pont Magazine, Wilmington, Delaware.

Copyrighted 1918 by E. I. du Pont de Nemours & Company. Publishers may reprint from this magazine, with credit, all articles and illustrations except those that carry a special copyright. Electrotypes for reprints will, when possible, be furnished on request.

Eastern District, that our New York Guard was organized.

It is essential that those who shall have the responsibility of guarding our homes during this crisis, a duty which is so important a part of the home drudgery of the war, should be intimately acquainted with the local conditions, and it is obvious that no one can be so well equipped for that purpose as men recruited from that very neighborhood. For example, we have a battalion of six companies, stretching out through six towns along our Long Island Coast. It is commanded by an officer who served two years in the Philippines, and is therefore peculiarly well prepared to handle separate units over an extended territory. Furthermore, his long experience in the purchase of fish along that coast gives him an acquaintance among the local fishermen which, combined with the fact that all of the officers of his command, as well as their enlisted men, know every bay, inlet and possible landing place upon that coast, equips them far better to act as Coast Guards for that shore line than any other soldiers brought from other districts of the country.

Everyone admits that it is important for our militia to know how to shoot in peace time, but it becomes vitally important in war time, when quick, straight shooting may mean so much to the community which the Guard is called out to defend. We, in New York, are making a special feature of rifle shooting, and are taking every advantage of the present war enthusiasm to help us in our task.

The organization of a Home Guard in each State is almost certain to carry with it many useful by-products. For example, in New York State, I issued orders that in every company one squad should be designated as a fire-fighting squad, and should have special training for that purpose, so that if occasion arose, the commanding officer would have ready to hand, trained men for that important and dangerous business. The results of this order have been gratifying in the extreme, for, in a very few days, we have secured an excellent additional fire-fighting force distributed throughout every county in the State. Furthermore, as a result of the organization of our New York Guard, containing as it does citizens of the finest type, we are in constant receipt of useful information from all parts of the State, which otherwise could be obtained only through an expensive secret service force.

In addition to the New York Guard of sixteen thousand, we have eleven thousand more trained men in the Home Defense Reserve, equipped by their home communities, and serving as an auxiliary police reserve in those communities. We have also twenty-five thousand youths from sixteen to nineteen years of age, constantly receiving instruction under our Military Training Commission. A short time ago I saw a regimental drill of eight hundred of these youths, which, in view of the fact that they had had only eighteen drills, was really remarkable.

Enlistment in the New York Guard, in the Home Defense Reserve or training under the Military Training Commission, does not exempt a man from the operation of the Federal draft law. It does, however, give such military preparation to large numbers of men, that upon being drafted, they are fitted to become non-commissioned officers, a fact of the greatest value to a new army like ours. We New Yorkers take pride in our hastily gathered home army of over fifty thousand trained citizens, and are convinced that similar military preparedness should and can exist in every other State of our beloved Union.

Coal Saving That Counts

WITH the passing of the winter months the coal shortage loses much of its terror, but the vigil over the coal pile should not be relaxed, and every economy should be continued through the summer to prevent a recurrence of this season's famine.

It is estimated that the shortage of coal for every day of the ensuing year amounts to two and one-half pounds for every man, woman and child in the United States. Possibilities of economies by factories and railroads are receiving the most exacting studies, but more attention is needed for the small savings which can be made in each home. These savings can be made to set free thousands of tons of coal for essential industries and for the navy and the many ships needed to carry men and supplies to France.

Heating is not the only home use of coal. Most gas and electricity come from coal, and decreased consumption of either means a proportionate saving in coal. Only the most economical light bulbs should be used, and these should be of as low candle power or wattage as is permissible. All gas fixtures should be in the best condition, and Welsbach mantles substituted for the open flame burners. The flat flame burner uses more than twice as much gas as a mantle burner, and gives much less light. Every mantle burner substituted for a flat flame burner saves coal every day.

These substitutions in light may in many cases provide better illumination with a smaller consumption of gas or electricity. All lights should be turned off when not absolutely needed.

Savings in gas and coal can be made in the kitchen by arranging the cooking so that the stoves are heated for the shortest possible time each day and by a more general use of fireless cookers.

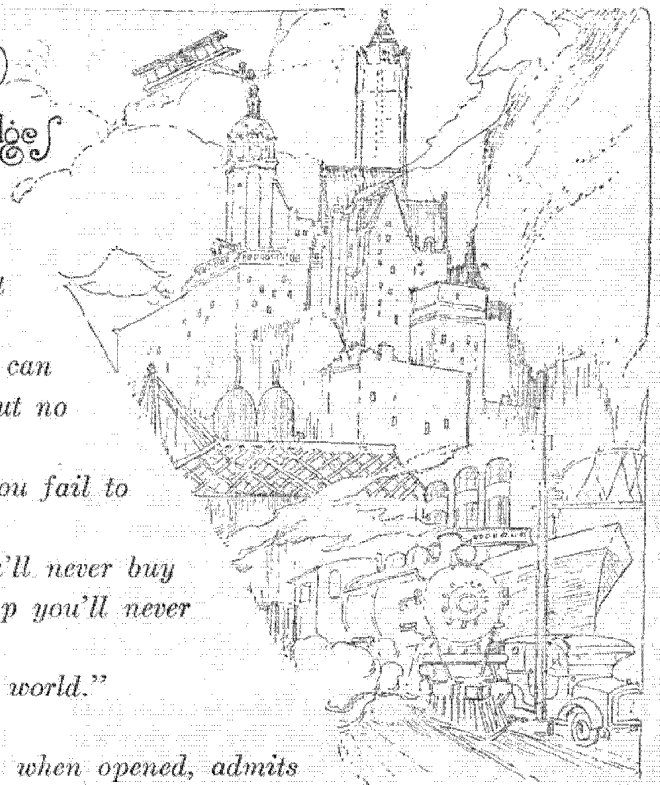
Coal is a military essential, and every ounce saved will help.

The Cost of Hauling

The prevailing cost of hauling over the public roads of the United States is about 23 cents per ton per mile. More than 350,000,000 tons are hauled over these roads each year, and the average haul is about eight miles, from which it can readily be seen that our annual bill for hauling over the public roads is nearly $650,000,000.

Imagination

by Leigh Mitchell Hodges



WHEN you go to work tomorrow morning, Young America, leave your tools at home, if you choose, but don't forget your imagination!

At mill, shop or office the boss always can find tools for the man with imagination, but no boss can supply imagination.

You must find it yourself, and if you fail to find it, you find failure.

You can't buy it, but without it you'll never buy much. You can't sell it, but minus its help you'll never succeed beyond a certain point.

Napoleon said "Imagination rules the world."

What is this super-sovereign?

It is the window of the mind which, when opened, admits the leading-light called vision. It is a John-the-Baptist every man must send ahead to prepare the way for better work. A soul scout!

It is the long arm of inner energy, reaching out beyond Today to lay Tomorrow's foundation.

It spells the difference between the blind detail-doer who, from the economic standpoint, dies long before his last breath, and the never-satisfied delver who lives long after he is dead.

Non-thinkers have a notion it is needed only by poets and painters. The FACT is this—imagination is most valuable in practical matters.

With it a machinist becomes a Watt or a Stephenson—without it he remains the village foundryman whose name you can't remember.

A counter salesman with it develops into Marshall Field or John Wanamaker, but without it remains the poor old fellow retained at $10 a week out of sympathy.

With it a Minnesota telegraph operator founds a mail-order business whose net profits last year, after deducting $4,000,000 for war taxes, were $15,000,000.

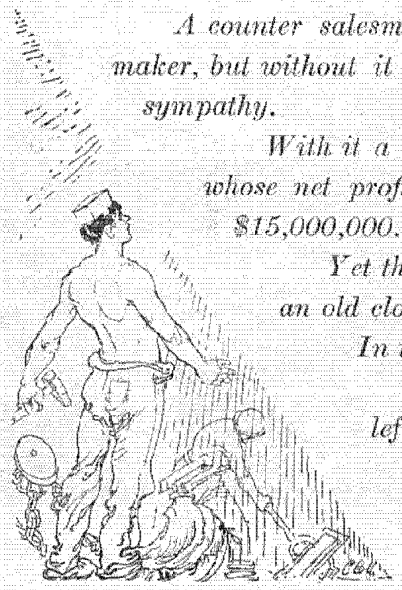
Yet thousands of telegraphers keep on ticking out their lives like an old clock—marking time, but making small use of it.

In this land imagination is needed today as never before.

A million young men who were making good use of it have left their work to fight for freedom.

The million who take their places must cultivate and use it.

Dare to dream!



The Development of Transportation

E. C. Ferriday

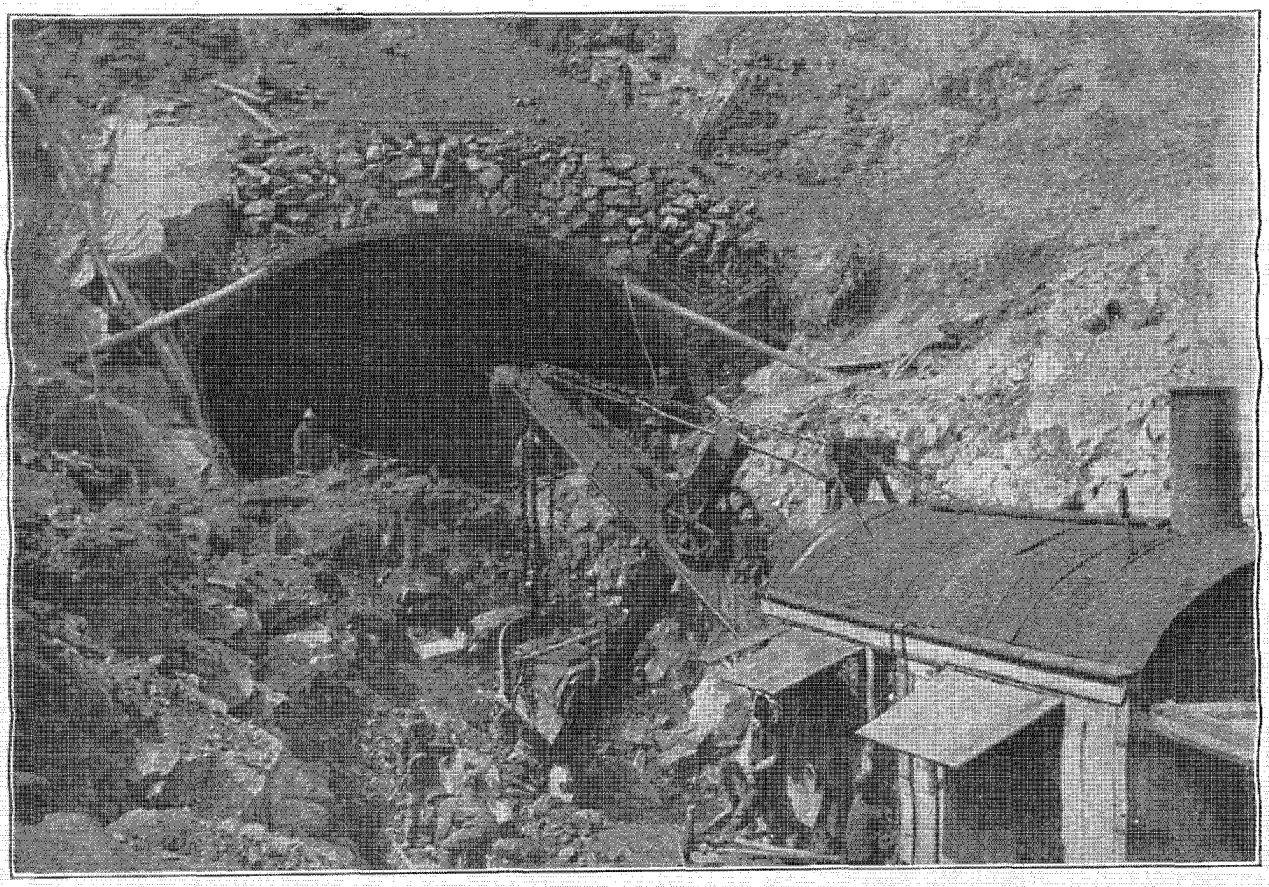
AT no time has so much been said with regard to transportation as during the past few months. Not only the congested conditions of rail and ocean freight, but the actual operation of transportation lines by the Government has brought to mind, as never before, what an important part transportation plays in our everyday American life; and one need only turn back the pages to our early history to realize the inestimable boon it has been in the industrial life and advancement of the nation. It has brought the necessities, comforts and luxuries, not to mention the development of vast resources, so that with the broad interpretation now placed upon the word "transportation," which conveys to the mind not only traffic in the sense of freight tonnage and travel, but also transportation as applied to water for power or domestic uses. In other words, transportation is a much broader subject than is construed by the average layman in the ordinary definition of the word.

Date the birth of modern land transportation from the day of Stevenson and the locomotive, for that was the beginning of the new era in the construction of transportation lines.

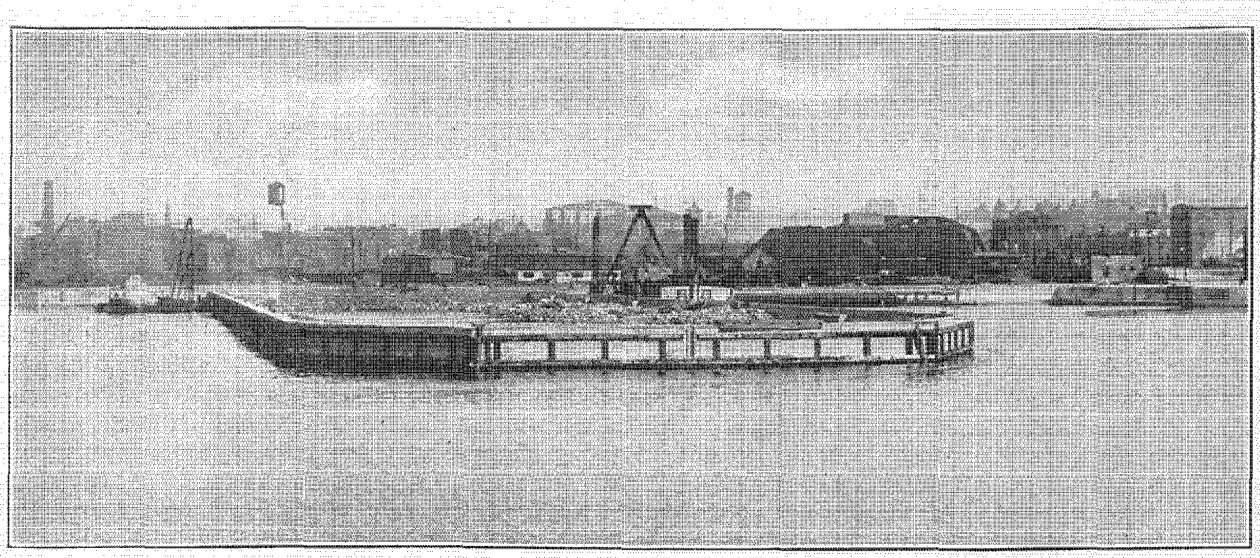
Date the birth of modern water transportation from the day of Fulton and his steamboat, for from that time there arose the need for the improved waterways, which eventually were the instruments for connecting the Great Lakes with the seaboard and the opening of the channels of the navigable rivers.

In the days of the Roman Empire aqueducts were the rule rather than the exception. With regard to transportation of power, we would point to the improvements since the days of the mill by the dam site, the development of which has in later years made possible the transportation of power through electrical means.

Improved transportation, most largely through railroad construction, has probably been the greatest single factor in eliminating sectional lines and feeling. In early days, of necessity the modes of travel were restricted largely to stage or water transportation, and the distances covered were not great. This had a tendency to keep persons largely within a well defined radius, and never gave them the opportunity that exists today for travel and frequent interchange of ideas or customs. With the big railroad systems traversing the country, whereby practically solid trains cross the continent and operate schedules from our eastern cities to our gulf ports, it is no wonder



Through Solid Rock for Better Transportation



Canal Terminal at Buffalo

that the lapse of time has brought about gradually a diminution of sectional feeling and a commingling of ideas, habits and customs between peoples of the several states. These changes are amalgamating Americans into a definite unit.

Improved transportation has also played an important part in civilizing, if such a term can be used, various parts of our country, which during the early days and even recently were inhabited to a large extent by law-breaking citizens or by feudists who dared the outsider to tread their preserves. It is an acknowledged fact that with the construction of the great railways across the plains of our western country the wild Indian and the buffalo have gradually become extinct and replaced by industrious communities and domesticated cattle. Anyone who so desires may now visit "Bloody Breathitt" County, Kentucky, with an almost absolute sense of security, which was impossible even so short a time as five years ago. In a word, transportation has brought the secluded districts of our nation so much nearer the centers and marts of trade that there is no longer encouragement for the desperado or feudist to continue his warlike depredations with civilization and enlightenment encroaching so closely upon his preserves and offering its advantages to him so freely.

Little does one think on board a train at the Pennsylvania Station, New York City, of the work done in the excavation for the site of that magnificent building, to say nothing of that for the twin tunnels stretching out under the North River towards the Jersey meadows. The same may be equally said of the wonderful structure of the New York Central lines in this great metropolis, where tier after tier of foundations for that monumental improvement were made possible only after thousands of tons of hard rock had been torn from its bed.

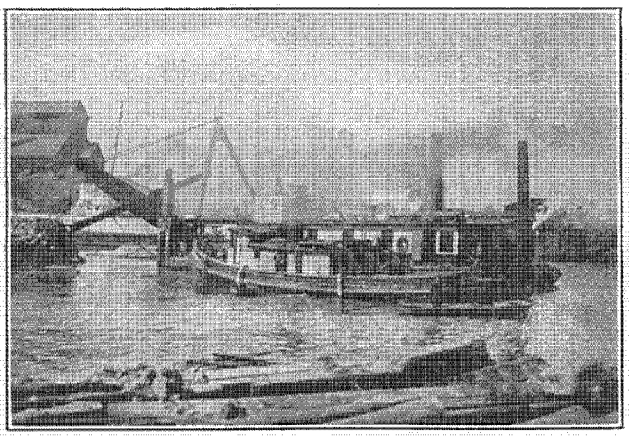
It has often been said that nothing amazes the Americans, who become so accustomed to stupendous undertakings that they take for granted these wonders as they arise. The travelers on trains de luxe from terminals built upon solid rock pass under rivers, over streams, and through mountains to different destinations, meeting and passing as they go long trains of coal, ore and merchandise, all needed to sustain the industrial fabric of the world. These freight carriers travel the same expensive tracks that bear the modern diner at sixty miles an hour with nothing but the necessary motion of the train, which is barely sufficient to disturb but not spill the coffee in the cup. Grades have been reduced, curves straightened, and safety signals installed to hasten and make safer the human and other freights.

Only those who follow railroad or construction work realize the expenditure of millions which the transportation systems undertake each year, not only for the construction of new lines, but also for greater speed, as well as the reduction of operating costs, in all of which explosives are a necessary factor.

There is no overestimating the importance of the part played by dynamite and powder in construction work, for on any work where rock excavation is encountered the explosives cost is next to that of labor. Consequently, it is with reason that the explosive manufacturer takes pride in the part he has played in these improvements. Were the specific undertakings of our transportation systems, where millions have been spent for easier travel and less operating cost, enumerated, the list would be without limit.

We might with perfect propriety call attention to Rapid Transit—another word for transportation, which to the New Yorker since the day of the Subway has earned its name. When the "L" was the rapid carrier and it took thirty minutes from Forty-second Street to The Battery, is it any wonder that even though hanging to a strap the passenger gives thanks when this trip can be made in less than half this time through the four-tracked tunnel hewn in rock through the use of explosives?

Transportation by rail, though our chief industrial asset in which billions of our dollars have been invested, does not constitute the only use to which explosives have been put, for the great trans-Atlantic liner with her nose pointing towards the Hook, or the palatial sound steamer headed for "The City of Baked Beans and Brown Bread," or the Hendrick Hudson on her trip through the Catskills, or the Buffalo boats starting a jaunt through the Great Lakes, are a testimony to what explosives have done in deepening the harbors, widening the channels and constructing the locks which make all this possible.

