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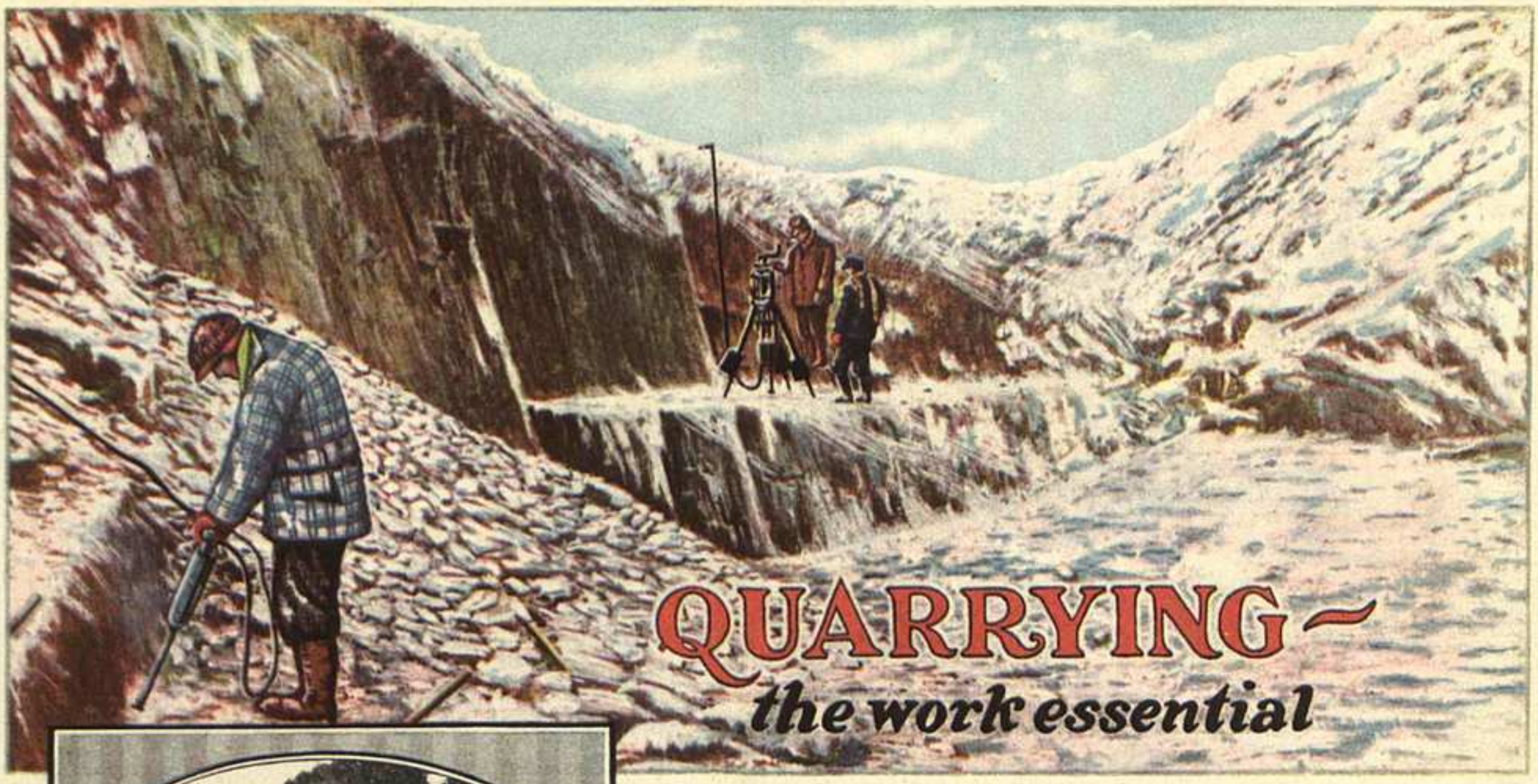
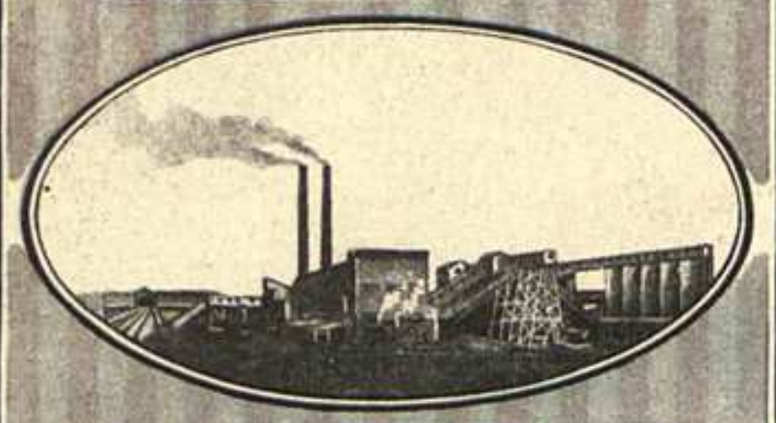
THE COAL MINER

DU PONT AMERICAN INDUSTRIES

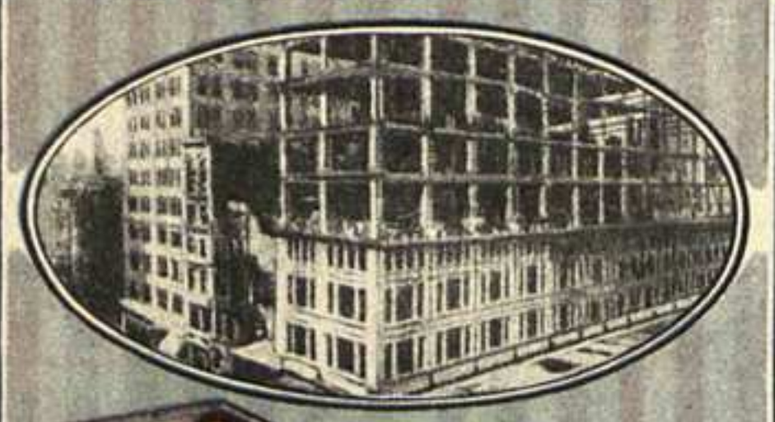


QUARRYING—
the work essential

BALLASTING THE ROAD-BED



PROVIDING FOR LIME AND CEMENT



CONSTRUCTION WORK

TO PROVIDE an adequate supply of material for railroad construction, lime kilns, cement furnaces and other dependent industries, quarrying—the work essential—must be a continuous, year-'round performance.

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EXPLOSIVES

demonstrates their efficiency and has established the claims made by us to quarrymen when we introduced "low freezing" explosives. "Every day a blasting day" is the verdict of quarry owners using Red Cross Low Freezing explosives to

Assure Constant Operation

of quarries so essential to continuous production and progression of industrial and commercial activities. Make every quarry 100% production—a year-'round producer.

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

DU PONT

DU PONT MAGAZINE

A REVIEW OF AMERICAN INDUSTRIAL PROGRESS

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J. R. SHULTZ, Managing Editor **J. F. CAMPBELL, Associate Editor**

Volume IX WILMINGTON, DELAWARE, NOVEMBER, 1918 Number 5

More Coal for Steel and Victory

Prepared for the "Du Pont Magazine" by the United States Fuel Administration

TODAY the production of steel falls behind war requirements. Lack of coal supply to the steel mills is the cause of this under-production. Yet steel is the first essential of modern war. Sufficient steel will mean sufficient shells and guns to shorten the war and bring speedy victory.

The United States is mining this year 50,000,000 more tons than it mined last year, and last year it mined 50,000,000 more tons than in 1916, yet our production of war materials, our transportation of troops and supplies are increasing so continuously and by such leaps and bounds that without the help of an enlightened and patriotic public working to conserve even as the mines and railroads are working to produce and transport, we should not be able to maintain and equip our armies.

No nation at war, except the United States, has mined more coal since the struggle began than before. Our achievement is remarkable, for much of the manpower at the mines has flowed into the army, while the railroads, by means of which coal is removed from the mines and carried to the consumer, are over-burdened by their new loads of troops and war supplies. Coal must be transported almost as fast as it is mined, otherwise mining operations cease. Mine operatives and miners are working in loyal co-operation with the United States Fuel Administration to keep mines open and operative during as many hours a week as production is feasible. By supplying as complete a transportation service as is possible with their handicap, railroad administrators and employees are seeking to increase the number of hours when mines can produce profitably.

To assist both phases of the coal-production problem, that of mining and that of transporting, the Fuel Administration has organized an effectual distribution system. Weekly reports are furnished Dr. Garfield showing the output during the past week of each one of ten thousand or more mines in our country, the amounts consumed and the amounts on hand. Possessing this information he can distribute the coal supply into those routes and to those destinations where its use will be most beneficial to war industry. By means of these measures 50,000,000 tons more than we mined last year will be mined during the current coal year, which runs from April, 1918, to April, 1919.

Fifty million tons, however, is only half of the excess amount which is required, so the Fuel Administration turns to industry and says, "Will you save 35,000,000 tons out of your customary waste of fuel if the Administration shows you how this conservation is possible without reduced production?" And it turns to housekeepers and says, "Will you save out of your former fuel waste in furnaces, in stoves and ranges, out of your former waste in gas and electric current, fifteen million tons, if the Administration shows you how this is possible, without sacrificing health?" The answer is affirmative from both industries and homes. Conservation, therefore, is committed to a saving of 50,000,000 tons this year, an amount which added to the 50,000,000 tons which we shall produce in addition to our output last year, will give us the additional 100,000,000 which we need.

Economies in the industrial world concern themselves chiefly with the elimination of wasteful practices in industrial furnaces and steam power-plants and in the generation and use of electric current.

In order to effect industrial conservation an organization has been put into operation by the Fuel Administration which instructs the managers of industrial furnaces, boiler plants and factories in fuel economies and which inspects and rates plants according to their fuel efficiency.

Before inspections are made a standard questionnaire is sent to the owners of plants with the request that they fill it out and hold it for the Inspectors. Together with this questionnaire is furnished a set of recommendations, by following which the shop managements have opportunity to correct wasteful practices. The Inspectors check the questionnaire with their own findings and return it and a personal report to their office. On the basis of this rating a certificate indicating fuel-efficiency is issued by the United States Fuel Administration to the owners of the plant.

The Fuel Administration believes that twenty million tons of coal can easily be saved this year in these

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plants by the correct operation of their present equipment. Until the present fuel emergency, little attention was paid to coal consumption in steam powerplants because, even though it were burned wastefully, it represented usually less than one per cent. of the total cost of the commodity manufactured. Ninety-nine plants out of a hundred do not know how many pounds of water they are evaporating for every pound of coal used, and this question is crucial. Obviously, a large fuel economy results when the amount of evaporated water is increased from six pounds to nine pounds per pound of coal. This was accomplished in one plant merely by correct management on the part of an intelligent fireman and the installation of a simple accounting system which kept the record of coal used and water evaporated from day to day. There are devices which should be used to measure coal and water and to indicate the quality of combustion by analyses of flue gas.

Extensive conservation measures are possible in the generating and in the use of electric current.

One of the measures from which economy will result is the closing-down in some cases of private and inefficient plants and the purchase of electric energy from Central Stations where one ton of coal frequently will produce four times as much electric power as in a small plant.

Utilization of excess water power and the interconnection of power systems open up a field of almost limitless economies, many of which, it is true, involve expenditures of time and money that must be deferred till after the war. Many other cases, however, present opportunities for present development. Duplicate transmission systems exist, for instance, which serve practically the same territory. Fuel economy will result where these can be connected so as to exchange energy, allowing the more economical plant to carry the load for both when this is not excessive. Particularly would this be true when a plant using water power parallels one dependent on coal. The interconnection would make possible at times the delivery of the entire load to water power.

Nearly five hundred instances have been located where single communities are served by two or more Central Stations. Sometimes this condition is justified or unobjectionable, but in other cases fuel is conserved by connecting the stations and allowing the most economical plant to carry the combined loads or a large portion cf them.

Refrigerating and ice manufacturing industries present a number of coal conservation possibilities. If ice were marketed, for instance, as a white, opaque substance, the fuel consumed by the process of agitating raw-water plants or of producing distillate in distilled water plants, would be eliminated. In winter it is not necessary that all ice plants should operate. If the least efficient of these were closed and the owners allowed to buy at wholesale from the more efficient factories, fuel would be conserved and the ice business suffer no losses. It is possible that all ice and refrigerating plants could operate with ten or fifteen per cent. less coal than last year if they were instructed in conservation measures.

Nearly every industry offers opportunities for fuel saving other than that involved solely in the production of power. It has been found that in most industries a material fuel-saving can be effected by the elimination of wasteful practices which have grown up as the result of competition, or by rearranging manufacturing schedules so as to obtain the maximum production with the least consumption of fuel. All industries consuming large amounts of fuel will be carefully investigated along these lines.

One of the coal-economy measures which has attracted great popular attention has been the adoption of the skip-stop system by street car lines. This plan advocated by the Fuel Administration has been adopted voluntarily by many cities and several entire states. It is hoped that its observance will become nation-wide in cities of a population of 25,000 and over. In this case 1,500,000 tons of coal would be conserved annually. To start a car requires six or eight times as much power as to keep it running; therefore much coal was consumed in producing the energy for the frequent stops which occurred under the old plan, amounting on an average to twelve or fourteen a mile. The skip-stop reduces these stops to eight stations for every mile in business sections, six in residential and four in open country. These distances are, of course, not arbitrary but governed by conditions. Stops should not occur at dangerous intersections nor on curves or slopes where excessive power is required to make them.

It is well known that defective machinery wastes fuel and that every leak means loss, yet these conditions often are allowed to continue. Repairs must be made more speedily and cleaning and lubricating occur regularly if conservation is to accomplish its results.

Such simple measures for conserving heat, and therefore the fuel which produces it, as the weather-stripping of doors and windows and the shutting off of drafty spaces will add an appreciable quota to conservation.

Daylight should be used as far as possible; clean windows will save coal. The number of lights used and their candle-power should be sufficient for seeing clearly, but no more. Tungsten lights must replace carbon-filament lamps and nitrogen-filled lamps, arc lights.

It may be human and natural to neglect small matters, to let affairs run on by inertia instead of controlling and directing them. War, however, demands of us efforts which are more than human. Down in the trenches, across the fields of Flanders and in the air above them our men are doing what is superhuman. Shall we excuse in ourselves carelessness, wastefulness, selfishness, when across the ocean their voices call to us for steel and yet more steel? Theirs to fight and ours to make their fighting effective by ignoring what is easy and natural and working incessantly and joyously at the task of conserving fuel in order that they may have steel.

The Patriotic Sport

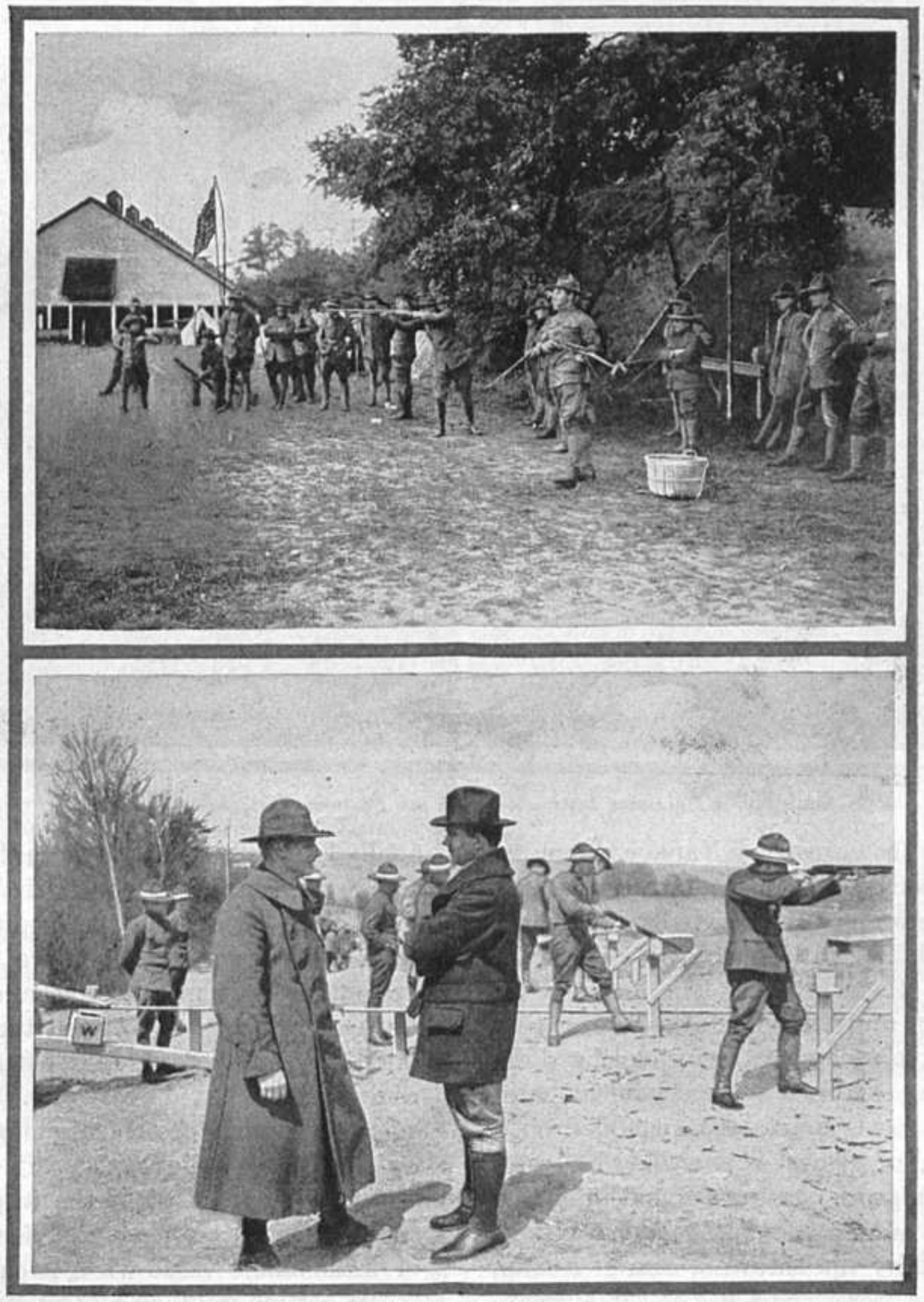
By George W. Peck

TRAPSHOOTING first came into vogue in the early '70s when the North American continent was the natural habitat of the now extinct passenger pigeon.

Nature, so wise and far-seeing in the matter of protective color scheme for most of her living charges, vegetable and animal, seems to have discounted the future of some animals even though she has given them intuitive resource and, when conditions demand, a decided, combative power coupled with it.

The wild pigeon of history is a fitting example. Primarily, its enemies were the hawk, owl, crow and similar nest pirates that prey upon eggs in process of incubation and upon young fledglings. Nature's solution to this problem was productivity so prolific that this non-combative, uncamouflaged game bird, during its biannual migrations, darkened the sky with its countless thousands and by sheer weight of numbers broke the limbs of trees at the selected roosts.

Nature may or may not have visualized the future, for her ways are "past understanding." Certain it is that God's noblest work, man, took advantage of the circumstance. At his door as night fell, he found thousands of helpless birds crowding into the trees only waiting to be taken in nets, while hundreds of nests needed but to be prodded with poles to yield a harvest of squabs. By day the fields swarmed with the birds so that only nets and well-baited crates propped up at one end with figure 4 trigger, or the simpler stick, to be jerked out by a string at the proper time, were needed in order to secure hundreds of strong hard-flying old birds.



