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VOLUME 24

JULY, 1918

NUMBER 295

# American Forestry

FACULTY OF FORESTRY  
JUL 27 1918  
UNIVERSITY OF TORONTO



An Illustrated Magazine about Forestry and Kindred Subjects Published Each



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# AMERICAN FORESTRY

THE MAGAZINE OF

THE AMERICAN FORESTRY ASSOCIATION, WASHINGTON, D. C.

VOLUME XXIV—JANUARY TO DECEMBER, 1910, INCLUSIVE

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THE MAGAZINE OF THE AMERICAN FORESTRY ASSOCIATION

PERCIVAL SHELDON RIDSDALE, Editor

JULY 1918 VOL. 24

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# GIVE

## FOR THE RELIEF AND COMFORT

### OF THE

# Lumber and Forest Regiments

IT WAS THEODORE ROOSEVELT WHO SAID—

**WE FIGHT NOT ONLY TO PROTECT OURSELVES BUT TO BRING NEARER THE DAY WHEN JUSTICE AND HONOR AND FAIR DEALING BETWEEN NATION AND NATION, AND MAN AND MAN SHALL EXIST THROUGH ALL THE CONTINENTS. WE LOVE LIFE, BUT THERE ARE THINGS WE LOVE EVEN MORE THAN LIFE, AND WE FEEL THAT WE ARE LOYAL TO ALL THAT IS HIGHEST IN AMERICA'S PAST, WHEN WE ACT ON THE BELIEF THAT THOSE ONLY ARE FIT TO LIVE, WHO ARE NOT AFRAID TO DIE.**

CITIZEN SOLDIER No. 238, OF THE NATIONAL DRAFT ARMY, WRITES:

“**THEY** say, who have come back from Over There, that at night the troubled earth between the lines is carpeted with pain. They say that Death rides whistling in every wind, and that the very mists are charged with awful torment. They say that of all things spent and squandered there young human life is held least dear. It is not the pleasantest prospect for those of us who yet can feel upon our lips the pressure of our mothers' goodbye kiss. But, please God, our love of life is not so prized as love of right. In this renaissance of our country's valor, we who will edge the wedge of her assault make calm acceptance of its hazards. For us the steel-swept trench, the stiffening cold—weariness, hardship, worse. For you for whom we go, you millions safe at home—what for you? *We shall need food. We shall need care. We shall need clothes for our bodies and weapons for our hands. We shall need terribly and without failure supplies and equipment in a stream that is constant and never ending. From you who are our resource and reliance, who are the heart and hope of that humanity for which we smite and strive, must come these things.*”

The American foresters who are doing such valiant work in France deserve the hearty support of their friends back home—the members of the American Forestry Association and all others interested in the subject of forestry.

To these men, the members of the Forest Regiments, has been assigned the important task of supplying for the American army and the fighting forces of the Allies the timber needed for a thousand uses in construction work. **BACK UP OUR FIGHTING FORESTERS!**

---

FILL OUT AND SEND THIS FORM WITH YOUR CONTRIBUTION

### Donation To The Welfare Fund For Lumbermen And Foresters In War Service

I enclose check for \$\_\_\_\_\_ a donation to be used for the comfort and relief of the men of the Tenth and Twentieth Engineers (Forest) Regiments.

Name\_\_\_\_\_

Address\_\_\_\_\_

*A list of the donors will be acknowledged in the AMERICAN FORESTRY magazine each month.*

# AMERICAN FORESTRY

VOL. XXIV

JULY, 1918

NO. 295

## WITH THE AMERICAN LUMBERJACKS IN FRANCE

BY W. B. GREELEY, LIEUT.-COL., ENGINEERS, N. A.

**I**F LUMBER will win the war, the Kaiser may as well call it "quits." The American lumberjacks are on the job in France, barring the 95 men who went down on the *Tuscania*. Their April drive netted 14,800,000 feet of lumber, 153,000 standard railroad ties, 103,000 ties for light railroads, and 316,000 pieces of piles, poles, and small round products; and we have hardly gotten started. Already the shipping office, which has the hardest car-supply job a lumberman ever tackled, is working nights to keep the loading ground clear.

As a business concern, we

time of this Major, who heads the 4th Battalion, — Engineers, is spent in signing requisitions or telling the District Commanders that something they want cannot be had and must be done without. The regimental engineer officers are members of his staff, working in and out of Headquarters and a busier spot would be hard to find.

A second Major from the — handles the specifications of the products which are cut, works over the requisitions which pour in upon us from every branch of the army, and places the orders with the various operations. This office also has



EVERY YANK ON  
THE SAW MEANS  
ONE LESS BOCHE  
— THIS IS WHY  
THEY SMILE!



A LOG ON ITS WAY TO THE MILL



FRENCH BIG WHEELS ON AN AMERICAN LOGGING JOB

A LULL IN THE DAY'S OCCUPATION

have an organization which might draw the envy of a Minnesota Line Yard Company. The Colonel of the — Engineers is at the head of it with the Colonel of the — as Assistant General Manager. Both of these officers are shouldering other large responsibilities aside from the work of the Forestry Section. Then come the Department heads, three Majors in charge of Operation and Equipment, Products and Shipment, and Timber Acquisition respectively. Upon the first falls the approval of operation plans, the allotment of saw mills and transport equipment, action upon requisitions for all sorts of technical equipment and supplies, and field inspection of the efficiency of the operations. About sixty per cent of the

the difficult task of rustling cars and keeping our shipments moving to the front and to the various base ports and depots of the American Army.

The Timber Acquisition Department is as far flung as the borders of France herself. In every Operating Dis-

trict, one or more officers are looking up new logging chances. We have timber scouts in the Pyrenees, in the lower French Alps, and in the rough Central Plateau of France where mountain timber and mountain logging are the rule. Three officers represent the Forestry Section in the *Comite Interalliee du Bois de Guerre* which sits in high state and passes upon stumpage purchases or requisitions for all of the allied armies, while a fourth handles our interests with the French *Direction d'Etapes*



FORESTRY TROOPS OF THE AMERICAN EXPEDITIONARY FORCE—USING ONE OF THE TRICKS THEY KNOW

With timber scouts in the Pyrenees, in the lower French Alps and in the rough mountain section of the Central Plateau, logging by the American troops goes merrily on in France, and they find use for every trick they learned in the good old U. S. A.