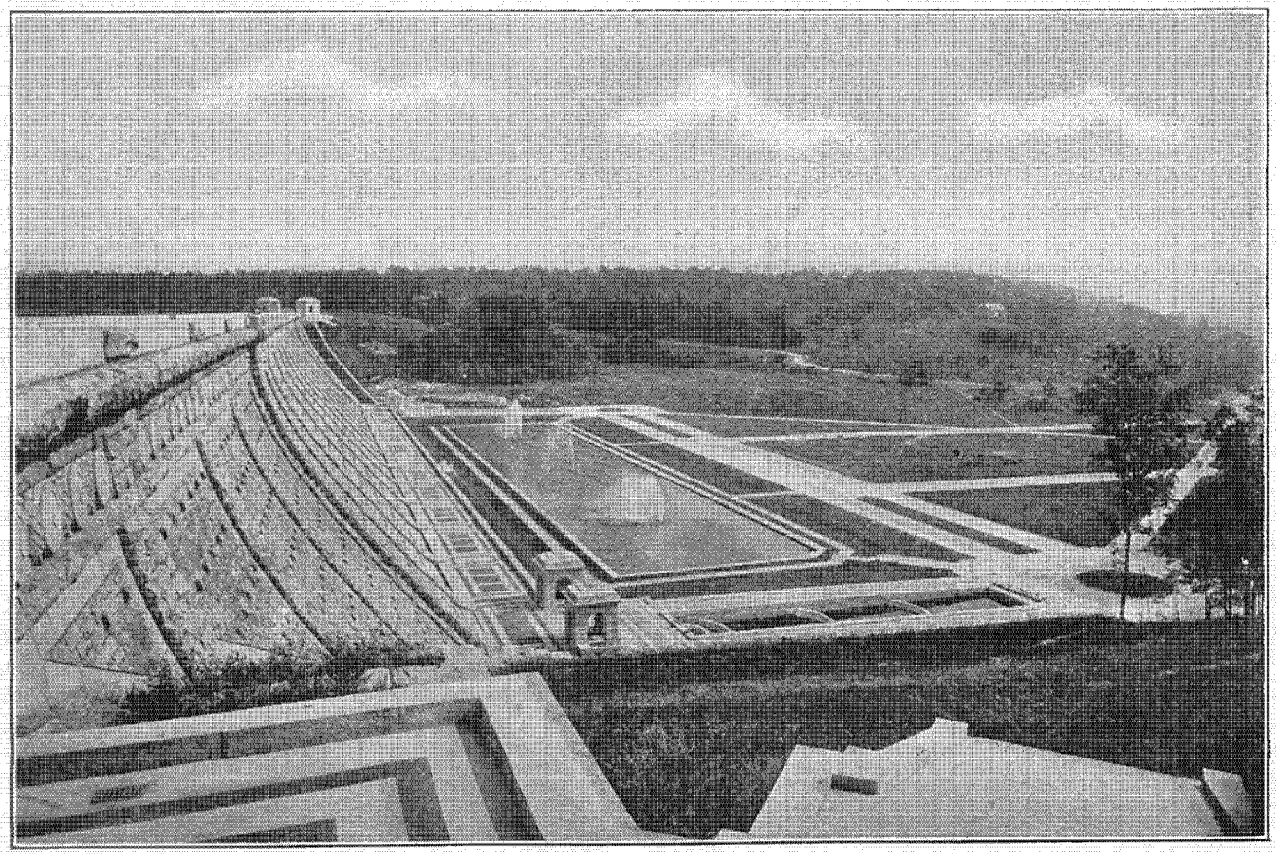


Cutting Out the Harbor Bottom to Admit Larger Boats

The interior waterways always demand attention. Through recent construction a vast ship canal has been cut across the "Empire State" so that freight from our lakes can be brought to seaboard by barge. The locks of the Soo, blasted through the living rock, make possible the "Iron City" and its progress by furnishing the transportation for the needed ore.

Last, but by no means least, should be mentioned transportation of water and power which has been facilitated, if not almost made possible, through the use of explosives, and as illustrative of this is cited the wonderful Catskill aqueduct, which project comprises a water supply approximating ninety miles from the picturesque Catskills into the heart of our metropolis. Millions of dollars were needed for this continuous tunnel in rock, through which is poured the water supply for the millions of New Yorkers. This aqueduct from the Ashokan Dam to the heart of the metropolis is a constant memorial to the use of explosives in aqueduct work.

Of equal importance is the transmission of power as it is now undertaken by the hydro-electric properties built in the mountain gorges and on the important rivers, so that today with power and light so easily transported by these developments the thoughtless person becomes accustomed to it and accepts it as a matter of course and forgets the efforts needed to bring it all about.



The Kensico Dam



The Overnight Bag

An ever present help in time of trouble from quick trips is the fully equipped Overnight Bag. The one shown is light and sufficiently roomy for the needs of a short trip. The bag is of Fabrikoid and the dainty toilet articles of Ivory Py-ra-lin.

Increasing Cotton Production

F. W. Wilson

TRAVELING over the Southern Railroad from Washington to Birmingham, Alabama, the observer will notice how very few of the cotton fields are cleared of stumps.

Ask a farmer the reason for this, and he will say that it is due to absentee ownership—that is, the owner of the land lives in one of the cities and rents his plantation, divided into sections, to tenant farmers, on shares; that the owner as a rule is not interested in having his fields cleared because he is satisfied with his income from the crops and, therefore, has no incentive to incur the expense of clearing.

This has never seemed to be a good argument. It is against human nature. Was there ever a man, ten times a millionaire, that was not working his head off trying to make his fortune twenty million? Not because he needs the additional ten million, not because he has any way of spending the additional income; but simply because it is human nature to want as much as it is possible to obtain. Oliver Twist, the creation of Dickens' fertile imagination, was a very normal boy. He wanted more. Investigation would disclose the fact that there are more "Oliver Twists" among the cotton plantation owners than there are credited with being. It is simply because he has not figured out what it means to him in dollars and cents to have his cotton fields cleared of stumps. No normal man is satisfied with an income of five thousand dollars a year if there is any logical way of making it six.

It is an insult to the intelligence, the business acumen, of the plantation owner to accuse him of being thus abnormal in this respect. The only reason he has not cleared his fields is because he simply has not thought seriously about it.

There is every logical reason why cotton fields should be cleared during 1918. The world faces an alarming shortage of cotton. The labor necessary to plant, cultivate and pick it is scarce, and wages are higher than ever before. There is no question about the demand for the crops, no question about the crops being highly profitable, for at the time of writing cotton is selling for around thirty-two cents per pound. Ten to twelve cents affords the planter a very satisfactory profit under normal conditions.

Cotton Prices for Different Fiscal Years, Ending August 31st

(Before the Effect of War)

YEAR	HIGH	LOW
1910–11	$15.05	$11.25
1911–12	12.99	8.76
1912–13	13.18	10.00
1913–14	14.45	11.98

(After the Effect of War)

YEAR	HIGH	LOW
1914–15	$10.38	$7.15
1915–16	13.38	9.68
1916–17	27.45	12.95

High since last annual report on August 31, 1917, was on January 9th—$32.44

The average cotton field yields approximately a half bale per acre. With the stumps removed, this average can easily be increased from twenty-five to a hundred per cent.

The cost of the clearing would be met, in most cases more than met, by the increase in value of one crop. As the clearing has to be done but once, all increases in future years would be clear gain.

There never will be a more favorable time for the plantation owner to have this clearing done. Cotton at thirty-two cents a pound gives him a surplus which he can expend without missing it at all in the work. It is as if Providence had tendered him the money on a silver platter.

Few people realize the amount of space taken up by a stump. The area will maintain several cotton plants.

But that is not the only consideration. Having the stumps out enables the planter to use modern machinery for preparing the land and cultivating the crop. That means doing the work with less labor, and that in turn means greater profit.

Again, the use of modern machinery means more thorough cultivation. That likewise means larger crops and greater profits.

Another most excellent reason for disposing of the stumps is that cotton production is decreasing, due to the depredations of the boll weevil, weeds and other enemies. These little pests breed and winter to a certain extent in the litter found around the stumps. By blowing up the winter habitation, the family life becomes less happy and the numbers automatically decrease. The converse of this is that by using the space occupied by the stumps for additional cotton plants, the crop becomes enough larger to counterbalance, or partially so, the destructiveness of the troubles.

If the stumps are removed with dynamite, the subsoil is broken up by the blasting and increased crops may be looked for. This is especially so if the plantation is located on the Piedmont plateau, where the red clay subsoils prevail. Some really astonishing results are reported by the cotton planters who had used dynamite to break up the subsoil. When this is done in conjunction with stump blasting, it really costs nothing because the expense is charged to clearing rather than to cultivation.

Some extracts from reports of planters that have tried dynamiting for subsoiling might be of interest:

M. M. Shanke, Brewton, Alabama, reports that before subsoiling he got ¾ bale of cotton per acre; after subsoiling, 1½ bales.

Joseph Willman, Talladega, Alabama, got 1,735 pounds of seed cotton per acre; crop value $98.72, from a blasted acre. An adjoining acre, unblasted, produced 1,115 pounds, valued at $53.52.

John P. Fontaine, U. S. Department of Agriculture, Linden, Alabama, reports 1,080 pounds of seed cotton from a blasted acre, as against 900 pounds from an unblasted acre.

The Central of Georgia Railway Test Farm, Dawson, Georgia, reports that their blasted acre produced one-third more cotton than adjoining unblasted land; that the cotton yielded 40% of lint, as against 33% from the unblasted land.

Ben S. Mooney, special agent of the Department of Agriculture, Statesboro, Georgia, reports an increase of between three and five hundred pounds of seed cotton produced by a five-acre plat that was blasted, as against a similar area unblasted.

With cotton almost as urgently needed "to win the war" as food, with the money handed to the planters with which to clear their fields, with greater income absolutely assured by disposing of the stumps, it is inconceivable that 1918 may not witness the exodus of most of the stumps.

Plenty of Credit

Mr. Butterworth, the grocer, was looking over the credit sales-slips one day. Suddenly he called to the new clerk:

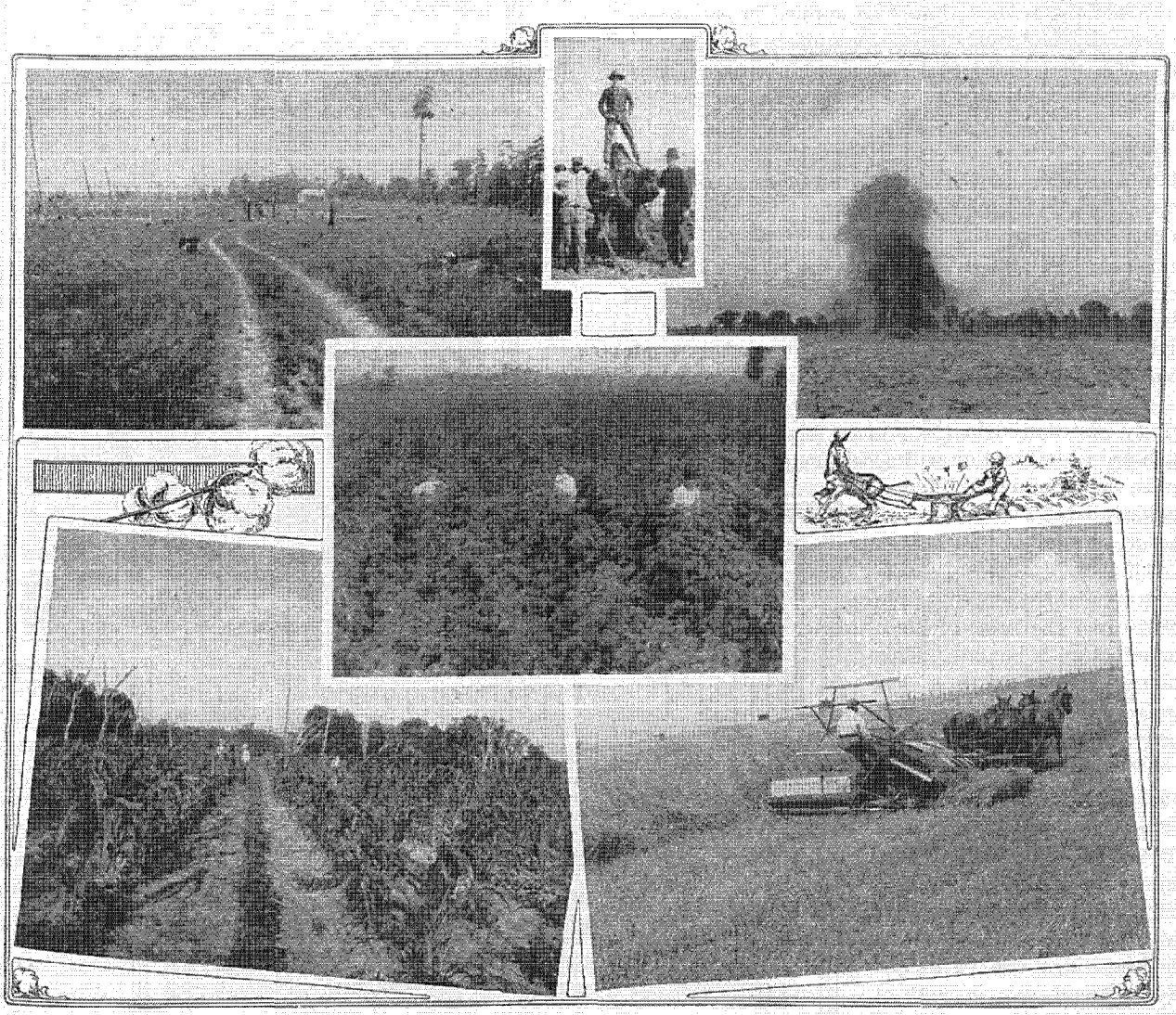
"Did you give George Callahan credit?"

"Sure," said the clerk. "I——"

"Didn't I tell you to get a report on any and every man asking for credit?"

"Why, I did," retorted the clerk, who was an earnest young fellow. "I did get a report. The agency said he owed money to every grocer in town, and, of course, if his credit was that good I knew that you would like to have him open an account here!"

—*Rehoboth Herald.*



Fields in Cotton and the Other Crops of the Cotton Region Must be Cleared to Permit Economic Tillage

Alum and Its Uses

H. D. Schanche

ALUM, in its various modifications, was known to the ancient Greeks, Romans and Egyptians, who obtained it from the efflorescence or frosting of certain rocks and prized it highly for its medicinal virtues as well as its application to dyeing and tanning. The oldest artificial method of producing alum from alumite or alum stone was of Oriental origin and was introduced into Europe about the thirteenth century. The first important alum factory was actually established in Italy towards the fifteenth century, by a Genoese merchant who had traveled extensively in the Orient.

It was not until the middle of the nineteenth century that commercial sulphate of alumina made its appearance on the market in considerable quantities, and its advantages in certain industries over the crystal alums were so evident that it gradually supplanted them until at the present time by far the greater part of the alum trade centers around sulphate of alumina.

While the term "Alum," as applied in commerce, is generally understood to cover quite a few different products, the alums can be classified into two groups: the crystal alums and the sulphates of alumina. The most important crystal alums consist of the double sulphates of potash or ammonia on the one hand and alumina on the other. They are characterized by their freedom from impurities, especially iron, which is due to their sparing solubility in water and consequent easy separation from contaminating salts when crystallized out of their solutions. The sulphates of alumina on the other hand have the advantage of a higher alumina content, and, moreover, their ready solubility in water makes their use very convenient.

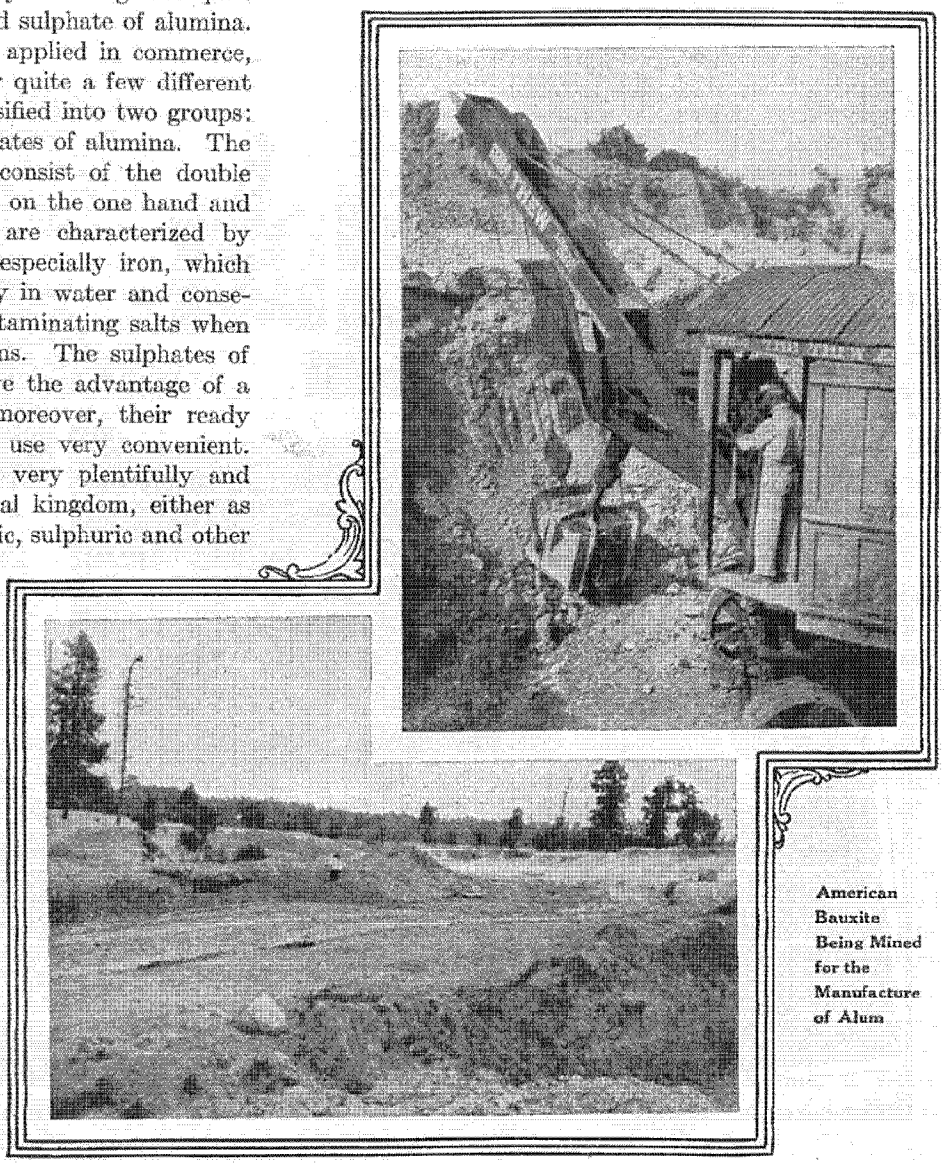
As oxide of alumina occurs very plentifully and widely distributed in the mineral kingdom, either as such or in combination with silicic, sulphuric and other acids, there are many different ores available for the manufacture of alums.

Of these, the most important ore and the one that is in most cases the basis of alum manufacture is bauxite. This interesting mineral is a hydrated oxide of alumina with varying amounts of oxide of iron, titanium and silica. It was discovered at Baux, in France, whence its name is derived, and occurs in Calabria, Ireland, Austria and in very considerable quantities in the United States.