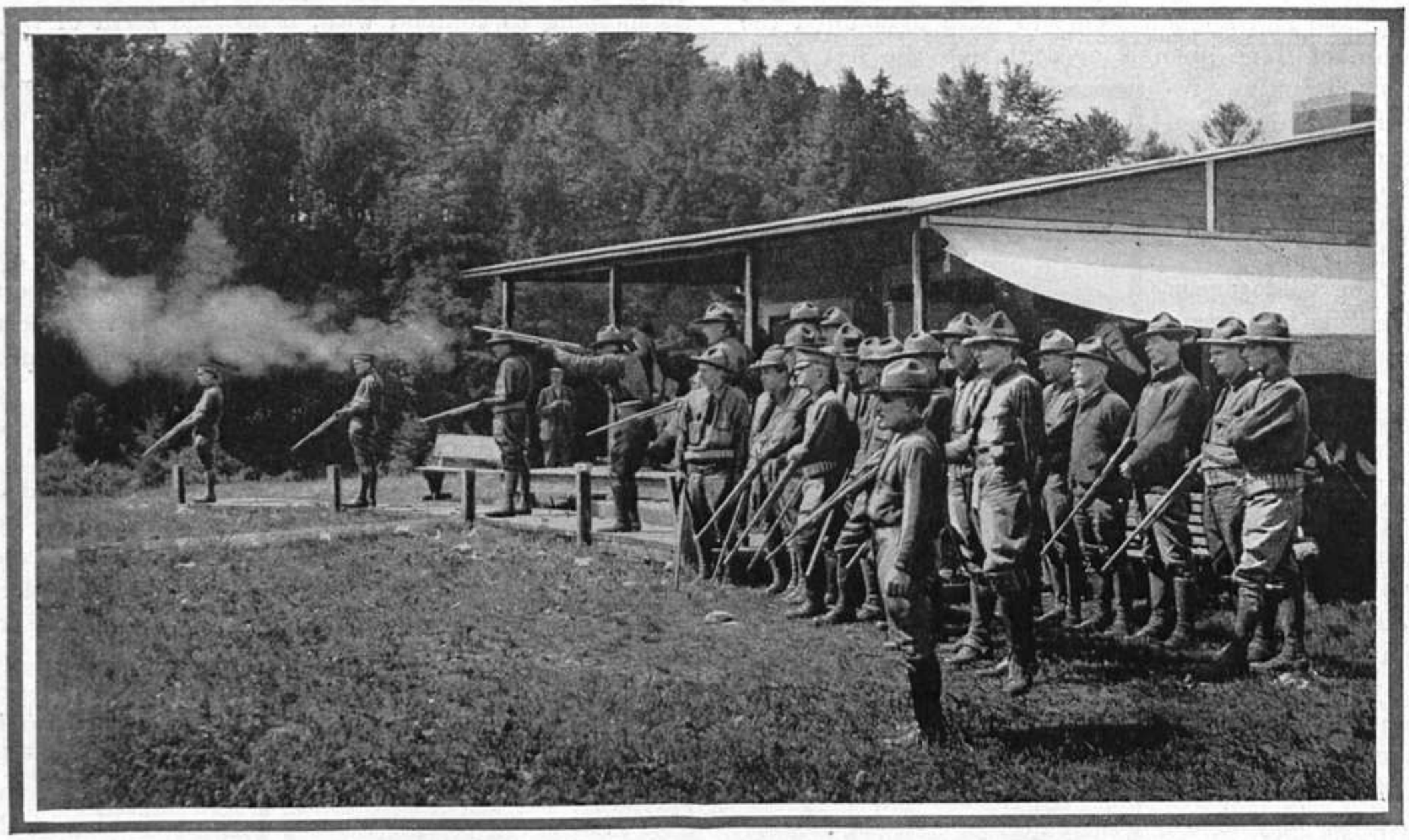
1. Home Guards using Shotgun with the aid of a hand trap
2. Lieutenant speaking to Capt. L. D. Willis, who installed the Trapshooting School for U. S. Government at Ithaca, N. Y., May, 1918

It was at this juncture that man's sporting instinct conceived the idea of the plunge trap. No sport attended the shooting of these birds in the wild state when one charge of shot into a tree would litter the ground with game, but this strong and swift flyer, thrown suddenly into the air, gave the best marksman something to contend with, hence the birth of trapshooting. Not very pretty, eh? Well, read on; evolution is ever working to strike an equitable balance, and trapshooting can today, as a sport, hold up its head, and for decency of operation, healthful occupation and essential governmental cooperation find no peer.

Came a day when Nature revolted. The greed, cruelty and blood lust of the game hog—the trapper and netter—had done their fell work. Every year had witnessed tons of this game spoiling at the docks and markets which were glutted. Every year witnessed new devices placed in operation to make the slaughter more effective. Then one season the pigeons failed to return. Mind you, it wasn't a gradual falling off in numbers with final cessation, but an abrupt failure to return, following the year of the greatest abundance of this species of bird. Nor have they ever returned. The very uncanniness of it was startling in the extreme and the superstitious vied with the philosophic in an attempt to arrive at an explanation. True, various sea captains reported sailing for days through miles of dead pigeons floating on the surface of the sea. As this phenomenon was preceded by a terrific sleet storm it was believed that the birds in their migratory flight were overwhelmed by it, the sleet affecting their pinions

in such a manner as to make flight impossible, so that they fell into the sea and perished.

However, the sport of live-bird shooting had been adopted, and with the passing of the wild pigeon its domestic cousin was utilized, especially as a between-season pastime for the gunner who went afield spring and fall in quest of game. Much was said against this phase of the sport, and with the majority of the people



State Militia Receiving Instruction With the Shotgun, Their Adopted Arm

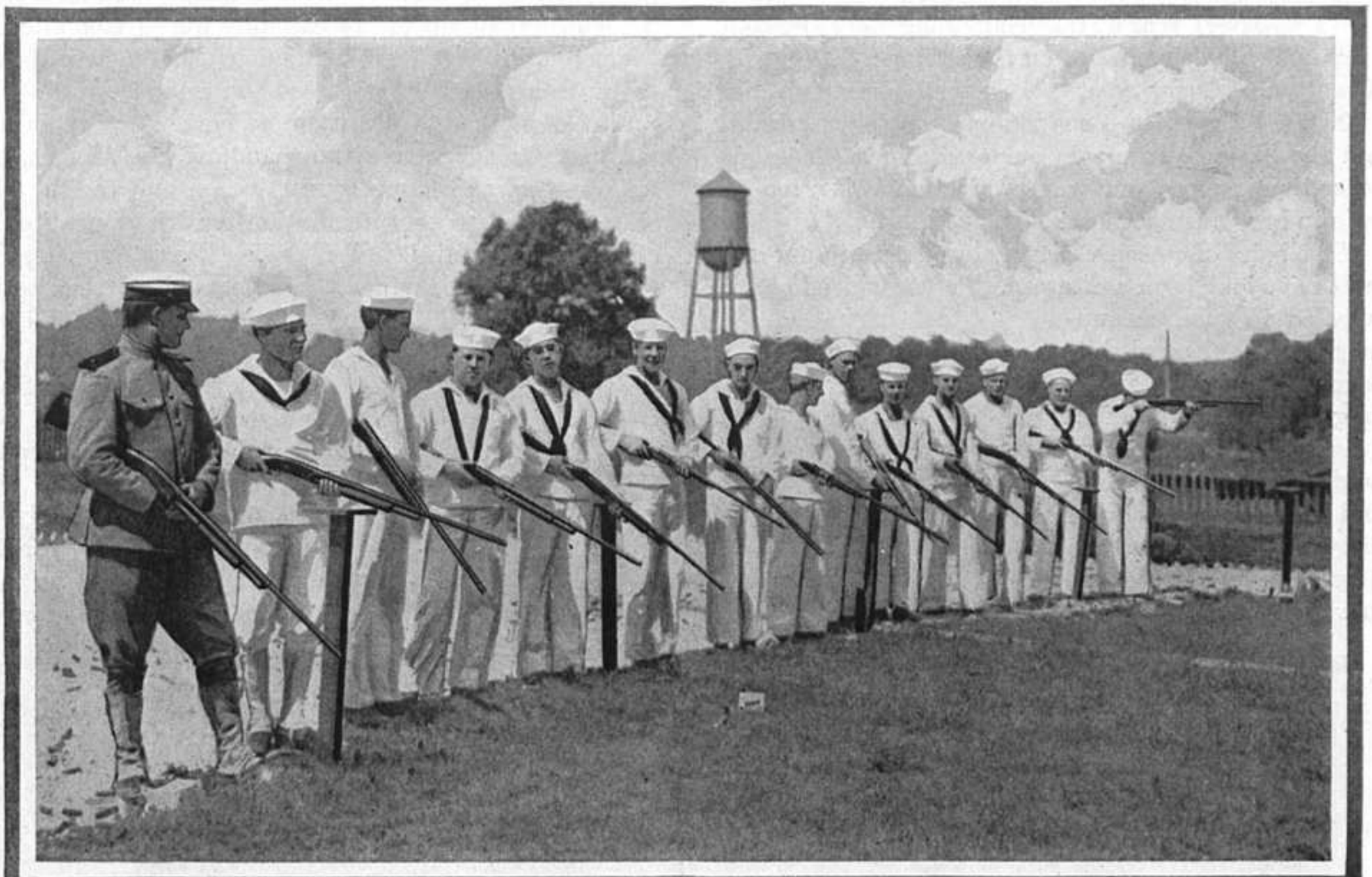
frowning upon it only the customary Yankee ingenuity was required to hit upon a substitute, and the glass ball was the result. There were plain glass balls, balls filled with feathers and balls filled with charcoal dust. Clean trapshooting history then began. The element of cruelty was eliminated, and the name of Bogardus as a record-breaker will live as long as trapshooting does.

More ingenuity was exercised and mechanical metal "pigeons" had their day—targets that would drop a disk or tag at the end of a short chain when hit—and finally the true clay pigeon. Saucer-shaped, moulded of red clay and baked in a brick oven, it made a vicious target when animated by the throwing arm of a trap, and as no two of them were baked to the same breaking point, some being hard and others soft, it left an element of uncertainty to contend with which won or lost many a contest to topnotch consistent shooters. Because of the expense of manufacture and that same element of uncertainty, this target, the Legowsky clay pigeon, gave way to the Peoria Black Bird, a machine moulded target consisting of a mixture of coal tar and gypsum. The Peoria became extinct in the early '80s but was the illustrious forebear of the targets in use to-day. The Blue Rock, Black Diamond, White Flyer and Morrel, though still referred to as clay pigeons in unconscious tribute to the old brood of the brick oven incubator, have no clay in their composition.

And so, touching lightly on a span of almost a half century we arrive again at the consideration of our caption—The Patriotic Sport. How many of its devotees are at this moment doing their bit in the trenches or elsewhere in active service, can only be guessed at roughly on a percentage basis. When Uncle Sam finally knocked the chip off the shoulder of that Hohenzollern person there were a half-million active trapshooters of all ages in the country. Assuming that a great percentage of them were within the established fighting age, it means that a contingent of finished marksmen has gone to swell the masses that are destined to win victory, and better still, new ones are coming into the fold every day. Trapshooting clubs all over the country are encouraging the sport, and young men eligible to the next draft should embrace every opportunity to shoot at the traps, as familiarity with the gun that does things and does them quickly will be of incalculable value when it comes to a crucial issue.

At certain military centers and aviation camps part of the training consists of trapshooting, and the results have opened the eyes of even the most optimistic, while the erstwhile scoffers are loudest in their endorsement of it. Where once trapshooting was essential only in that it was conducive to the health of the participant, to-day it stands at the elbow of the nation, as it were, a dependable servant which makes for efficiency. Every trapshooting tournament or club shoot these days has its sprinkling of contestants in the regulation khaki of the line or the white of the navy, until it begins to assume a military aspect, which, as a sport,

classes it alone. And while the boys on this side are thus preparing for intelligent manipulation of this deadly hand-gun their brothers in the trenches are using it with telling effect. Short of barrel, long of bayonet, with six loads of buckshot to settle the argument, even the stupidity, stubbornness and arrogance of the Hun must succumb to its convincing logic.



Here are the Jackies with Shotguns

Hold Your Liberty Bonds

To successfully finance the war it is necessary that owners of Liberty Bonds hold their bonds if possible. Where for any good reason it is necessary for them to turn their bonds into cash they should seek the advice of their bankers.

Liberty Loan Bonds are very desirable investments, and crafty individuals are using various means to secure them from owners not familiar with stock values and like matters. One method is to offer to exchange for Liberty Bonds stocks or bonds of doubtful organizations represented as returning a much higher income than the bonds.

There are various other methods used and likely to be used, some of the gold-brick variety and others less crude and probably within the limits of the law. All offers for Liberty Bonds except for money and at market value should be scrutinized carefully. The bonds are the safest of investments and have non-taxable and other valuable features.

To hold your Liberty Loan Bonds, if possible, is patriotic. To consult your bankers before selling them is wise.

Not What, But HOW?

Did you tackle the job that came your way,
With a resolute heart and cheerful?
Or hide your face from the light of day
With a craven heart, and fearful?
Oh a trouble's a ton, or a trouble's an ounce,
Or a trouble is what you make it;
And it isn't the fact that you're licked that counts,
But only, How did you take it?

You're beaten to earth? Well, well, what's that?
Come up with a smiling face.
It's nothing against you to fall down flat,
But to lie there, that's disgrace.
The harder you're thrown, why, the higher you bounce;
Be proud of your blackened eye.
It isn't the fact that you're licked that counts,
It's HOW did you fight? and WHY?

And though you be done to death, what then?
If you battled the best you could,
If you played your part in the world of men,
Why, the critic will call it "Good."
Death comes with a crawl, or comes with a pounce,
And whether he's slow or spry,
It isn't the fact that you're dead that counts,
But only, HOW did you die?

Cotton—Its Waste

By Richard Hoadley Tingley

AMERICA holds, and has long held, a monopoly of the world's cotton production.

Every year we raise something like 14,000,000 bales, and a bale contains, on the average, 500 pounds of cotton. Every year we export something like 8,000,000 bales to keep the European spindles turning and the balance we use in our own mills. These are peace-time figures, our war production being too erratic to base averages upon.

The bales of cotton we send abroad and to our own mills have long been a disgrace. Perfectly good cotton is baled in such an unscientific, haphazard, hit-or-miss way that, in its long journeyings, it often loses all semblance of its original shape and form and becomes a mass of dirty, weather-beaten fibre, greatly depreciated in value. By the time it reaches the mill, be the mill in Manchester, England, or Fall River, Massachusetts, it is a disgrace, a scandal, a crying imputation upon our boasted efficiency. Who is responsible? Many people; many interests.

1. Improper Baling of Cotton Causes Losses in Transportation by Wagon
2. Placing Cotton on Open Platforms Lowers Its Quality
3. Open Car Shipment Exposes Vast Amounts of Cotton to the Elements

The Value of the Cotton Crop

Measured by the standard of dollars cotton ranks second in value of all our agricultural products, corn being first. The money value of an average cotton crop is, at war prices now prevailing, something like $2,000,000,000. War cotton is about double the price of peace cotton. But, be the cotton crop worth $2,000,000,000 or half that amount, it is of sufficient importance to command more respect than it has ever yet received at the hands of those responsible for raising, harvesting, ginning, compressing, baling, sampling and transporting it to the "haven where it would be."

The Abuses of Perfectly Good Cotton

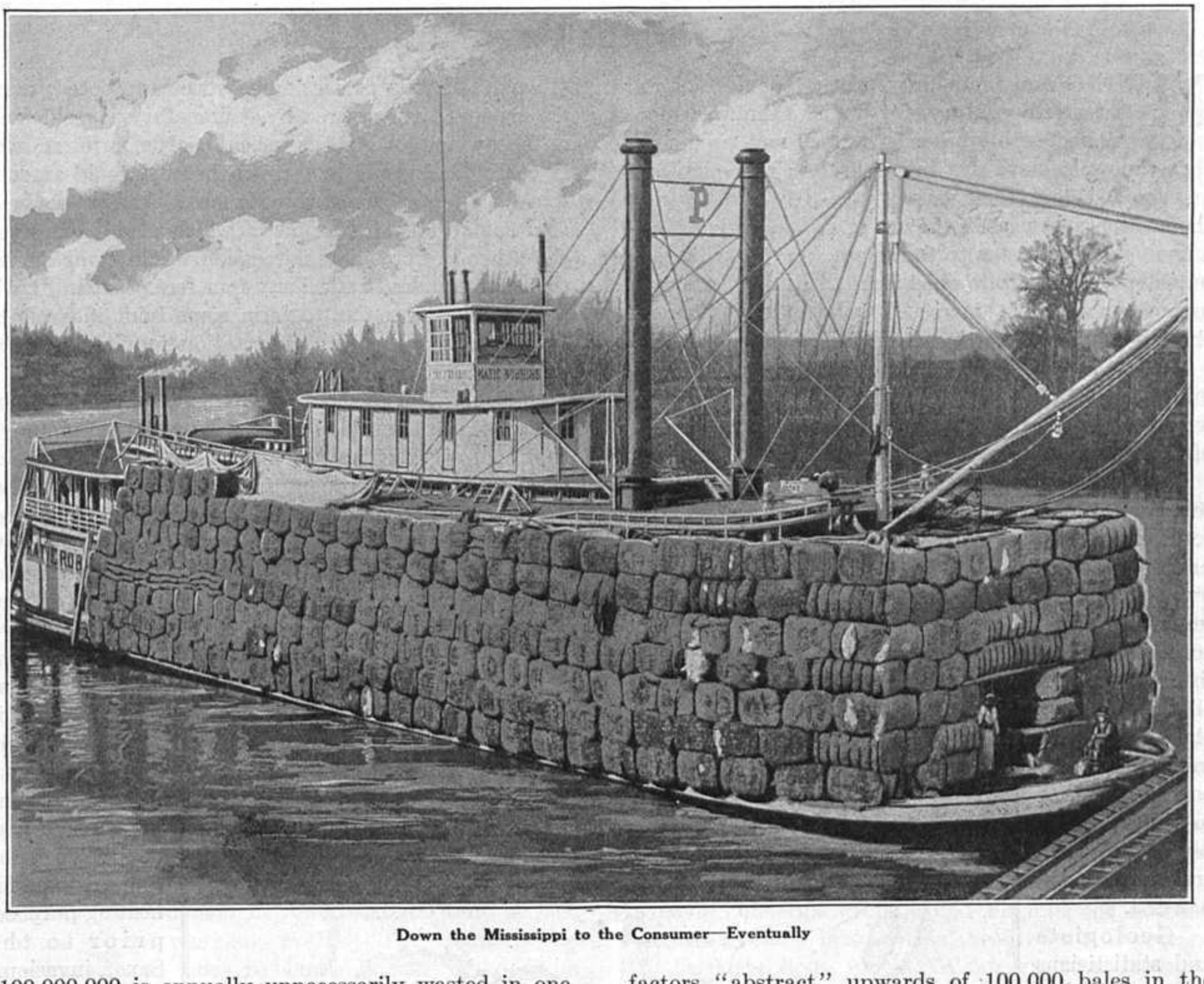
Corn, wheat, hay, sugar, tobacco and all other agricultural products are carefully and systematically prepared, inspected, graded and certified in accordance with established rules based on sound, up-to-date business methods. They are so covered as to insure against damage from rough handling, the vicissitudes of weather, and losses by mutilation and theft. The care devoted to the preparation for transportation of these commodities indicates intelligent, progressive and commercial methods; but behind all this is the powerful incentive of competition, an incentive that is lacking in the case of our monopolistic cotton.

The world demands something more than 20,000,000 bales annually, a demand that is rapidly increasing. Since no real competitor country or group of countries has yet come forward it is apparent that all who want cotton must come to the United States for it, and necessity compels them to accept our product in such form as it is presented, good, bad or indifferent. If the spinners of Europe could obtain cotton elsewhere in sufficient quantity and of the right quality they would not come here and accept our unsightly, antiquated bale.

There is no commodity that enters into the domestic or foreign trade of any country so carelessly prepared and so inadequately covered as our American cotton. In the markets of the world it is prized and execrated in one breath; prized for its inherent qualities; execrated for the slovenly condition in which it is presented. This condition is admitted by all.

Annual Waste of $100,000,000

It is estimated by cotton experts that at least



Down the Mississippi to the Consumer—Eventually

$100,000,000 is annually unnecessarily wasted in one way or another in planting, packing, sampling, ginning, compressing, baling and transporting this product. In nearly every one of the processes to which cotton is subjected while on its way from the plantation to the mill there is a remedy that might be applied to eliminate the present unnecessary waste; there is an approved process that could be installed; there is an economic method of handling that could be adopted. Nearly all of these are well known and proven, and would, if applied, help greatly in cutting down this $100,000,000 waste that is going on every year; a waste equal to nearly 6 per cent. of the present abnormal value of the crop; a waste nearly equal to 12 per cent. of the normal value of a year's crop.

Distinct and separate losses are sustained in the mutilation of the fibre in the operation of ginning and compressing; in exposing the raw cotton to the elements; in dragging it through the dirt, oil, and other foreign matter; in baling it into packages that force the cost of transportation far beyond what it should be; in baling in such form as to invite fires; in baling by the old-style methods that give the dishonest operator an opportunity to "water pack" the bale; by countenancing the time-honored "City crop," or custom of free sample pulling whereby the not over-scrupulous factors "abstract" upwards of 100,000 bales in the course of a season that are purely "graft," an economic loss to the producer. All these are practices and abuses that might, by co-operation and systemization, be wholly or partly eliminated, and all of these reforms would make, too, for a reduction in the high cost of living.

In war times like these, when the nation is straining every nerve to effect economies in all directions and when every dollar that can be saved is needed by our Government, no effort should be spared to remove so obvious a waste.

War Brings the Cotton Interests Together

But war is bringing the cotton interests together. The various associations of cotton manufacturers, the ginners, the compress men, warehousemen, growers, transportation men are all getting together now. They are sitting down quite amicably with their legs under the table with the Railroad War Board, the Federal Shipping Board, the Department of Commerce and other government departments. They are formulating plans to take the cotton industry out of the ranks of the unscientific, the uneconomic, and place it in the ranks of the scientific, the economic, the up-to-date.