THIS IS ONE OF THE 20,000-FOOT DAILY CAPACITY AMERICAN MILLS IN FRANCE

Working under tremendous pressure, running day and night, the machinery and men of the Forestry Troops have been severely tested, and have given a splendid account of themselves, with the generous assistance of the French.

which controls forest cessions in the advanced zone. The Timber Acquisition department is responsible for keeping a supply of forests ahead of our saw mills, and at the rate at which our mills and pole crews and tie hacks are eating up the stumpage, there is a hefty job cut out for it.

Aside from these technical departments, our Central Office includes the headquarters of the two forestry regiments with their adjutants and the regimental supply officers who have their hands full in keeping the camps stocked with quartermasters supplies, forage, gasoline and oil, and the like. The forestry operations in France are grouped in districts, each of which conforms roughly to a battalion in troop strength and comprises from three to six saw mills. Our districts now extend well over eastern, central, and southern France. One group of them covers the eastern mountain ranges, from the Vosges down to the edges of the French Alps. These are truly wonderful softwood forests, many of whose dense stands evoke the admiration of even our Pacific Coast lumbermen. This timber is largely silver fir, which is the white pine of France; and the mountain belt forms our best supply of general construction lumber. The region is much like the Adirondacks or White Mountains, though with larger timber, and presents similar logging conditions. Two old-time Pacific Coast loggers are working out the most difficult chance we have with a 2200 foot hoist, which would not be sneezed at even in the Cascades. Sled hauling was possible during a part of last winter and gave our men from Minnesota and Northern New England a chance to show their prowess in this kind of logging.

Another group of Districts stretches over the rolling hills and plateaus of Central France, which offer a wide variety of forests and forest products. The most common timber is oak, usually growing over a thick understory of hardwood sprouts, the principal source of French fuelwood. The initiation of many of our

Northwest lumberjacks was in cutting three or four inch sprouts and even in cutting fine brush and binding fagots. Much of the oak is well suited for railroad ties and this region will be one of the principal sources of the monthly supply of hundreds of thousands of ties which the Railroad and Dock Section requires at the ports and depots of the Expeditionary Forces and for enlarging the capacity of the railroad lines used in forwarding troops and supplies to the front. While waiting for their saw mills, many of our men have been hewing ties with every sort of tool from a French ax,

cast along medieval lines, to a genuine American broad ax. Occasional stands of oak are large enough for bridge and dock timbers, and every log suited to that use must be carefully reserved. The Central French districts also contain many Scotch pine forests, planted for the most part, and from several of these we are getting excellent construction lumber, some large timbers, and even a considerable quantity of piling. The areas of small Scotch pine furnish our main supply of telephone and telegraph poles, corduroy, and wire entanglement stakes. Here is located our principal "pole factory" which broke all records when the sudden call came last winter for 200,000 wire entanglement stakes "tout de suite."

Central France is a region of woodlots. We are developing flying squadrons of small detachments, lightly equipped with bolter mills and motor trucks, to work out the little bunches of tie or pole timber which are almost unlimited. These are the patrols or snipers of the forestry army, and they must be employed more and more largely as time goes on.

A third group of Districts takes in the sandy pineries of southern France where the longleaf lumberman feels at home. The extent and value of the forest resources of this region and the way they have been built up by human thrift and patience have given every one of us a lesson in conservation which will never be forgotten. The