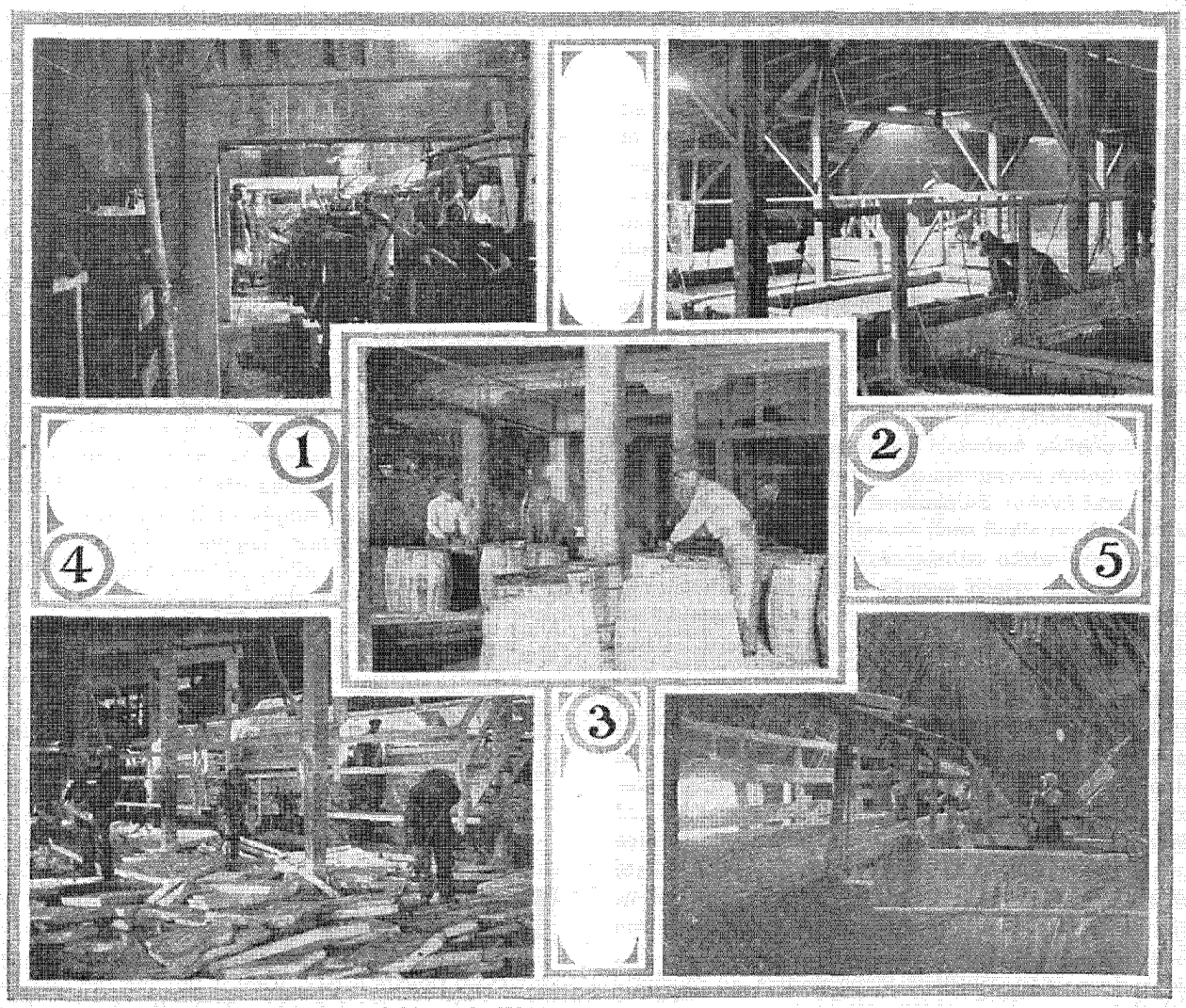
Some idea can be gained of the tremendous growth of the bauxite industry in this country if the total production of 297,041 long tons in 1915 be contrasted with 17,069 long tons in 1895.

The principal deposits of bauxite occur in the states of Georgia, Alabama, Arkansas and Tennessee. The ore occurs in pockets or beds interspersed with clay and covered with more or less overburden to be removed before the mineral can be obtained. The ore is dug out with pick and shovel—occasionally blasted—separated, where necessary, from the clay, dried and shipped. Bauxite is graded according to its analysis for industrial purposes. Freedom from impurities exceeding specified amounts, particularly as applied to iron, is required where it is to be utilized as a raw material for the manufacture of alum.

Upon arriving at the works, the ore is unloaded into bins and ground as needed. It is then introduced into large lead-lined tanks equipped with steam coils



American Bauxite Being Mined for the Manufacture of Alum



1. Presses for Separating Alum Liquors from Bauxite Sludge
2. Crystallizing Boxes for Crystal Alum
3. Packing the Finished Alum
4. Removing Alum from Cooling Pans
5. Tanks Where Bauxite is Leached with Acid

and containing the appropriate amount of sulphuric acid. The reaction is very lively at first and is promoted towards the end by the application of heat until the acid has been completely neutralized and the resulting raw alum liquor has reached the required basicity due to solution of the provided excess of alumina in the ore. The basicity of the alum liquor and of the finished product made from it is highly important and is regulated according to the use for which the alum is destined.

After the attack has been judged complete the liquor and sludge are drawn off into suitable tanks, and after reduction of the iron contained in it, due to solution of this mineral originally present in the ore, to the ferrous state, it is clarified by settling and after being filter-pressed, constitutes the finished alum liquor from which, dependent on its basicity and iron content, the various alums are made.

Commercial sulphate of alumina is made by evaporating this liquor by means of steam coils to a thick viscous mass, which is then run out into ingot moulds or onto floors, as the case may be, and allowed to solidify. This mass after cooling is broken up into pieces and either sold as such in lump form or ground and packed in barrels.

Sulphate of alumina is extremely soluble in water, to which it imparts a flavor that is sweet at first, but astringent afterwards. Its solution exhibits acid properties, such as turning blue litmus paper red and attacking certain metals such as zinc and iron with liberation of the gas hydrogen.

The principal uses of alum are for

Water purification,
Paper manufacture,
Production of "Lakes."

The function of alum in the purification of drinkable water is based on the fact that sulphate of alumina reacts with alkaline substances to produce hydrate of alumina. The natural alkalinity of most waters is often sufficient to do this; otherwise, an alkali, such as lime or soda ash, is artificially added.

The hydrate of alumina that is formed in the above manner is very gelatinous and possesses the property of coagulating and carrying down with it suspended

impurities, such as finely divided clay or mud and organic matter together with any bacteria that may be present.

Paper when first manufactured is very porous and contains many interstices or pores, as in the case of filter or blotting paper. In order to fit it for commercial purposes, it must be subjected to a process known as "sizing," for which large quantities of alum are used. Rosin is boiled with a solution of soda ash and a rosin soap prepared to which a solution of sulphate of alumina is added, which precipitates resinate of alumina into the pores of the paper and makes it, after treatment, fit to write upon or utilize in the usual manner.

The property of hydrate of alumina to pick up or absorb organic materials has already been alluded to and is taken advantage of in the production of dry colors and lakes. Sulphate of alumina when precipitated with an alkali such as soda ash gives a beautiful voluminous white substance known as hydrate of alumina, onto which organic dyestuffs, both natural and artificial, can be precipitated with suitable reagents and the hydrate permanently stained. After washing, pressing, drying and grinding, the stained hydrate or lake is ready for use in the manufacture of wall paper colors and printing ink. It may be mentioned here that whereas the ordinary commercial sulphate of alumina, which of course always contains some iron, can generally be used, there is a class of dyestuffs, such as the alizarines, that is very sensitive to the presence of iron. In such cases a pure sulphate of alumina known as "iron free alum" or "porous alum" is used. This is made by dissolving an iron free hydrate of alumina in sulphuric acid and boiling down to a cake, which is made porous, to facilitate solution.

Crystal alums, *i. e.*, potash alum or ammonia alum, are made by dissolving calculated amounts of sulphate of potash or ammonia, as the case may be, in the finished alum liquor already spoken of, and crystallizing out in large lead-lined tanks with metal strips suspended into them. The crystallization is allowed to proceed until complete, whereupon the other liquor containing the greater part of the impurities is drawn off, and the crystals taken out. The finest crystals are obtained from the strips and sides, whereas the bottoms sometimes need to be recrystallized.

The crystals are given a good wash in a log washer, air dried and sold in lump, pea, ground or powdered form.

Paint as an Investment

"We wish to drive home to the mind of the public—to the mind of every consumer, actual or potential, the fundamental fact that when he buys paint he is not spending money, but making an investment; to fix in his mind as an axiom the conviction that paint is a prime necessity of economic life."—George B. Heckle, in *Drugs, Oils and Paints.*

Lime and Food

With the reduction in the amount of farm labor and the increased demands for food and forage it becomes imperative that all farm labor be used to the maximum advantage. In some cases this will necessitate the abandonment of crops requiring large amounts of hand labor and substituting therefor crops that can be grown with less manpower per acre.

Peas and beans play important parts in this changed farming, as they produce food for both man and beast, and can be raised with little effort.

To supply the shortage of fertilizing materials, green manure crops, usually legumes, must be grown. Much lime will be required for sweetening the land for these crops, as they cannot be grown successfully on sour land. Careful planning will be necessary in order to insure a sufficient supply of lime in time for the planting season. Where supplies can be obtained from large plants or kilns, orders should be placed well in advance of the time of need, and where local kilns or grinders are to be built to supply the needs of a community no delay should be tolerated.

Peas, beans and their kindred crops are good for the soldier, sailor, home and live stock. They play no favorites in their good food values, but they must have lime.

Your Wage

Every employee pays for superintendence and inspection. Some pay more and some less. That is to say, a dollar-a-day man would receive two dollars a day, were it not for the fact that someone has to think for him, look after him, and supply the will that holds him to his task. The result is that he contributes to the support of those who superintend him.

Make no mistake about this: incompetence and disinclination require supervision, and they pay for it—and no one else does. The less you require looking after, the more able you are to stand alone and complete your tasks, the greater your reward. Then, if you cannot only do your own work, but direct intelligently and effectively the efforts of others, your reward is in exact ratio, and the higher the intelligence you can rightly lend, the more invaluable is your life.

The Law of Wages is as sure and exact in its working as the law of the Standard of Life. You can go to the very top. And going down the scale, you can find men who will not work of themselves and no one can make them work, and so their lives are worth nothing, and they are a tax and burden on the community. Do your work so well that it will require no supervision, and by doing your own thinking you will save the expense of hiring some one to think for you.

—Elbert Hubbard, in *The Three Pardners.*

Leather Substitutes for the Marine

SHIPS, ships, and more ships; criticism, criticism, and more criticism—everything that has helped delay, obstruct or defeat the Nation's shipbuilding program has had wide publicity. From steel to steals the ground has been raked over and sieved out for things to condemn, while the many fine things accomplished by the Shipping Board have gone unnoticed through the meshes.

The infinite planning and innumerable nice adjustments; the shortages of labor, materials and transportation dealt with; the improvements made and economies effected and the great work of standardizing and co-ordinating the vast shipbuilding effort have never been credited.

All the troubles disclosed as yet have concerned hulls exclusively. But the hull is only part of a boat. The Shipping Board must also handle the thousand and one other things that make a boat navigable and habitable, every one of which presents its own problems. It is only because these problems are being solved adequately that we hear nothing of them.

The problem of upholstery is typical. On each of the fabricated ships of the new Merchant Marine, there are about fourteen transom seats and backs which require upholstering. The Shipping Board had a choice between leather and artificial leather. The former was in general use, there was no prejudice against it. The easiest way was to adopt it.

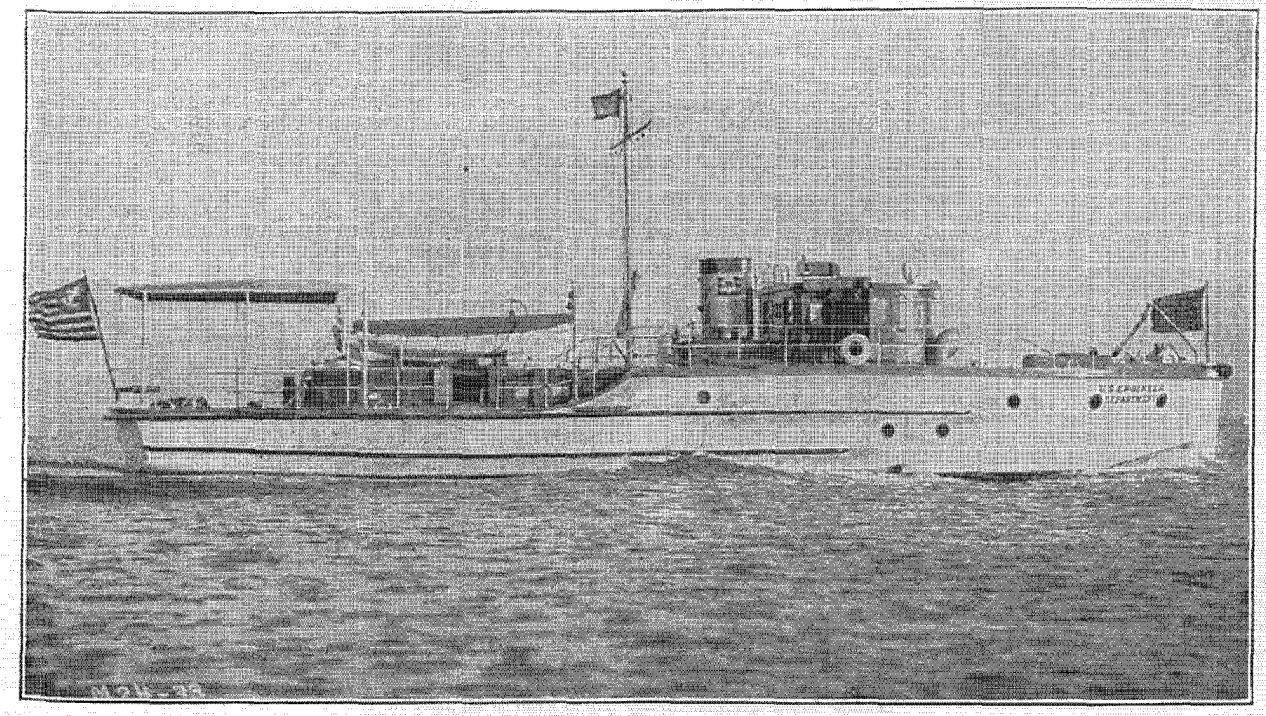
To adopt leather, however, meant to pay more, to intensify the shortage of leather, and to increase its price at a time when the War Department needed all it could get for shoes, saddles, harness and other military supplies for which leather is indispensable. It meant that in the increased competition for leather the Shipping Board's own requirements might not always be supplied promptly.

With leather substitutes there was no such problem, as the supply was ample. The vital factor in the shipbuilding program was time, and leather substitutes were time-savers. Coming in long rolls of uniform width and quality, they were perfectly adapted to standardized methods of production. They had the service qualities needed. They were water, grease, stain and dust-proof. They could be washed and kept perfectly clean and sanitary. They were mildew and mould-proof, and strong, much stronger than ordinary leather "splits," and had in addition splendid wearing qualities. So leather substitutes were specified for upholstery in the ships of the new Merchant Marine, where their real service economy will be amply demonstrated, as has already been done in other branches of the Marine for several years.

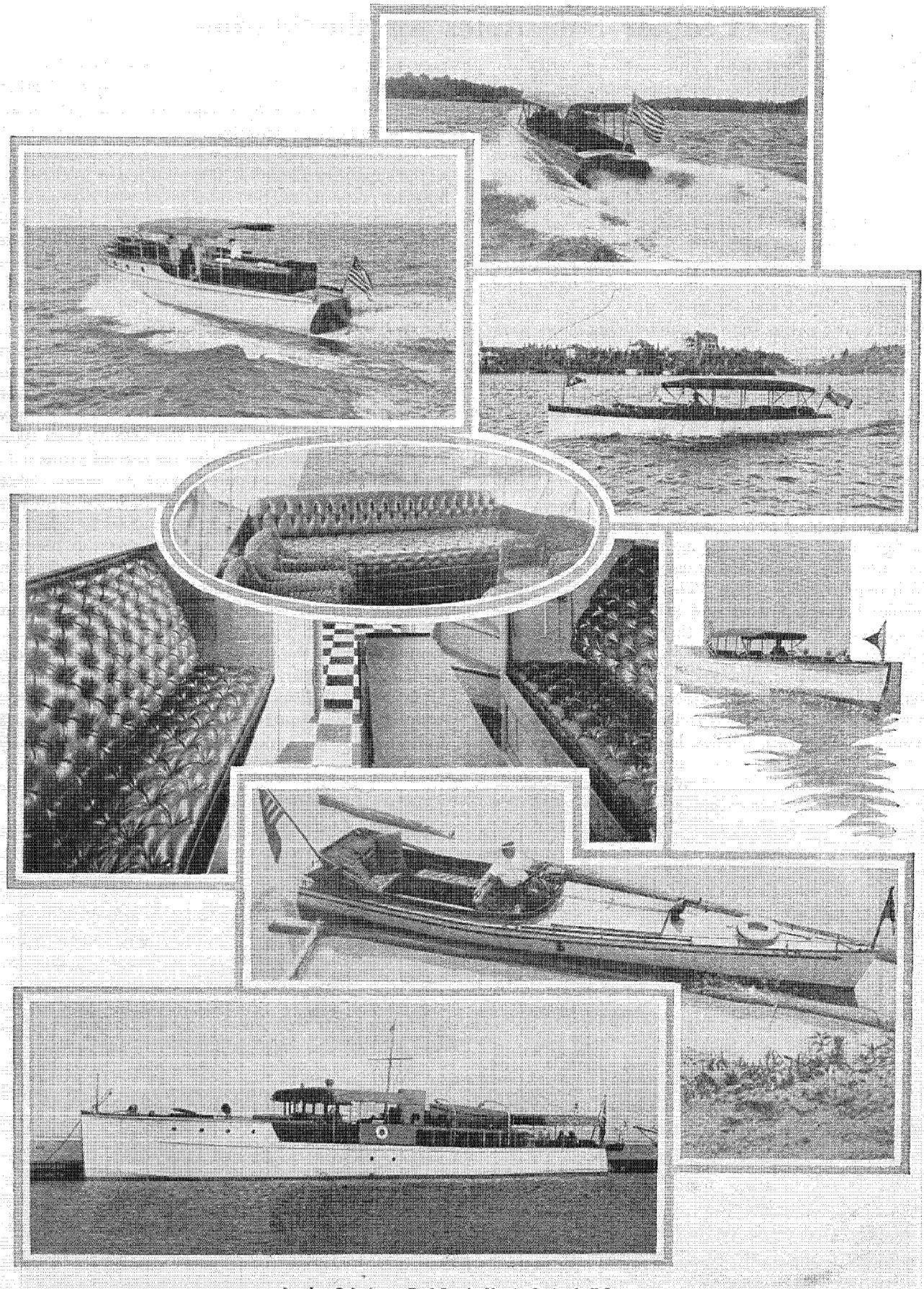
Leather substitutes were used in many large freighters prior to the war, where their impermeable and cleanable character made it practical to upholster not only the officers' quarters, but also the benches in the quarters of some of the crew, such as firemen and oilers, who had never enjoyed the comforts of upholstery before, simply because the absorbent leather and cloth upholstery fabrics in use were incompatible with the grease and grime of their employment.

Leather substitutes are and have been used very extensively by manufacturers of motor boats, launches and all the larger types of pleasure craft, where both

(Concluded on page 22)



Finished Throughout with Leather Substitutes



Leather Substitutes Find Ready Use in Craft of all Sorts

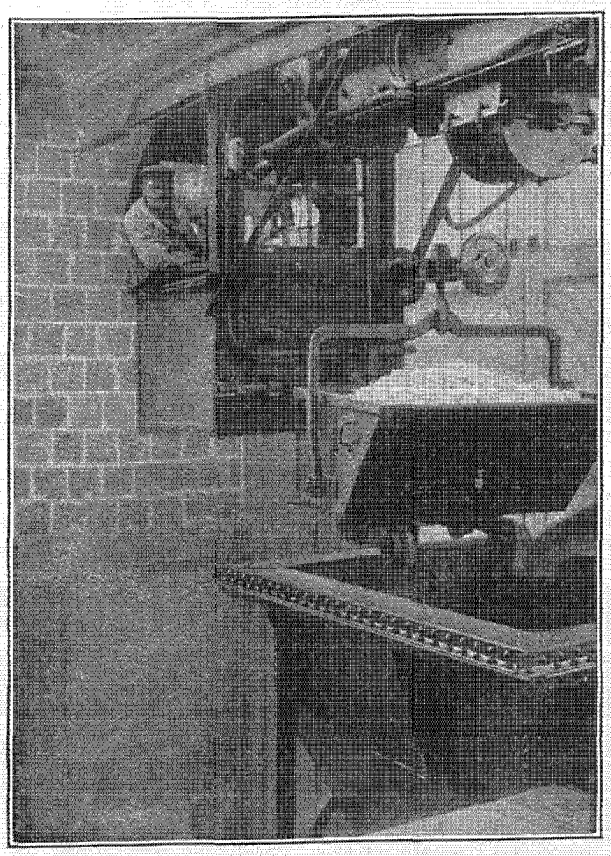
Making White Pigments

THE first step in the making of paint is the selection and preparation of the pigments. Upon the care and skill with which this is carried out depends in large measure the excellence of the finished product.