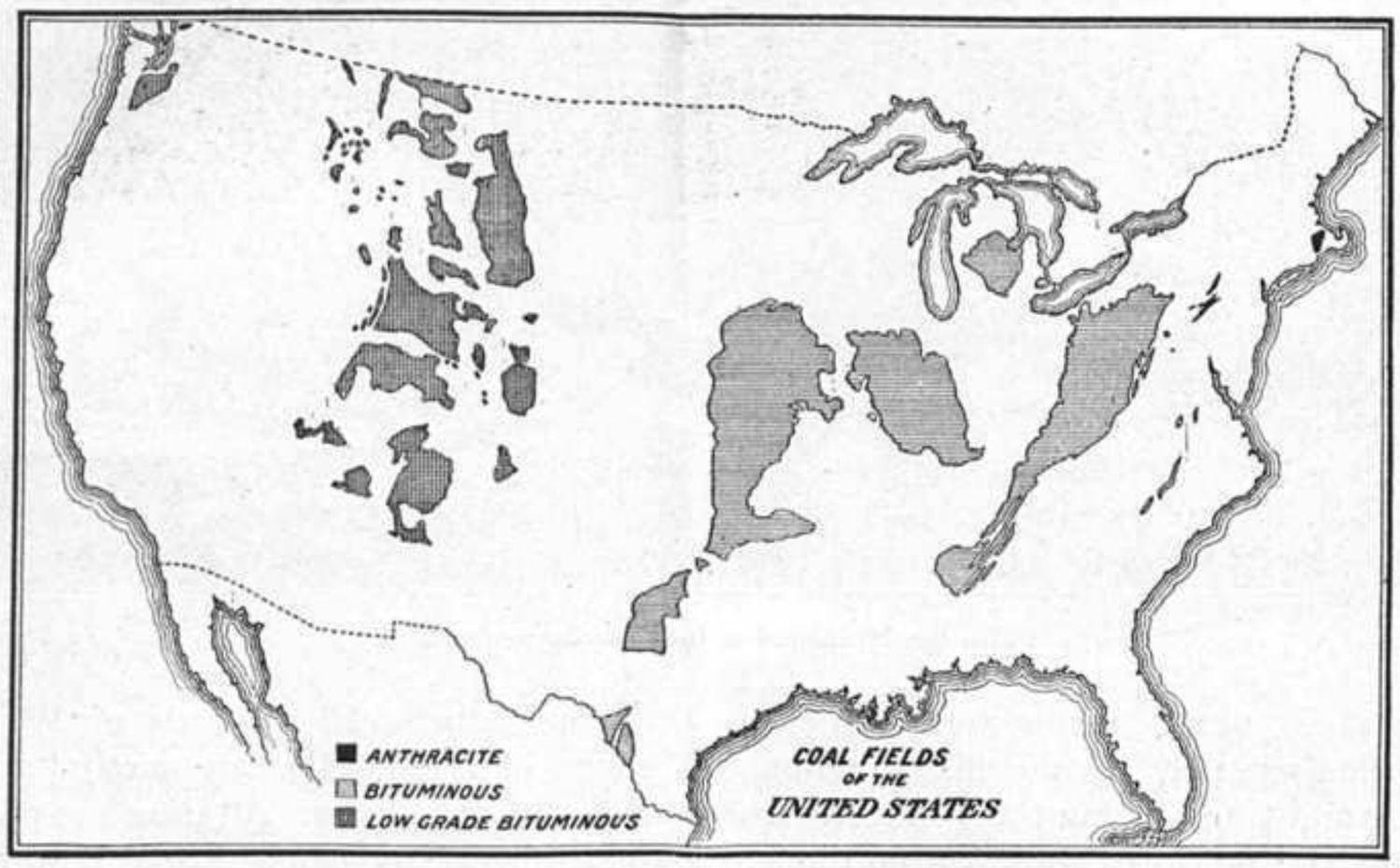
(Concluded on page 14)

Coal—Our Most Powerful Ally

MINING and metallurgy are not devices of the twentieth century, for Tubal Cain was mentioned as a worker in metals and ever since that time men have dug minerals from the earth and fashioned them to their various uses. However, during the century just passed, the use of explosives has given a tremendous impetus to the mining and metallurgical industry. Agriculture has increased only twofold, manufactures have increased only sixfold, whereas, the mining output has increased thirteenfold.

About 75 per cent. of the total weight of minerals mined is coal, so that a review of the mining of coal would cover the most important and greatest portion of mining in the generic sense.

Too much importance cannot be attached to this mineral as a chrysalis of latent energy—as the greatest force of all modern industrial evolution. So important a factor has it become in civilized life that it is with a shudder that our minds in fancy conceive of a time in which the supply of this mineral may be exhausted.



Geologists and statisticians have more or less logically demonstrated that at the present rate of consumption the coal supply of the entire world will be consumed in 200 years. In answer to the question, "What then?" the layman stands mute. His fears, however, are somewhat allayed when he thinks of the genii of the laboratory who are ever ready with the remedial power of substitution. He rests assured in the belief that the function of the human brain is to present a solution for every problem as it arises and that this problem of fuel supply will be no exception.

In the meantime, although speculation on a synthetic fuel may run high and theory vie with theory for establishment in fact, we are sufficiently satisfied with this black, grimy substance and place upon it our hopes for comfort and well-being. To our forefathers it was unknown except as an obnoxious and unwelcome substitute for wood. In fact, at the beginning of the nineteenth century, the world was in comparative ignorance of its industrial value.

Seventy-five years ago it might have seemed a far cry from the homely scuttle of coal to the luxuriant vegetation of a forest of mammoth trees. But there are few individuals today who do not know the origin of coal. If our present forests were uprooted, overthrown and then covered by sedimentary deposits such as those which covered the ancient coal fields, the amount of coal which would be formed thereby would amount to a thickness of two or three inches. And yet we have coal fields today the seams of which placed one upon the other in immediate succession would total no less than two hundred and ninety-four feet of coal. It will be possible, therefore, to form some faint idea of the enormous growth of the vegetation required to form some of our richest coal fields.

This mineral used as a fuel was first mentioned by Theophrastus about 300 B. C., from which it is inferred that coal was dug up previous to this time. Excavations in England brought forth flint axes and other implements of a like nature embedded in layers of coal, and indicate the excavation of coal by workmen of the Stone Age. The fact that coal cinders have been found in old Roman walls together with Roman tools and implements goes to prove that coal was used for heating purposes prior to the Saxon invasion.

The first charter granting permission to dig and gather coal in the New Castle fields was given the freemen of New Castle in 1239, and the history of coal as an important mineral product may be said to have begun at this time. The coal mine and miner had not previously existed even as a figment of the imagination and people got their fuel from the vast forests or from the charcoal burners, or "colliers," as they were called.

Opposition through remonstrance and proclamation prevented its being used except in sparsely settled sections of England. The strongest objection was that the coal was injurious to vegetation. In London subsequent attempts at prohibition were made because it was considered inimical to the health of the inhabitants. However, in the onward rush of industrial progress, coal began to be recognized as the most valuable and the cheapest material for fuel. It might well be said that the objection made seven centuries ago is the same objection that arises today, namely, that the smoke and soot of manufacturing plants are undesirable accompaniments of industry.

The first discovery of coal in America was made in Ottawa, Ill. The event is chronicled by Father

1. Colliery 2. Incline to Breaker

Hennepin, a Jesuit explorer. The first coal mine was excavated near Richmond, Virginia, about 1751, and the second in the vicinity of Pittsburgh about 1758. Later coal was discovered by Nicho Allen near Wilkes-Barre, Penna., about 1792. It is related that Allen encamped one night and built his fire upon some small black stones that lay scattered about in profusion. Having cooked his supper, he went to sleep as usual. He was awakened in the middle of the night by intense heat, and found himself lying in a bed of flames. The stones were all on fire, and he barely escaped with his life. He told the story of his adventure far and wide, and shortly afterwards a company was organized to mine and ship the black stones to Philadelphia. Colonel Shoemaker, a worthy colonial gentleman, was at the head of the enterprise, and upon his recommendation most of the first consignment was sold. In 1803 the city of Philadelphia purchased 100 tons of coal for use in the pumping works. The engineers did not understand how to burn it and broke it up to gravel the yards. A feeling of indignation against Colonel Shoemaker arose, and he was denounced as a rascal for having sold the city rocks instead of fuel.

In 1814 two ark loads of large lumps of coal (twenty-one to a ton) were sold at the falls of Schuylkill. A morning was wasted in futile attempts to burn this coal, and at noon the employer and his workmen, discouraged at their ill luck, shut up the furnace and went to dinner. On their return they were astonished to find a roaring fire, the furnace doors red hot and the furnace itself in danger of melting. From that day dates the successful use of anthracite in America.

It is a fact that at the present time coal, if not the ruler of industry, is absolutely essential to the maintenance of world progress. It was the chief cause of the rapid development of manufacturing and commerce in the nineteenth century.

Together with steel it is a factor prominent in the civilization of the period through which we are passing.

We need not be alarmed by the thought that there is not a sufficient supply of coal in the ground to meet our requirements. Our concern is with the conservation of the supply that has already been taken from the mines. It must be remembered at this time that labor shortage, transportation congestion, and the extreme demands for fuel in manufactories all help to decrease the available supply of coal. The best navy in the world would become perfectly helpless without abundant supply of fuel. The cutting off of the coal supply from the water works in most cities would paralyze domestic and industrial life and would prevent fire protection. The steel industry is so dependent upon coal and coke, which is a product of coal, that contemplation of failure of the supply causes one to shudder. Let the facts given suffice to show that the conservation of coal is vastly important to the individual as well as the manufacturer.

Intentional or unconscious neglect on the part of individuals often causes waste of valuable fuel supplies. It is lamentable that fires are maintained in homes where the occupants wear thin summer garments. Heavier undergarments would obviate the necessity of fires because less artificial heat would be required to keep the body warm. WEAR HEAVIER CLOTHING.

Oil lamps serve a double purpose, as they increase the temperature of the room as well as afford light. They are economical, for there is no wastage as the burning can be stopped instantly. USE OIL FOR HEATING AND LIGHTING.

Weather stripping on doors and windows, particularly those of the basement, prevents the escape of heated air or the influx of cold air. SEE THAT DOORS AND WINDOWS ARE TIGHTLY STRIPPED.

Too frequently chimneys are designed as part of the architectural effect without due regard to the functioning of the chimney as part of the heating system. Chimneys, flues and furnaces should be thoroughly cleaned out so that no soot remains. The heating plant should be inspected in order that any defects which would cause loss of heat may be remedied. Have all chimneys cleaned and the heating system put in perfect condition. During the fall months, when only a little heat is needed to take off the chill and dampness from buildings, wood can be employed as fuel. BURN WOOD THROUGHOUT THE AUTUMN.

Coal fires should be started as late as possible, then only when they are necessary for maintaining a temperature sufficiently high for safeguarding health. WAIT TILL WINTER TO START THE FURNACE FIRE.

(Concluded on page 17)

Conserving Old Furniture

EVERY woman, who has passed or is passing through a similar trial, can appreciate with what feelings of regret and vexation I watched the growing shabbiness of the upholstery on several of my highly prized pieces of furniture, unfitting them finally for further use. For a time their disposition was a perplexing problem and the satisfactory and economical solution I arrived at may prove interesting and helpful to other women. Without previous upholstery experience I have restored my furniture to attractive usefulness with Craftsman Quality Fabrikoid. What I have done with the aid of this material any other woman can do.

The tapestry covering burst open, displaying the hair stuffing

In my library I had a massive oak armchair with a flat leather seat. It was the most comfortable chair in the house, hence the most used, as the seat plainly showed. It had sagged out of shape, cracked through in places and was badly peeled and scuffed. The leather seats on my walnut dining-room chairs were in a similar condition, not so much from use as from the inferior quality of the leather that had been used on them. These chairs were an anniversary present from my husband and were comparatively new. They were of the pattern and shape that I admired above all others in a dining chair. The place of honor in my living room was occupied by a handsome mahogany settee, a wedding gift from my parents, which I valued more highly than any other piece of furniture in the house, not only on account of its beauty and intrinsic worth but for the wealth of fond memories associated with it. Its tapestry covering had faded and frayed and obviously could hold together little longer.

Now, the framework on all of these pieces was still in excellent condition. I had always taken good care of them, keeping them dusted and polished. Their surfaces were practically unmarred and, as the workmanship on them was of the best, they were as strong and durable as ever. The unsightliness of the upholstery, however, was a constant thorn in my flesh. I imagined that my callers had eyes for nothing else and I was continually making matters worse by apologizing for their appearance. Although I realized that I should make some disposition of them, I put off doing so from economical and sentimental reasons. I hated to think of discarding them, even temporarily.

It was my beloved settee that finally forced me to a decision. The tapestry covering suddenly burst wide open, showing the hair padding underneath. I might still retain my chairs in service despite their shabbiness, but such a course with the settee was out of the question.

I sat down and went over carefully in my mind the various methods open to me for disposing of it, including the chairs in my plans, for I felt that when at it I might as well decide for all of them. Replacing them with new furniture I could not afford in these days of high prices. Selling them to the second-hand man would net only a fraction of their real value and was too wasteful to consider for a moment. Sentiment and economy both rejected these methods.

The remaining and obvious thing to do was to send them to the upholsterer and have them re-covered. This course also presented difficulties. Our little town cannot support a skilled upholsterer. I could have sent them to the city to be re-covered but the extra expense for crating and transportation and the uncertainty of deliveries were against this plan. Relegating them to the garret with the idea of "some day" having them brought out to be "done over" did not appeal to me either. My garret was a storehouse of such good intentions, being already crowded with articles for which my plans never had worked out. I racked my brain for a way out of my dilemma, for something had to be done right away. But, what?

The answer was given me that evening. As I was turning over the pages of a favorite magazine, my eye was caught by an illustration of a woman engaged in upholstering a chair. The illustration proved to be part of an advertisement of Craftsman Quality Fabrikoid, which recommended restoring old furniture by re-upholstering with this material and stated that a working sample, ample to cover a dining chair seat, 18 x 25 inches, would be sent in either brown or black upon receipt of 50 cents. Then and there I decided to accept that offer and attempt the re-upholstering of the armchair. If satisfied with the result I could repeat it on the settee and dining-room chairs. If not, I would be out only a small amount of money and some spare time. At any rate it was worth the trial. Accordingly I ordered the goods in a dark brown and in due course it was delivered at my home together with a sample book of other colors and grains. I had previously received a letter, acknowledging receipt of my remittance and giving me the address of a department store in a nearby city that sold the material by the yard.

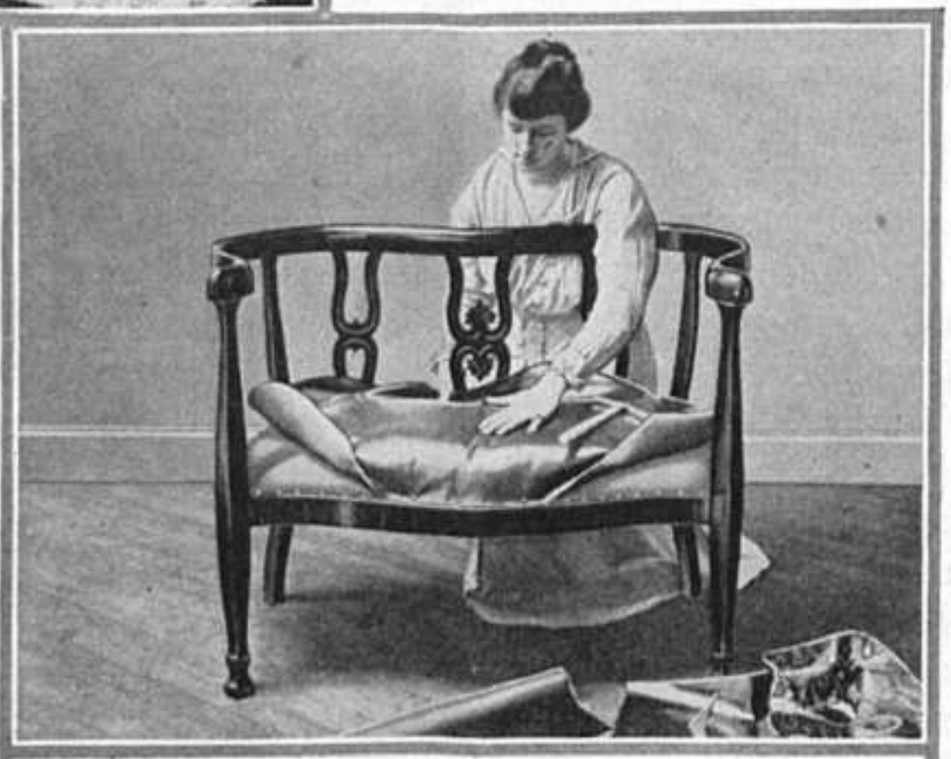
When I opened the package I was convinced of the suitability of the material for my purpose. Outwardly the Fabrikoid bore every appearance of leather. It had the same soft, luxurious feel; the same rich appeal to the sight; an exquisite Morocco grain. Only the soft, fleecy back disclosed that it was not real leather but a substitute. Wasting no time, I carried the armchair to the best lighted spot in my garret and began work by taking off the old seat. As this had proven too weak to bear the strain put upon it, I decided to make the new seat much stronger than the old. For this purpose I purchased a veneer seat at the 5 and 10 cent store and this is the way I made use of it:

I first removed the tacks which held the old seat in place, using a sharp chisel and being careful not to mar or scratch the woodwork. After taking off the old leather, I cut the veneer seat with a hand saw to fit the recess in the edge of the chair seat frame. When I had fitted it, I laid this seat on the back of the Craftsman Fabrikoid and with a blue pencil marked off the new cover, allowing a margin of 1½ inches on each of the four sides and marking diagonals from the four corners of the veneer seat. I then cut out the new cover along this marked line. Between the veneer seat and the Fabrikoid I placed a layer of cotton padding. Next, I folded over the margin of the Fabrikoid, stretched it tightly to fit and with liquid glue fastened all four sides, except the corners, down firmly on the underside of the veneer. This completed, I placed a heavy book on the seat and allowed the glue to set. When it had thoroughly hardened, after pulling out all remaining wrinkles, I completed the corners. As the several thicknesses of the Fabrikoid were too bulky for neatness, I cut out the diagonals previously marked, being careful to have the point of each diagonal far enough from the corner of the veneer so the latter would not show when the corner was turned in. I tacked down one side of the goods, then the other side tightly over it, making a neat corner.

Cutting the New Fabrikoid Cover

I next placed the completed seat in the chair seat frame and tacked it to the recessed edge of the seat frame with large headed leather upholstery nails, placing them about one inch apart in straight lines. I encountered some difficulty in starting these nails into the veneer and solved it by first starting the holes with a wire nail. When I had driven the last nail, I surveyed my handiwork. It was, I flattered myself, exceedingly well done and to say that I was delighted with it, is putting it mildly. My armchair was as good as new—in fact, better, because the Fabrikoid seat was handsomer and stronger than the old leather one and also, as I have since learned by experience, more comfortable because of a padding which I inserted. The entire cash outlay for material, veneer seat, tacks and glue was exactly 80 cents and the actual time consumed in the work was less than one hour. The confidence in my upholstering ability gained through the success of my first effort inspired me to attempt next the more difficult task of repairing the settee, leaving the easier dining chairs until last.

I consulted my sample book and decided on a beautiful Moorish material, dark red, veined in black, which harmonized perfectly with the mahogany framework.



Stretching the Cover Into Position

Finishing the Last Corner

I measured the settee and found the seat to be 36 inches long and 16 inches wide. As the Craftsman Fabrikoid is made 50 inches wide, I bought one-half yard of the material which was sufficient for the cover and enough over to make the gimp with which I intended to finish the work.

A careful inspection of the settee showed me that the splitting of the tapestry covering had been caused by a broken spring and that the webbing to which the springs were attached at the bottom was in bad condition. I took off the old covering, being careful not to tear it any more than it was as I wanted to use it for a pattern in cutting out the new one. I removed the hair stuffing on a large sheet, worked it about with my fingers and tossed it in the air to remove the dust particles and restore its original bulk and resiliency. When I finished this work it seemed as though I had enough hair to stuff two settees. Underneath the hair was a burlap covering which held the springs in place. This I removed, disclosing the springs and webbing to view. I realized that it would be a waste of time and material to put a new cover on the settee unless I first put the webbing and springs in first-class shape.

I bought some webbing and a new spring to replace the broken one at a local furniture store. When I had all my materials at hand, I studied the manner in which the springs were tied together at the top and sewn into the webbing at the bottom and the way in which the strips of webbing were interwoven and tacked into the frame before removing them. The webbing which I purchased in one

Tacking on the Gimp

piece I turned over at one end and tacked through the double thickness firmly into the frame exactly as the old webbing had been tacked. I then stretched the webbing across the frame lengthwise pulling it as tightly as possible and driving a tack into the frame to hold it taut. I cut this strip of webbing from the piece leaving enough material to turn over. I turned the edge and tacked permanently to the frame through both thicknesses of webbing. I repeated this operation until I had tacked all the lengthwise strips to the frame. Then I tacked on the cross pieces, weaving them in and out through the longer strips and tacking them all in the same manner. In order to make a stronger foundation for the seat I did not content myself with using the same number of

Placing the restored settee back into service—as good as new

strips as had been used originally but added extra strips up to the capacity of the frame. I then sewed the old springs on to the webbing and tied them together at the top with strong twine following the original method. As the old burlap cover was torn in several places, I made a new one and tacked it down tightly over the springs. On this cover I arranged the stuffing in position and in order to make the tacking on of the outside cover easier, I cut a muslin cover and tacked it over the stuffing to hold it in place. I was now ready to put on the Craftsman Fabrikoid.