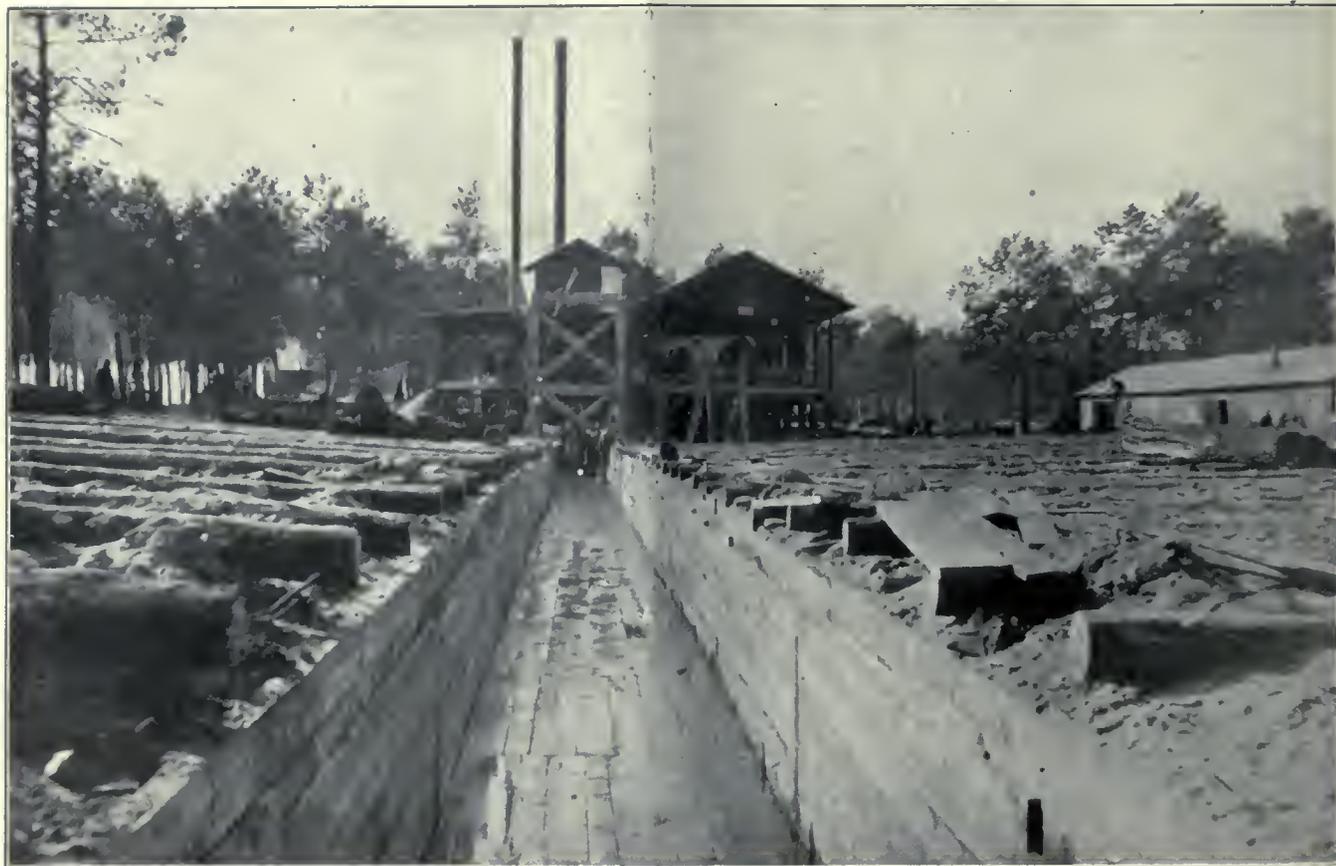


LIEUT.-COL. W. B. GREELEY, N. A.

Recently assigned to a high staff position, Colonel Greeley is attached to the Forestry Section of the Corps of Engineers, American Expeditionary Forces.

forests are of pure maritime pine, which is probably nearly equal to longleaf as a resin producer and fully as good as shortleaf in structural qualities. The timber is usually cut at 55 or 60 years after active resin production ceases. It runs mostly to a good tie size or a little larger, with occasional patches of real saw timber. The southern French pineries are one of our large sources of railroad ties; and the American mills established there are also furnishing a good cut of lumber and timber for the base docks and shortage depots. It is a flat sandy country, rolling up into dunes near the coast. The American big wheels are very much at home there; also the light railroad, which can easily be picked up and relaid. We have scoured France for everything resembling light railroad equipment, from 60 centimeter

first to begin running, were both rated at 10,000 board feet in 10 hours. Once shaken down to their work, both were clipping off from 20,000 to 25,000 feet of lumber in two nine hour shifts, the Central Office egging them on with frequent reports of the good work the other crew was doing. Then A Company put on three seven hour shifts and passed 29,000 feet. B Company came back with a run of 35,600 feet of lumber and 1200 feet of ties in two nine hour shifts, although we suspect an overly careful selection of logs. Monthly figures, of course, tell the real story. One of the 10,000 foot mills of E Company, — Engineers, turned out 448,000 board feet in March and 565,000 feet in April. A second small mill operated by another detachment of this company, with the help of a little French water



ANOTHER VIEW OF ONE OF THE BIG AMERICAN SAWMILLS NOW OPERATING IN FRANCE

This is the mill of C Company, 10th Engineers (Forest), showing flume and log decks. The mills are running at a good clip, the cut of the five larger mills in April alone totaling 6,805,000 board feet.

track with little cars that look like a Christmas toy up to meter gauge roads running anything that had four wheels on it. There is a motley collection in the American logging camps, man trains, horse trains, and real locomotive trains, but they are getting out the logs. Now that our own standardized rail equipment is arriving, the railroad logging is looking up.

The American saw mills are giving a good account of themselves in France. We have worked under tremendous pressure, and machinery as well as men have been severely tested. Keen rivalry between the different companies has put added punch into the game. The A and B Company mills of the — Engineers, two of the

power plant rated at one and one-half thousand feet, cut 647,000 feet of lumber in March and 723,000 feet in April. The 10,000 foot mill of B Company, — Engineers, produced 1,275,000 feet of lumber in the two months. Another mill of the same type operated by B Company, first Battalion, — Engineers, manufactured 525,000 board feet in March and 700,000 board feet in April.

Our larger mills, rated at 20 thousand feet in ten hours, clung to the Atlantic shore for many months, either waiting to join the triumphal entry into Berlin or following the principle that heavy artillery should keep well in the rear. Finally they began to arrive in skirmish formation, first a fly wheel, then a couple of edger saws, then a car-

riage, with the boiler always as rearguard. Meanwhile we grew gray and desperate and worked our hearts out on pitiful little French mills where the logs are fed to the saw by man-power applied to a crank or by the bare hands. At last, however, we have the five 20 thousand foot mills of the — Engineers up and running at a good clip. Their April cut was 6,805,000 board feet, mostly of thin lumber. D Company's mill, which includes a bolter saw and a little French portable rig, led the race with a cut for the month of 1,923,242 feet. F Company's mill came second with 1,525,282 feet. The mill equipment of the — Engineers is coming along somewhat faster, and we were generously helped by the Canadian Forestry Corps with three large and two small mills. At the present writing, we are operating seven 20's and ten 10's, while eight mills of each capacity are being installed. We are also working nine French mills

besides a number of American bolter mills and small French portable rigs.

One must see the enormous scope of the construction work as well as of the military activities of the American Army in France to appreciate its needs for forest products and the exceedingly important part they must play in winning the war. The demands upon our section, in quantities and variety, pass the comprehension of the old-time military campaigner. They range from 100 foot piles to fascines of six foot twigs, from bills of dock and bridge timbers totaling five million feet to basswood cants for the manufacture of artificial limbs by the Red Cross. Construction lumber for barracks and warehouses, standard gauge ties, and cordwood are the great staples, of which we cannot produce too much. Then come the heavy plank for artillery roads, telephone and telegraph poles, short ties for light railroads, and



A FORESTRY CAMP IN FRANCE

Who can make a better camp than a lumber-jack soldier? This is a typical street in one of the camps. The conditions of the soldiers are nearly perfect, as the men are either housed or quartered in such tents as these, floored and walled with lumber affording ample protection.