Paints are mixtures of solid particles or pigments and a liquid or vehicle. Pigments are finely ground metallic, earthy or animal substances which give to paint body, hiding and covering qualities, and color. The vehicle is a liquid in which the pigment particles are held in suspension, with the object of producing a durable paint film, uniform in color and consistency.

In making a good paint many different pigments are used, and it is only by their most careful selection and mixing that the best results can be obtained. One pigment may have good covering qualities but lack durability. Another may be much more durable but lack the necessary hiding qualities. Still a third may have the property of neutralizing elements in the paint film that would otherwise impair its stability or shorten its life. The very highest order of skill on the part of the paintmaker is required in order to select and combine those pigments best adapted for the purpose.

The oldest and most frequently used pigment is white lead, which was used as a paint material before the Christian era. The Romans called it "ceruse" and made it by exposing lead over sharp vinegar, which differs only slightly from the modern practice. Progress has been chiefly in the direction of greater fineness, higher purity, and more efficient methods of handling.

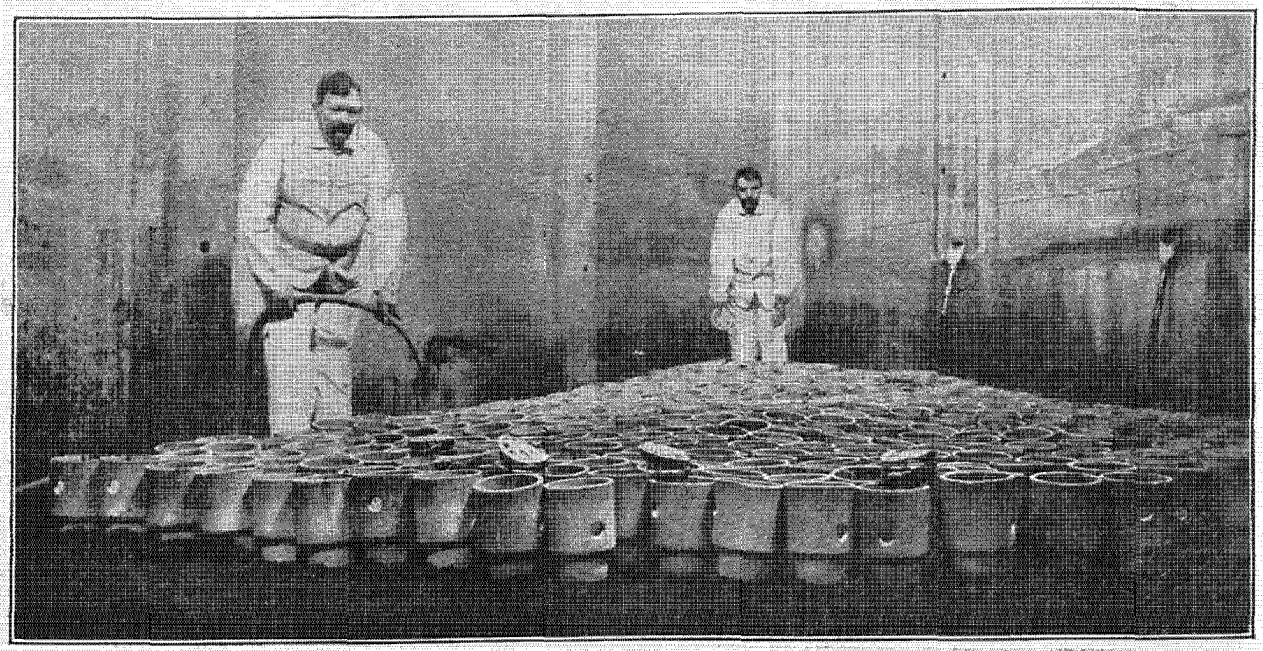


A Modern Crane Used for Removing Corroded Lead from the Stacks

The metallic lead from which white lead is made occurs in nature as an ore, which must, of course, be mined and refined before it can be made into a pigment. The ores of lead occur in veins and pockets far under the surface of the ground. They are associated with other minerals which must first be removed. The lead is then cast into bars or pigs and is ready to be made into the white lead of commerce.

The Dutch are credited with being the originators of the process by which most white lead is made and which is called after them—the Dutch Process. In this process the lead is first melted and cast into "buckles," so called because of their fancied resemblance to the shoe buckles of colonial times, but which look much more like the round waffles of the present day. These buckles are then placed in earthen jars over a small quantity of weak acetic acid—which is practically our domestic vinegar. The pots, filled with buckles, are then piled twenty or thirty feet high in huge sheds in what are known as "corroding stacks." Each corroding stack, which is as big as a house, is built up of alternate layers of corroding pots and spent tan bark, which is nothing more than oak bark that has been used in tanneries.

In the corroding stacks, which are



Inside a Corroding Stack

closed tight except for small openings for ventilation, the tan bark begins to slowly decompose and give off carbon dioxide gas, which is the same thing that our lungs give off when we breathe. In fermenting, the tan bark also generates heat, which warms the acetic acid until it forms vapor. The vapor rises up through the lead buckles and gradually turns them white, for acetic acid has the power of corroding lead. It is the nature of lead to turn white when it corrodes just as iron turns red and copper green. The white substance is lead acetate.

But that is only half the story. As fast as the lead is corroded the carbon dioxide which is constantly being given off by the fermenting tan bark attacks it. A chemical change takes place and converts the lead acetate into basic lead carbonate, or, as we call it, white lead. The complete process so briefly described takes from three to four months. The stacks are then torn down and the particles of white lead ground in linseed oil. The resulting product is the finished pigment—the white lead in oil of commerce.

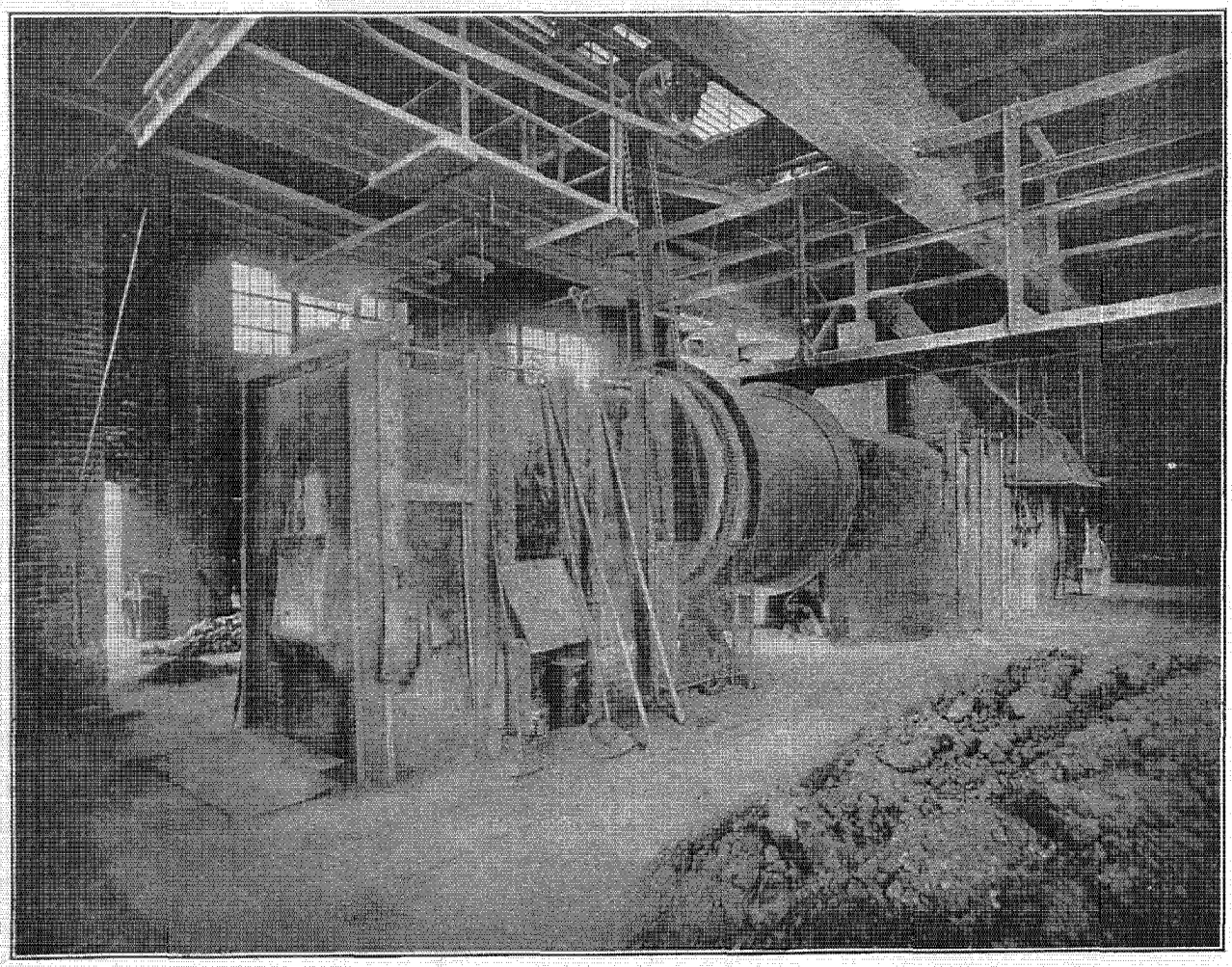
The Carter, or, as it is sometimes called, the quick process, is also in common use for making white lead. Here the change from lead to white lead takes place in fifteen days, so that there is a decided saving in time over the Dutch process. In this process, the lead, instead of being piled in stacks, is powdered from the molten condition and placed in large closed wooden cylinders which revolve slowly. While they revolve, acetic acid and carbon dioxide are introduced into the cylinders and corrode the lead, converting it into lead carbonate in much the same way as in the Dutch process.

White lead, the most commonly used of all paint pigments, has the greatest covering power of any of the white pigments. That made by the Dutch process has unusual hiding power, while the quick process lead has better whiteness and spread. The best paints are, therefore, made by using for the white lead base a mixture of stack and cylinder process lead. Such paints have greater durability and combine the advantages of each. Unfortunately, white lead produces a rather soft surface in the completed paint film and it is turned black when it comes in contact with sulphur fumes in the air. It cannot, therefore, be used satisfactorily in paint without having another pigment present to counteract these tendencies.

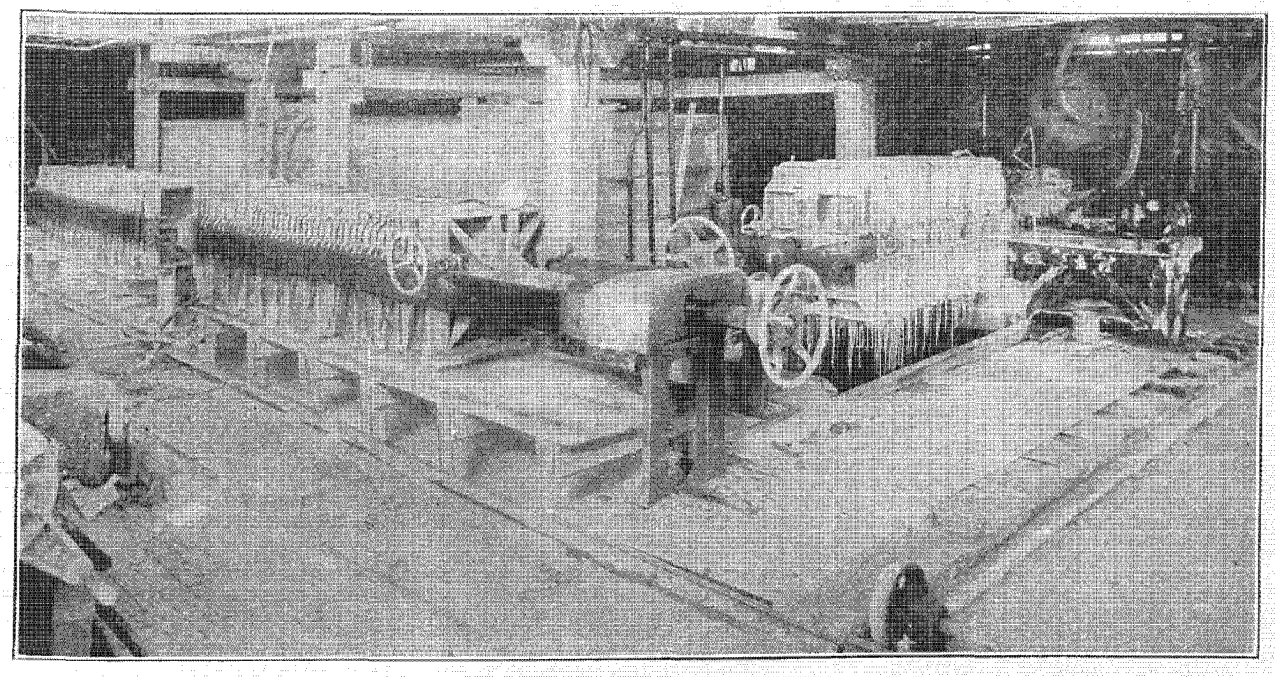
The pigment usually used in paint in conjunction with lead is zinc oxide. This pigment has been in use for only about sixty years, but its use has assumed important proportions in the paint trade. Like white lead, it is made by two processes. In the indirect, or, as it is sometimes called, the French process, the metallic zinc is subjected to extreme heat which converts it into vapor. The vapor or "smoke," as it is called, is conducted through large chambers where the zinc oxide settles in the form of dust.

In the direct, or American process, the zinc oxide is made direct from the zinc ore, which is mixed with fine anthracite coal and charged in furnaces. The gases are conducted into huge bags or filters which retain the zinc oxide dust but allow the other gases to pass through.

As a pigment, zinc oxide is very long wearing and has good covering power. It is second only to white lead in this respect. While lead when used alone produces a film that is too soft, zinc oxide, on the other hand, when used alone, has a tendency to produce a paint film that is very hard and brittle. These two pigments are, therefore, nearly always used in combination with each other so as to counteract the defects of each and produce a well-balanced paint.



Muffle Burner Where Rock is Burned in Making Lithopone



Lithopone Filter Presses

Sublimed white lead or lead sulphate, as it is commonly known, is also made directly from the raw ore in practically the same manner as zinc oxide. It has a fine grain and produces a film a little harder than white lead, but not quite so elastic. It dries very slowly, and, of course, this is a good quality for it prolongs the life of the paint film.

A fourth class of white pigments are the leaded zincs, which are usually about half and half lead sulphate and zinc oxide and partake of the nature of both. They are made in the same way as sublimed white lead, by heating the ore and collecting the dust in chambers. The leaded zinc pigments lack the covering power of white lead, but they are more durable and less likely to chalk.

One of the newer pigments used in the paint industry is lithopone, or Beckton White, which has become exceedingly popular in the last few years, particularly for interior painting. It is a mixture of the solutions of the salts of zinc and barium. These are mixed together in the proper proportions in a vat, and the lithopone precipitated in the form of a powder. This powder is then washed, baked, and ground very fine, and it is ready for use as a pigment.

Many other pigments are used in the manufacture of paints. The more important of these will be discussed in a later article.

Held His Audience

The Lecturer—There was one time in my life when I had no difficulty in holding an audience.

The Sympathizer—When was that?

The Lecturer—The night I proposed to my present wife.—*Answers.*

Watch the Details

During this period, when unprecedented activities are demanding the full time of every worker, many details are likely to go without notice. In many cases this may not have a bad effect, but in farm operations neglect of certain details can result only in failure. This is especially true of orchard and garden pests. Many orchards appear to be healthy during the winter and spring months, but later develop troubles of one kind or another that absolutely ruin the fruit crop. The only guard against these troubles is constant spraying, a detail which should never be neglected at any time.

In the anxiety to produce the maximum amount of food crops, there is a likelihood of planting crops on lands to which they are not suited, or on lands that have already become sick of these crops, or that are poisoned or diseased in such a way as to make the crops unprofitable. This should be avoided by careful rotation.

Only the best seeds should be selected, as faulty seeds cannot be expected to produce satisfactory crops.

The little details of crop growing must be as closely watched by the gardener as they are by the extensive farmer if success is to be expected.

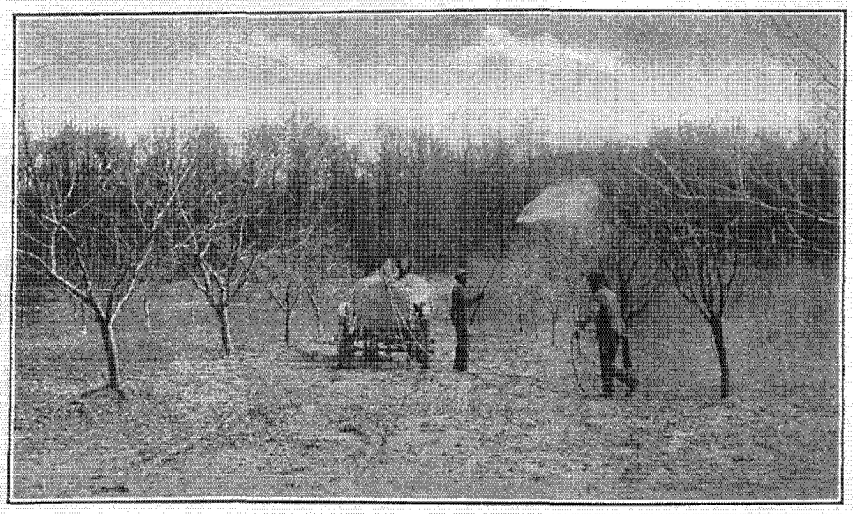
Why Waste Time?

"Why do you consider women to be superior to men in intelligence?"

"A bald-headed man buys his restorer by the bottle, doesn't he?"

"Er—yes."

"Well, a woman doesn't waste time on a hair-restorer; she buys hair."—*London Passing Show.*



Spraying the Only Safeguard Against Many Orchard Pests

Keep Up the Farm Buildings

THIS year, many farmers and suburbanites who have hitherto gone about their spring repairs as a matter of course, will perhaps delay before getting them under way to ask "Will it pay?" The unprecedented scarcity of labor and the unusually high prices of nearly all kinds of building materials will, no doubt, suggest to many the advisability of postponing the usual improvements to a later time. As a matter of fact nothing could be more shortsighted and contrary to every principle of sound management and economy.

While building materials of many kinds are, undoubtedly, higher in price than they have been in many years, there is every reason to believe that they will mount still higher. As the war goes on, the available supplies will be steadily decreasing, and it is hardly possible that any but higher prices will result. On the other hand, should the war come to an end in the near future, it is not likely that the general range of prices will show an appreciable decrease for many years. The war will, undoubtedly, be followed, in this country, by an unprecedented period of building, which, in conjunction with the enormous reconstruction necessary in Europe, will for a long time prevent a return to normal prices. History shows that this has been the effect of every great war both in this country and in Europe.

But whatever the effect of the war on prices, money spent now on property maintenance can not well be better spent. The fact that building materials are higher in price than ever before means that property investment is just that much more valuable. It is always cheaper to keep property in good condition than to replace it. It is even more so at the present time. Good upkeep now is insurance against having to make replacements at a time when they will be almost prohibitive in cost. To postpone the necessary repairs is to give up that insurance just when there is most need of it.

A practical builder in explaining what he meant by good maintenance said the other day, "Repairs and painting when necessary." He placed his emphasis on the last two words. It is as impossible to make up at a later date for painting and repairs on buildings that have been neglected as it is to take out insurance after buildings have burned to the ground. Painting, like insurance, has for its object protection, and to be effective it must be done on time.

Paint is so ordinarily considered as a beautifier that very often not enough thought is given to its protective functions. Actually a building coated with sheets of India rubber would not be as well protected from decay as a structure that has been well painted, because the rubber is not nearly so durable as an elastic film of properly prepared paint. A paint film one one-thousandth of an inch in thickness, as long as it remains intact, will protect the surface to which it is applied indefinitely from moisture and decay.