Using the old cover as a pattern and allowing plenty of margin to afford the necessary purchase in stretching the goods, I cut out a new cover with a pair of shears. This I placed in position on the seat and tacked with 4 oz. tacks at the centers of all four sides, driving the tacks only part way in so that they could be easily removed and reset while stretching and coaxing the cover into shape. After I had manipulated the cover on straight and tight, I began the permanent tacking, starting at the center tack in the back and tacking first to one side and then to the other to avoid wrinkling the goods. The front and sides were tacked the same way. All corners were left until last. These were turned in neatly and tacked down firmly, the few remaining wrinkles being pulled out of the cover first. I cut off the excess material with a sharp knife, placing a piece of cardboard between the Fabrikoid and the wood so as not to scratch the surface of the latter. Next I took a narrow strip of the remaining Fabrikoid, folded it into a narrow gimp, stretched it over the tacks and nailed it down with small headed gimp tacks.

The restored settee afforded me more pleasure in its appearance and pride in my workmanship than had the armchair. The work had been more complicated but was creditably done. The settee was truly beautiful, the Fabrikoid giving it a rich dignity which the tapestry had not. A further source of satisfaction was the economy of the operation. The goods had cost me $1.50; the spring 10 cents; the webbing, 5 yards at 10 cents a yard, 50 cents; the tacks 10 cents—a total of $2.20 and the work had been done in spare moments. An upholsterer would have been compelled to charge me several times that amount.

Re-covering the six seats of the dining-room chairs came next. For them I bought 1½ yards of black Craftsman Fabrikoid with a small leather grain. This gave me six 18 x 25 inch covers which were a lot larger than necessary. It cost me $4.50. From the bottom of each chair I removed the dust cloth exposing the screws which held the seat in place in the chair frame. I took these out and removed the seat from the frame. I took off the old cover intact and used it as a pattern for cutting out the new one. Underneath this cover was a plain cloth covering over the springs, padding and webbing. As all of these were in good condition I did not touch them. In cutting out the new Craftsman Fabrikoid seats I allowed plenty of margin all around, as I had with the settee cover, and in putting on these covers, I proceeded practically as with the settee. I laid the new cover on the seat and tacked it lightly on the bottom of the seat frame at the center of all four sides. Having smoothed out the wrinkles as much as possible I began the permanent tacking, starting in the center on the underside of the back of the seat pulling the goods moderately tight and tacking first to one side and then to the other of the center tack to avoid wrinkling the goods and leaving the corners free. I next proceeded to tack the front side, pulling the goods quite tight. This finished, I tacked the sides and pulled the material as tight as possible. Before turning in and tacking down the corners the few remaining wrinkles were all pulled out and the corners were tacked down firmly. The seat was then screwed back in the frame, the dust cloth replaced and the job was finished.

I was very proud of my achievement and the sincere praises of my husband and friends for my restored furniture more than repaid me for the time and effort I expended. In addition, however, there were several other sources of satisfaction.

I discovered in myself an ability to do things which has impelled me to attempt other tasks which I once deemed beyond my powers. I have served myself in practicing economy and feel that I have also served the nation in two distinct ways: first by conserving the labor which would be required to make new furniture for me, and second by saving a goodly sum of money which will make a substantial payment on a Liberty Bond.

The furniture has now had its new covering for several months. It does not show any signs of wear and is wonderfully easy to keep clean. A cup of coffee was spilled on one of the dining chairs and some grease dropped on another. Baby's sticky fingers have repeatedly left their telltale marks on the settee, but a damp cloth has removed all traces of these accidents in a twinkling without harming the Fabrikoid in the least.

I do not hesitate to recommend to any woman that she attempt the upholstering of any of her pieces of furniture that need it, provided the upholstery is not of too complicated a character or the furniture exceptionally expensive, in which case a competent upholsterer should do the work. Upholstering is not as hard a task as it looks. It has few difficulties which cannot be overcome by the exercise of common sense, care and patience.

Cotton—Its Waste—(*Continued from page 7*)

It has taken a generation to bring about even a *spirit* of co-operation, but war, and the exigencies of war, are doing what the exigencies of commerce and business could not do. If something like this does not happen it is only a question of time when the American bale will kill itself. But our cotton industry is too well established to be overthrown so long as we observe the ordinary rules of good business, and we refrain from angering our best customers, the European and American spinners, with our damaged products.

The Old Miner

By Berton Braley

I'm a bit too old for fightin', but when workin' on my shift,
As my noisy drill is bitin' at the ore seam in the drift,
I feel kind of like a soldier, and it seems this shakin' drill
Is a trusty young machine gun that is shootin' with a will;
And I sight along its piston like a gunner in the line,
And I guess it sort of thrills me when I run this drill of mine;
For it's makin' holes for powder that will shoot the copper free
To be used to make munitions for the cause of Liberty.

So I keep this drill a-throbbin' an' I listen to its song
Like a bunch of rapid-firers that is goin' mighty strong;
And I finds myself a-thinkin' "Here's a round or two for Fritz,
That'll cause him some discomfort in his innards when it hits."
And although I'm just a miner, rather gray and bent and lame,
I can feel I'm smashin' Boches by my labor, just the same,
As my drill is jumpin', thumpin' at the copper-bearin' rock
Which'll go to make munitions that'll give the Hun a shock.

I would like to shoot a Lewis or a Browning gun in France,
But I'm dim-eyed and rheumatic, and I'll never have the chance.
Yet I find some consolation when I fancy this machine
Is a snappy new machine gun that is drillin' Teutons clean;
I can think I'm right in battle as I hear its ringin' bark
And imagine every bullet that I'm sendin' hits the mark.
And although that's all a vision, and it goes and leaves me flat,
I can still feel like a soldier as the drill sings "Rat-a-tat!"
For I'm minin' the material that goes to feed the guns
With shells an' rifle cartridges to land among the Huns;
So I'll call myself a fighter while the air drills bark and drum,
For I'm helpin' send the Kaiser and his gang to Kingdom Come!

(Reprinted through courtesy of Engr. and Mining Journal)

For Young and Old—The Sport Alluring

An Old Timers' Shoot held recently at Madison, Wisconsin, was won by a man over seventy years old, with the splendid score of 48 out of 50. Mr. A. A. Mayers, the popular druggist of Madison, has followed the trapshooting game since 1884 and to this fact he attributes in large measure his excellent health and his remarkable activity. There is nothing, he says, that drives away business cares and worries so quickly as trapshooting. Mr. Mayers' winning of the gold trophy in this event was most popular, for he is a shooter among shooters, and follows the game energetically and exclusively for the pleasure of mingling with his acquaintances and fellow-sportsmen and for the genuine benefit to health derived from the sport.

A. A. Mayers, President Madison Gun Club, Winner of the Old Timers' Shoot

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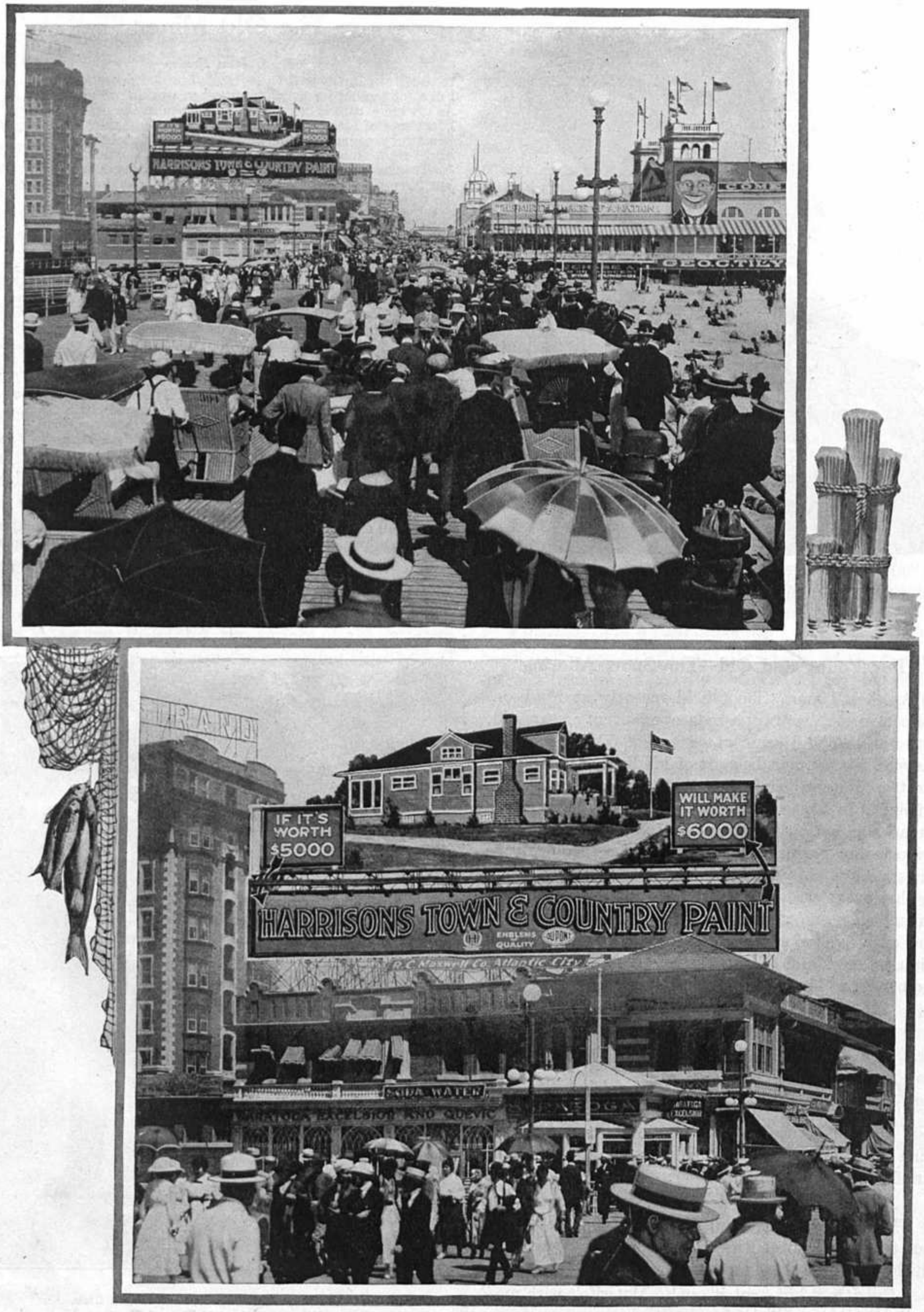
Unfortunately

Mrs. Blank could find only two aisle seats—one behind the other. Wishing to have her sister beside her, she turned and cautiously surveyed the man in the next seat. Finally she leaned over and timidly addressed him.

"I beg your pardon, sir, but are you alone?"

The man, without turning his head in the slightest, but twisting his mouth to an alarming degree, and shielding it with his hand, muttered:

"Cut it out kid—cut it out! My wife's with me."
—*Public Service Chat.*



New Electrically Illuminated Sign on Boardwalk, Atlantic City, N. J.

The New Semi-Electric and Illuminated Bulletin in Atlantic City

BY ingeniously arranged illuminating devices, a most unique and particularly appropriate display for Harrisons Town & Country Paint has been placed on the Boardwalk, Atlantic City.

It is estimated that there are about 20,000,000 annual pleasure-seekers in Atlantic City during each year.

This sign is located on the roof of the new Riddle Block, which is immediately opposite the famous Steeplechase Pier, and is in the vicinity of those important beach-front hotels—the Chalfonte, Strand, Haddon Hall and the Alamac. It is in view for a quarter of a mile as the crowds approach it, going east from Young's Ocean Pier.

The size of the display over all is 80 ft. in length and 39 ft. in height, the house being 24 ft. in height.

At night the electrical illumination is so arranged as to make this a most interesting study, bringing out the "before and after" thought by using it in an entirely new way, applicable only to Harrisons Town & Country Paint. The electrical action is so arranged that there appears in the dark sky, in full view of all pedestrians on the Boardwalk, a house of very dim, worn coloring, very much in need of paint. Simultaneously with this illumination there appears in a panel to the left this statement: "If It's Worth $5000" —a red electric arrow then races from this panel to the large sign below, which illuminates in large letters the words—"Harrisons Town & Country Paint"—carrying the thought all around, by means of another red arrow racing up to a panel which bears this statement: "Will Make it Worth $6000." Simultaneously with this illumination there appears the house, which, as if by magic, changes to a newly, brilliantly painted house—very vividly bringing home to all observers the fact that Harrisons Town & Country Paint will, when applied to an old house, add the $1000 to its value.

The minor features of the display include the lighting up by flashing effect, by means of installed flashers, of certain windows in the house—giving the impression of life and activity. "Old Glory" waves from a flag pole located on the lawn—true to the American patriotic spirit.

This follows and ties up splendidly with the mammoth 266 ft. railroad bulletin, reiterating the same message to people from all sections of the country.

It is safe to say that because of the vast circulation from every section of the United States, this display offers the greatest national publicity given by any single advertising display anywhere. It not only advertises direct to the millions both day and night, but makes its appeal during the leisure hours, when the minds of the millions of prosperous patrons are at ease.

To give some idea of the number of visitors who visit Atlantic City in a single day—Easter Sundays have been conservatively estimated as having had over 250,000 visitors. On Labor Day this year there was the largest crowd ever known in the history of Atlantic City—and so numerous were the people that even with the tremendous hotel accommodations of the "Nation's Playground," many had to take late trains home, as accommodations could not be found within twenty-five miles. Many people who could neither get accommodations in the hotels, nor get trains home, were forced to sleep on one of the famous piers—such as Young's Million Dollar Pier, on which our famous "Shooting Sign" and "Shooting School" are located —the Steeplechase Pier, known as "The Funny Place," or the Steel and Garden Piers.

All the material used in painting this sign is of the high standard quality Harrisons Town & Country Paint, and is a practical demonstration, not only as to its wearing qualities—being subjected to the most severe test—salt air—but of the splendid harmonious tones that only Harrisons Town & Country Paint can produce.

This is another of those "Absolutely New" and "Widely Different" ideas which make up successful advertising campaigns. In short, this is the finest display—on the best location—showing to the largest circulation in the United States.

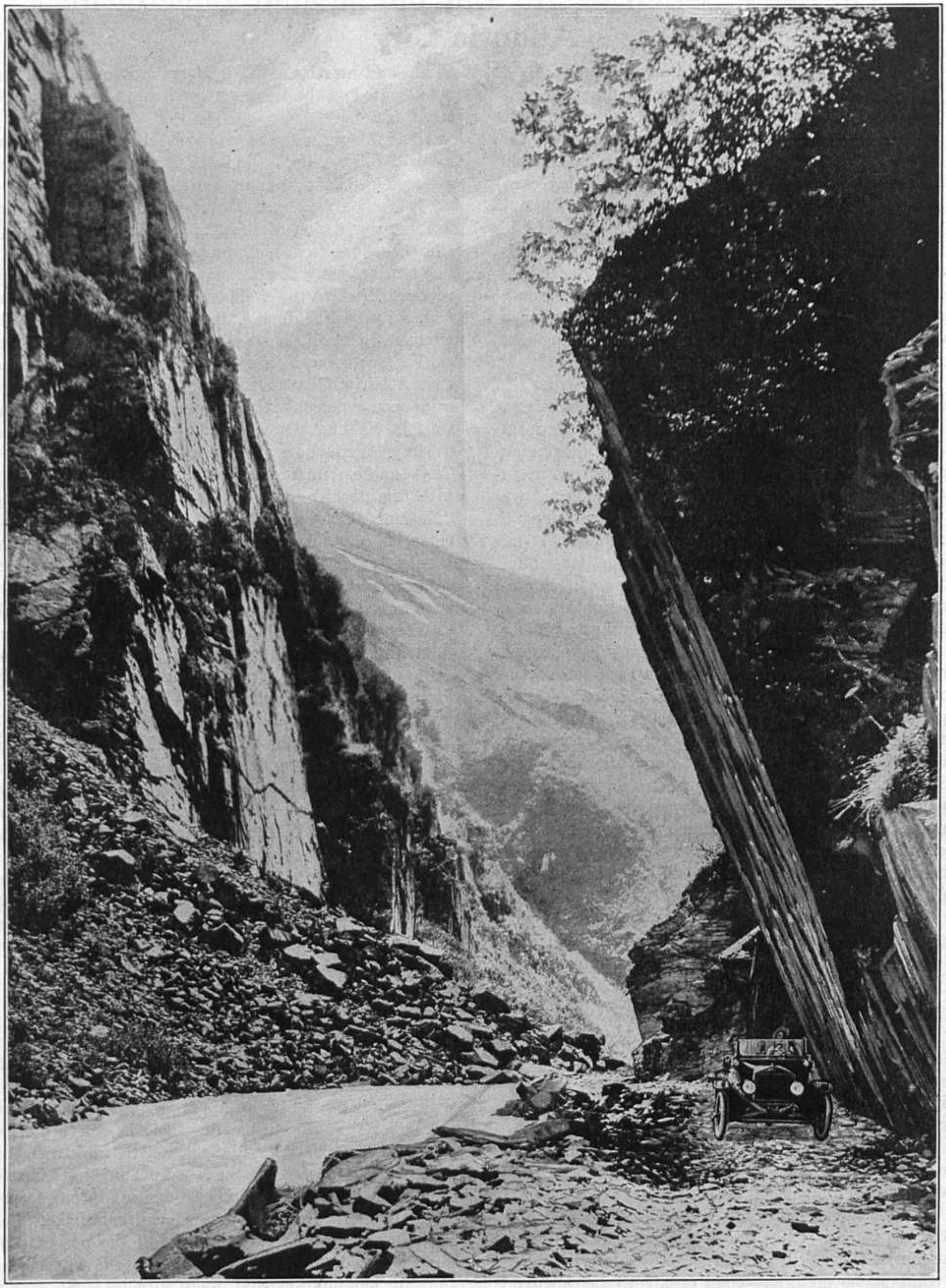
Coal—Our Most Powerful Ally—(Concluded from page 9)

Fires should be kept with as little coal as possible. A shovelful is sometimes sufficient when the inclination may be to use two or three in order to save an extra trip to the furnace room. SAVE THAT EXTRA SHOVEL OF COAL.

Fires should be banked earlier in the evening, and we should sleep under heavier covers rather than burn coal during the night. BANK FIRES EARLY.

Coal is composed principally of carbon which is combustible and of ash which will not burn. Almost one-fourth of the ash ordinarily thrown out, however, is combustible material—good coal. All ashes should be sifted. No one should consider himself too fastidious to aid in this performance. There are on the market, at very reasonable prices, devices by means of which the separation of the coal from the ashes can be effected with very little trouble and practically no dust. If we remember that the men and women in active service are often mud covered and dirty, a little work with the ashes should not chagrin us. SIFT THE COAL ASHES.

We ought not to find any enjoyment in our accustomed comfort if our boys are cold, rainsoaked and hungry because our extravagance in the use of coal has shortened the supply available for the transportation of ammunition and food supplies. SACRIFICE SOMETHING OF YOUR OWN COMFORT AND SAVE COAL.