THE "CAPTAIN," WITH A LOAD OF LUMBER, STOPS TO LET US TAKE A PICTURE

Bringing out the lumber for the construction of barracks and warehouses, ties and cordwood, and the special effort to rush supplies for construction to the American base ports is a strenuous business, but our American boys are making good.

corduroy and wire entanglement stakes by the hundreds of thousands of pieces. We have recently undertaken the manufacture of a large order of excelsior for the bedding of soldiers at the front, and must add probably two excelsior mills to our plant equipment. Our hardest immediate problem is to supply dock materials—piles,

stringers, and caps, for the enormous additional dockage under rush construction at the American base ports. It is a strenuous game, where life-long training in business efficiency and economy must be subordinated to the one goal of *speed*. But the American lumberjacks are right on the job.

## WAR LUMBERING IN FRANCE

A DIRECT ACCOUNT OF THE WORK OF THE 20TH ENGINEERS (FOREST)

BY LIEUT. R. H. FAULKNER

EDITOR'S NOTE—The following article by Lieut. Faulkner, with the accompanying photographs, will be of unusual interest to foresters and lumbermen as indicating the output and character of the lumbering work done by the men of the lumber regiments under war conditions. It also indicates that the men are in good health and well cared for, a large part of which is due to the timely assistance rendered by the Welfare Fund Committee for Lumbermen and Forestry Soldiers.

THE larger and earlier fortunes made by lumbermen in America were due chiefly to the acquirement of vast areas of stumpage at a price so ridiculously low that conservation was a thing to be scoffed at, while today the ever increasing price of stumpage makes necessary the most careful and conservative management.

Could any operator today in the United States of America make a tour of the lumbering operations of the Forestry Regiments, 10th and 20th Engineers, in France, they would see economical operations carried out to the minutest detail. And this is not fanatical conservation, it is not conservation that adds excessively to the cost of production but it is due to an entirely new spirit of lumbering, the spirit of the American forestry troops,

which taboos absolutely the waste of any material which can be of use. And when this is said, in France, it means the utilization of every part of the tree, down to branches only one and one-half inches in diameter.

The American forestry troops are divided into ten districts scattered practically through all timber areas of France and this, by the way, is approximately one-tenth of the total area of the country. These ten districts are divided into about forty operations ranging in size from small pole, piling and tie cutting to the operations of 20 thousand capacity mills, running night and day shifts.

There is a great variety in the species of timber over here, with the consequent variety in operating conditions. There is everything from a spruce forest, with



ONE OF THE AMERICAN LOGGING OPERATIONS IN FRANCE

Notice the method of handling the logs, and their size. This is one of the saw mills operated by the Forestry Troops of the American Expeditionary Force, where we find a wonderful example of economical utilization down to the smallest detail.

logging conditions quite similar to those in the Adirondack Mountains—to the maritime forests, almost identical to the pine found in southern Georgia.

The maritime pine forests in France cover approximately 2,500,000 acres and contain about 130,000,000 trees. The stand varies from approximately 6,000 to 15,000 feet, board measure, per acre. While there are some very large blocks of solid timber it is against the custom of the country to allow the cutting of great single areas, particularly for the reason that the peasantry in the maritime pine section are practically dependent upon the resin industry. Consequently, while there is quite a bit of timber available for American exploitation, it is meted out, as a general rule, in small *parcelles*, necessitating the installation of portable ground mills. The American forestry troops in the pine country here, are cutting, besides lumber, a great quantity of round timbers, ties, trench props and wire entanglement stakes. There is absolutely no waste, for all slabs and limbs are cut into fuel wood.

There was a popular idea expressed by lumbermen in America before the departure of the first forestry battalions, that the cost to the Government to produce lumber with the engineer troops in France would be tremendous. Several wiseacres went so far as to predict the approximate cost and the writer heard a very well-known



A FAMILIAR SIGHT IN A STRANGE LAND

In use on an operation of the 20th, these "big wheels" look like they might be busy in the piney woods of our own Southland instead of in sunny France.

American lumberman say, last summer, that it would cost the Government \$200 to \$300 per thousand to produce lumber in France. As a matter of cold hard fact it is a well-established point here now, that the forestry units of the United States Government are a remarkably good investment. The primary purpose of rapid production to meet immediate needs in the most economical manner by sending the men to France has been much

more than satisfactorily realized. When the war is over, there will be returned to the lumber industry of America approximately 20,000 men who are, through their training and experience over here, the last word in logging and lumbering efficiency.



Committee on Public Information

AN AMERICAN OFFICER BEFORE HIS DUGOUT

This village in France was under fire at the time the picture was taken.

The condition of the troops are nearly perfect, everything that could be desired. The men are either housed or are quartered in tents floored and walled with lumber. They are well-equipped with proper clothing and effects. Each camp has shower baths. The large size appetite that accumulates in a lumber camp is very satisfactorily treated three times a day with good, substantial, clean and well cooked food.

Then there is the Y. M. C. A. with the attendant convenience and comforts afforded by this institution to counteract the "blues"—the canteen for tobacco and sweets; books, magazines, free stationery, etc. There is always great interest in the athletic contests conducted by the "Y," in baseball, track, tennis, etc.

Besides the music by the various battalion and regimental bands, numerous vocal and instrumental musicians, American, French, English and Italian, some of whom have attained opera fame, appear at regular in-

tervals to share their splendid gifts with "the boys."

Between times, in the different companies, impromptu quartettes chant American favorites, accompanied, perhaps, by a mongrel stringed orchestra. The "local talent" is varied and is always an interesting and important part of any camp.

The men that make up the forestry troops are a strong and hearty type and their patriotism and their attitude toward one another and toward their organization is most admirable. Just to relate a single instance—twenty-

five men of one of the companies went out one evening without orders and on their own free initiative cut one hundred and twenty-five ties. One man can cut twenty-five ties in a day here. The lumberjack, though he represents a non-combatant branch of our great army, has done and is doing his full "bit." His relative importance to our success in this tremendous conflict is real and each man in the United States forestry troops can rightfully feel proud and happy to hold a place in this branch of the service.

## THE FORESTRY TROOPS IN FRANCE

BY FRANCIS KIEFER, CAPTAIN, ENGINEERS, U. S. R.