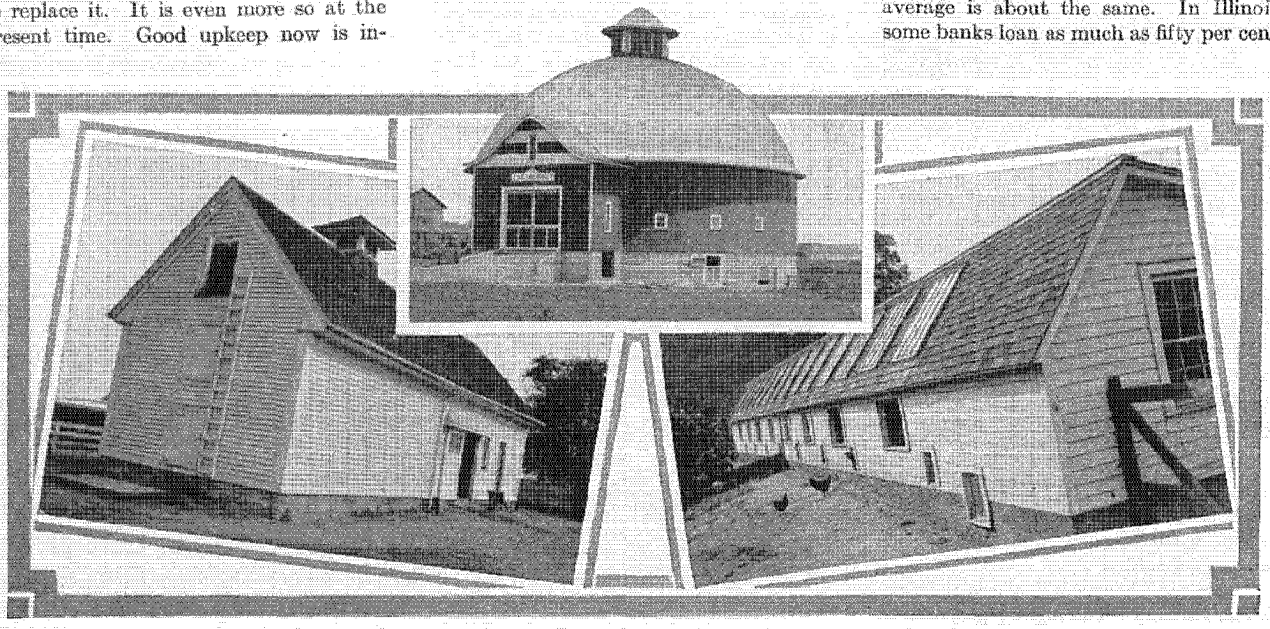
Moreover, with the development of special paints for every purpose the protective value of paint is no longer confined to wooden structures. Whatever the material of which they are constructed —wood, metal or cement—dwellings, barns, sheds, posts, fences, wagons, tools, implements and silos can all now be preserved practically without limit from decay and deterioration by the use of paint.

True economy is in keeping farm buildings well painted at all times. A paint film on a few square yards of surface costs but little, yet it will protect and beautify several dollars' worth of surface for many years. To leave a surface unpainted for several years will "save" in paint by a few cents for every square yard of surface, but it will cost several dollars in structural materials wasted and beyond repair. When buildings are painted frequently, they are always well protected, the surface is in better condition for repainting, less paint is required and the appearance of the property is always at its best. The cost represents the lowest possible rate of insurance.

Nothing shows more clearly the value of good painting and repairs than the attitude of bankers in making loans on farm property. A careful inquiry of leading bankers shows that a farmer can borrow all the way from five to fifty per cent. more when his buildings are well painted and in good condition than when they appear neglected.

The average increased loan value under such conditions is considerable. Bankers take this attitude not only because well-painted buildings are well preserved and better security but because where houses, barns, fences and tools are well taken care of the assumption is that the farm is a profitable proposition and the farmer a good client. A well-kept farm is invariably an indication of thrift, and the banker knows that money can safely be loaned to the thrifty farmer.

The influence of well-looked-after buildings on bank loans varies in different parts of the country. In Minnesota, it is customary to loan twenty to twenty-five per cent. more if the buildings are in good condition. In Ohio, twenty-five per cent. is the average. In Iowa the average is about the same. In Illinois, some banks loan as much as fifty per cent.



UNDERWOOD & UNDERWOOD

Painted Country Buildings

more on a farm when the buildings are well painted and in good order than on run-down property. The attitude of bankers in general is well summed up in the statement by an Illinois banker that "there probably are many farmers good financially and morally who permit their buildings to remain unpainted, but as a rule the substantial people who live in the country keep their buildings well painted."

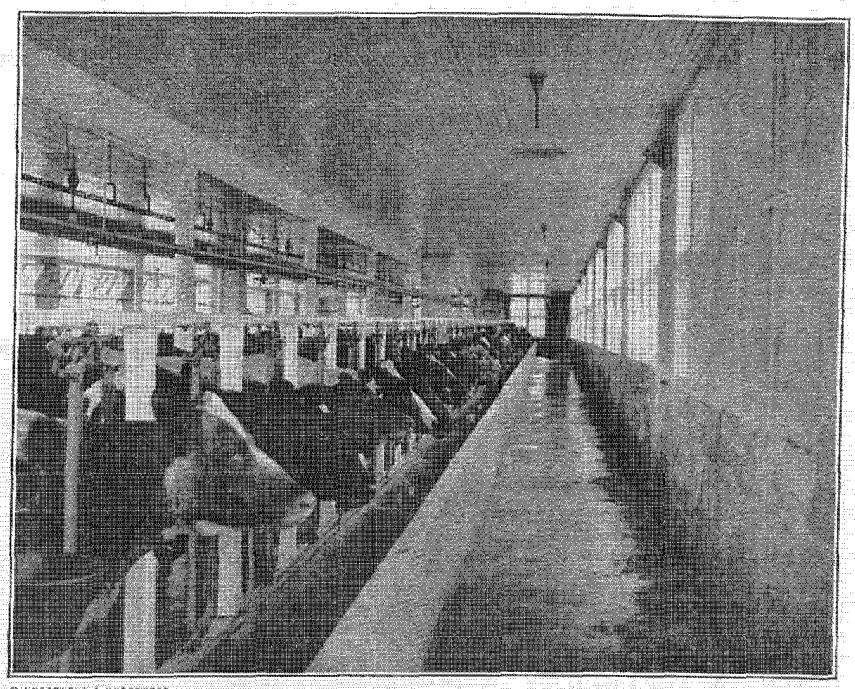
As a general thing, the standpoint of the banker is that farm buildings out of repair indicate that the owner is inefficient and careless, and, therefore, likely to be slow pay. Usually such a farm is rated at about one-third of the assessed value for the purpose of making loans. When the buildings are well painted the rating is usually one-half or even higher.

Some banks even go so far as to refuse a loan on any basis in the case of farms where the buildings have not been kept up. The general appearance of the outbuildings in addition to the house, barn and also the condition of the fences and farm implements have a great deal to do with influencing the banker for or against your loan.

The same line of reasoning applies, of course, to the selling value of farm property. Farms with buildings in good order invariably sell more readily and for a higher price than those whose appearance indicates that the farm was an unprofitable venture. It is common knowledge among real estate men that well-painted farm buildings bring an increased price out of all proportion to the cost of maintaining them in good condition and keeping them well painted.

Not only is good maintenance a sound business proposition that no farmer can afford to put off to a later time, but it is also especially desirable at the present time, for the preservation of building materials, as a means of further conserving our national resources. There can certainly be no better way of aiding in the war against waste than by protecting through every means at our disposal the enormous investment we have in our dwellings and farm buildings as well as city property.

While this article deals principally with the dollar and cents value of good painting, certainly something should be said, in passing, of the pleasure and satisfaction that comes to the owner of the well-managed farm, whose buildings and implements are well protected and reflect his own spirit of thrift and industry. A farm that looks prosperous is very apt to be prosperous. The feeling of pride in its possession is alone well worth the slight expense. All are, unconsciously, affected by surroundings. Nothing is more conducive to success and happiness than trim, good-looking, well-cared-for farm buildings. They can be kept so at little expense by the use of the bright and attractive colors of paint.



© UNDERWOOD & UNDERWOOD

The Stable Interior Should be Well Painted for Sanitation and Light

Spring Road Dragging

Most earth and gravel roads are in bad shape during the entire winter, largely because of the heavy fall hauling of harvested crops, and the rush of necessary farm work, which takes precedence over any kind of road work. The cold weather strikes them in this condition and makes each rut and bump almost as solid as rock, and in the spring these break down into mud.

Traveling over these ruts is a very racking, uncomfortable, and sometimes painful, operation. The rough jolts require a reduction in speed, cause an added strain on all classes of hauling equipment, and frequently force the automobile owner to abandon the use of his car for the entire spring rather than risk a breakdown.

Much of the unpleasantness and difficulty may be remedied in many localities even in the worst weather, for there are times when the worst cut-up surface is in fairly good condition for dragging. By taking advantage of the proper moment, the ruts and bumps can be smoothed out and the next freeze will result in a smooth hard-surfaced pike that can be favorably compared to a concrete highway.

Owing to the fact that the road surface will be rather wet and sticky when dragged, greater care must be exercised in handling the drag. If the blades of the drag are set vertically, there will be a tendency to scrape up too much earth, or, in the language of the road man, "Ball up in front." Also, if the hitch to the team is set too near the center, the angle of the drag with the road will be too nearly a right angle, or straight across, to shed or crowd the wet earth.

Dragging under these conditions should be more an "Ironing out the wrinkles" process; hence the blades of the drag should be given a forward or flatter inclination than when working a dry road. The hitch should be so arranged that the angle of the drag is more nearly parallel to the road than ordinarily, thus causing the earth to shed better and prevent trouble. For extremely bad conditions, the use of the road machine ahead of the drag will be found effective. In all cases, the road should be freed of all stumps, snags, and boulders, as these seriously retard good dragging.

A little practice will enable the operator to do a fairly creditable job, and after a subsequent freeze the road will present a smoother and much more comfortable surface. Then, when the spring rain comes, the road will quickly shed the water that formerly collected in the deep ruts, and be dry and hard long before similar roads not dragged.

The present difficulties encountered in getting large amounts of crushed stone for road repairs necessitates the greatest care in maintaining all road surfaces in the best possible way without the use of additional materials.

Self-Explanatory

"You are accused of driving a motor truck while intoxicated."

"Your honor, I have an excuse."

"Let's hear it."

"The boss put alcohol in the radiator this morning to keep it from freezing. The fumes——"

"Sixty days," said the judge.

Charles H. Newcomb—Gentleman—Sportsman—Athlete

AMONG the trapshooters of the country none is more prominent and popular than Charles H. Newcomb, of Philadelphia, Pa., who bears an enviable reputation as a clean and gentlemanly sportsman, and at the same time is an opponent to be feared because of his great skill in breaking clay targets.

Mr. Newcomb started shooting in Richmond, Va., in 1902, and participated in his first large tournament at Pittsburgh, in 1905, when he shot through the Pennsylvania State Shoot. In 1907, shooting with H. E. Buckwalter, as a partner, he won the two-man state championship, and this was his first important win. His career as a trapshooter ever since, however, has been an uninterrupted succession of victories, and judging by the way he shot during the season of 1917, "Charlie" Newcomb's name will be among the topnotchers of the clay target shooting game for a long time to come.

For the five-year period, ending with the close of the 1917 trapshooting season, Mr. Newcomb shot at 20,200 targets in registered tournaments, breaking 19,305 of them, averaging .9556%. It is doubtful if any other amateur trapshooter in the country can point to a record as good, covering a similar period of years. Mr. Newcomb's five-year record follows:

Year	Shot at	Broke	Per cent.
1913	4,065	3,873	.9528
1914	3,985	3,808	.9555
1915	4,600	4,385	.9532
1916	5,155	4,928	.9559
1917	2,395	2,311	.9649
	20,200	19,305	.9556

Among Mr. Newcomb's other important achievements as a trapshooter may be mentioned his high averages in the Philadelphia Trapshooters' League for the seasons of 1906–1907 and 1911–1912.

In 1910 he won the Eastern Handicap with 97 from 20 yards, and 19 in the shoot-off; high average at Eastern Handicap tournament; Atlantic City Cup; Preliminary to Amateur Championship of the United States, at Travers Island; and duplicated this win in 1911.

Eastern Handicap average in 1911.

Pinehurst average in 1911 and 1914.

Pinehurst Handicap in 1911 and 1914.

Westy Hogan Championship in 1912.

Westy Hogan average in 1912 and 1913.

Amateur Championship of America, at Travers Island, in 1913 and 1917.

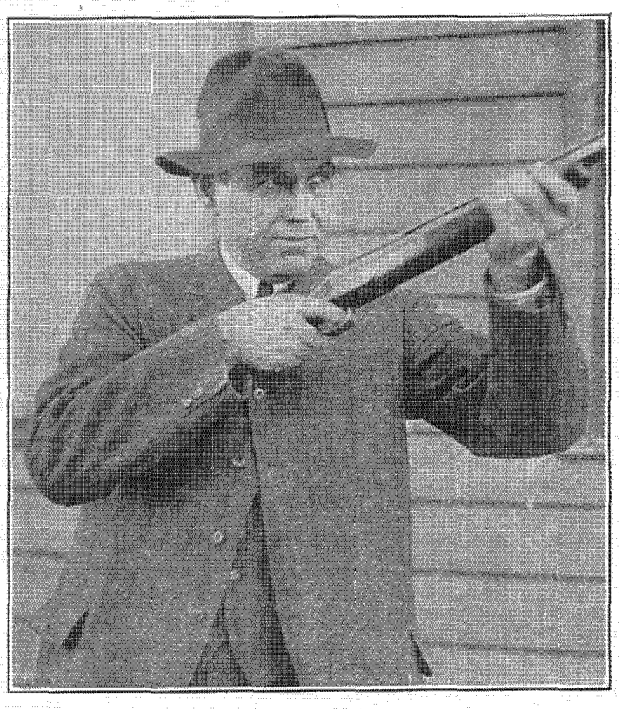
Inter-Club and Inter-Collegiate Championship at Larchmont in 1911 and 1913.

J. E. Caldwell Trophy at Wilmington, Del., in 1913 and 1914.

Pennsylvania State Championship twice in open competition in 1914, and three times in challenge contests.

High average at Pennsylvania State Shoot in 1914.

Broke 494 out of 500 at Pittsburgh in 1914, and made five runs of 100 or over, and one of 217 in same year.



Charles H. Newcomb

Has to his credit thirty-one straight runs of 100 or over.

Has made sixty-six runs of 50 straight and over in registered tournaments during 1915–16–17.

In June, 1914, established a record by breaking in a two-men team race, being challenged for the Championship Cup of the State of Pennsylvania, 100 out of 100 from 18 yards.

The official records show that he shot at from over 7,000 to over 11,000 targets each year, up to and including 1914. The average number broken over that period increased from 93 per cent. plus in 1910 to 95.5 per cent. plus in 1914. In 1915 his average was 95.32 per cent. of 4,600 targets and in 1916 he broke 95.59 per cent of 5,155 targets.

Among his notable wins in 1915 were the Interstate Association's Amateur Championship event shot during the Pennsylvania State tournament held at Milton, on a score of 98 out of 100; the Pennsylvania State Amateur Cup with a score of 437 out of 450, which score also gave him the high average of the tournament.

The National Amateur Championship, shot for by State Champions during the Grand American Handicap week, on a score of 99 out of 100.

In 1916 won the Preliminary Handicap at Pinehurst, N. C., and high average over all.

High average at the Maplewood (N. H.) Midsummer Handicap.

Was a member of the squad which established a world's squad record of 497 out of 500, at the Maplewood tournament on July 7, 1916.

Numerous are the championships which Mr. Newcomb has annexed, and he is a shining example of the good, clean, gentlemanly and sportsman-like athlete, who is a credit to any game and to the great out-of-doors.

Not the least of his great feats was the winning of the Amateur Championship of America, at Travers Island, in 1917, upon his return to the traps for practically the first time after an illness of several months, from which he only recovered through having an exceptionally strong constitution and vitality due no doubt to his participation in trapshooting.

A gentleman and sportsman to the bone, and everyone wishes him luck.

Louise, nine years old, asked her mother:

"Where is papa going?"

"To a stag party," she replied.

"What is a stag party, mama?"

Sister Mable, seven years old, who had been listening, with a dignified attitude of superior wisdom answered instantly: "It's where they stagger. Don't you know?"—*Pittsburg Sun.*

Free Government Game Law Summary

There has been issued by the United States Department of Agriculture, under the date of October, 1917, Farmers' Bulletin No. 910, a summary of the provisions of the Federal, State and Provincial laws, as they apply to our game. This booklet is right up to the minute, and the most complete pamphlet of this character that has ever come to our attention. It is for free distribution, and may be obtained by application to the Division of Publications, United States Department of Agriculture.

Everyone interested in American game birds or animals should write, and obtain for themselves a copy of this booklet.

Cherry Growing in Colorado

THE West has long been famed for the excellence of its fruit grown under irrigation, and in all sections where the climate permitted and sufficient water could be obtained orchards have abounded.

Not until recent years, however, has the growing of commercial orchards on the so-called "Dry Farm," or unirrigated land, been attempted. It was thought to be too dry for a tree to live and bear fruit, and the many failures of the first trials seemed to substantiate this belief. The main difficulty was encountered in getting the trees to survive the first two years. The losses were so enormous and the yearly growth so small as to lead to discouragement, until a method, learned from experience, of planting and handling them was worked out with successful results.

After several trials, it was found that the best variety of cherry for the climatic changes met with in this section and the one that will better withstand the rigors and hardships of "Dry Farming" conditions is the Montmorenci budded onto the Wild Mahalab stock. The latter stock is imported from France, and a bud from a bearing Montmorenci tree grafted onto this in the nursery. The graft is allowed to have one year's growth in the nursery before setting out in order that it may become thoroughly attached to, and form an integral part of the stock.

Our method of transforming a piece of raw land into an orchard is to plow it well, and then lay it off into sixteen-foot squares. At each corner of the squares a hole is driven twenty-two inches deep with a sharp steel bar and sledge hammer, and loaded with a small amount of dynamite. The explosion pulverizes and loosens the soil and forms a small pot hole at the bottom. This loose earth is shoveled out to a depth of sixteen inches, making a hole about sixteen to eighteen inches in diameter, and the pot hole is lightly tamped full of earth. The tree is set so that the joint between stock and graft is about two inches under the ground surface, good top soil being used under and around the roots and well firmed so as to afford close contact between the soil and the roots and not to allow settling of the tree.

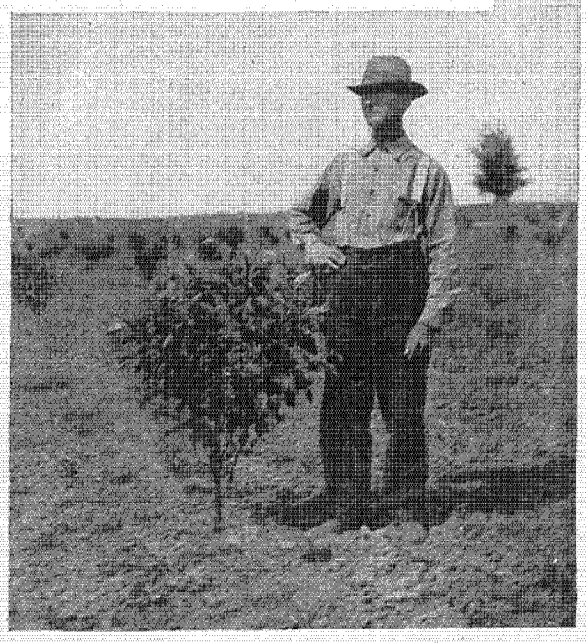
The explosion of the dynamite causes a loosening and shattering of the soil around and below the tree roots, leaving it open and seamed with fine cracks, so that the water from rains can penetrate readily, and be stored up for future use during drought periods. The roots can also penetrate more easily and go to greater depths where they are not so readily affected by the drying out of the top layer



CHERRY ORCHARD 2YEARS OLD, SET IN BLASTED HOLES



CHERRY TREE 2YEARS AFTER BEING SET OUT BLASTED HOLE



CHERRY TREE 1YEAR AFTER BEING SET OUT IN BLASTED HOLE

of soil. Surface cultivation is likewise practiced assiduously to destroy moisture-consuming, worthless weeds, and to form a dust mulch for the conservation of the moisture absorbed into the deeper soil.