A Rock Slide in the Keystone Canyon, Valdez-Fairbanks Trail

Along An Alaskan Trail

By Lucy H. Cuddy

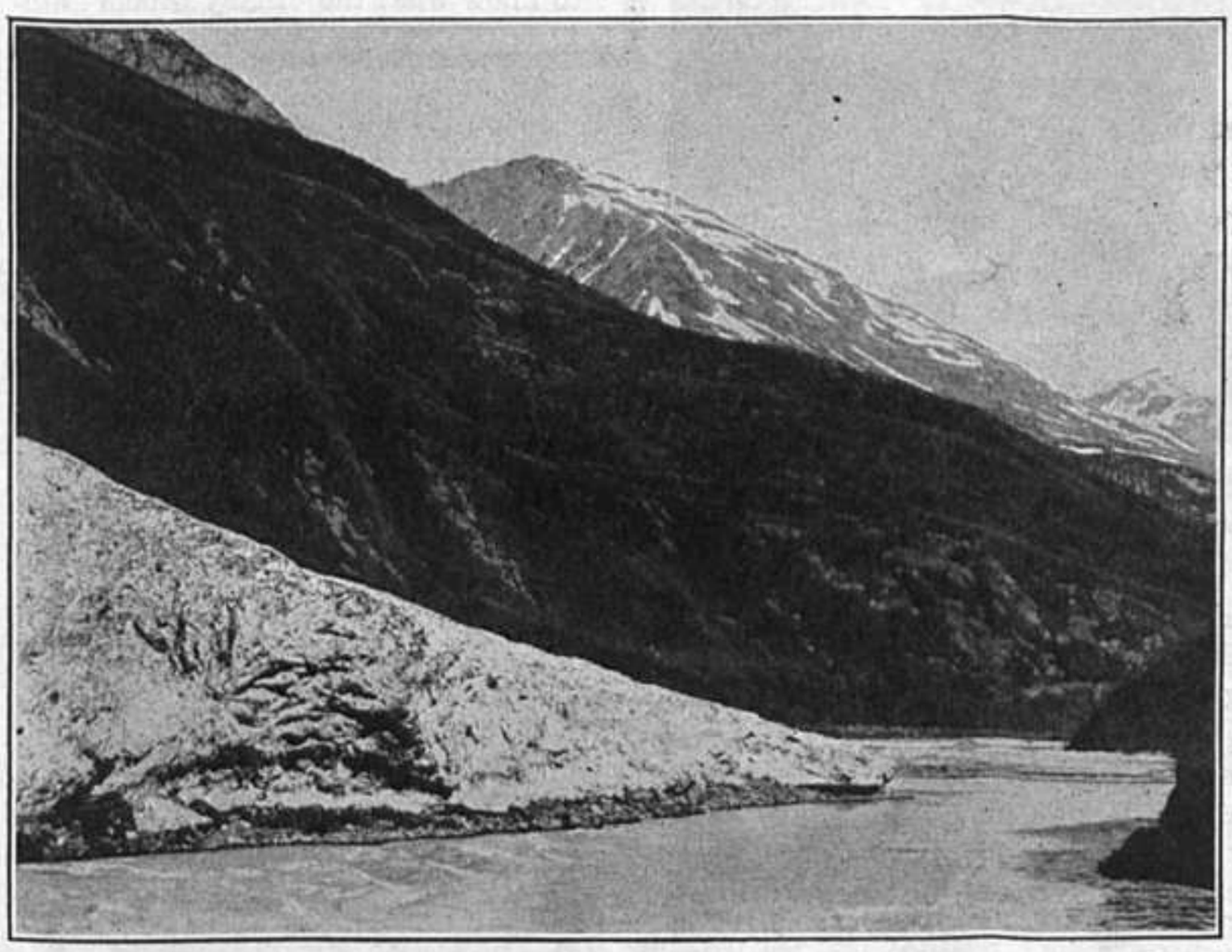
THE trail from Valdez through Keystone Canyon represents sixteen miles of the well-known Valdez-Fairbanks Trail. The whole of the trail or road is 400 miles in length, beginning at Valdez, a coast town of southwestern Alaska and terminating at Fairbanks, the largest Alaskan town to the interior. Primarily this trail is a wagon road built and maintained by the United States Government for military and transportation purposes.

Many difficulties not encountered in any other part of the United States had to be faced in building this Alaskan road. The working season was short, and in the interior the ground was frozen the year 'round. The mountainous country, the necessity of clearing away forests and boulders, the excessive rainfall, and the swift, raging glacier streams all combined to obstruct the building of the Valdez road, and the two latter influences continually threaten its maintenance.

The heavy rainfalls are very destructive, and in sections of the trail where the soil is not gravel some protective covering must be provided. If gravel is near that is used; otherwise a corduroy surface is constructed.

For this latter many small trees are cut down and, after the heavier branches are removed, are laid on the road perpendicular to its axis. Then at a distance of from three to five feet from the ends of the poles, on either side of the road, a ditch is dug. The material obtained from the ditches, except the heavier surface layer, is packed on top of the poles, thus making the road much smoother and protecting the poles from wear. The distance between the ends of the poles and the ditches is very necessary, for, without it, under the action of the heat, cold and rain, the road would be very quickly undermined. Often at a distance of fifty feet other ditches are dug to receive the water conducted by outlets from the first ditches. Corduroy is also used in the interior over the trail where the ground is frozen throughout the year.

U. S. Signal Corps Dog Team. (During the winter certain parts of the Valdez-Fairbanks Trail are traversed only by dog-drawn vehicle)

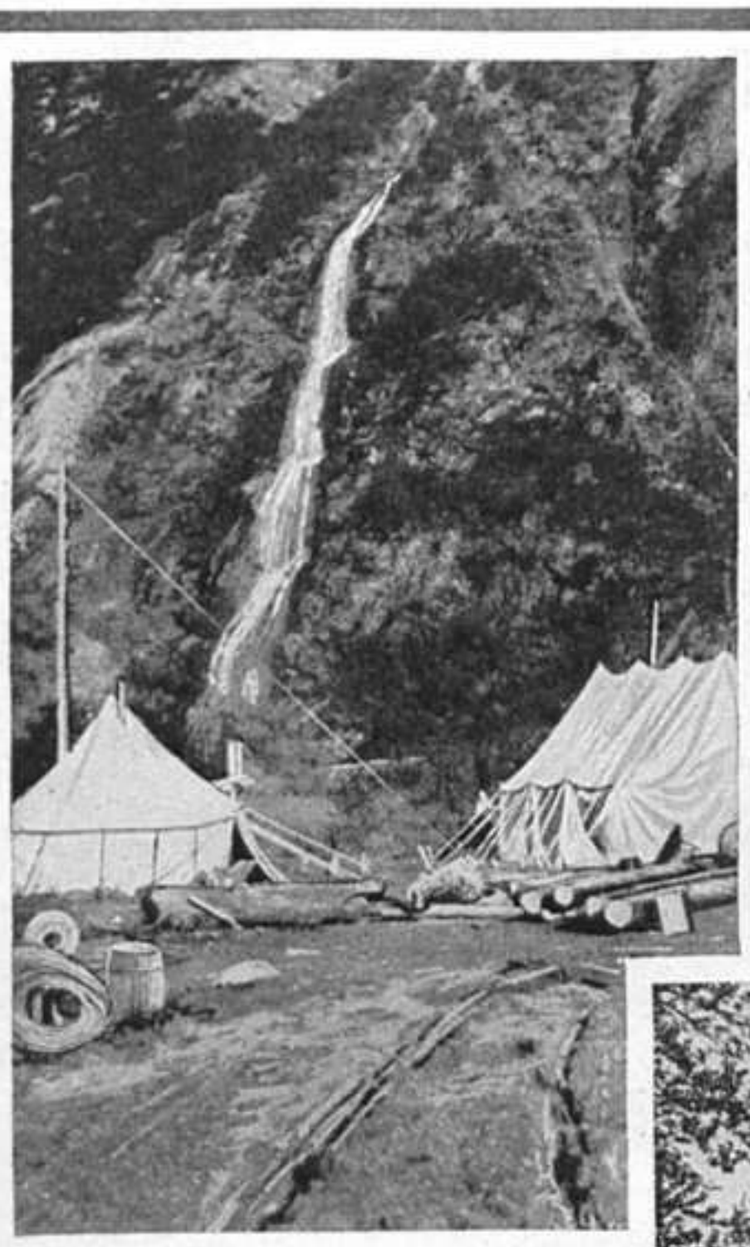


Portion of Valdez-Fairbanks Trail. Completely blocked at one end of Keystone Canyon by an enormous snow slide. The trail follows along the mountain side, Lowe River in the foreground. The ruts on the lower side of the slide are caused by the dynamite discharge

The troublesome glacier streams are found throughout the territory. When the warm days come the snow and glacier ice melt very rapidly. An apparently insignificant ditch may overnight spread its banks from a few feet to a distance of two miles. Or in a few hours, with the great rush of glacier water, a stream may change its course entirely.

When roads run parallel to a glacier stream they are in great danger of being undermined. The Alaska Road Commission uses the following method of protection. A layer of brush long enough to give the required protection is placed along the bank and then, just below the center, the brush is weighted by stone which is confined in galvanized wire netting. All of this is held in place by wire extending to "dead men." In case of a sudden rise and for immediate effective protection sacks filled with earth are placed over the loose brush against the bank and wired to it.

If a glacier stream must be crossed and natural features are such that the stream is confined to one



1. Road Commission Camp and Bridal Veil Falls, Keystone Canyon

channel, a bridge may be built. Pile trestles must be used, but the enormous boulders prevent their being sunk to any great depth, and hence there is always danger that the changing stream will wash out part of the trestle.

Lowe River is a very swift, unnavigable river, fed extravagantly by the mountain and glacier streams. It cuts through the mountains for a distance of three miles helping to form Keystone Canyon. In the early days all the traffic was by pack horse over the mountain trail but the government by much blasting has cut a narrow road through the Canyon along the mountain side and above the stream.

In this Canyon are ideal examples of the difficulty of road maintenance in Alaska. Enormous rock slides occur which delay transportation and in the spring, at the far end of the Canyon, the road is completely blocked by a big snow slide. This year because of the scarcity of labor the opening of this slide was left to nature and dynamite. Each day, at intervals, sticks of dynamite were placed in the wall of snow and ice and discharged. Then the sun and rain helped in the disintegration.

In one day's trip out the Valdez-Fairbanks Trail this summer we had occasion to see the effect of a hot day in hastening the rise of the water.

On leaving Valdez in the morning we found the two-mile bridge sagging treacherously from the fast spreading torrent of glacier water. Here the Road Commission had men busy reinforcing the piling. On the return trip two bridges beyond the Canyon were so nearly out that planks were placed from the bridge to the bank, from which the bridge was going out. The car was then run across on the planks.

On reaching the recently opened snow slide at the Canyon we were dumbfounded to see a mass of roaring, surging water confined only by the steep mountain sides. The trail through the Canyon was completely covered by the waters of Lowe River. We climbed up over the glacier from which the slide had come, reached the old pack trail of '98, and then tramped around to Camp Comfort, the nearest road house, where we spent the night. Next morning—and there are only about four hours of the grayish night

2. View on Government Road, Valdez, Alaska

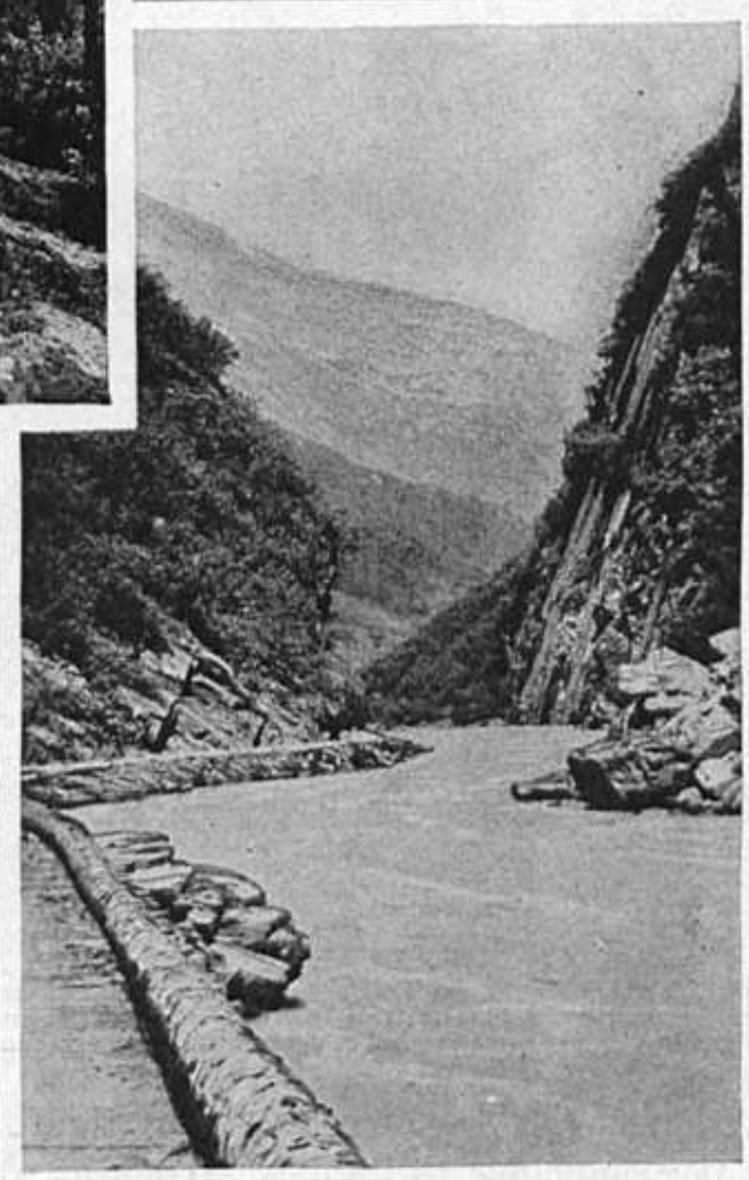
in Alaskan summers—the waters of Lowe River had subsided enough for us to bring the car through and drive to Valdez.

If Alaska has a good, sunshiny summer the Alaska Road Commission is kept busy maintaining the road or constructing new cuts to take the place of parts of the trail which cannot be maintained.

The obstacles encountered on this short part of the trail serve to typify what the government faces along her many miles of Alaskan wagon roads, each mile of whose estimated cost is three thousand four hundred nineteen dollars.

Utilization of the Laboratories of Our Universities

According to the *American Journal of Pharmacy*, it appears that the much needed synthetic chemicals, especially those that have proved their value, and which the teaching and research institutions in this country must certainly have if their work is to go on, are now being manufactured and supplied by the chemical laboratory of the University of Illinois. Nearly a dozen chemicals for which we had formerly to depend on foreign manufacturers for supplies were made in amounts the value of which is estimated to be $5,000, and were distributed among more than thirty laboratories and supply houses. We hear that the work of making these chemicals has since expanded and elaborated to such an extent that there are now available nearly 120 different products. To date $9,000 worth of these have been distributed outside the laboratory in amounts ranging from a few grams up to pounds. These products have been thoroughly tested in comparison with a standard product, and have absolutely conformed to every requirement, and in many instances have been found to be better than the product that originally came from abroad. The synthesized chemicals turned out by this laboratory were dimethyl glyoxime, nitroso beta naphthol, cupferron, nitron and ninhydrin, all of some use in laboratory research work and many others. It is interesting to know what the "many others" are.



3. Keystone Canyon showing how Valdez-Fairbanks Trail is re-enforced against Lowe River

Sulphur

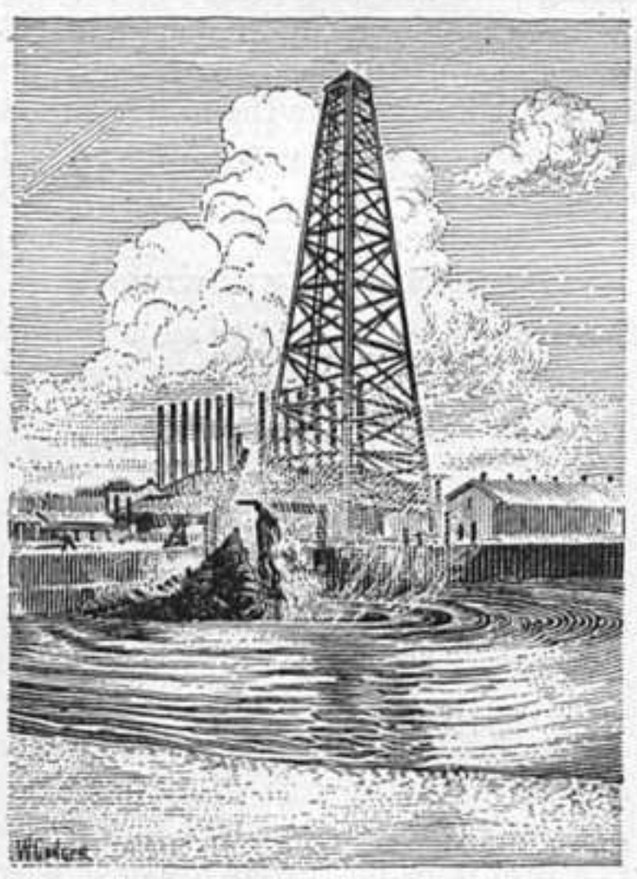
ONE of the most important chemical products in time of peace, but more especially in time of war, is sulphuric acid. Frequently, however, it is the case that a product of this nature is considered or written about without sufficient reference being made to the substance entering into its composition.

If it were not for the deposits of sulphur which are available at the present time in the United States the present method of prosecuting war activities would have to be materially changed. Without entering into a discussion of the uses of sulphuric acid it is sufficient to state that practically no high explosives could be manufactured without the use of sulphuric acid. We can, therefore, consider as one of our allies in winning this great war the undecorated and unattractive material, sulphur.

Block of Louisiana Sulphur After Blasting

Sulphur or brimstone, as it is often called, has been known from very early times and is deposited by the gases which issue from volcanoes. This probably accounts for the old belief of uneducated people that beneath the earth's crust there is a "lake burning with fire and brimstone."

Until recent years practically all the sulphur used in the world came from Sicily, an island near the southern end of Italy. Large quantities of it occur there, mixed with limestone, earth and other impurities. It was mined and then separated from the impurities by piling lumps of sulphur ore into heaps in shallow pits lined with plaster. The heaps were then covered with volcanic dust to limit the supply of air, and ignited. A smothered burning followed, during which about half the sulphur burned away and the rest was melted by the heat and drained out. This was a crude method, and objectionable because it not only wasted about 50% of the available sulphur, but also produced fumes which were injurious to vegetable and animal life in the vicinity. These fumes have been known to kill practically all trees and other vegetation within a radius of several miles.



Louisiana Sulphur Well in Operation

The United States, which formerly was a most important market for the Sicilian product, now produces enough sulphur to supply all American needs, and ordinarily affords large quantities for export. However, the demands of our government during the present war require the total product for home consumption.

Large deposits of sulphur are found in various parts of the United States: in Nevada, Wyoming, Utah and in Louisiana and Texas. The deposits in the Western States are not so large and for a variety of reasons have not been so readily available for production in large amounts at low cost.

The deposits along the Gulf of Mexico lie about 500 feet below the surface and are mixed with gypsum, which is a lime material. The earth lying over the deposits of sulphur is largely composed of quicksand which at first proved to be a very serious obstacle in mining the sulphur, causing many early attempts at mining to result in failure.

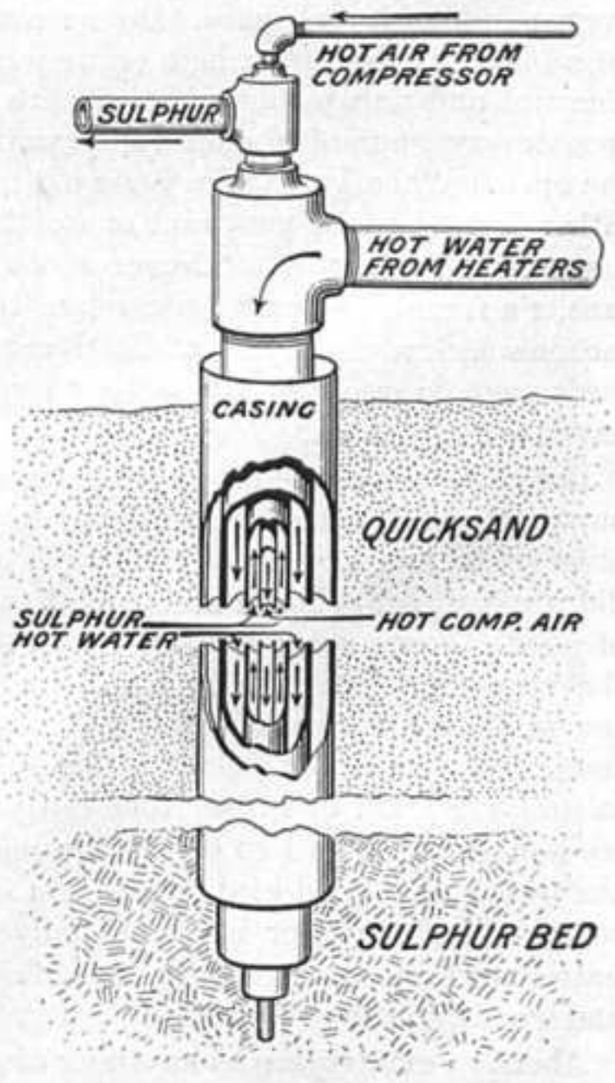
Eventually an enterprising American chemist, Herman Frasch, devised a most ingenious and scientific method for the extraction. Holes are drilled thru the overlying deposits of sand or other material to the bottom of the sulphur bed. The beds often have a thickness of as much as 200 feet and cover an area of many square miles.

The holes are cased or lined with 10-inch pipes which contain three other pipes, one within the other, as is shown in diagram.

Water heated to 167° C. (332.6° F.) under a pressure of 100 pounds is forced down the well thru the 6-inch pipe in order to melt the sulphur. Heated compressed air is forced down the one-inch tube and mixes with the melted sulphur, reducing the specific gravity thereby—affecting it as yeast does bread—making it lighter. The sulphur is raised to the surface thru the 3-inch pipe by the pressure of the column of hot water combined with that of the compressed air. A series of strainers at the bottom prevent earthy material from being forced upward.