**W**HAT the American Forestry Troops are doing in France is told in a measure by the production report of April 30, which shows the following totals:

Lumber .....	26,176,000	feet b.m.
Piling .....	5,214	pieces
Fuelwood .....	14,360	ords
Standard Gauge ties.....	257,186	pieces
Small ties .....	196,368	pieces
Miscellaneous round products.....	1,099,368	pieces

These figures may mean little or much depending upon your view point. By that, I have in mind the conditions under which the material making these figures was produced. Forest exploitation as generally conceived in the States is a pioneer undertaking of the first order, accomplished in wild regions removed from the centers of population, wherein pure sweat and brawn count more for the success of the enterprise than any other factor. This in a large degree is true and the training our men of the woods have had in that respect is one of the

reasons why they are able to boast of this accounting.

As a sample of that, because it comes handy, I mention the performance of the 20th Regiment Engineers. Upon their landing in France, they started in as though the success of the Allies depended entirely upon them. Exactly eleven days after the —th landed, they were actually stacking ties on the railroad right-of-way in well established fashion just as though they had been logging there a year instead of only eleven days. They had mighty little equipment then and carried the ties out by hand. Moreover, thirty-five days after breaking camp at American University and precisely eighty days after the —th was formally authorized, this outfit sawed their first board in France. However, it wasn't a board; it happened to be a 2" x 4" which may be a mere matter of chance, but there is some doubt about that feature of it. The Major is rather suspected of having it purposely cut to that dimension for convenient paper weight size.

At any rate he proudly uses his portion of it for that purpose during the short intervals he is at his desk.

Mentioning "first boards," it should be said that the first board cut in France by the American Expeditionary Force Forestry Troops with a sure-enough American mill came from



FORESTRY TROOPS IN FRANCE AT MESS

THIS IS WHAT MR. HOOVER DOES WITH SOME OF THE FOOD HE SAVES. AT THE LEFT IS SEEN A LOG RAMP AND FLUME AT THE MILL OF COMPANY C, 10th ENGINEERS (FOREST).



— detachment, Company E, — Engineers. Major —, on the other hand, claims the distinction for the 2nd Battalion, — Engineers, of having sawed the first board with the all mighty twenty thousand-foot daily capacity mill. But that is a touchy point, better left unsaid perhaps, because there isn't a man in the organization that does not possess splinters from the first board and they all come from different mills and different units! It is not my purpose to start a controversy on who sawed the first board, but simply to show the spirit of friendly though lively competition that exists, which illustrates the force that the men are putting into their work. Nevertheless, I have started a controversy: Captain — insists upon the inser-

tion here of a corrected statement to the effect that the honors go to Major —, of the 1st of the 10th Engineers, regarding the "first" board from the twenty thousand-foot mill. Here it is. It's inserted. At the peril of my life, I have opened the discussion that never will be settled as long as there are Forestry Troops alive to talk about it.



SCENE AT ONE OF THE LUMBER CAMPS

The housing is very substantial, and each camp has its own shower bath. The men that make up the forestry troops are a splendid type and they are kept comfortable and well cared for. Their patriotism and their attitude toward each other and their organization is most admirable.

— insists upon the insertion here of a corrected statement to the effect that the honors go to Major —, of the 1st of the 10th Engineers,

for the makeshift bridles were made from 60D nails. In ordinary times one might have waited for the neces-

While sweat and brawn enter into this sort of action, impelled by inspired determination to drive the Kaiser into the last ditch, it also involves a degree of ingenuity, as in the instance of improvising harness with any sort of material that may be at hand. One of the Forestry units, it doesn't matter which one, its merely a sample of what they all have done in one way or another, failed to be supplied with harness promptly. Undaunted, the boys set to making breast straps of grain sacks, tugs and reins of rope, and bits



TYPICAL ACTIVITIES AT ONE OF THE LOGGING OPERATIONS IN FRANCE

Except for the tents, this scene might be found at many small lumber operations in the States, but it is really a camp of one of the lumber regiments in France where our American boys are working strenuously to produce the wood so badly needed by the allied armies.

sary supplies to come along. But that isn't the present spirit of these lads. Production is what they are working for and production to them means nothing unless presented in the concrete form of ties, lumber, road plank, trench props, cord-wood, fagots, piling, poles, or wire entanglement stakes. With reference to en-

entanglement stakes, one recalls with serious amusement the "Rush" order that came over the wire from "Up Front" one day for an unlimited number of entanglement stakes. They were needed in a hurry! Our boys started in to thrash the Kaiser with entanglement stakes. They tackled the job with mighty little equipment; wagons, horses and motor vehicles were lacking; but no matter, a standing order was issued that no man should return to "Mess" from the woods without all the entanglement stakes

he could pack on his back. So in less time than it takes to say it, stakes were pouring out of the woods on the backs of men in an endless ant-like stream; stakes were moving forward from every quarter. That the job had been well done in short order is told by the wire that came back, "Stop sending stakes, can't use any more."

Major —, who has a group of operations made up of detachments from the 10th and 20th Regiments and the 503rd and 507th Service Battalions, received a dispatch at another time to furnish poles, as many as he could as soon as possible. This again was before the rest of the American Expeditionary Forces knew what

we really could do. After about two days of a deluge of poles, just when the Major had things organized in his own inimitable way to win the war with poles, a dispatch flashed in, "Flooded with poles, cancel further shipments."

No end of such tales can be told and one leads to another. Along about the same time, the wire brought in an order for 10,000 ties with which to construct a railroad spur at a hospital that was being put up in a rush. In six days those ties were made without a broad ax in the outfit, ordi-

nary single and double bitted chopping axes did the business.

It is a paradox of pioneering in an old and densely settled region, using the equipment our ships are able to bring us across three thousand miles of sea, and accepting in the meantime the generous assistance of the French.



A FRENCH "DINKEY" IS ENLISTED

Always generous in their assistance, the French, in a time of need, lend the American boys an engine to bring in a big load of logs.