As an example of how successful this method of handling cherry trees has operated, one section of the orchard containing 1,250 trees required only twelve replacements, a loss of less than one per cent. Another lot of 1,650 trees lost twenty-five or about one and one-half per cent. and part of this loss was due to gophers. It also has the added benefit of speeding up the rate of growth of the trees and decreases the time required before being in full bearing by practically one season. As an instance, some of the trees which are only four years old produced $1.50 worth of cherries per tree.

There is considerable idle ground between the tree rows, which must be cultivated, or at least kept free from weeds and to conserve moisture. This has been utilized in growing beans in rows. By this means the work of caring for the orchard has served a double purpose, and the beans defray expenses until the trees begin to bear. During the last two years the price obtained for beans has been good, so that the returns from this source have been from $25.00 to $30.00 per acre.

By closely following the methods mentioned as being applicable to dry farming conditions, wonderful transformations have been wrought in a dry, uninteresting, desert-looking land practically free from plant growth except short stubbly sagebrush, a few bunches of grass, and prickly cactus. C. L. HARVEY

Ft. Collins, Colo.

Editor—Your reports should be written in such a manner that even the most ignorant may understand them!

Reporter—Well, sir, what part is it that you don't comprehend?

Knew It Already

"I haven't paid a penny for repairs on my machine in all the ten months I've had it!" said the motorist.

"So the man who repaired it told me!" said a friend in corroboration.—*Country Gentleman.*

Advance Science

"You scientific fellers know a heap, I s'pose; but I'll bet you can't tell me how to save that big pile of pertaters," said the farmer. "The rot's got into 'em."

"N—o. They are past saying," observed the scientist.

"They are, eh? Well, I'm goin' to eat them pertaters."

"Impossible."

"No, it ain't. I'll feed the pigs on 'em, and then eat the pigs."—*Country Genileman.*

A Trapshooting School

NOVEL as it may seem, such a school was started two years ago with the object of providing expert instruction in the use of the shotgun, especially for trapshooting for the many pleasure-seekers who visit Atlantic City during the bathing season. Its popularity has been instantaneous, and a trip to Atlantic City is no longer complete without a visit to the Trapshooting School, whether the visitor is a novice or expert at target breaking.

The school is located on the end of Young's Million Dollar Pier, facing the ocean, so that the targets skim out over the waves, thus providing a most unusual and attractive background.

All shooting is in charge of the well-known professional shot, Mr. H. H. Stevens, who with his assistants devotes all of his time to instructing beginners. Guns of different makes and kinds are provided, and weekly prizes are awarded for the best scores made by novices and experts and to the best men and women shooters.

Since its inauguration two years ago, the school has had a most wonderful growth. In the first year of its existence 5,202 persons visited the school and shot over the traps. Among them were 2,773 novices who had never before shot at clay targets. Approximately 249,000 targets were thrown during the first season.

The second year of the school proved even more successful than the first. The number of visitors was 5,886, of which 515 were women and 3,470 were novices. Over 332,000 targets were thrown in 1917.

There have been many excellent records made by visitors at the school. The best score at 100 targets was made by Harry Harrison, of Rochester, New York, who broke 99. This score was also made the year before by Harton Pardee and Fred Plum, both of Atlantic City. Mrs. Belle G. Earle, of New York, broke 96 out of 100 targets in both 1916 and 1917. This was the highest score made by a woman. Dr. M. C. Bowers, of New York, averaged 85 per cent. for 1,000 targets in October, 1917, the best average made at the school for that number of targets.

In all probability schools of this sort will be established at other popular resorts.

Leather Substitutes for the Marine

(*Concluded from page 13*)

luxury and beauty are essential. They are being generally specified by designers and individual owners as the ideal material for cushions and upholstery. The permanently handsome appearance and immunity from injury by fresh or salt water are fully appreciated.

Tops and curtains are an exceedingly important item on pleasure craft, and a special type of leather substitute is largely used in their construction. The variety of tops on pleasure craft and work boats is much greater than on automobiles, and includes types of every style to meet the requirements of the particular boat or owner. Pyroxylin-coated top materials are the most satisfactory for water service, because they do not oxidize or fade, and afford good protection from wind, sun and water.

"In old days a girl used to keep hubby on his good behavior by threatening to go back to her mother." "And now?" "She threatens to go back to her job."—*Kansas City Journal.*

The limit of conservation seems to be reached by the Western hotel that puts this on its bill of fare: "Save your toothpick."



The Trap at the Shooting School

Make Use of the Stumpwood

PLANS for utilizing the supply of wood waste in the neighborhood of towns and cities have been worked out by the U. S. Forest Service with a view to further conserving the fuel supply.

In the suburbs of many cities and practically everywhere in the country districts there are thousands of stumps which in the aggregate could be made to supply large amounts of firewood.

The idea is to convert these stumps into cordwood during the spring so that they will have time to season properly and be available for fuel during the coming winter.

Professor Mandenburg, of the Michigan Agricultural College, has made an extensive study of the value of stumpwood as a coal-saving fuel, and finds that stumpwood, particularly pine stumps, if properly seasoned, make an excellent fuel. There is, in fact, already a large demand for stumpwood in many parts of the country where $6 to $10 a cord is being offered for it by the dealers.

It has been estimated that one cord of stumpwood from each acre of farm lots in New York State alone would save 1,125,000 tons of coal. This will give some idea of the enormous saving possible if, throughout the country, every land owner converted the waste stumps on his land into fuel.

Every land owner who has stumps or other waste wood upon his land has an excellent opportunity not only to make himself independent of uncertain coal supplies, but also to dispose of any surplus at a substantial profit to those who are not so fortunately situated.

Tulsa Blasts Way to Water

With the Arkansas River frozen solid for three weeks, the water department of Tulsa, Okla., conceived a unique way of getting water for the city. A hole was blasted out with dynamite about a half-mile up the river. Through the hole the undercurrent forced the water out and a channel was dug leading to the water plant. The result was a constant flow of the finest, clear water that had ever been turned into the mains in Tulsa.—*Southern Underwriter.*

When the Suffrage Amendment Passes

Mrs. Willis—Did Mrs. Bump register?
Mrs. Gillis—Yes.
Mrs. Willis—Did she give her age away?
Mrs. Gillis—Yes; away off.

Pulverized Limestone for Agricultural Uses

Pulverized limestone continues to be in favor as a soil sweetener or fertilizer. Since the figures of production were first compiled in 1911 the industry has steadily increased. The increase for 1916, compared with 1915, was about 32 per cent. in quantity and 28 per cent. in value. The average price per ton was $1.08 in 1916, 2 cents less than in 1915.

In some localities the pulverized material is a by-product of the crushed-stone and building-stone industries; in others the limestone is ground for this purpose entirely.

The use of the other standard forms of agricultural lime is also on the increase.

Gay Life on the Old Farm

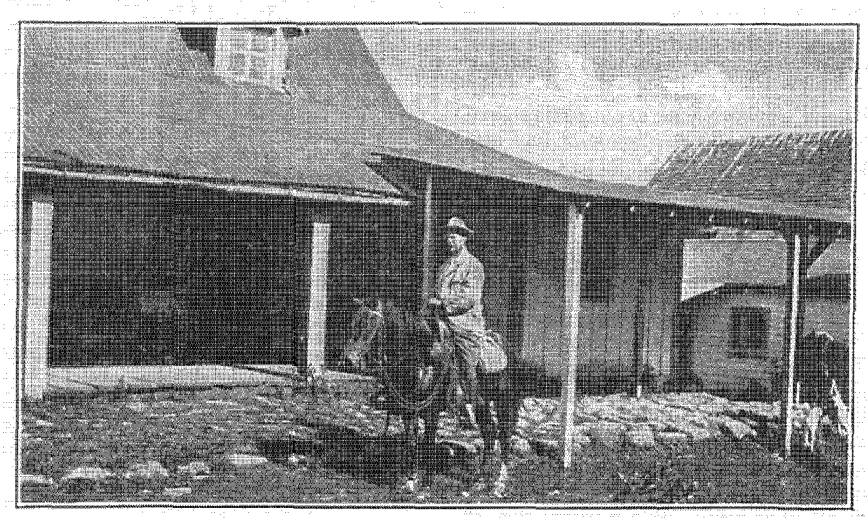
"Oh, Pop," said a farm boy to his daddy, "the circus comes to town today! Will you gimme a dime to go to see her?"

"Certainly not!" roared the farmer. "A dime to go to see the circus, when only last winter I let you go up on the top of Jones's Hill to see the eclipse of the moon! Do you think, you young dog, that life is one perpetual round of pleasure?"—*The Evening Mail, New York.*



Auto truck hauling coal from a central receiving yard where cars are unloaded without delay, to a nearby town where there is no equipment for quick unloading of cars. A saving is effected in railway cars and in man-power required for unloading. Many commodities offer equally good opportunities for truck hauls, especially in less than carload shipments. The motor truck can be used to the best advantage in relieving the present freight congestion.

Panama—A Hunter's Paradise

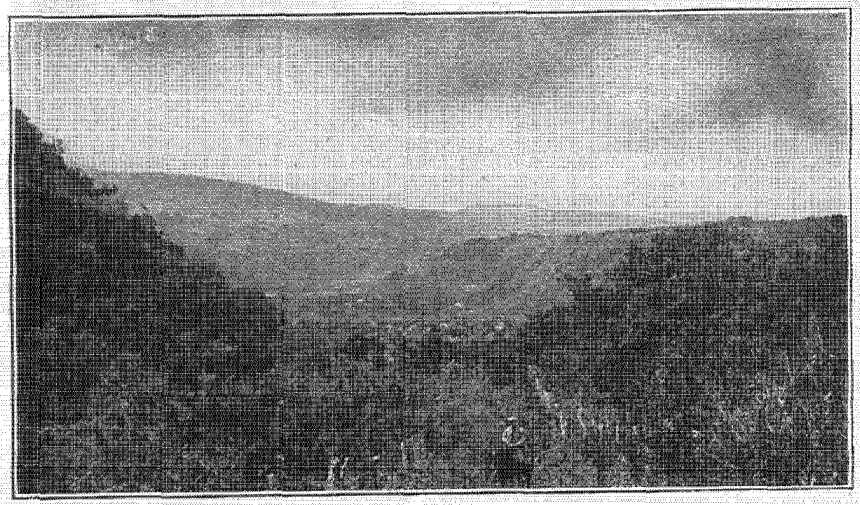


A Panama Hunter Who Takes With Him the Serviceable Riding Paraphernalia of the Western Plains

The district of Chirique, Republic of Panama, located 200 miles west of the Canal Zone, is almost virgin territory—a paradise for the hunter. The thick woods are filled with game—tapir, deer, wild hogs, jaguar and puma, together with numerous smaller species, among them several varieties of monkeys. The abundance of the game can be understood better by the statement of our correspondent, who says that all of the eleven deer which he killed last month were within two miles of his residence, and some were within two hundred yards.

Dogs are necessary for the successful hunting of most of the big game. Tapir hunting with dogs is an especially exciting sport. These animals are much more formidable than is generally supposed by hunters, and it is seldom that one is killed without the loss of some of the pack.

For those who prefer the shotgun, the meadows are filled with that gamest of all game birds—the Wilson snipe—and wild pigeons are so plentiful that the flights remind the gunner of the tales of the passenger pigeons of the United States fifty years ago.



Game Abounds in the Thick Woods of Panama

The Upkeep of Country Roads

Thousands of miles of excellent and expensive country roads are annually falling into bad repair and becoming practically worthless on account of the lack of attention to slight repairs. The net result is an enormous loss to those living along these roads, who are naturally most vitally interested. "A stitch in time" will prevent untold damage to roads and will obviate the necessity of such frequent resurfacing and expensive repairs.

Roads should be patrolled or inspected often, especially in the spring and after heavy rains. This should be done by men equipped with light tools suitable for repairing slight troubles in the surfacing or in the ditches, which, if left unrepaired, would soon develop bad breaks through erosion or the wearing action of the wheels.

Where the surface is of earthy material the use of the drag is imperative as soon as the roads are sufficiently dry to permit such work. In some communities this is done by voluntary effort on the part of owners of abutting land, either with or without direct pay; in others, by regularly employed or convict labor. Whichever method is employed, the distribution of drags and available teams should be such that the roads of an entire community or county can be gone over in a day or even less time. The enormous number of teams needed for such work makes the co-operation of the farmers having available teams imperative. Dragging should always be under the supervision or direction of a competent supervisor, who should notify all co-operating parties when to begin work.

Never allow side or outfall ditches to become clogged.

Repair slight breaks in the surface immediately.

Keep the surface well crowned and free from ruts.

A Profitable Change

The Corvallis (Oregon) *Times* in one of its fall issues calls attention to some wonderful results that have been obtained by Mr. Grant Elgin on his farm on Kiger's Island. Last winter the owner decided to get after the stumps which were rendering this land absolutely worthless, with explosives, and blew the stumps to atoms. This tract was planted to potatoes and yielded at the rate of 250 sacks or 2,500 pounds per acre. At 2 cents a pound, this means $500.00 an acre, which is an excellent profit on land that had before been dedicated to the use of wild ducks.

Sixty-seven state agricultural colleges and experiment stations are devoted to the developments of agriculture. Their endowment, plants and equipment amount to $160,000,000. They have an income of more than $35,000,000; and 5,500 teachers and a resident student body of over 75,000.

Under the federal-aid road act, within the next five years $160,000,000 will be spent by federal and state governments in improving rural roads.

Eight million six hundred and eighty thousand dollars of federal and state Smith-Lever funds will be spent each year after 1922 on the direct education of farmers.

An elderly lady of very prim and severe aspect was seated next to a young couple, who were discussing the merits of their motor-cars.

"What color is your body?" asked the young man of the girl at his side, meaning of course, the body of her motor.

"Oh, mine is pink. What is yours?"

"Mine," replied the man, "is brown with wide yellow stripes."

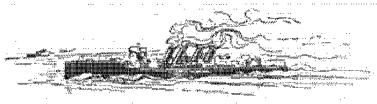
This was too much for the old lady. Rising from the table, she exclaimed:

"When young people come to asking each other the color of their bodies at a dinner-party, it is time I left the room."
—*Tit-Bits.*



Our Honor Roll

3364 Strong



Following is a list of employees of Du Pont American Industries who have entered the Army and Navy in the defense of Democracy. 3070 names have already been reported; this list includes 299 names; there have been 5 additional duplications and rejections, leaving a total of 3070. The Du Pont Company and their fellow-employees are glad to honor them. On their return to civil life, after their duties as soldiers have been performed, a hearty welcome will await them, and every effort will be made to place them in as good or better positions than they have left.

"Over the top with the best of luck—and give them Hell."

SALARY ROLL

Sales Department

Curry, Thos. J.
Grigsby, F. E.
O'Donohue, J. J.
McKelvey, Harry

Rifle Smokeless Division

Witsil, W. E.

The Arlington Works

PY-RA-LIN

Shakespeare, Wm. M.

Purchasing Dept.

Callahan, Michael

Chemical Dept.

Lawton, S. H.

Experimental Station

White, Raymond F.

Operating Dept.

SMOKELESS POWDER

Hart, Oscar S.
Moore, Wm. M.
Porterfield, Marvin H.

Carney's Point

SMOKELESS POWDER

Jaquett, Warren W.
Packard, J. C.
Patton, G. C.
Richeson, H. H.
Santiago, Santiago A.
Short, Albert P.

Hopewell

GUN COTTON PLANT

Kinsey, Wm. W.
Sheridan, Thos. J.
Tucker, Jesse M.
Watson, Claud W.

Explosives Mfg. Dept.

Biddle, Morris K.
McCoy, Robert E.

Eastern Laboratory

Prier, J. H.

Jackson Laboratory

Badenhausen, Otto A.

Miscellaneous Mfg. Dept.

DYE WORKS

Bierman, Wm. L.

PAY ROLL

Carney's Point

SMOKELESS POWDER

Alspach, Irwin
Arnata, Gemara
Babcock, D. H.
Bacigahipo, Louis
Beatty, H. H.
Bentley, E. S.
Bogar, Jim
Braxton, E.
Brokenbaugh, Phillip
Bunting, Walter M.
Byrd, Max
Cafier, Frank
Cardosa, Manuel
Carty, W. G.
Canconi, Paul
Cavalier, Grover C.
Joe Soto
Croft, Willie
Cromer, L.
Coray, Joe
Delmar, Adams
Dickerson, John
Dougherty, Roger
Dugan, John
Durgin, C. B.
Egnaszels, Alex.
Enery, J.
Evans, Paul K.
Feldman, R.
Fisher, Evan
Ford, Jas. T.
Frechs, Harry C.
Fry, J. J.
Gibbx, Herbert
Halstead, Walter
Ham, J. H.
Hannel, F. C.
Heller, Irving
Heade, Lemuel
Herring, Joseph
Jefferson, Charles Wesley
Kabaleuko, Thesdor
Lake, H. E.
Lashley, Robert
Lawrence, Edward
Lear, Fred
Lewkowski, Vincent
Long, Samuel
MacGalliard, J.
Mackey, Edwin S., Jr.
Merkle, Ray
Milligan, James J.
Mirage, Mike
Morgan, George
Morrelli, A.
Munite, Carmelo
Natale, Fanzino
Nikitas, Cost
O'Connell, John
Osborne, Edward J.
Peterson, Harry J.
Pettit, Walter
Phifer, Lester
Reed, Edw.
Roetzevicz, Felix
Schellinger, Leslie
Seitz, Wm.
Sharkey, Edward
Shanklin, J. L.
Shesko, Jim
Simmons, J.
Simon, James
Sinclair, Wm. C.
Sinnott, J.
Sinuta, E.
Stafford, Ernest
Stones, Walter
Thomas, Wm.
Vannaman, H.
Vajsnes, Jaisas
Walton, J.
Warren, H. F.
Webster, Thomas
Wescoat, William
Whalen, Daniel
Wingate, Robert L.
Yarrows, Wm. F.

GUN COTTON PLANT

Hopewell

Alexander, John
Austin, Clarence
Ayers, William
Bagley, Alvin
Beach, Howard
Bennett, William
Blackwell, Eddie
Blair, William
Bundy, Clarence
Boyd, Ryan
Brooks, John
Brown, Joe
Brown, Harry
Brown, Richard
Brown, Tony
Bugg, James
Burns, James
Butler, Daniel
Byrum, Graham
Campbell, James
Carey, Archie
Carr, Nell
Carter, William
Chambers, James
Christopher, Emmitt
Clary, Roy
Clayton, Hunter
Cochrun, Samuel
Copeland, Johnnie
Crewe, Thomas
Crosby, John
Collins, Matthew
Dash, Tom
Davis, Elbert
Davis, William
Dunston, Lonnie
Eldridge, Hezekiah
Elmore, Charles
Evans, Joseph
Evans, Willie
Fabu, Thomas
Finlayson, William
Forbes, William
Freeland, George
Gaddy, Earnest
Gibbs, Jeter
Gilbert, Leroy
Gilliam, John
Gray, Charles
Graham, Sam
Hall, Harry
Hallyburton, John
Hamilton, Fred
Hamilton, Fred
Haughton, James Alfred
Hawk, John
Hendley, Robert L.
Henry, Lawrence
Herring, James
Holmes, James H.
James, Ambrose
Johnson, Manuel
Jones, Thomas
Jones, Willie
Jordan, Walter
Key, Floyd
Leete, Thomas
Langhorne, David
Lewis, Frank
Martin, James
Mason, Charles
Mayes, Herbert
Mayo, Edgar
McDonald, George
McLurkin, Robert
Merrell, Alonzo
Miller, Lee
Mitchell, Elliott
Morris, Johnnie
Mungo, Broddus
Owens, John
Page, Andrew
Page, Aron
Pagett, Harry
Parker, Thomas
Pendleton, Everett
Perkins, James
Petterson, Clarence
Phipps, Ben
Poindexter, Chaucer
Pope, George
Pope, Joe
Prettyman, Sam
Reams, Frederick
Redmond, Dumas
Rhodes, Richmond
Robinson, Willie
Sanks, John
Shine, Kid
Smith, John
Smith, Ed.
Smith, Emmett Hugh
Spitzer, William
Springer, George
Stackhouse, Boyd
Stevens, Clarence
Stratford, Mack
Thompson, James
Thompson, Jordan
Thompson, Van
Truitt, William F.
Turner, Johnnie
Turner, Luther
Tyndall, William
Walker, John
Wallace, William
Walters, John
Watkins, Bob
Wells, John H.
Wescott, Earl
West, John
White, William
Woodward, Wyatt
Wright, Ed.