The melted sulphur is run into huge bins, 50 feet high, built of rough planks, where it cools and solidifies to form a block of practically pure sulphur, sometimes containing 100,000 tons. The block is broken by blasting, loaded on cars by means of steam shovels and shipped.

Sulphur has many important uses. Pasteur found that finely divided sulphur was effective in destroying parasites on trees and vines, and it is used as a constituent of sprays. It is used in wool bleaching processes and as a disinfectant, also in the manufacture of black powder and fireworks. A most extensive use is made of sulphur in the manufacture of hardened or "vulcanized" rubber.



Frasch Apparatus for Extraction of Sulphur

Soft rubbers take from 2% to 3% and harder grades an increasingly larger per cent. Sulphur is being extensively used in making the dyes known as sulphur colors. By far its greatest and most important use is in the manufacture of sulphuric acid.

The Farmer's Chief Enemy

By C. O. Le Compte

THE record of the crow is like its coat—about as black as black can be. It may be that in the great plan of Nature, sometime in the past, the crow served a useful purpose—likewise the hawk and the buzzard. Take the buzzard for example. Once protected by human laws everywhere because useful for removing carrion, the stench of which offended the nostrils of all animal life, it is now outlawed, because man realizes that it is better to burn or bury the dead—leaving no excuse for the existence of the disease-carrying buzzard. So, in the beginning, the mission of the crow, we may conjecture, was to preserve some equilibrium, some balance in the economy of nature. It may be he was placed here to hold in check the weed-seed and grain eating birds, because weeds were a factor in the past in covering the waste places of the earth and making them fertile. However that may have been, there seems to be no excuse for his existence now since man, the agriculturist, seeds the waste places to useful grains and grasses, and needs the help of the insectivorous birds.

Probably no one has ever had a better opportunity than I have had to observe the crow and to study its life throughout every period of its existence. I was reared on a farm in a country where crows were plentiful and on account of my health I spent every hour of my life for years in the open. When I was nine years old my father bought me a gun, and one of his first admonitions was: "Never shoot a farmer's friend." Always the robin, the meadow lark and the other insectivorous birds were as safe near me as they could have been anywhere.

But, believe me, the crow was never on our protected list, because we knew from observation and experience that the crow did a maximum of harm and a minimum of good. Years ago I wrote: "You see the crows hopping here and there over the pastures and flitting along the hedge-rows, and you may think they are only looking for grain or insects, but did you see behind them, as I so often have seen, the trail of desolated bird homes, you too would cherish in your heart an undying hatred for these winged devils of the fields and woods."

About as omnivorous as anything could well be, they eat dead animals and are dreaded agents in the spreading of diseases such as hog cholera, foot and mouth disease and glanders. Insatiable egg eaters, they scour the fields, hedge-rows, thickets and orchards for nests of birds and even for the eggs of the barnyard fowls. They displayed, I well remember, almost human intelligence in watching our turkey hens to their nests, and then waiting on some nearby fence-stake or dead treetop for the eggs. They follow the wild ducks to their nesting grounds in the far North to feast on the eggs and young. Prairie chickens suffer severely from their depredations and the pheasant preserves are the frequent victims of their marauding habits.

Lester German—Seven Crows With Seven Shots in Seven Minutes

In the olden days, the corn-planting farmer said:

"One for the black-bird
Two for the crow.
One for the cut-worm,
Two for to grow."

So, he would put five grains of corn in every hill. Most commonly, the crow is hated by the farmer because it pulls up the young corn to get the soft seed kernels at the root, and everywhere is to be seen the scarecrow in the newly-planted corn fields. Later on the damage they do to the corn crop can hardly be estimated, because they peck the end of the young ears, allowing the water to enter the shuck and rot the corn.

They are destructive to the melons, pecking holes in them and causing them to rot on the vines. It is no uncommon sight to see small cotton cords encircling and across the melon fields of the South—stretched to keep away the crows, because the crows fear a trap where they see the white strings. They pull young rabbits from their nest, destroy young birds and chickens and even sometimes young pigs. They are very destructive to the pecan groves, and men are employed on some of the big pecan plantations to keep the crows away.

All in all, the crow is the farmer's principal enemy, and the plan of the Du Pont Company to hold a National Crow Shoot during 1919 will undoubtedly prove a big factor in the conservation of grain and the protection of game and insectivorous birds. It should have the hearty support and co-operation of every farmer in the country.

Dangerous Experiments

A man rocked a boat to see if it would tip. It did.

A laborer stepped on a nail to see if it would go through his shoe. It did.

A man looked into the gun to see if it was loaded. It was.

A press hand kept his foot on the treadle to see if it would repeat. It did.

A woman looked into a patent medicine booklet to see if she was sick. She was.

Last June a helper smelled escaping gas and lit a piece of oily waste to find the leak. He found it.

A drill press hand wore a pair of gloves to see if he would get caught. He was.

What to Do With Old Floors

By Geo. A. Toussaint

THE home that does not possess some floors that have lost all claim to the title of attractiveness is fortunate indeed. Unfortunately the owner of such floors does not usually know what treatment to apply to them, and consequently experiments with various preparations which produce only temporary improvement.

Floor refinishing is a perplexing problem to anyone but a painter. So varied are the conditions to be met with that no set rules will apply in every case. Each floor presents a study in itself and must be prescribed for and treated as such.

On the basis of wide practical experience in finishing floors some of the more common floor conditions are given below, with suggestions as to the proper methods of treating them.

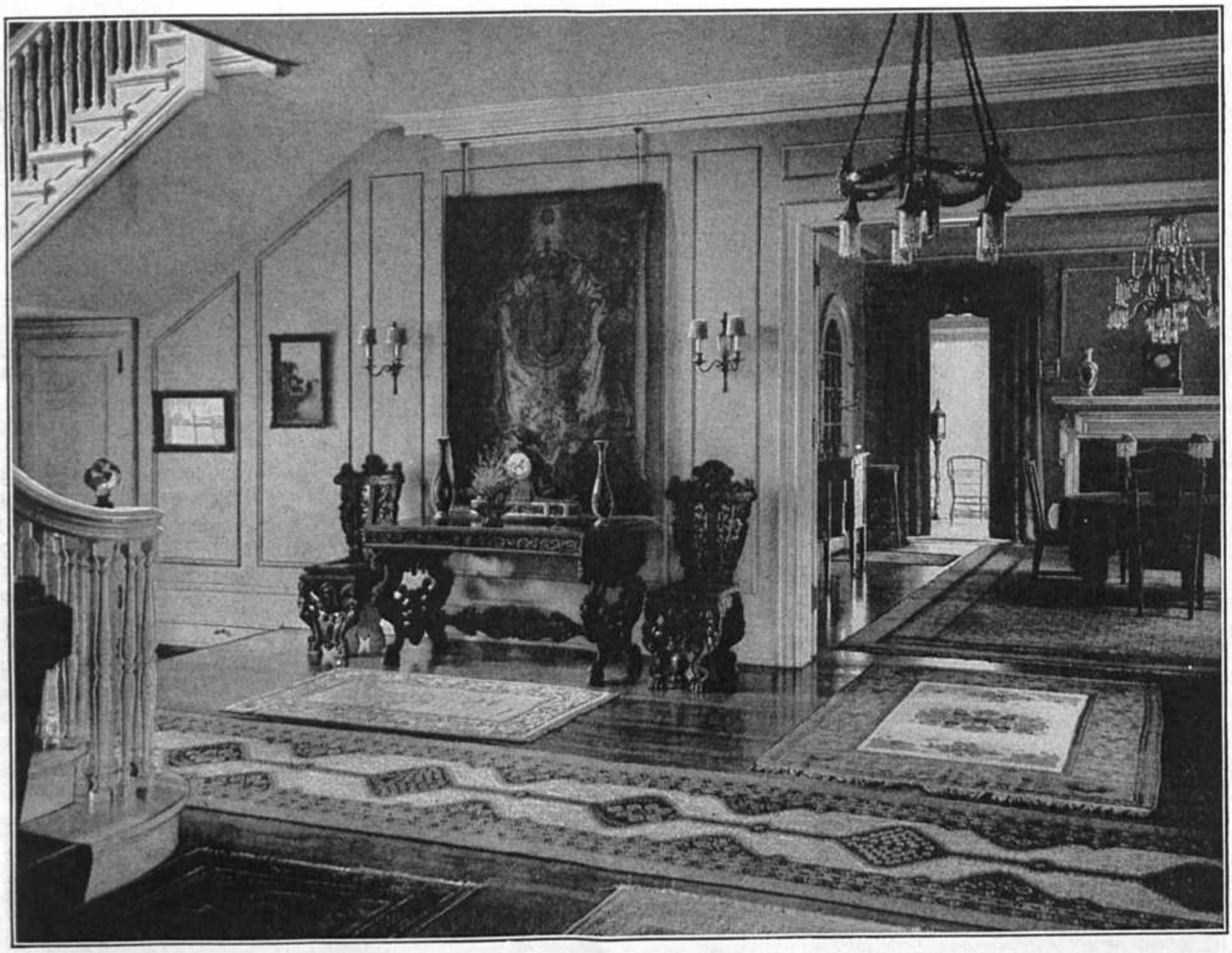
Result of Leaving Floors Insufficiently Protected by Rugs

Old Varnished Floors

The most prevalent and troublesome type of floor is that from which the finish has worn in spots. This always occurs where traffic is heavy, as in halls, doorways and the frequently used passage-ways through different rooms. The main portion of the floor is usually in excellent condition, while these spots are glaringly conspicuous. It is difficult to "patch up" such places and retain a uniform appearance over the whole floor.

The best method is

Metal Casters on Chairs and Tables are Destructive to Beautifully Finished Floors



Well-Finished Floor Properly Covered

to coat such spots with floor varnish first, and then varnish the entire floor. If the spots are particularly bad, it is advisable to apply two coatings of floor varnish first before doing the entire surface.

Old varnished floors which are spotted and worn cannot be restored by the application of any additional coating. The only remedy is to remove the old finish entirely with paint and varnish solvent and then refinish the wood. If the work is thoroughly done, the floor will be practically the same as new.

When it is desirable to change the color of a floor another treatment can be employed. For example, we will say that a natural or light-colored floor shows considerable wear, and that the owner wishes to refinish it in a darker shade, either dark oak, mahogany, or walnut. The surface should be thoroughly cleaned and the worn spots should be touched up with varnish stain or stain finish of the shade selected. Then one or two coats should be applied over the whole floor.

An ordinary wood floor (not hardwood) which has lost its original finish and worn rough and "slivery" may not warrant the expense of removing what remains of the old finish. Floors of this type should be given a coat of ground color, then grained and finished with a heavy coat of varnish stain. A good hardwood floor is almost a priceless possession. Never attempt to grain it. Only old floors of cheap material which possess little or no natural grain should be grained. This method makes them quite attractive and satisfactory.

Where it is desired to change from a varnish to a wax finish, this is easily accomplished by cleaning the floor and applying two coats of prepared floor wax over the varnish.

Old Waxed Floors

A waxed floor requires more frequent renewing than does a varnished one, but the process is less difficult. Wax gives a film different from that of varnish, and one that never chips under the most abusive treatment.

When a waxed floor shows wear it simply requires a new coating of wax. In the case of a floor which has an accumulation of many old coatings, it is advisable to wash these off with turpentine and apply two new coats. This also cleans and lightens the floor.

Spots that are worn can be treated by applying fresh wax without recoating the entire floor. Such places will not stand out conspicuously, as in the case of a varnished surface.

To change from a wax to a varnish finish, wash off all wax coatings with turpentine, and then apply two coats of high-grade floor varnish.

Painted Floors

Floors which are subjected to hard service, like kitchen or laundry floors, are best painted with a good grade of floor paint. Sleeping room floors of doubtful quality are sometimes painted, a treatment which serves to make them sanitary and more easily cared for, as well as to improve their appearance.

From the sanitary standpoint, if no other, a floor should have all cracks filled and then be finished or painted, according to its quality and the usage it is likely to receive.

No matter how elaborately decorated walls and ceilings may be, or how expensive the furnishings, unless floors are in keeping, the total effect of the room is spoiled. No other part of the home receives the same relentless and constant subjection to dust, dirt, water and wear as floors. While floor finishing materials are made to withstand such conditions to

(Concluded on page 25)

Subsoiling to Prevent Erosion

THE Altmont Orchards Company is very enthusiastic over the result secured by the use of dynamite in subsoiling.

The apple orchard of this company is planted on the hillside in soil of such a nature that it is easily eroded after the protecting brush has been cleared away. They were very much alarmed because it appeared that their enterprise might be ruined by the continuous washing away of the top soil. As has been the case in many agricultural and orchard problems, they had recourse to the use of dynamite.

1. Tamping the Charge

The method of operation was to place one-half cartridge, 20 per cent. Red Cross Extra dynamite, in holes drilled to a depth of twenty feet and at a distance of five or six feet from each tree. They found that the subsoiling broke through to the roots of the trees and thus protected the orchard against erosion.

In this manner the company has subsoiled 1,700 trees, and during the fall months will blast holes for 2,000 new trees. The subsoiling previous to the setting out of trees will, it is believed, obviate the necessity of subsequent subsoiling.

The accompanying photographs show the method of procedure. These methods can be employed either on a small or large scale and in the ultimate will prove beneficial and economical.

2. Lighting Fuse and Removing Bar

3. The Explosion

Bird Conservation

By Dr. B. H. Warren

FOR the past five years I have been conducting some very interesting and successful experiments on the eastern shore of Virginia in the way of bird conservation. My experiments have been conducted at Wallops Island and at Chincoteague Island, Accomac County, Va.

We have erected on these two islands over 800 bird boxes, over 90 per cent. of which have been occupied by song birds.

By a systematic plan of destroying crows, certain hawks, house cats and certain other predatory animals, we have brought about a phenomenal increase in bird life, both game and non-game species. We have now on Wallops Island large colonies of sea gulls and terns as breeding species—five years ago practically none nested there. This increase is due to our methods of conservation. We have also by our system increased greatly the mud hens or clapper rails, which inhabit the salt water marshes at Wallops Island, these marsh lands covering some 2,500 acres.

Before we began to destroy crows and other egg-devouring creatures, we seldom had over two or three pairs of black ducks to nest on our premises, whereas this spring fifty or more pairs of these toothsome wild ducks reared broods on the Island.

The results of these efforts is sufficient argument for systematic development of methods for increase of production in bird life and maintain it by conservation.

Underdraining

A resourceful farmer discovered a new use for dynamite and by it saved a crop of potatoes which was nearly matured. One of his fields became badly flooded, due to unusually heavy rains which inundated the ditches and drains. The farmer overcame this emergency by putting down a number of holes, eight to twelve feet deep, by the use of post augers. The charge of dynamite was loaded, tamped and exploded in the bottom of each charge. A passage into the subsoil was thereby formed and thus the surplus surface water was rapidly drained. The potatoes were saved, although many neighboring crops were ruined by the excess water standing in the fields.

What to Do With Old Floors

(Continued from page 24)

a remarkable degree, reasonable precautions should be taken to ensure even wear on all parts of the floor.

A hardwood floor will grow more beautiful with age if given the opportunity, and the care that is expended on it will amply repay the slight effort necessary.

If the housewife will regard her floors in the same light as her china and silver, and the man of the house as his wearing apparel, they will soon acquire the habit of caring for their floors and will find in their improved appearance compensation for the trouble.

Our Honor Roll

7668 Strong

Following is a list of employees of Du Pont American Industries who have entered the Army and Navy in the defense of Democracy. 6315 names have already been reported; this list includes 1353 names; there have been no additional rejections, making a total of 7668. 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 positions as good as or better than those they have left.

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

SALARY ROLL

Carney's Point

SMOKELESS POWDER

Burke, Wm. F., Jr.
Coverdale, Watson S.
Daniels, Harry D.
Dolliver, H. Gray
Jones, Barnard
Lyman, John Q
O'Brien, Patrick
Richardson, Marley V.
Spencer, Geo. E.
Yerkes, Hobart M.

Cap Works

Butler, Wm. V.
Lindsley, Christopher
O'Gorman, John V.
Scandone, James

Barksdale

HIGH EXPLOSIVES PLANT

Anderson, Levi
Hinrichs, Dr. R. G.
Mudge, John R.
Peterson, Victor
Soshea, Harry

Eastern Laboratory

Bell, K. E.
Cowgill, John M.
Gery, W. B.
Gossard, J. L.
Heacock, J. Gelston
Leonard, Clifford S.
Smith, Herbert A.

Experimental Station

Albert, Talbot J.
Bake, Louis S.
Charles, Reuben
Myers, Allen D.

Miscellaneous Mfg. Dept.

DYE WORKS

Irwin, Kenneth P.
Pitcher, Albert M.
Truax, M. Davis
Woodruff, C. N.

Hopewell

Feltham, Douglas L.
Kerpen, Geo. T.
Strudy, Reginald E.
Turner, Richard H.
White, Clarence C.
Wilson, Daniel A.

Parlin

SMOKELESS POWDER

Disbrow, Geo. F., Jr.
Fahrenholz, Chas H.
Nix, Wm. S.

Haskell Guard

SMOKELESS POWDER

Hamilton, H. R.
Quackenbush, Roy P.

Jackson Laboratory

Barlow, R. G.
Johnson, A. J.
Whitehead, Gilbert

Arlington

Campbell, Donald
Maddams, Thos. E.
Wentworth, Wallace E.

Du Pont Nitrate

Hitz, J. J.

Sales Department

Baynum, Grier
Blickle, Harry A.
Carpenter, F. G.
Cole, Lester W.
Eiser, A. V.
Flanigen, Bernard J.
Fox, Geo. A.
Hance, F. A.
Handy, E. E.
Jeandell, W. F.
Kavanaugh, J. M.
Koontz, John W
Lau, Jos. W.
Lilley, H. S.
McCoy, F. D.
McWilliams, J. A.
Mahaffy, F. P.
Mahoney, J. E.
Robinson, M. H.
Rogers, W. H.
Shaul, H. M.
Shields, John F.
Walsh, John J.
Welch, Walter A.
Wheeler, J. N., Jr.

Repauno Plant

Weatherill, Robt. T.

Harrison

PAINTS AND VARNISHES

Brown, H A.
Bucher, R. P.

Purchasing Dept.

Cook, Josiah M.
Livermore, A. H.
Toppin, J. Harry

Brandywine

HIGH EXPLOSIVES PLANT

Marsh, Charles D.

Engineering Dept.

Bloode, Delaware H.
Crenshaw, Alfred F.
Gravatt, W. L., Jr.
McAdams, John H.
Manuel, Warren A.
Stuart, Charles C.
Todd, William Booth
Wright, Marvil W.

Treasurer's Office

Mitchell, John S.

Chemical Dept.

Morgan, Roland R:

Order Bureau

Crum, Alva

Accounting Cost

Beacon, Hamilton B.

Miscellaneous Mfg. Dept.

BY-PRODUCTS

Dunn, Eugene

Accounts Payable

Wright, Earl H.