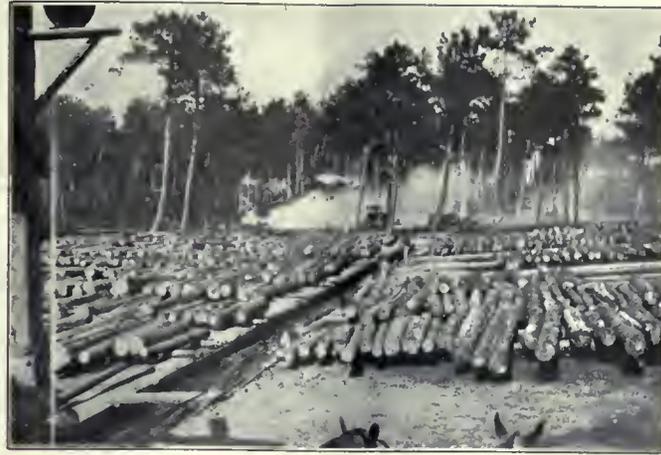


Underwood and Underwood—New Zealand Official Photograph

UTILIZATION IS THE WATCHWORD OF THE LUMBER AND FORESTRY ARMY

And here we see timber which has been salvaged from German dug-outs and cut up in the saw-mills of the New Zealand Tunneling Company to be used in the construction of dug-outs for our troops.

This is the view point from which we regard those production figures over here, which is shared at least by those in the States who selected and are giving their tireless and skillful attention to sending the Forestry Troops their supplies. "When you get over there, you'll be a long way from home and mother, boys." When he said that, Major Long showed that he had a good conception of the forestry task in France.



JUST AT TWILIGHT

This shows the skidways at one of the 20,000-foot American mills in France, 1st Battalion, 10th Engineers. Ready for the night run.

So a total of 26,000,000 feet of lumber to April 30 is a figure the troops are justly proud of as far as

they have gone; they are now getting nicely into their stride. There is no telling what they will do when all of the mills get under way. The monthly outputs have been increasing constantly by leaps and bounds; in March the reports showed 6,965,000 feet; in April 14,578,000 feet. The forecast for May is 15,000,000 feet. It is just to be plainly seen now that with the full complement of equipment rapidly coming into play, with the sawmills buzzing day and night, Uncle Sam soon will be able to rout the Germans with the lumber he is putting out.

## DONATIONS TO THE WELFARE FUND FOR LUMBERMEN AND FORESTERS IN WAR SERVICE

**A**MERICAN FORESTRY will publish each month the list of those making donations to this fund. Many of the donations from members of the American Forestry Association so far received were made without solicitation and were inspired by reading in the magazine that a relief and comfort fund for men of the forest regiments was being collected. Many substantial contributions are being received from the Forest Service and from lumber companies and lumbermen following requests sent to them by the Secretary of the Welfare Fund for Lumbermen and Foresters in War Service, by the lumber organizations of which they are members, and by the committees of lumbermen which had charge in various sections of the United States of securing enlistments for the forest regiments.

Contributions to the Welfare Fund to June 20, 1918, are as follows:

Previously acknowledged .....	\$19,497 06	Nelson, John M., Jr.....	5 00
Carpender, Mrs. Charles J.....	4 00	Henry B. Newhall, Jr.....	10 00
Eckert, Harry K.....	3 00	Soble, John J.....	2 00
Geisler, Max .....	5 00		
Gunnison National Forest.....	18.00	Total.....	\$19,544.06

### WORK OF THE WELFARE FUND COMMENDED

**L**IEUT.-COL. W. B. Greeley, attached to the Forestry Section of the Engineer Corps, and in direct touch with the boys of the lumber and forest regiments now at work in France, writes as follows to the Committee having in charge the Fund for the Welfare of Lumbermen and Foresters in War Service:

"I want to tell you also of my very deep personal appreciation of the admirable work done by the foresters and lumbermen of the country through the 'Welfare Fund' and to express my thanks to yourself and your associates. Thanks to your efforts, our troops are being splendidly supplied with recreational facilities and personal comforts; and I can assure you that they are mighty welcome to our men. The average soldier suffers more from lonesomeness than anything else. The arrival of a mail train brings us all a thrill of expectancy like that of children called to a Christmas tree. It means a great deal to men under these conditions to know that old friends and new friends at home are remembering them, wholly aside from the comfort and recreations made

possible by your generous gifts. I hope and intend that you will hear from me more frequently in the future. I am reading the numbers of American Forestry with more than the old-time appreciation and enjoyment. It is certainly holding up to its possibilities splendidly."

### A NEW USE FOR DOUGLAS FIR

**Y**ET another use has been discovered for Douglas fir—the principal forest product of West Oregon and Western Washington. The United States Steamboat Inspection service at Washington, D. C., is preparing to make elaborate tests of Douglas fir with a view to its extensive use for the manufacture of oars for naval, emergency fleet and merchant marine use.

This only goes to prove once more that Douglas fir is one of America's most useful woods. The possibility of Douglas fir oars was called to the attention of the Government last fall by the New York Boat Building Company, which previously had been in correspondence with the West Coast Lumbermen's Association on this subject and had made up a number of fir oars which proved to be highly satisfactory.

## ENGLAND'S FUTURE FORESTS

SINCE the outbreak of war, the need for conserving and augmenting the supply of home-grown timber in England has been amply demonstrated, and the possibilities in this direction are fully explored in the report which has just been presented by the Forestry Sub-committee of the Reconstruction Committee, says the London *Daily Telegraph* of January 9. They strongly urge the adoption of a State afforestation policy, both as a measure of war precaution and as a means towards national improvement and social benefit, pointing out that the case for such a policy, on these as well as on financial grounds, is well-nigh unanswerable.

A scheme of State planting is therefore recommended which in an emergency would keep the United Kingdom independent of imported timber for three years on a present-day war basis of consumption. The total cost for the first ten years would be about £3,500,000, allowing not only for the direct cost of afforestation, but for all incidental charges for administration, education, and research. It is estimated that there are not less than three and probably more than five million of acres of land utilized for rough grazing, but capable of growing first-class timber of the same character as that imported. Of this area 2,000,000 acres could be put under timber without decreasing the home production of meat by more than 0.7 per cent, and it would ultimately give employment to at least ten times the number of men now employed by grazing.