Experimental Station

Rickmann, John G.

Louviers

Brown, William S.
Richardson, Fred
Yetter, Warren R.

Repauno

Peters, Edward
Shane, William

The Arlington Works

PY-RA-LIN

Alexander, Harold
Avery, Joseph
Bentley, Louis
Billert, William
Bingelis, Steve
Borecky, John
Caprio, Frank
Cardinale, Lorenza
Cardinale, Patsy
Carey, John
Ciak, Anton
Cody, James
Crummey, Ambrose S. M.
Delpesce, James
Dembrinski, Edward
Downey, James
Flandess, Ben
Frost, Elmore
Gibson, William E.
Grosso, Louis
Grunel, James
Habgood, Albert
Hysen, John J.
Kaverick, Joseph
Koester, Philip E.
Kopeiski, Joseph
Korduk, Tony
Landy, Nick
Mason, Harry T.
McGregor, Robert Roy
McKenna, John
Miller, Albert
Mills, James Joseph
Misik, George
Montgomery, Harold E.
Napeerkoski, Peter
Petro, Tony
Pigeonne, Arthur B.
Poltook, Alonzo
Romano, Mac
Sharkey, Frank
Swan, James
Themiat, John
Trinoli, Bruno
Valk, Henry
Walberg, George
Walsh, Patrick
Warren, Albert J.
Weiss, Edward D.
Wisotcky, Ales.
Zabroski, Steve
Zaleski, Ben

Norwich
The Arlington Works

PAPER MILL

Nolan, Joseph
Rodenda, J.

Du Pont

HIGH EXPLOSIVES PLANT

Johnson, Gunner



Raise Pigs to Help Feed the Boys

(Correct to March 2, 1918)

Selection of the Rifle

J. B. Stoneking

PROBABLY no question is given more consideration and thought by the prospective purchaser than that of the proper rifle to select from the many excellent guns upon the market. No one question has as many different answers from the various users of rifles, each of whom generally has a pet rifle, the performances of which are the best ever given by any gun. Hence, the novice is as much undecided after seeking the advice of a number of different rifle "cranks" as before starting on the quest.

The purpose for which a rifle will be used is the principal factor in the selection, for there are numbers of rifles which are especially adapted for certain purposes, while others are much more elastic in their make-up, and cover a wider range of general usefulness.

The general tendency of the times in the shooting world has been to get away from the old large caliber, low velocity gun, and to substitute for it the small bore, high velocity, flat trajectory rifle. This applies both to the target range and to the wild game field for both large and small game. It is the result of a logical development in the production and perfection of modern powders, from the quick flashing black powder to the progressive burning smokeless variety, which is capable of producing these heretofore unthought of high velocities to a rifle bullet. Then, again, the shape and composition of the bullet has been so modified as to offer a minimum resistance to the air and to more closely fit the rifle bore and prevent the escape of the gases, and the weight has been reduced in order to decrease the starting inertia of the bullet. Meanwhile the steel in the barrel has been perfected to safely withstand the high pressures developed by the powder. All of these factors have resulted in a change in velocities at the muzzle of the rifle of 1300 and 1400 feet per second in the old black powder cartridges to those of 2000 and 2200 feet per second in the average smokeless powder sporting rifle, while the most modern high velocity rifles of today give a bullet speed of from 2700 to 3000 feet at the muzzle.

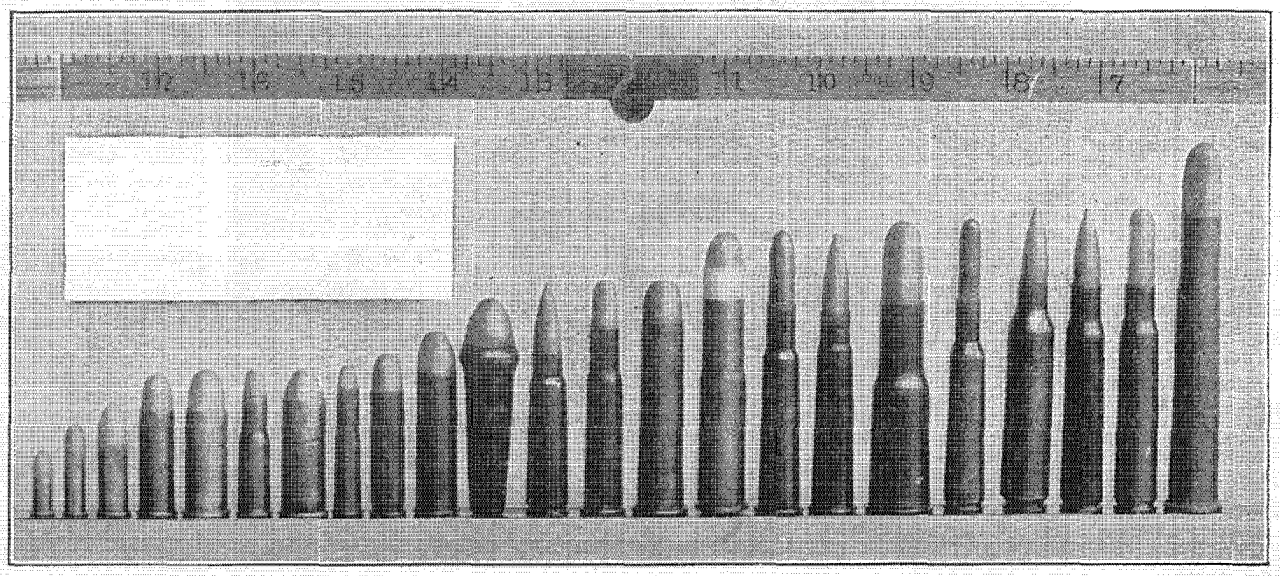
The caliber of a rifle is the diameter of the bore, and is expressed in decimal parts of an inch. Thus, ".22 caliber" means a diameter of 22-100 of an inch. ".30 caliber" means 30-100 of an inch, and ".256 caliber" means 256-1000 of an inch. Sometimes a double figure is used, such as .32-20 or .45-70, the first figure referring to the caliber and the last figure generally to the powder capacity of the loaded shell in grains of black powder. Calibers in rifles vary from .22, the smallest, to .56, the largest; however, most of the present development in high power and high velocity cartridges has been between the .25 and .40 limits.

The uses to which the average man will put a modern rifle may be logically classed as two—for target shooting and for hunting purposes. To some extent these fields overlap, but somewhat different conditions govern the target range; hence a rifle selected primarily for this work is not especially adapted for hunting purposes. As most target shooting is of a rather deliberate nature, the rapidity of action of the repeating mechanism is of minor importance, and automatic rifles are generally not used. Again, the length of the barrel and weight of the rifle are of importance, for a longer barrel with the sights farther apart is conducive to greater accuracy, as is also a heavier weight rifle. A target rifle is not subject to the hard knocks, rough usage, and ill care that must be a part of a hunting rifle's daily lot, hence the parts can be finished with greater beauty, can be machined to fit with greater nicety and exactness, and the whole rifle can be more cumbersome than one designed wholly for hunting. The sights are of great importance and are chosen for fineness and delicacy of sighting, with absolute disregard to quickness of vision and adjustment.

Target shooting is generally divided into four classes—gallery, short range, mid-range and long range. For gallery shooting the most popular caliber is the .22 rim fire. The ammunition is relatively inexpensive, and the noise of the shooting not unduly unpleasant.

For ranges up to 200 yards, the small .25 and .32 caliber center-fire cartridges give excellent results, while for the so-called mid-ranges from 300 to 500 yards there are large numbers of calibers from which to make a selection. These include the .25, .30, .303, .35, .38, and similar cartridges. The higher power cartridges for the longer ranges can also be used to good advantage at mid-ranges by reloading the shells with a reduced load. The manufacturers of smokeless powder have developed the proper loads for these various mid-ranges, and can always furnish data with regard to almost any caliber.

Long-range target shooting up to 1000 yards requires a powerful cartridge for accurate work, and the favorites for this type of shooting are high-power rifles such as the .256, .280, .30-40, and .30 U. S. calibers. Most target shooting should be done with a full metal-cased



Various Types and Calibers of Rifle Cartridges for Hunting and Target Shooting

bullet—especially long-range work with high-velocity loads, as the bullet is stronger and less liable to fray or split under the terrific strain.

The high-power and mid-range rifles can be used with excellent results for short range, and even for gallery shooting by using cartridges with special reduced loads. Generally these cartridges must be loaded by the user himself to get the special load which he may desire.

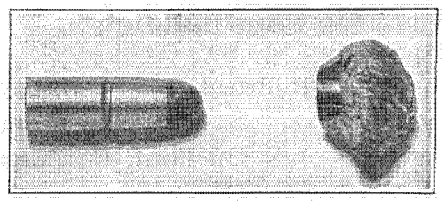
In changing from the target to the hunting field, a different set of conditions is encountered. The rifle must be of rugged construction, and the beauty of finish is immaterial, for the rough usage received will ruin any finish. Frail, delicate parts are subject to failure at critical moments, when such a failure may mean the loss of the game or even the life of the hunter. The repeating mechanism should be fast and reliable, while the working parts should not be too closely and finely fitted, as a small amount of dust, gummed oil, or rust is very liable to jam the action. Weight and length of barrel are rather important features, for a heavy rifle will cause fatigue in an all-day hike over rough country, while a long barrel results in considerable inconvenience when hunting in a brushy or heavily timbered section. The sights for hunting are also different from those of the target range, for much of the sighting must be done quickly and at rapidly moving objects; hence a good wide field of vision is required, and rather coarse, easily seen, quickly centered, and quickly adjustable sights are desired. The sights should be strong instead of delicate, and should fit closely to the gun barrel, so as to offer a minimum of surface to catch on brush with the consequent liability of being pulled or knocked out of alignment.

The real measure of a rifle for hunting purposes is the killing power, and this is a rather hard term to express in figures, for so many different conditions and variables are encountered in the actual field which must be taken into consideration. Therefore, practical field tests under all sorts of conditions are necessary to fully demonstrate whether a given rifle will "get the game."

A rifle will impart a certain amount of energy to a bullet, a part of which energy is spent in overcoming the resistance of the air and the balance in delivering an effect on the game. Energy is expressed in foot pounds, and depends upon both the weight of the bullet and the velocity of flight. A heavy bullet traveling at a slow velocity will have as much energy as a light bullet going at a higher velocity. This total energy is absorbed by the animal, provided the bullet does not pass entirely through the body, and the relative quickness with which the bullet delivers its whole energy to the animal may be called the shocking power.

Actual depth of penetration is not a measure of killing or shocking power, for a full metal-cased bullet will give maximum penetration, yet an animal can be drilled through by one of these balls and not even falter in its stride unless a vital part has been struck. This may largely be accounted for in that the bullet after hitting still retains its shape and gradually slows down, thus permitting the animal to absorb the energy of the bullet more slowly, with a consequently lesser shock to the nervous system. If, however, a soft point or lead bullet is used, the expansion produced by striking will offer much more resistance; thus a larger part of the energy will be more quickly given off for absorption by the animal. This excessive volume of energy gives a terrific shock to the nervous system and brings down the game, even though an essentially vital part has not been actually perforated. Animal tissue is very largely composed of water, which is but slightly compressible and highly fluid; hence the striking shock of a soft bullet is transmitted readily and quickly to a large area, thus affecting vital animal parts at a considerable distance from the bullet.

There are several considerations entering into the shocking power, such as the



A Soft-nosed Bullet Before and After Impact with Animal Tissue

design, shape, weight, strength, and composition of the bullet; the velocity of travel; and the rate of twist or spin. These are all very closely related and dependent each upon the other. The shocking effect of a bullet of any given caliber is greatly increased if there is a tendency to flatten out upon impact; hence a bullet that is so strong as to prevent flattening will not give a good shock. The velocity has an influence on this, for the higher the velocity the greater the flattening when the bullet strikes a solid object. The spin or rate of twist due to the centrifugal force tends to make a bullet fly to pieces, the same as drops of water fly from a rapidly turning grindstone. These two forces are greatest at short ranges, and least at long ranges, and some of the modern high velocity rifles will cause even a full metal-cased bullet to practically explode and fly in pieces upon striking a hard bone at short ranges. Both the velocity and rate of spin decrease with the range, so that a point is reached where there is not force enough to even flatten out the soft-nose expanding bullet.

High velocity is also of considerable benefit in that it gives a flat trajectory. This allows very accurate shooting to be done up to 300 yards without changing the elevation of the sights, for which there is often not sufficient time in game hunting. It also compensates for a greater error in the estimation of the range.

Large animals will require a heavier shock than small game, so the size of the game largely determines the rifle to use. For small game, such as rabbits and squirrels, at short ranges up to 50 yards, the .22 caliber rim fire is an excellent weapon. At longer ranges the .25-20 and .32-20 are used. They are also used for such game as foxes and coyotes. Within the 200-yard range, small deer, wolves, and bobcats may be killed with the .38-40, .32-40, and .44-40, and similar calibers. Such game as deer, antelope, small bear, and mountain lions are susceptible to the shock of calibers similar to the .38-55, .25-36, .38-56, and .25-35, up to the 300-yard range.

For deer, elk, mountain sheep, bear, and moose within a range of 400 yards, such rifles as the .250, .30-30, .32 special,

George P. Bissell
Member New York Stock Exchange
Powder Stocks
a Specialty
DU PONT BUILDING
Wilmington, Del. Phone 333

INVESTMENT REGISTRY OF AMERICA INCORPORATED MORRIS BUILDING, PHILADELPHIA

Impartiality

Characterizes the work of all our departments because we do not own bonds.

Investigation before purchase.

Complete details currently, of progress of the companies, after purchase.

Buying and Selling in all markets at same available prices obtainable by investors.

Brokerage is allowed us by houses of issue and bankers generally.

Recommendations for purchases and trades, based on complete facts only, regardless house of issue or market.

Inquiries Invited

INVESTMENT REGISTRY OF AMERICA, INC.
H. Evan Taylor, Pres.
Morris Bldg. - Philadelphia, Penna.
Boston Baltimore
Investment Registry, Ltd., London, England.

.303, .45-70, and .45-90 will deliver a heavy blow.

When it comes to longer ranges and the largest and fiercest game the .256, .280, .30-40, .30-06, .35, .405, and similar calibers will give a better result in shocking power and game getting.

Of course there are many other calibers which will give good results at varying ranges, and wonderful kills have been made with calibers which were out of proportion to the game hit, but generally a given amount of energy is required to kill big game unless an extremely vital point has been hit. For these reasons the average hunter feels much safer and more at ease in tackling big game when his rifle has a good margin of energy and shocking power.

Is This the Time to Stop Advertising?

Address before the New York Business Publishers' Assn., Inc., by George Frank Lord

[Reprinted, by permission of *Printers' Ink.*]

THE question I have been asked to discuss is one of the many growing out of the atmosphere of uncertainty that permeates the business world due to the unprecedented conditions that now exist.

It seems to me that this question and commercial America's answer to it is the crucial test of the progress of advertising.

If advertising is the power advertising men claim, there should be no doubt as to how that power can be used in the present emergency.

My observation and belief is that the reason for the existence of the question is that we advertising men have failed to sell advertising properly to our executives, because the average executive insists upon tying each year's expenditures to that same year's sales expectations. If the sales outlook is poor he wants to restrict his advertising, if good, he is willing to increase it.

What we apparently have failed to do is to sell the really greatest power of advertising, and that is its ability to stabilize and develop the business advertised rather than the particular commodity chosen for merchandising.

If advertising is ephemeral, living or dying with the daily, monthly or yearly merchandising campaign, then we should surely trim our sails to meet the current shifting breezes.

If, on the other hand, advertising is a process of market development heading for a specific goal, we will push on through storm or calm, with or against the wind or current until that goal is reached.

History records that all great wars have been followed soon by periods of intense reconstruction. That the present war surpasses all others in magnitude and destructiveness, only means that its sequel of reconstruction will also surpass all others in magnitude.

What shall be the part of America in the post-bellum reconstruction of the world?

Unless we decide differently our part will be chiefly that of the buyer of imports from a Europe struggling to restore and increase its commercial facilities.

All the European belligerents are bound to strain every resource to get as large a

Du Pont Powder Securities
Hercules Powder Securities
Atlas Powder Securities
Bought, Sold, Quoted
WILLIAM WHEATLEY
Specialist in Powders
120 Broadway New York
PHONES: RECTOR 9717-18

Investment Service

Clients and prospective investors are cordially invited to make use of the facilities at our offices.

The requirements and convenience of investors are our first consideration.

Laird & Company
Du Pont Building Wilmington, Del.

Railroad, Public Utility and Municipal Bonds
Short Term Notes
Du Pont, Hercules, Atlas Securities

Write for FREE
Explosives
Sales Record Book

We will mail, free, to any dealer in explosives a book for keeping records of sales of explosives, as required by the Federal law.

The form used will be that approved by the United States Bureau of Mines.

Dealers in dynamite, sporting powder, blasting supplies and blasting powder may get the record book by mailing request to

E. I. du Pont de Nemours & Co.
Wilmington, Delaware

OR ANY BRANCH OFFICE:

Birmingham, Buffalo, Chicago, Denver, Duluth, Huntington, Joplin, Kansas City, Mo.; New York, Portland, Ore.; Pittsburgh, Pa.; St. Louis, San Francisco, Seattle, Scranton, Spokane, Springfield, Ill.; Juneau, Alaska.

CANADIAN BRANCHES
OF THE
DU PONT
American Industries

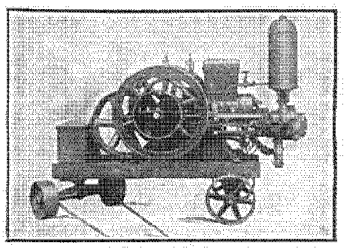
E. I. du Pont de Nemours & Co.
Ed. G. White, Representative
Sporting Powder Division
OTTAWA, ONTARIO

Du Pont Fabrikoid Co.
LEATHER SUBSTITUTES
FAIRFIELD RUBBER CLOTH
W. A. Cotton, Manager
NEW TORONTO, ONTARIO

Du Pont Chemical Works
PYROXYLIN AND COAL TAR CHEMICALS
W. A. Cotton, Sales Representative
NEW TORONTO, ONTARIO

The Arlington Co.
IVORY PY-RA-LIN and CLEANABLE COLLARS
J. A. Chanter, Sales Manager
TORONTO, ONTARIO

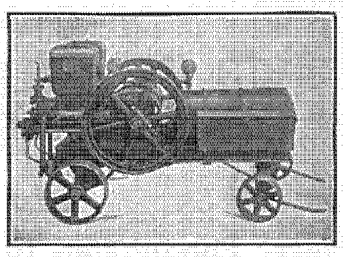
Inquiries invited relative to descriptive booklets and prices



Shallow Well Pressure Pumps

Schramm Power Units

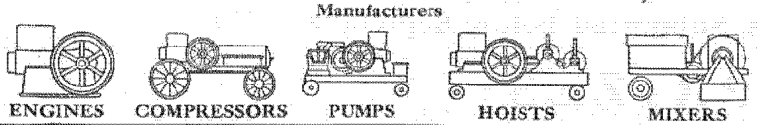
Pumps for removing water from your quarry, compressors for drilling blasting holes, and hoists for lifting the rock out of the quarry. Tell us your present methods and get our advice on methods of saving time, labor, and money. This will not obligate you in any way.



Portable Air Compressors

Chris D. Schramm and Son, Inc.

Manufacturers



ENGINES COMPRESSORS PUMPS HOISTS MIXERS

Home Office and Showrooms:
PHILADELPHIA 709 Arch St.

Branch Offices and Showrooms:
NEW YORK, 140 West St. CHICAGO, 605 S. Dearborn St.
BOSTON, 27 School St. BALTIMORE, 15 E. Fayette St.

Factory, WEST CHESTER, PA.

share as possible of the wealth that has been poured into this country since the war began.

"If this be true," a critic may remark, "how can we hope to sell in a larger way to countries that lack the money to buy?" The answer to this query is, in my opinion, that our export customer countries will have ample means or credit left to buy what they must have to exist as commercial nations.

Our total exports in 1913 were only $2,450,000,000—a small sum compared with the combined war expenditures of the European belligerents. Their needs will be so urgent that it would not be surprising if our exports in the year following the war were to total $5,000,000,000.