PAY ROLL

Hopewell

GUN COTTON PLANT

Allison, Percy A.
Anderson, Bryan G.
Andrew, Dixon
Argino, Frank
Barksdale, William B.
Barnes, Arthur
Barr, Winfred W.
Bellingmeyer, Elmer
Belma, Francis
Berry Josephis G. D.
Biehle, Elmer C.
Black, Stewart W.
Black, William Geo.
Bossieux, Alston
Bradberry, Ed.
Bragg, Bryant B.
Bridgeforth, Stanley
Bridgeforth, Stanley
Bridgemen, Bernard
Bridges, Marion H.
Brooks, Columbus
Brousen, James C.
Brown, Willie
Bryan, John
Buckner, Theodore W.
Butler, Eddie
Byrd, Willie
Campbell, Manuel
Cawthorn, James
Christian, Eurias
Clarke, Plummer N.
Clements, Oscar
Coleclough, John
Coles, Jessie
Companies, Emanuel
Comstock, William G.
Conoly, John G.
Cook, Oscar J.
Cooper, Loney
Correll, Alfred
Covington, Hector
Daran, Harry B.
Darden, Arthur O.
Davenport, Joseph B.
Dickson, Geo. D.
Dobson, Earl
Dunbar, James Y
Dunnavantl, Richard T.
Edmonds, Robert
Edwards, James B.
Elliott, John G.
Ellis, Golden
Evans, Wilson
Fletcher, Millard H.
Fortner, William
Fowlkes, Samuel H.
Frazier, Aanious G.
Garber, William J.
Gary, Alex
Gelistopnas, Zakarin
Ginings, Flag
Glidewell, James W.
Godwin, Johnnie
Gould, Tellman
Grady, John
Grant, Cicero M.
Greenleaf, Clement O.
Griffin, Robert D.
Hardin, Edward A.
Harrell, Allen W.
Harrington, Berkeley
Harris, Eugene
Harris, Lueco
Harrison, Charles
Harrison, George
Hayes, Spencer L.
Henderson, James L
Hill, Robert
Hood, Robert H.
Houston, William E.
Howard, James
Howard, Kinney
Howell, Frank B.
Humphreys, Hirman B.
Irving, Ulysses
Irving, Ulysses G.
Jackson, Robert
Jackson, Walter
Jamison, William E.
Jenkins, Joseph
Johnson, Charles
Johnson, Harrison
Jones, Herbert
Jones, James
Karas, George
Keel, Lonnie M.
Keller, Marie
Kirkland, Frank
Ladson, Richard A.
Lang, Thomas W.
Layman, John L.
Leary, Harry C.
Leavy, James
Lewis, Clarence
Lewis, Henry
Lewis, Robert
Lusk, Edwin R.
McCall, Fleming
McCann, Alexander
McConnell, Samuel F.
McGray, Walter
McNeal, Jacob
Macklin, Henry L.
Maclin, Oliver
Mages, William I.
Manley, James
Manson, Linwood B.
Marcum, Hobart K.
Marcum, Hobart
Matakis, Manoil
Mayo, Walker
Meaciner, John W.
Mewsome, Arthur E.
Monk, Curtis
Murdock, Letcher
Murray, Joseph O.
Nash, James C.
Nimocks, Robert E.
Nunallie, Joseph H.
O'Donnell, Edward A.
O'Donnell, Harry
Oliver, Earle C.
Pace, Robert L.
Parks, Martin G.
Payne, William C.
Peck, James A.
Pennington, Warren K.
Percy, L. Woodard
Perry, Frank
Petteway, Nep
Polson, Leon D.
Price, Furnie C.
Prince, Oscar E.
Quck, Philip S.
Randlett, George C.
Randolph, Charles
Ratcliff, Sam
Rhodes, Charles A
Rivenbark, Wilbuern H.
Roberson, Jim
Rodgers, Charles S.
Rodgers, Tom
Rogers, George
Rowell, Fred
Ruffin, Willie
Russell, Benjamin F.
Rutledge, John
Satterwhite, Crawford C.
Schakel, John C
Schebel, Armanda A
Scott, Walter Lee
Shupe, Roy
Smith, Carl J.
Smith, William R.
Stephenson, Allen D.
Stout, Edwood G.
Suarty, Charlie
Sykes, Thomas L.
Tabot, George E.
Taylor, Allen
Trimble, Julius E.
Tucker, Norman
Tuttle, Ernest
Van Jeffreys, Carl
Varasoff, August
Waters, William N.
Watson, Joseph M.
Webb, Jethro
Wheeler, Reyborn E.
Whitaker, Henry
Williams, Lenwood T.
Williams, Walter
Wilson, Garnett M
Wilson, Lester F.
Wilson, William P.
Wood, Leonidas A.

Pennimen

Adams, H. P.
Adams, J. T.
Adams, William
Addison, G. D.
Addison, M. L.
Allen, L.
Altizer, William
Amherst, G.
Anderson, D.
Anderson, L. L.
Anderson, R. C.
Androzzi, F.
Arnold, Jas. J.
Austin, Allen C.
Baker, Glen
Ballard, E. R.
Banks, A.
Banks, Grady
Banks, James
Banks, T. C.
Barnard, Fred
Barr, Wm H.
Barton, John
Bass, J. A.
Bell, George
Bell, H.
Bell, Robt. E.
Benson, Carl J.
Berry, Will
Best, Jos.
Bevings, Eake
Billings, John R.
Blanton, Jos. L.
Blikeley, E.
Bologna, F.
Boney, L.
Booker, Stanley
Boseman, Tom
Botts, K. P.
Bowles, F. H.
Bradford, John T.
Branch, Benjamin
Brewer, Levie
Britton, F. F.
Brown, B.
Brown, C.
Brown, C. A.
Brown, James
Brown, R.
Bruce, J. G.
Bryant, H. C.
Buchanan, C.
Bulloch, Thos.
Bundy, R.
Bunn, E. F.
Burgin, D. H.
Burnett, William
Burns, George
Burns, J. F.
Burrell, Thos.
Burton, James
Bush, William
Butler, James D.
Butler, Norman
Butler, W. E.
Butts, H.
Cagle, A. B.
Caldwell, S.
Cannon, W. T.
Carlton, J. L.
Carneal, C. D.
Carpenter, P.
Carroll, J. T.
Carter, A.
Carter, Harry
Casady, V. J.
Cellers, Nat
Chandler, Fred
Cheatham, W. H.
Childers, M. C.
Chison, L.
Clark, Archie
Coine, D. C.
Cole, Chas. E.
Cole, J. H.
Coleman, June
Coleman, John
Coleman, W.
Coles, William
Conihay, J. M
Connaughton, F.
Conner, E. E.
Conner, J. H.
Connors, E. W.
Cooper, Evans
Cooper, John
Cox, J.
Cox, J. W.
Cox, Owen
Corbin, William
Crawley, Lee
Crawley, W.
Crawley, William
Crew, A.
Cumbers, E.
Curtis, John P.
Curtis, Tom
Dalhouse, S. N.
Dalton, L.
Daniels, H.
Daniels, Hardy
Danto, E. D.
David, M. L.
Davis, Elliert
Dawkins, A.
De Selva, A. R.
Dockery, J. S.
Donovan, Wm.
Dove, A.
Dowdy, C. M.
Downey, W.
Dunkum, W. A.
Dunlop, H. G.
Dunn, Jas. W.
Dunn, H. C.
Dunnaman, Tom
Durham, H.
Eddins, R. C.
Edwards, Harry
Edwards, J.
Emory, Clarence K
Evers, Ellis
Faison, Willie
Farmer, Nathan
Farrington, H. M.
Field, Thos. J.
Fields, Clifton
Fields, W.
Fields, Winfred
Filler, Louis
Finland, Chas.
Fiorillo, F.
Fipps, Dan
Floyd, W. D.
Foreman, Ed.
Franklin, W. C.
French, N.
Fulton, E. E.
Garrett, Ned
Garland, George
Gates, G. D.
Gay, A. S.
Gayle, Robert
Gayle Sam.
Gayle, V.
Gibbons, L. B.
Gibbs, L.
Gibbs, Lewis
Gibbs, William
Gibson, William
Gilbert, E. F.
Gilbert, Steve
Gillespie, A. P.
Globe, S. B.
Good, M.
Graves, W. C.
Gray, R. A.
Gregory, D.
Green, Ben.
Green, D. E.
Green, Herbert
Green, Lewis
Green, Ray D.
Green, T. O.
Haig, John
Hall, George L.
Hamberry W.
Hammond, H. G.
Hammond, J. B.
Hamrick, C. D.
Hanks, Van. B.
Harrington, C.
Harvey, B. L
Harris, Chas.
Harris, Frank
Harris, James
Harris, L. B.
Harris, M. T.
Harris, Ossie
Harris, R.
Harris, W. A.
Harris, William
Harvey, B. G.
Harvey, R.
Haselhurst, R. B.
Haskell, R. L.
Hawkins, Mitchell
Hawley, Harry
Haynes, R.
Henderson, Gus. C.
Hester, Macon
Hicks, Matthew
Higden, A. M.
Higden, C. W.
Hill, Jas.
Hines, C. T.
Hoke, H. J.
Holland, H. C.
Holloway, Michael
Holmes, Isaiah
Holmes, Mickey
Honor, James
Horne, K.
Howard, O.
Howell, C. J.
Hudson, J. E.
Huffman, H. F.
Hunnaford, T. L.
Hutsell, L. E.

Pennimen—Continued

Hyatt, H.
Isase, J.
Isreal, Jesse F.
Jobe, David F.
Jobe, F. W.
Johnson, Ed.
Johnson, J.
Johnson, J. A.
Johnson, John
Johnson, Percy
Johnson, R. E.
Johnson, W. I.
Johnson, W. T.
Jones, Charlie
Jones, H. L.
Jones, J. H.
Jones, J. T.
Jones, Leonard
Kassler, B.
Kaufelt, William
Kefawver, E. G.
Keller, F. A.
Kelly, Frank
Kemp, E.
Kern, J. F.
Kidd, Lige
King, Ely
King, M. H.
Knight, R. R.
Lamb, Burgess
Lane, George G.
Lane, Lee
Lanier, L. T.
Lanning, A. E.
Lanor, Bynn
Larvis, Burt
Laskey, C. T.
Lassiter, Lendon
Lawrence, J.
Lawrence, Jim
Lawrence, W.
Layne, W. M.
Lee, J. A.
LeGrand, Wm. T.
Lewis, A. L.
Lewis, Mac
Lightfoot, Geo.
Lightfoot, J.
Lilly, F. S.
Livingood, H.
Lockley, R.
Long, H. R.
Looney, E. H.
Loving, W. B., Jr.
Lysel, William
McCake, L. M.
McCrimon, F.
McElreath, H. B
McGalliard, John
McHone, E.
McIntosh, M. F.
McKern, Robert
McKinley, Thos. W.
McLeain, John
McMill, George
McNair, W. H.
Maca, William
Mahone, W. E.
Mahood, A.
Mapes, J. H.
Marshall, D. B.
Maxwell, Frank
Maxwell, R.
Monday, M.
Miffleton, G. S.
Miller, Clyton
Miller, R. C
Millon, T. H.
Mills, Joseph
Minkins, A.
Minkins, Jas. A.
Mitchell, J. E.
Mitchell, Leslie
Mitchell, N.
Montheith, Samuel G.
Moore, Charley
Moore, R. A.
Morris, J. B.
Morris, O.
Morrison, Oscar
Morton, O. L.
Moseley, E. R.
Mullen, L. H.
Murphy, Frank
Myer, Floyd
Nelon, James H.
Nichols, Cecil
Noble, Andrew
Norwood, F.
O'Leary, R. F.
Oden, W. C.
Ogburn, L.
Ogden, William
Oliver, Fleming
Oliver, James
Oliver, Lawrence
Osborne, William
Oswald, A. E.
Otey, Addie
Otey, Eddie
Overby, M.
Oxford, Percy G.
Pankey, G.
Pankey, George
Parker, A.
Parker, Albert
Parker, B. D.
Parker, M. W.
Patterson, J.
Patton M.
Payne, I. L.
Peasley, R. D.
Peek, R. M.
Penland, B. J.
Perkins, F. E.
Perkins, H.
Peruchi, D. E.
Petrone, C.
Phurston, Willie
Pinkerton, L. E
Plemers, G.
Plenty, Clarence
Plenty, Haney
Pollard, Henry
Potter, F.
Price, C. W.
Price, R.
Propst, A. L.
Pugh, J. C.
Randolph, P.
Ray, Landon
Ray, Russell
Redman, Chas. L.
Reed, James H.
Renick, A. M.
Rest, W.
Reynolds, M.
Richardson, Jno. T.
Ricks, Chas.
Ricks, Richard
Ripley, A.
Roberts, James W.
Roberts, Roy
Robinson, L.
Robinson, R. H.
Rodrigue, Peter
Rollins, Alex.
Rowland, J.
Royester, James
Sampsons, Charley
Sanders, C.
Sarcione, L.
Seay, J.
Seeper, C. W.
Sechrest, J. H.
Shavers, Geo.
Sheber, B.
Shepard, Jeff
Shepard, Sam
Shepard, Tom
Sheppart, M. G.
Sherrill, B.
Shildes, H. W.
Shook, O. E.
Sigmon, W. B.
Simmons, J. G.
Simpson, Taylor
Simpson, H. J.
Simms, Jos.
Simms, Price
Singer, William
Slaughter, A.
Smith, E.
Smith, Joe
Smith, G. M.
Smith, R.
Smith, T. T.
Smith, W.
Smith, Will
Sparrow, Jack
Spencer, H. M.
Spencer, Henry M.
Spencer, K.
Sprinkles, George
Staley, Willie
Stallings, William
Staton, V. B.
Steinmetz, Henry
Stewman, H. A.
Stewman, W.
Stillwell, Wm. A.
Stokes, Vanderbilt
Strang, E. P.
Strain, Chas. A.
Straub, R. E.
Stumpp, J. P.
Sydnor, Clay
Tadwell, H.
Tainman, F. S.
Taite, C.
Tate, Jas. W.
Tavlin, Henry H.
Taylor, George
Taylor, H.
Taylor, L.
Taylor, Linwood
Taylor, Robt. H.
Taylor, Robert
Taylor, Troy
Tell, R. H.
Thomas, J. B.
Thompson, A. A.
Thompson, Joseph
Thornton, Jack
Threat, M. L.
Tillage, M.
Titers, W. L.
Tolar, George
Toney, Leir
Toth, F. E.
Townsend, J.
Townsend, James
Treague, Nick
Trout, H. H.
Troutman, R. L.
Turner, H.
Tyler, H.
Tyler, Harod
Vance, J. W.
Vanorsdala, L. G.
Velez, John
Waddey, A.
Walker, George
Walker, R.
Walton, Horace
Ward, Harry
Warren, V. O.
Washington, Geo.
Washington, Norman
Watson, David
Watson, E.
Watts, H. A.
Way, M.
Weedman, C. O.
Wendler, C. S.
West, A.
Western, J. E.
Whitaker, R.
White, A. C.
White, Bryant
White, Chas.
White, E. W.
White, M. E.
White, Scott
Whiting, F.
Whittaker, E. W.
Wiggens, Henry
Wilmer, M. L.
Williams, Fred
Williams, F. F.
Williams, R. A.
Williams, William
Williamson, H. J.
Williamson, M.
Willis, D. W.
Wilson, George
Wilson, J. O.
Wilson, M.
Wilson, Paul
Wingfield, Jim
Winks, Alfred G.
Winks, G. W.
Winn, Max
Winston, A.
Winston, Archie
Witherman, R. C.
Witherspoon, E. H.
Witherspoon, L.
Wood, J. R.
Woodfin, Waverly
Woodridge, William
Woodruff, Dug.
Worth, E. W.
Wright, James
Wright, P. H.
Wroten, T. E.
Young, J. C.
Young, J. L.
Young, R. B.
Young, R. H.

Carney's Point

Allen, Clinton B.
Antonio, Martiney
Ayers, John H.
Bailey, L.
Barber, Louis J.
Bennett, E.
Bento, Saul
Biddle, L. E.
Boyce, John
Boyer, Chas.
Boyer, Charles
Brandiff, J. Wesley
Brayerton, William B.
Broadman, H.
Brown, Benjamin
Candill, John
Cantelly, Howard
Canter, Harry
Carter, M.
Carter, Morton
Castelow, Herbert C.
Clemente, George
Condon, Edward
Connors, Jos.
Coolidge, Girard
Coughlain, Wm.
Cullen, Frank
Custer, Chas.
Davis, George
Davis, Henry
Davis, William
Deacey, Michael
Debaney, Thomas
Demmel, Franklin
De Suza, Jose
Edir, Chankrance
Ennis, Robert
Eyster, Joseph Z.
Fisher, Chester
Ford, Arthur
Franklin, Benj.
Gallagher, Joseph
Gildea, James
Gillispie, Patrick
Gilmore, Thomas
Goghlan, William
Gognat, Frank
Gordy, Orley
Green, Clarence
Green, Harry C.
Griffin, Harry
Harr s, Richard
Hartman, V.
Hearn, Robert
Hill, James
Hill, Julian
Holloway, John B.
Horner, Hobart
Houck, Charles H.
Hudson, Harry E.
Hungerford, Spencer
Ivory, Joe
Justice, T. E.
Kalatuze, T.
Kemper, Odie A.
Kester, R. A.
King, Frank B.
Kopach, Adelbert T.
Koy, Charles
Lackey, Boyce S.
Lee, James
Little Luther L.
Lockhart, David
Lopez, Alberta
Loupresto, C.
McFadden, J. J.
McGovern, J.
Makone, James P.
Manning, Michael J
Mason, Frank
Mason, William
Massey, Stanley R.
Matthews, Barty
Mullen, Henry
Neidlein, Charles
Neidlein, Chas. E.
Newman Joseph
Pancoast, C.
Pancoast, Cleveland
Pole, George
Predow, John P.
Pride, William
Reeves, Talbert
Reisinger, John C.
Rogers, Edwin Leroy
Roon, M.
Savage, Willard H.
Seele, Monroe
Shields, Arthur C.
Slater, Jas.
Smith, Arthur R.
Smith, Charles H.
Smith, P. R.
Smith, Warren
Sorenson, Julius
Trede, Edward
Tripkin, Robert
Tuttle, Edgar
Vaffides, Mide
Venable, Russell
Vincent, Chas.
Wainwright, Gronvel E.
West, John H.
White, M. M.
Wiley, Watson
Wilkins, Joe C.
Williams, Ed.
Williams, Mack L.
Wilson, Geo.
Wilson, Joseph E.
Wilson, H.
Wingate, William

Arlington

PY-RA-LIN

Appello, Patrick
Bechtold, Edward
Bunbitiz, Peter
Devine, Vincent
Dicarza, Joe
Gillick, William
Hall, Ralph
John, George
Kazimier, Frank
Konik, Barnet
McCarren, Daniel
McNally, Joe
Nateillo, Tom
Nicola, Donatono
Penna, Frank
Perry, Joseph
Plaia, Peter
Schmorr, Ellwood
Secresky, Tony
Shaft, Arnold J.
Soboleski, John
Sweeney, Edward
Weise, Angelo
Weiss, Martin

Deepwater Point

Allen, Clyde
Greck, Theodore
Harowitz, Elias
Korte, Charles
Lewis, Martin
Panlo, Harry
Rodder, Paul S.
Wheatley, Edward H.

Haskell Guard

SMOKELESS POWDER PLANT

Beckford, Joshua
Bicotee, Salvatore
Botimer, Walter F.
Brailey, John
Brown, James A
Brown, Robert
Burns, John
Corney, William
Dargenio, Carmine
Edmonds, Jackson
Elder, Price S.
Ellert, William
Farguharson, James
Gates, John
Graf, William C.
Gregson, Theodore B.
Hartig, William
Harty, John
Herring, Horace L.
Hipkins, Clifton A
Howell, Louis
Jensen, Alfred C.
Jersey, Sidney
Jones, Ladd
Luca, Carmelo
Luckan, Charles H.
McKay, Austin
McLennan, Finlay J.
Mejia, Jose
Milligan, George W.
Mirano, Angelo
Preziosi, Angelo
Rice, George
Richards, W. H.
Romanio, Peter
Ryan, William J.
Schilling, Arthur L.
Schoendor, Nicholas, Jr.
Scrivani, Louis
Shannon, Henry
Sharpley, Samuel
Shea, John
Smith, Clarence W.
Smith, Harry
Smith, Lloyd
Stiles, Charles E.
Vander Made, Cornelius
Wheeler, Parker A.

Parlin Guard

SMOKELESS POWDER PLANT

Ackerson, Wallace
Anderson, Emil W.
Anderson, James
Aniekevic, Carol
Anuminski, Kazmier
Arleth, William
Auer, John W.
Bergen, Joseph
Bleyman, Jacob
Burns, James
Collins, James
Domine, Charles L.
Fleishman, William
Fox, Austin
Fusesky, Yozes
Garvey, Owen
Goodman, Sam W.
Gormley, James
Grazulevic, Zigenont
Grogan, Lawrence
Guise, John
Halbourne, William
Halliman, Michael
Hargrave, Harold
Hosbel, Otto
Jakevich, George
Kennedy, Joseph F.
Kerns, James
Kinneay, Daniel
Kozeka, Ylia
Kucharsky, Felix
Kuchorski, Adolf
Kurek, Stanley
Lauresen, Alfred
Leedom, Benson F.
Loesch, Harry
Lountsen, Jean
McDonald, Chester E.
Marckenok, Alek.
Michalawsky, William
Michovich, Edmundro
Nevehlas, Taras
Parker, Walton R.
Pavesak, George
Polichuk, Mike
Selabko, Walter
Smith, Howard M.
Smith, William E.
Sorenson, Thomas
Stichuk, Ignatz
Yarafa, Alek
Tears, Fred
Twigg, John
Whelan, Edward J.
Yanser, Burdwell F.
Yrmolowicz, John

Wayne

BLACK POWDER

McArdell, Simon

Newburgh

FABRIKOID

Berkery, John
Frederick, Peter
Henderson, John
Kernochan, George
Maloney, William R.
Monarchie, Fred
Sarns, Ellsworth J.
Woodruff, Howard L.

Brandywine Shops

MACHINE

Barry, Patrick
Burrows, G. Willard
Ferguson, Robert
Fermany, Alessander
Koons, Frank G.
LeCompte, George N.
Mahoney, Michael J.
Outten, John L.
Rust, Carl H.
Salerno, Feliciano
Stein, Sam
Stewart, James J.
Stewart, William
White, William

Barksdale Const.

HIGH EXPLOSIVES PLANT

Nolandera, Adolph
Wang, Hans

Meadow Plant

Borilla, Stanislaw
Nelson, Walter
Prusko, Benny
Purn, Farris

Paulsboro

Gee, Herbert

Bay City

WOOD DISTILLATION

Bebb, Lewis
Watton, Lewis

Du Pont

HIGH EXPLOSIVES PLANT

Halpin, Joseph L.

Poole Shops

MACHINE

Radley, Fred
Schoeffer, Robert E.