Below are the principal points of the scheme recommended by the sub-committee:

It is proposed to afforest 1,770,000 acres. Taking eighty years as the average rotation, two-thirds of the whole should be planted in the first forty years.

From the fifteenth year onwards the scheme would begin to provide pitwood from the quicker growing species on the better kinds of mountain land.

By the fortieth year the plantations made in the first ten years alone would contain enough timber to keep our pits supplied in emergency for two years at the present rate of consumption.

The total cost for the first forty years may be £15,000,000. After that time the scheme should be self-supporting.

The whole sum involved is therefore less than half the direct loss (£37,000,000) incurred during the years 1915 and 1916 through dependence on imported timber.

A Forestry Commission (represented in the House of Commons) would have charge of the work, and there would be Consultative Committees for England, Wales, Scotland, and Ireland.

It is estimated that the scheme would result ultimately in the settlement on the land of not less than 25,000 families, or 125,000 persons in all.

More important from a war point of view than the enormously enhanced cost of imported timber in 1915 and 1916 was the amount of tonnage absorbed by these imports,

which the report states at 7,000,000 net tons of shipping, equivalent to approximately 14,000,000 tons dead weight.

It is pointed out that should the Government wish to employ the maximum number of men discharged from the services during the period of demobilization, the rate of planting might be greatly speeded up. The sub-committee propose that at least 150,000 acres of the initial 250,000 should be planted by direct State action, and that for the remainder (left to local bodies and private land-owners) there should be State assistance and control.

It is suggested that the Forestry Commission should consist of six members, three of them whole-time salaried officials, the others unpaid. For carrying out the scheme forest officers, foresters, and foremen would be required, and would have to be trained. It is recommended that the Commission should undertake the general control of forestry education, and should maintain "demonstration woods" for practical work.

Touching on the present position of our home resources, the sub-committee states: "The war has disclosed no demand which could not have been satisfied by timber grown in this country with its favorable soil and climate and abundance of waste land. It is only a question of time before the whole of the country's growing timber which is fit for commercial use must disappear. The result is a depletion which the Government cannot afford to neglect. This country, poorer in timber at the beginning of the war than any other European country except Portugal, will be more destitute still at its close. Even if every acre felled is replanted, it will be many years before the present output can be repeated."

The sub-committee point out that, among other advantages which may be expected from the adoption of an extensive national scheme of afforestation are the following:

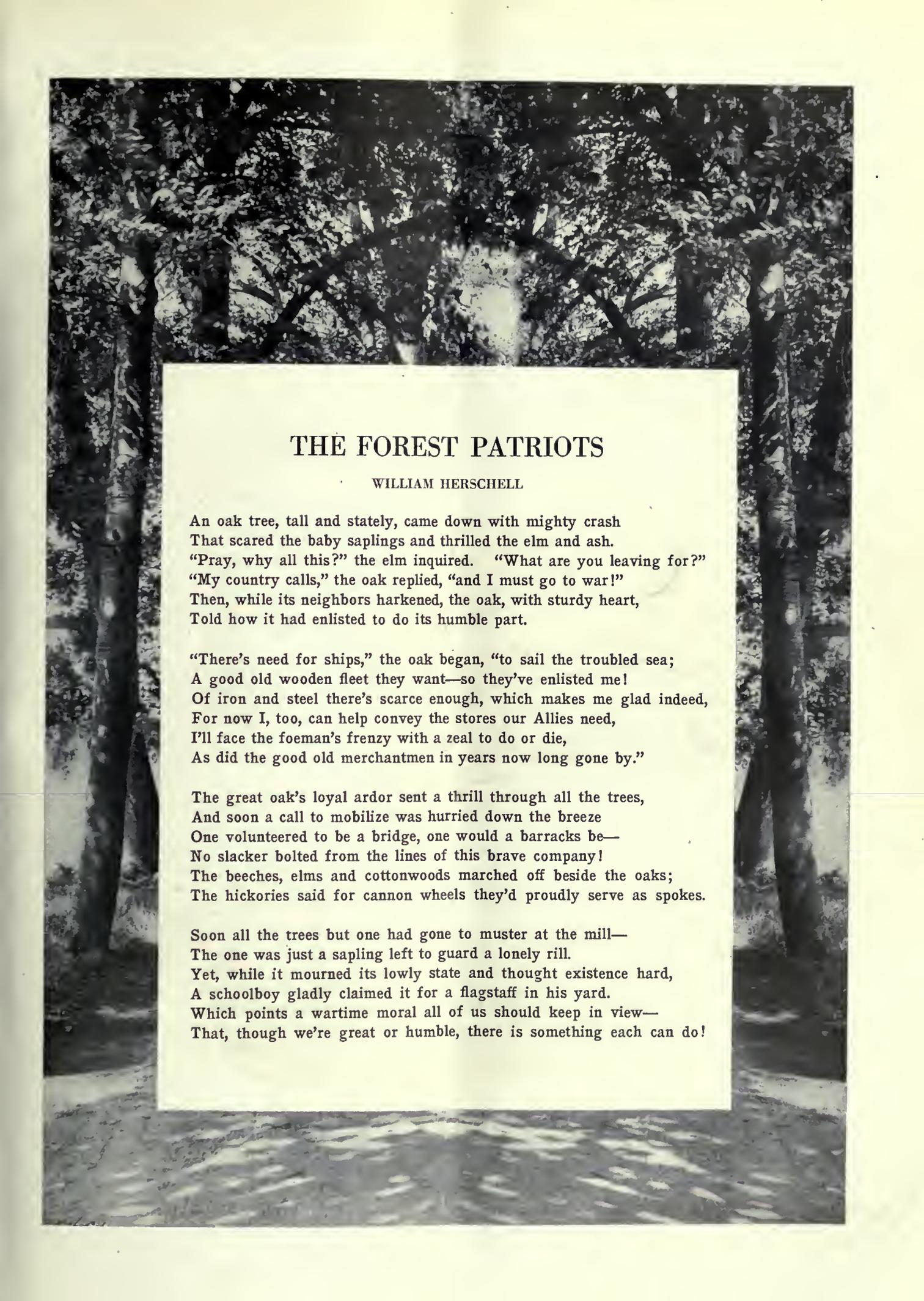
That by afforesting only a portion, namely, 2,000,000 acres, of the 4,000,000 or 5,000,000 acres available (without encroaching on food producing land, we should, in from fifty to sixty years, be largely self-supporting in the matter of timber, both for military and commercial purposes, and to a great extent independent of imported timber.