As to the capacity of Europe to buy to that extent at that time, consider how quickly France paid what was expected to be a crippling war indemnity to Germany after the Franco-Prussian war.

But, in my opinion, the world market is not the one from which we may expect our greatest commercial return. The greatest market for American products should be America.

We imported in 1913 goods worth in round figures $1,800,000,000, equivalent now at the current purchasing power of our money, to nearly twice that sum.

For more than three years we have been obliged to produce in this country much of what was formerly imported, and with our war-born facilities we are going to be still less dependent on imports than ever before.

In this period normal construction has been largely stopped in this country, particularly in that forerunner of trade—railroad construction.

With the major portion of the world's cash in American hands, can there be any doubt that in this country construction of railroads, homes, factories, and utilities and luxuries of every kind will leap forward at an unprecedented pace?

The demand for everything of use or beauty is bound to be tremendous. Those who have stopped the purchase of utilities or luxuries, either because not obtainable during the war or because their purchase price had been diverted to war expenditures, will want to make their deferred purchases as soon as the glad tidings of peace burst upon the world.

If America is unprepared for this business, our European trade rivals will be quick to take the fullest possible advantage of the free-for-all market.

Shall America let her dazzling wealth of today slip away to more enterprising nations that before the war and in the midst of war had ever before them gigantic world-wide plans of commercial conquest?

Shall we not rather start now to entrench American business against foreign attack and preserve for America the tremendous financial and commercial advantages a world revolution has thrust upon her?

Remember, there will be no sentiment of human lives or liberty actuating any nation or individual in the vast commercial war to follow—the war of arms. The bars will be down and only commercial efficiency will count.

The war has taught us that preparedness is really the longest word in the dictionary and also the strongest. We cannot start preparing for big business on the day peace is declared, any better than we started preparing for war on the day we declared war. We did not like to prepare for war because we did not want war.

But this does not apply about preparing for business, because our worst enemies never accused us of not wanting business.

Most emphatically I believe that now is not the time to stop advertising. On the contrary it is the time to start more and better advertising than we have ever done before.

It takes fully as much time to bring an advertising campaign into full action as a military campaign. We do not know how much or how little time we have to sell the Made-in-America idea to America and to the world at large.

We do know that we have right now all the resources necessary to make this country the most prosperous manufacturer in the world, as soon as we are able to turn our capital, facilities and organizations loose on peace products.

Why should we hesitate to show our faith in the future of America by building for that future?

A man left his umbrella in the stand in a hotel with a card bearing the following inscription attached to it: "This umbrella belongs to a man who can deal a blow of two hundred and fifty pounds. Will return in ten minutes."

On returning for his property he found in its place a card inscribed: "This card was left here by a man who can run one mile in four minutes. I shall not be back."—*The Yellow Strand.*

Belber TRAVELING GOODS

ASK FOR BOOKLETS

Outwear Travel

Made in genuine grain leather and DU PONT FABRIKOID—Craftsman Quality. At all good dealers.

THE BELBER TRUNK & BAG CO. - Philadelphia, Pa.

JAMES F. NIELDS

Du Pont Building - Wilmington, Del.

Atlas, Du Pont, Hercules Powder Company's Securities

BOUGHT SOLD QUOTED

$500 For Photographs

To Increase the Interest in Du Pont Products and to Secure Suitable Photographs to Illustrate the Advertising and Publicity of Our Various Companies, the Du Pont American Industries Offer $500 in Prizes for the FIFTY Best Photographs, Illustrating the Following Subjects, Submitted before September 1, 1918

PRIZES:

First Prize, $100. Second Prize, $50. 2 Third Prizes, $25 Each
14 Fourth Prizes, $10 Each. 32 Fifth Prizes, $5 Each

SUBJECTS:

Agricultural Uses of Explosives.—Blasting stumps, boulders, ditches, wells, ice jams, log jams. Draining swamps and wet spots. Planting trees, shrubbery and hedges. Splitting logs, blasting post holes, blasting down masonry walls, breaking up steel castings. Blasting fish ponds and reservoirs, cleaning out mill races, straightening streams, terracing hilly land to prevent erosin, exterminating gophers and burrowing animals. Miscellaneous agricultural uses of explosives.

Industrial Uses of Explosives.—Road building—especially clearing, straightening and draining roads and improving grades, showing work before and after. Railroad construction. Excavations and trenches of all sorts. Miscellaneous industrial uses of explosives. Quarry blasting. Mining.

Fabrikoid Leather Substitute.—Automobiles or motor trucks, with upholstery or tops, especially in hard service, or in exposure to rainstorms and extreme sunshine. Motorboats, in use, showing tops or upholstery. Fabrikoid luggage in use. Views in plants using artificial leather for manufacturing articles. Miscellaneous uses of Fabrikoid—table-covers, bookbinding, bags, sofa cushions, furniture, upholstery and similar uses.

Painting.—Well-painted exteriors, large or small, of city, suburban or country homes, farm houses and other buildings. Artistic interiors of living-rooms, bedrooms, bathrooms and kitchens, showing painted or tinted walls or well-finished floors and woodwork. Well-painted factory, hospital, hotel, store and public building interiors and exteriors. Automobiles, boats, ships, bridges or other structures being painted. Under this head special consideration will also be given to photographs which show any improved conditions due to painting inside or out.

Trapshooting and Hunting.—Important trapshooting events. Squads of shooters in action. Trapshooting celebrities. Exteriors and interiors of trapshooting club houses. Using the hand trap at gun clubs, homes, camps, summer resorts and outings, ashore and afloat. Unusual stunts with the hand trap. Interesting trapshooting and hunting scenes.

Miscellaneous.—Ivory Py-ra-lin (Artificial Ivory) in use. Challenge Cleanable Collars in use. Removing tar from automobiles with Pontoklene. Using household cement, lacquers or enamels. Any subjects illustrating the use of any Du Pont Products, whether or not included in this list, will be given equal consideration.

CONDITIONS OF AWARD

1. No employes of the Du Pont American Industries are eligible in this contest.

2. Each photograph to be eligible for a prize, must be accompanied by the negative, film or plate, carefully packed for shipment.

3. On the back of each photograph submitted must be plainly written the name and address of the contestant, the *subject illustrated, the time and place* where the photograph was taken, the name of the Du Pont Product illustrated, if any, and any other helpful data.

4. The number of photographs that can be submitted by any one contestant is unlimited, nor is there any limit to the number of prizes that can be won by any contestant.

5. All photographs submitted, whether or not awarded prizes, are to become the property of E. I. du Pont de Nemours & Co., with all publishing rights.

6. Except in the cases especially mentioned above, the subjects photographed need not be Du Pont Products. If, however, Du Pont Products are used, it must be stated on the reverse of the photograph what products are illustrated.

7. All photographs submitted will be judged by a committee to be appointed by the Director of Advertising of the Du Pont American Industries. Prizes will be awarded not later than September 15, 1918.

8. The Du Pont Photograph Contest will close on September 1, 1918. No photographs postmarked at Wilmington, Delaware, later than September 1, 1918, will be accepted in this contest.

9. Each contestant must fill out and mail the attached entry blank to Advertising Division, Du Pont Company, Wilmington, Delaware, *with the first photographs submitted* or the photographs will not be accepted in the contest.

10. All photographs entered in this contest must be plainly marked "Photograph Contest" and mailed to the Advertising Division, Du Pont Company, Wilmington, Delaware, full postage prepaid.

To Win A Prize

Run over the list of subjects suggested above and note the photographs you have or can get that would illustrate the subjects. Probably in the home, or elsewhere in the neighborhood is a good chance to get a *prize-winning* photograph.

A photograph to win must have good contrast, and be clear and sharp and in focus. It must be at least 3 x 5 inches in size.

Make a black and white, glossy finish print and write a complete description of the photograph and your name and address on the back.

Send the print, *with the negative and entry blank*, to the Advertising Division, Du Pont Company, Wilmington, Del. Be sure and mark it "Photograph Contest."

Don't try too hard to get an "unusual effect." This is not an art contest. These photographs are to be used for advertising purposes and if they show clearly and effectively what they are supposed to represent and will reproduce well they will have a good chance of winning a prize.

Note.—If any individuals show prominently in the photograph we must have their written consent to its use in advertising. "Release Blanks" will be supplied on request.

MAIL THIS ENTRY FORM

To Advertising Division, E. I. du Pont de Nemours & Co., Wilmington, Delaware

I wish to enter the Du Pont Photograph Contest. I hereby assign to E. I. du Pont de Nemours & Co. full title to any and all photographs which I submit in this contest.

NAME _____

ADDRESS _____

PLACE _____ STATE _____

DATE _____

Du Pont Mag., April, 1918

DU PONT AMERICAN INDUSTRIES

The Opportunity of the Hardware Trade

The entrance of the Du Pont Company into the paint field means much more than that we are going to sell paint.

It means the beginning of a new epoch in the paint industry.

The same organizing, operating, selling facilities and abilities that have earned for the Du Pont Company unquestioned world leadership in other fields of industry, are being applied in the paint business.

Just as the dealer who represents Du Pont in the explosives field automatically gets the bulk of that trade in his locality, so will the dealer who represents Du Pont in the paint field automatically get the bulk of the paint trade.

We believe there has been too much tin can and too little annual net profit in the merchandizing of paint.

We propose to sell the protective and decorative features of paints, varnishes and finishes, rather than the cans, and at the same time to make the business show a much larger annual net to our dealers.

We offer to the thousands of hardware dealers now selling Du Pont explosives, the opportunity to join us in establishing a new national paint, varnish and stain service.

We want in every city, town and small town a full line agency for

HARRISONS
TOWN AND COUNTRY PAINT

And another full line agency for

BRIDGEPORT
STANDARD WOOD FINISHES

Each line is complete in itself and on the highest plane of quality and reputation. Each is now backed by the organization and resources of the Du Pont Company.

Act Promptly if You Want This Desirable Connection.

In many towns one or the other or both of these agencies are already established.

In other towns we have numerous dealers in other lines, and we are likely to hear from several from the same city or town.

Except in large cities, we do not want more than one Harrison and one Bridgeport agency.

Prompt action will impress us that you are a live wire and probably the man we want.

Please write, stating which line you prefer, and we will promptly lay our plan before you.

SALES PROMOTION DIVISION

E. I. du Pont de Nemours & Company

Wilmington, Delaware

DU PONT

DU PONT AMERICAN INDUSTRIES

For the convenience of buyers considering the purchase of any Du Pont product, and desiring specific information, this coupon is printed. Upon receipt, it will be forwarded immediately to the proper office for attention.

Fill in, Cut Out and Mail This Coupon

(Du Pont Magazine, Apr. '18)

Sales Promotion Division Date.....

E. I. du Pont de Nemours & Co.
Wilmington, Delaware

EXPLOSIVES

- ☐ Farm Explosives
- ☐ Blasting Supplies
- ☐ Industrial Dynamites
- ☐ Blasting Powder
- ☐ Permissible Explosives
- ☐ Road Building
- ☐ Clay Mining
- ☐ Land Clearing
- ☐ Tree Planting
- ☐ Charcoal
- ☐ Wood Pulp
- ☐ Saltpetre
- ☐ Refined Nitrate of Soda

PAINTS

- ☐ Town and Country Paint
- ☐ Colors in Oil
- ☐ Virrolac Varnish
- ☐ Virrolac Stain Finish
- ☐ Flowkote Enamel
- ☐ Dulite for Mills
- ☐ Antoxide Iron Paint
- ☐ Shingle Stain
- ☐ Auto Finish
- ☐ Sanitary Wall Finish
- ☐ Bridgeport Standard Paint
- ☐ Wheeler's Wood Filler
- ☐ Bridgeport Wood Finishes
- ☐ Smokestack Paint
- ☐ Floor Varnishes
- ☐ Floor Paints
- ☐ Enamels
- ☐ Concrete Paint
- ☐ Marine Paints
- ☐ Industrial Paints
- ☐ Railway Paints
- ☐ Ferro-Keep (Metal Paint)
- ☐ Barn Paint
- ☐ Wagon and Carriage Paint
- ☐ Auto Paints and Enamels
- ☐ Decorative Stains
- ☐ Varnishes
- ☐ Wire Screen Paint
- ☐ Japans
- ☐ Shellac
- ☐ Red Lead

SPORTING POWDERS

- ☐ Hunting
- ☐ Trapshooting
- ☐ Black Sporting Powder
- ☐ Smokeless Powder
- ☐ Hand Trap
- ☐ Rifle Smokeless Powder
- ☐ Pistol Smokeless Powder
- ☐ Resort Shooting
- ☐ Shooting in Colleges
- ☐ Shooting on Boats

CHEMICALS

- ☐ Acids
- ☐ White Lead
- ☐ Alums
- ☐ Lithopone
- ☐ Litharge
- ☐ Rubber Makers White
- ☐ Dry Colors
- ☐ Pulp Colors
- ☐ Salt Cake
- ☐ Barium Chloride
- ☐ Distilled Water
- ☐ Bronze Powder
- ☐ Bronzing Liquids
- ☐ Wood Lacquer
- ☐ Metal Lacquer
- ☐ Waterproof Cement
- ☐ Py-ra-lin Enamel
- ☐ Pontar
- ☐ Pontoklene
- ☐ Pitch
- ☐ Pegamoid Aluminum Paint
- ☐ Mantle Dips
- ☐ Leather Renovators
- ☐ Ether
- ☐ Parlodion
- ☐ Nitre Cake
- ☐ Creosote
- ☐ Shingle Oil
- ☐ Pyroxylin Solutions
- ☐ Benzol Products
- ☐ Carpo (Metal Paint)
- ☐ Carpolene (Wood Preservative)
- ☐ Wood Oil
- ☐ Dead Oil
- ☐ Belt Cement
- ☐ Household Cement
- ☐ Blanc Fixe
- ☐ Solvents
- ☐ Leather Substitute Solutions
- ☐ Split Leather Solutions
- ☐ Patent Leather Solutions
- ☐ Coke
- ☐ Belt Cement

PY-RA-LIN

- ☐ Py-ra-lin Toilet Goods
- ☐ Challenge Cleanable Collars
- ☐ Novelty Sheeting
- ☐ Transparent Sheeting
- ☐ Py-ra-lin Rods and Tubes
- ☐ Py-ra-lin Pipe Bits
- ☐ Py-ra-lin Specialties
- ☐ Brushes
- ☐ Mirrors
- ☐ Combs
- ☐ Toilet Sets
- ☐ Manicure Sets
- ☐ Desk Sets
- ☐ Colored Sheeting

COATED TEXTILES

- ☐ Fairfield Rubber Cloth
- ☐ Rayntite Top Material
- ☐ Motor Fabrikoid
- ☐ Craftsman Fabrikoid
- ☐ Truck Special Fabrikoid
- ☐ Marine Special (U. S. Standard)
- ☐ Shoe Special
- ☐ Book-Finish Fabrikoid
- ☐ Fabrikoid Sheeting
- ☐ Home Uses for Fabrikoid
- ☐ Fabrikoid for Baggage
- ☐ Fabrikoid for Upholstering
- ☐ Rug Anchor
- ☐ Hat Sweat Material
- ☐ Buggy Aprons
- ☐ Fabrikoid for Railway Cars

Name..... Position.....

Your Address (If Personal).....

Name of Concern (If Company).....

Address of Company.....

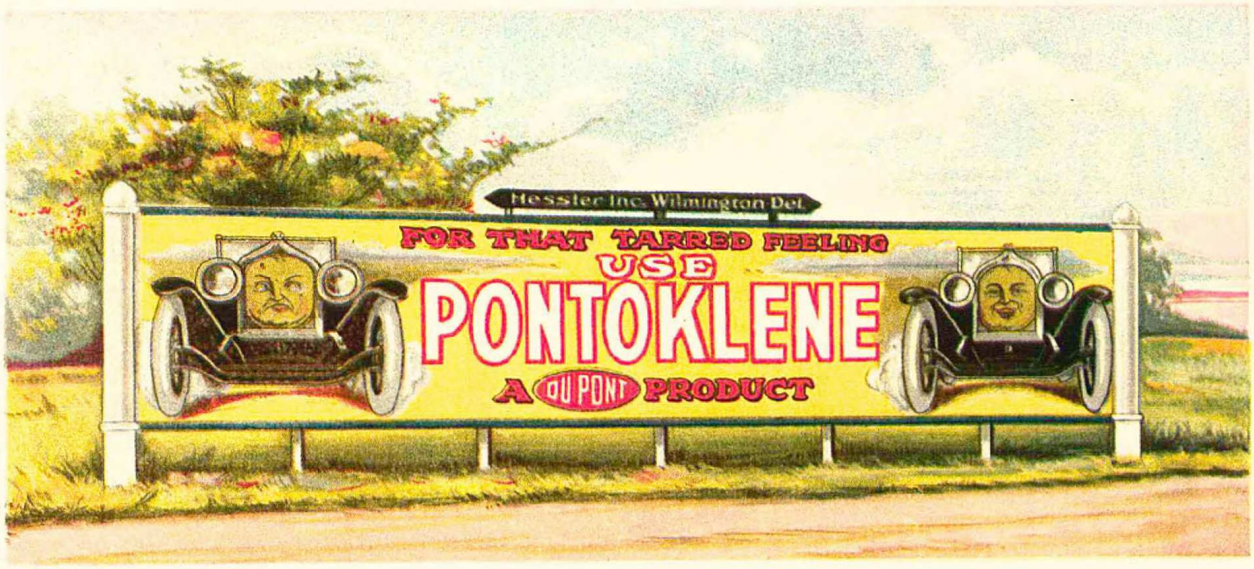
BUSINESS: ☐ Manufacturer; ☐ Producer; ☐ Jobber; ☐ Dealer; ☐ Consumer. (Check which)

What Du Pont products do you sell?.....

If a user, for what purpose does the product checked, or that which you now use, interest you?.....

Specific Questions Should Be Asked In An Accompanying Letter

DU PONT



Here's a 100% Seller for Du Pont Dealers

Every motorist has tar trouble. Every motorist will buy a sure tar remover.

Most automobile polishes are offered as tar removers. This claim is thrown in for good measure, and, as motorists soon discover, is not to be taken seriously.

Du Pont PONTOKLENE is compounded to remove tar, and it does the trick almost instantaneously and without rubbing. Rubbing tar spots is bad business, because tar contains ingredients that hurt varnish. Just sop the spot with a piece of waste or soft cloth soaked with PONTOKLENE. Then wipe it off with a second cloth dampened with PONTOKLENE.

PONTOKLENE also dissolves grease and gummy oil like heat dissolves snow. It contains no polishing abrasive, hence its only value as a polish is in its ability to restore the original brilliant finish by removing all tar, grease and dirt.



PONTOKLENE Sells Itself

With case lot orders we supply a case of samples. Every sample used makes a customer.

Retail prices, $1.00 per quart can, $1.50 per half-gallon can. Liberal quantity discounts to the trade. Order your Spring stock now to allow for delay in transit. Gill sample free, or regular size delivered on receipt of price.

Du Pont Chemical Works

General Office: Equitable Bldg.

NEW YORK, N. Y.



The Dean-Hicks Co

THERE is fine artistic distinction in handsomely finished wood work. The rare beauties of American woods are revealed only by proper finishes, which bring out the charm of grain and figure in tones that are pleasing and appropriate.

BRIDGEPORT STANDARD

WOOD FINISHES

Stain — Filler — Wax — Varnish

have been used on the world's most important wood finishing work for the past 40 years. Manufacturers of the finest furniture and pianos ; architects of the largest hotels, public buildings and palatial homes ; interior decorators, who demand practical working materials ; nearly all specify Bridgeport Wood Finishes.

If building or refinishing this year, send for a sample of the actual trim to be used on the building or tell us the kind of wood that has been used. We will send you samples of the latest Bridgeport finishes on that wood and tell you where to get the materials. Complete samples of our wood finishes on standard house trim are now on display in many of the leading cities.

Lumber Dealers : The Bridgeport plan of Service Departments has the endorsement and co-operation of the leading Lumber Associations. Write us for full details of the plan, which will enable you to show architects, contractors and house owners how to get the best results in finishing the woods you sell.

BRIDGEPORT WOOD FINISHING WORKS

OWNED AND OPERATED BY

E. I. DU PONT DE NEMOURS & CO.

6 East 39th Street, New York City

BOSTON PHILADELPHIA CHICAGO MINNEAPOLIS KANSAS CITY