Repauno

HIGH EXPLOSIVES PLANT

Fisher, Chester A.
Frazier, Edward A.
Reilley, William
White, Otto

Riverside Mines

Wilson, Jim

U. S. Box Repair Plant

Brown, Silas
Baynham, James
Ceresini, Gabriel
Valocchi, Thomas G.

Asburn

HIGH EXPLOSIVES PLANT

Belville, Frank H.
Brown, Clifford C.
Conner, Harold
Foehringer, Edw.
Griffin, Isaac R.
Griffin, Jesse W.
Hess, Virgil
Irwin, Dee
Laratta, Guiseppe
Northcutt, Loyd
Pritchett, Oscar
Stevens, William R.
Taylor, Lacey
White, James
Young, Paul

Grayling

WOOD DISTILLATION

Bebb, Alfred
Deckrew, John
Jenson, Wm.
Wilson, Henry

Harrisons, Camden

Fisher, Joseph E.
Smith, Charles A.

Deering Junction

Howard, Harold
Lowery, Martin
Spring, Tom

Mooar

BLASTING POWDER

Bever, Leslie L.
Hornung, Frank F.
Hoffman, John H.
Hoffman, George M.
Seabold, William E.
Scheulka, Lewis A.

Rushdale Works

Blake, George H.
Gebhardt, Walter P.

Scranton

Jones, David S.
Shrader, James L.

Georgetown

Haun, Grover C.

Cap Works

Donahue, James O.
Eisele, Jos.
Kushner, Benj.

(Corrected to Sept. 25.)

An effort is being made to place Du Pont Magazine on the reading tables in every reading room in the camps at home and abroad. It will be sent to every man who left the employ of the company to enter the service, whose correct address is supplied by either himself or friends. Any omission of names is unintentional, and will be corrected if called to the attention of the editors.

Letters giving news items are requested from the boys who have gone into military service. Good pictures can also be used to advantage. These must show no military details. Send them to Editor of Du Pont Magazine.

Corporal Kenison

Corporal Kenison, of Sebago Lake and Portland, the son of Wilber R. Kenison, of the Du Pont Company at Smith Mills, died of wounds received July 22d.

Corporal Kenison practically never worked anywhere except with the Du Pont Company. He began his employment with this company about 1910 at Hartland. He was an employee of the Deering Junction Plant at the time he enlisted in Co. B, 103d U. S. Infantry, which was formerly the 2d Maine.

Lieutenant Timothy

Lieutenant Timothy was killed in action "somewhere in France," on the 14th of June. He was a first lieutenant in the regular army and had been in France since January. He was killed during the artillery activity around Chateau Thierry.

When war was declared, he resigned as assistant paymaster at the du Pont de Nemours plant in Wilmington, Delaware, to prepare himself for an officer's commission in the regular army. Following a course of training at Plattsburgh, N. Y., and the French war college, he passed his examinations with a high rating, ranking third in his class, and receiving a lieutenant's commission.

Soon after his arrival in France he was badly gassed, and his recovery and return to duty took place less than a month before he was killed.

Lieutenant Timothy was 25 years old and is survived by his parents, Mr. and Mrs. P. H. Timothy, of Nashville, Tenn., and a brother, Lieut. P. H. Timothy, Jr., who was recently graduated from West Point.

General Pershing, in awarding distinguished service crosses to officers and enlisted men, particularly cited the bravery of Lieutenant Timothy.

"Although weakened by gas poisoning inflicted while serving with the French in the Verdun sector," says the citation, "Lieutenant Timothy declined medical assistance and served with heroic fortitude with the marines. In the operations of June 14th, near Chateau Thierry, he inspired the officers and men with whom he was serving by his fearlessness and fortitude until he was instantly killed by a high explosive shell."

The medal which he was to receive for courage under fire will be presented to his mother.

"Croix de Guerre" for Former Du Pont Man

When the war broke out Mr. Howard P. Potter was employed by the Du Pont Company at Arlington Works, and was considered one of their most capable and reliable men. Having no dependents Mr. Potter decided it was his duty to go even though he was not of the draft age. He joined the Ambulance Service in France, and while located at Chateau Thierry had his first opportunity of bringing in some of our own boys, which he described as "bringing the war pretty close to home." It was here also that he received his "gift" from the Boches. On account of the heroism and courage he displayed while under fire at this place he was cited to receive the Croix de Guerre.

"I was sent out as an orderly in the evening to an advanced post in a small village and right at the crossroads," runs his letter, "there had been little shelling, and as the folks at the dressing table did not point out any cave to us we slept in a house nearby; about 3.00 A.M. a barrage fire suddenly opened up on us and we crawled thru a little window into a basement woodshed to the accompaniment of flying shrapnel and breaking glass. We went into a cellar and stayed until things quieted down a little and then one car was sent away with the wounded, and we arranged the others for a quick get-away when needed. I was the extra man on our car and I dragged myself up the stairs and after what seemed a long time we got our car off safely to the hospital. I hope this will be my most exciting affair while 'over here.'"

Private Potter

Manufacture, Sale and Use of Explosives During War

THE 65th Congress passed on October 6, 1917, a law regulating the manufacture, sale and use of explosives in time of war, making it "unlawful to manufacture, distribute, store, use or possess powder, explosives, blasting supplies or ingredients thereof, in such manner as to be detrimental to the public safety, except as in this act provided."

The word "explosives" is defined in the Law as meaning "gun-powders, powders used for blasting, all forms of high explosives, blasting materials, fuses, detonators, detonating agents, smokeless powders, and any chemical compound or mechanical mixture that contains any oxidizing and combustible units, or other ingredients, in such proportions, quantities, or packing that ignition by fire, by friction, by concussion, by percussion, or by detonation of, or any part of the compound or mixture may cause such a sudden generation of highly heated gases that the resultant gaseous pressures are capable of producing destructive effects on contiguous objects, or of destroying life or limb, but shall not include small arms or shotgun cartridges."

Congress invested the enforcement of this Law in the Director of the Bureau of Mines, and, with the approval of the President, he was authorized to utilize, where necessary for the proper administration of the said act, the services of all officers of the United States and of the several states, territories, dependencies and municipalities thereof, and the District of Columbia, and such other agents and agencies as he might designate. The Law was approved by the President, October 6, 1917, and by his proclamation made effective forty days thereafter, i. e., November 15, 1917. During the present war with Germany it will be unlawful to manufacture, sell, purchase, use, distribute, store or possess explosives or ingredients thereof without being properly licensed.

To make compliance with the Law as convenient as possible for the consumer of explosives, the Director of the Bureau of Mines has appointed licensing agents in each county in the United States and is endeavoring to appoint as many additional licensing agents as local conditions require. These appointments have so simplified the securing of licenses by persons lawfully entitled to them that the workings of the Law have caused little or no interference with legitimate business.

The press throughout the country has so effectively disseminated information concerning the Law that it is safe to say there now are few persons interested in the making, handling or use of explosives who are not familiar with its requirements and operation. The manufacturers of explosives have aided greatly in the execution of the Law through their constant and valuable advice to the consuming trade and the public.

To obtain explosives, no matter for what purpose, the prospective purchaser must present himself in person to a licensing agent within his county or state and must declare, under oath, his place of birth; whether native born or naturalized citizen of the United States; if a naturalized citizen, the date and place of naturalization; the business in which he is engaged; and certain facts regarding any previous purchase and use of explosives. In the case of corporations, firms or associations the nationality of the controlling stockholders must be indicated. The application must then be filled out and the necessary oaths taken. After this procedure has all been completed the licensing agent can then issue a license to the applicant.

It is unlawful for any individual, corporation, firm or association to obtain explosives except upon presentation of a federal explosives license, as well as any state or local licenses required under state laws or local ordinances, as the Federal Explosives Law does not affect in any way state or local requirements. The purpose of this Law is to keep out of the hands of groups of persons or individuals explosives or their ingredients in any form, the use of which would be detrimental to public safety or the Allied cause. It is the duty of every citizen to play his part in the fulfillment of the intent of the Law.

A person calling upon a jobber, vendor or manufacturer of explosives, desiring to purchase, but not possessing a license, should be notified of the Law, as it may be possible that he is ignorant of its existence. He should be informed that County Clerks and Justices of the Peace or Prothonotaries, properly authorized by the Director of the Bureau of Mines, may issue a license to him if he lawfully qualifies, and the sale of explosives should be made to him only after such a license has been secured.

Commodities for which licenses are required are set forth in the following table and anyone manufacturing, selling, purchasing, distributing, storing, using or possessing these commodities must be properly licensed before he is legally entitled to use, consume or trade in the commodities:

I. EXPLOSIVES—including the following:
Ammonium nitrate.
Blasting powder.
Blasting caps.

(*Concluded on page 32.*)

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, November, '18)

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

Date.....

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

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

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

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

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

COATED TEXTILES
- ☐ Auto Truck Special Fabrikoid
- ☐ Book-Finish Fabrikoid
- ☐ Craftsman Fabrikoid
- ☐ Fabrikoid for Baggage
- ☐ Fabrikoid for Home Uses
- ☐ Fabrikoid for Railway Upholstery and Vestibule Curtains
- ☐ Fabrikoid for Upholstering
- ☐ Fabrikoid Sheeting
- ☐ Fairfield Hospital Sheeting
- ☐ Fairfield Rubber Cloth
- ☐ Fairfield Rubber Top Materials
- ☐ Hat Sweat Material
- ☐ Marine Special Fabrikoid
- ☐ Motor Fabrikoid
- ☐ Rayntite Fabrikoid Auto Top Material
- ☐ Rug Anchor
- ☐ Shoe Fabrikoid

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

Manufacture, Sale and Use of Explosives During War

(*Concluded from page 29*)

Caps, blasting, detonating, percussion—all classes.
Chlorate powders.
Detonating fuse, or cordeau detonant.
Detonators.
Dynamites.
Electric blasting machines.
Electric blasting caps.
Fireworks.
Flashlight powders.
Fulminates.
Fuse of all varieties.
Gun cotton.
Gunpowder and gunpowder mixtures (except small arms or shotgun cartridges).
Nitrocellulose, exceeding 10.18 per cent. nitrogen.
Nitroglucose.
Nitroglycerine (except in official U. S. Pharmacopœia solution, or in form of pills, or granules, containing not more than one-fiftieth of a grain each).
Nitroglycol.
Nitromannite.
Nitrostarch.
Nitrosugar.
Permissible explosives.
Ammonium picrate.
Picrates.
Picric acid.
Smokeless powder (except small arms or shotgun cartridges).
Squibs.
Trinitrotoluol (triton).
Trinitrocresol.
Trinitronaphthaline.
Tetranitroanaline.
Tetranitromethylanaline.

Exceptions.—1. When the above are sold or issued by licensed foremen to workmen under them.

2. Small arms and shotgun cartridges.

NOTE.—Small arms are defined as firearms, which may be discharged from the hand or shoulder.

II. INGREDIENTS—including the following:

Bichromates:
- Ammonium.
- Potassium.
- Sodium.

Chlorates:
- Barium.
- Potassium.
- Sodium.
- Strontium.

Chromates:
- Ammonium.
- Barium.
- Calcium.
- Chrome green.
- Chrome yellow.
- Lead.
- Potassium.
- Sodium.

Nitrates:
- Ammonium.
- Barium.
- Copper.
- Ferric.
- Lead.
- Magnesium.
- Nickel.
- Potassium.
- Silver.
- Strontium.

Nitric acid:
- Aqua fortis.
- Fuming.
- Nitric acids of all grades and strengths.
- Mixed acids.

Perchlorates:
- Perchloric acid.
- Potassium.

Perborates:
- Magnesium.
- Sodium.
- Zinc.

Permanganates:
- Calcium.
- Potassium.
- Sodium.

Peroxides:
- Barium.
- Calcium.
- Magnesium.
- Oxon (cubes and cartridges).
- Sodium.
- Zinc.
- Strontium.

Phosphorus.

Exceptions—1. When the above are sold or issued by licensed foremen to workmen under them.

2. When small quantities are involved.

NOTE—Small quantities of ingredients are defined as quantities of less than one ounce.

The above list of explosives and ingredients is subject to change at any time.

Wanted—A Better Name Than "Leather Substitutes"

WHO can suggest a name for Pyroxylin coated fabrics that will indicate their character, cover all their present uses and be elastic enough to provide for a very promising future—something that, like a baby's skin, will still fit as time passes?

The term "leather substitutes" is outgrown. The materials it is intended to cover are already being used to replace a large number of products beside leather. By a process recently patented, various metals are being replaced by "leather substitutes" for the first time, and incidentally, pearl, bone and vegetable ivory.

A new and interesting process has been developed by a New York manufacturer for covering buttons with Fabrikoid. Already many thousand gross of buttons have been turned out and used on uniforms and overcoats. These buttons are an exact duplicate of the bronze button heretofore used. In this case the bronze is replaced at a great saving in cost, while the buttons in appearance, wear and workmanship have all the value of bronze. The same process is being applied to the manufacture of a large variety of buttons for ladies' suits and cloaks. In all of these cases it is something other than leather that is being replaced.

Leather substitutes are replacing more expensive materials as a covering for concentration tables in mining districts, especially where the mine waters bearing the metals to be collected contain free acids.

Leggings made of a khaki-colored leather substitute in place of canvas are now being made and hundreds of thousands of yards of canvas, which is now very scarce, will be saved in this way. The new leggings are an improvement over the old because they are water, dust and stainproof, and have a smooth, impermeable surface to which briars, burs and mud will not cling.

The Fabrikoid puttee is also an important arrival and promises to conserve large amounts of high-grade cordovan. These puttees have the exact appearance of cordovan and wear splendidly.

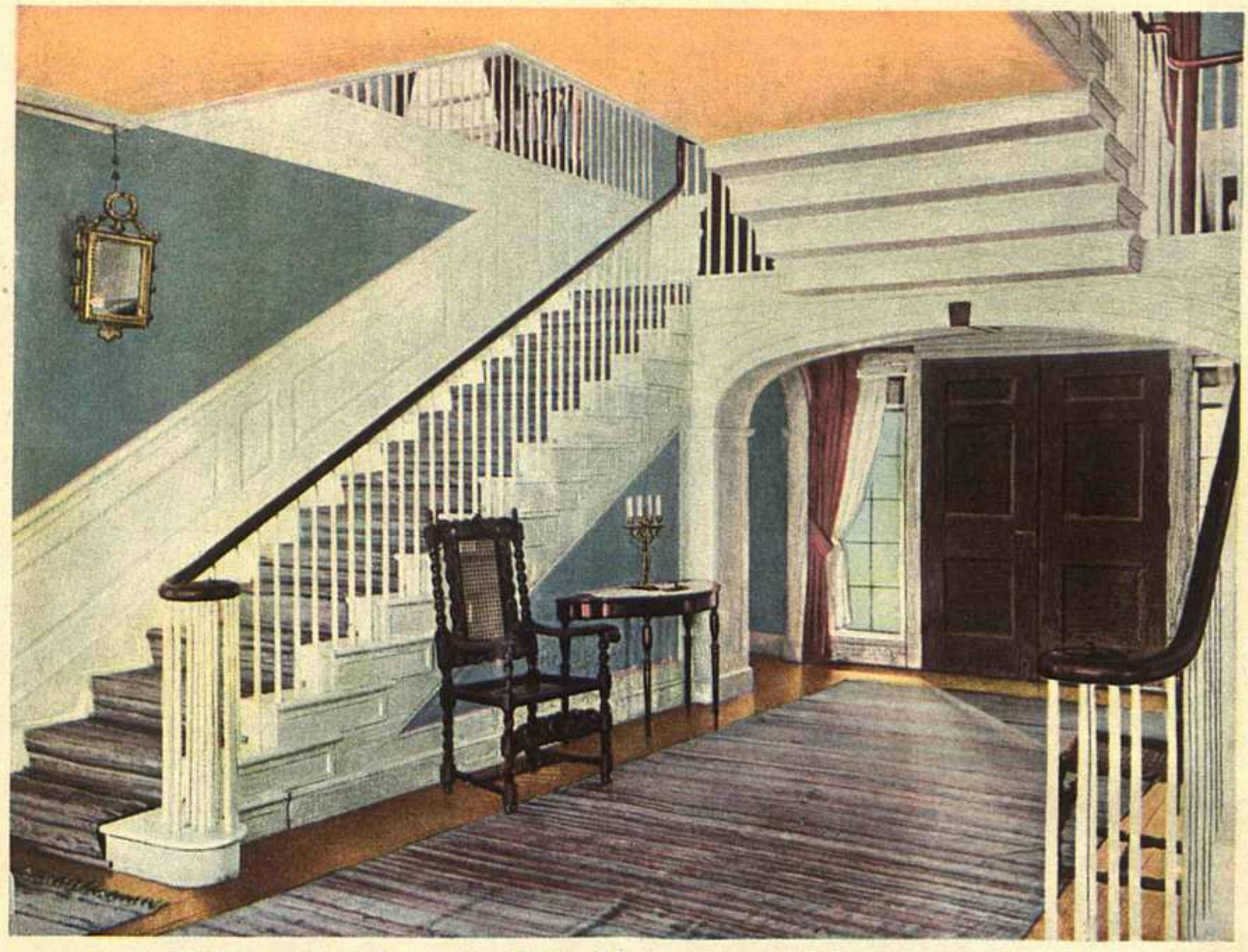
There is a big field for leather substitutes which has been little noticed in the manufacture of various other articles of wearing apparel. Special grades are now being made into aviators' clothing, chauffers' coats and similar garments. Other grades are in wide use for men's belts, work gloves, millinery, uniform caps, theatrical costumes, sports' clothing and children's play suits. The washable and sanitary character of pyroxylin-coated fabrics makes them useful for many articles of infants' wear. Almost everything baby needs from washable bootees to waterproof bonnet can be bought or made.

The toy and game trades have developed many uses for leather substitutes of importance to them. Here they replace several different fabrics and papers as well as leather. Many a young American is using a bean bag or baseball covered with Fabrikoid, or riding a hobby horse with Fabrikoid reins.

In the shoe trade leather substitutes have for a long time been used for sock linings, eyelet stays, button fly facings, tips and toes. Now another use has been found for them in fancy colors as an inner lining in the vamps of ladies' shoes. The purpose of the lining is to give the shoe a more attractive appearance by showing through the perforations in the outer leather.

In the past year it has been almost impossible to obtain white kid, and Fabrikoid has taken its place for at least two purposes where its use has been the greatest—for the making of baby bootees and for covering drug and perfume bottles.

DU PONT AMERICAN INDUSTRIES



Distinctive Hallways Done In

BRIDGEPORT STANDARD

Interior Finishes

WHEELER'S WHITE ENAMEL

The snow-white beauty of this superior American-made enamel gives to the balustrades on each side of this entrance a merited distinction. Nothing but the finest design can stand the "publicity" given by White Enamel. On the other hand, where the design is correct, the combination of mahogany and white enamel produces a very impressive effect.

PENETRATING STAINS

The finish of the handrails and doors is Bridgeport Standard Penetrating Stain in the dark mahogany shade. This is a class of stains adapted to the artistic coloring of almost all woods except real mahogany. The use of this stain makes possible a very close approximation of the expensive imported woods on woods of commercial grades which are readily obtainable. The final coat, which protects and makes permanent the beauty of the stain, is Wheeler's Interior Varnish, rubbed flat.

WASHOTINT

The beautiful tints obtainable by flat wall paints of high grade have brought them widely into use in many fine homes today. The picture shows, better than words can describe, the mellow blending of the wall colors with the dark mahogany rails, the varnished floors and the white enameled paneling.

WHEELER'S FLOOR VARNISH

Here is a varnish that the master painter — the man who *knows* — swears by. It is light in color, withstands the hardest kind of wear, and will not mar or scratch white. The floor pictured has been rubbed "flat" and finished with Bridgeport Standard Prepared Wax. The final effect is equal to that of a hardwood floor and the finish is really more durable.

BRIDGEPORT WOOD FINISHING WORKS

OWNED AND OPERATED BY

E. I. DU PONT DE NEMOURS & CO.

WILMINGTON, DEL.

BOSTON NEW YORK PHILADELPHIA CHICAGO MINNEAPOLIS KANSAS CITY COLUMBUS, OHIO

DU PONT

DU PONT AMERICAN INDUSTRIES

Let's Go Hunting—

ON the edge of a woods, a little brook, your gun and the dog—a stealthy crawl, a sudden stiffening of every muscle and he has come to a "stand." Then a whir and you have dropped one, or maybe two.

There's no more healthful recreation than a few days of rambling over the country with your gun and the favorite dog. The joy of preparation, the satisfying scenery and the thousand thrills as the dog "puts up" singles or maybe a covey, gives you a new lease on life—puts new red blood in your veins and makes you a better citizen. This country needs the best.

Then come the long winter evening pipe-dreams in which you "work" down that stubble field again and picture to yourself that double. If you had taken the "straight-away" first, the second shot on the difficult right angle might have counted.

Life is truly worth while to the hunter.

Shotgun shells loaded with

DU PONT POWDERS
DUPONT AND BALLISTITE

give the best satisfaction.

For information on Game Loads write Sporting Powder Division,
E. I. du Pont de Nemours & Co., Wilmington, Del.

DU PONT