That this would result in: (a) The retention of money at home for expenditure on a home industry of great importance; and (b) The profitable utilization of very considerable areas of land in this country now almost entirely unprofitable.

That afforestation would provide employment for an increased rural population, and that such population would also be available for agriculture and food production, either on farms or small holdings.

That the employment of a larger rural population under the best and healthiest conditions would result in great benefit to the general health and well-being of the nation.

It is announced that the Minister of Reconstruction is now giving careful consideration to the report with a view to ascertaining how far and by what means effect may be given to the sub-committee's recommendations.



## THE FOREST PATRIOTS

WILLIAM HERSCHELL

An oak tree, tall and stately, came down with mighty crash  
That scared the baby saplings and thrilled the elm and ash.  
"Pray, why all this?" the elm inquired. "What are you leaving for?"  
"My country calls," the oak replied, "and I must go to war!"  
Then, while its neighbors harkened, the oak, with sturdy heart,  
Told how it had enlisted to do its humble part.

"There's need for ships," the oak began, "to sail the troubled sea;  
A good old wooden fleet they want—so they've enlisted me!  
Of iron and steel there's scarce enough, which makes me glad indeed,  
For now I, too, can help convey the stores our Allies need,  
I'll face the foeman's frenzy with a zeal to do or die,  
As did the good old merchantmen in years now long gone by."

The great oak's loyal ardor sent a thrill through all the trees,  
And soon a call to mobilize was hurried down the breeze  
One volunteered to be a bridge, one would a barracks be—  
No slacker bolted from the lines of this brave company!  
The beeches, elms and cottonwoods marched off beside the oaks;  
The hickories said for cannon wheels they'd proudly serve as spokes.

Soon all the trees but one had gone to muster at the mill—  
The one was just a sapling left to guard a lonely rill.  
Yet, while it mourned its lowly state and thought existence hard,  
A schoolboy gladly claimed it for a flagstaff in his yard.  
Which points a wartime moral all of us should keep in view—  
That, though we're great or humble, there is something each can do!

## A MONUMENT TO SEA GULLS

BY H. E. ZIMMERMAN

A REMARKABLE monument now has place on the grounds of the Mormon temple in Salt Lake City, Utah. It is a shaft that cost \$40,000, and was raised in honor of the sea gull. Because such birds saved the Mormon pioneers from a plague of grasshoppers they are regarded with a reverence almost equal to that paid to the sacred cow in the Orient. It was when the Mor-



THE MONUMENT

For sheer beauty of design and purity of outline, it would be difficult to find the peer of this monument, erected in honor of the gulls.

mons had first come to the Salt Lake Valley, in 1848, that the grasshoppers visited them. They had much difficulty in irrigating the arid land of the Salt Lake Valley, and their food supply was almost exhausted before the time for the first harvest. Then the pests appeared

and it seemed that everything would be destroyed, and that they must face starvation. Flocks of sea gulls, however, came from the great Salt Lake and elsewhere and, showing no fear of the people, destroyed the grasshoppers. At the time the Mormon leaders declared that this was a sign from Heaven that they had come to the chosen land of modern days, and later generations have not been permitted to forget the miracle. The laws of Utah provide severe penalties for any one who kills a sea gull, and they have been permitted to breed unmolested about the inland sea.

The State would have helped pay for this shaft, but the church declined aid. The sculptor chosen was Mahonri Young, a grandson of Brigham Young, who has studied in Paris, and whose work is known among artists abroad as well as in this country. In recent years he has lived in New York.

The monument is 36 feet high, and is surmounted by a ball of granite from the Utah mountains, on which a huge gull, fashioned from pure white marble, alights. The square base of the shaft has four beautiful panels. One shows a pioneer camping for the first time in the valley. The second shows him following a plow, in turn followed by gulls; the third shows a harvest scene with the gulls eating the grasshoppers, and the fourth tells of the miracle of the gulls' visit.

## GOVERNMENT JOBS FOR QUALIFIED MEN

THE United States Civil Service Commission announces that the Department of Agriculture is in urgent need of assistants in white-pine blister-rust eradication, at entrance salaries ranging from \$1,200 to \$1,440 a year. These positions are open to men only. The duties of assistants in white-pine blister-rust eradication are scouting for white-pine blister-rust, directing squads of men on blister-rust eradication, and in some cases conducting, under supervision, investigations of methods of eradication of this disease. For these positions certain specifications are made as to education and experience. Applicants will not be required to report at any place for scholastic tests, but will be rated upon their education, training and experience, as shown by their applications and corroborative evidence and upon these submitted with the applications. Full information and application blanks may be obtained by addressing the United States Civil Service Commission, Washington, D. C., or the secretary of the board of U. S. Civil Service examiners at Boston, New York, Philadelphia, Atlanta, Cincinnati, Chicago, St. Paul, St. Louis, New Orleans, Seattle or San Francisco.

## RICHARD T. GUTHRIE DECORATED

CAPTAIN Richard T. Guthrie, formerly Forest Examiner in District 2 of the U. S. Forest Service, now a member of Battery E, 17th Field Artillery, which is brigaded with the French Army, was decorated on May 7th with the Croix de Guerre. Captain Guthrie resigned from the Forest Service early last spring and entered the regular Army.

# CONSERVING OUR FOOD SUPPLY

BY CHARLES LATHROP PACK

PRESIDENT, NATIONAL WAR GARDEN COMMISSION

**J**UST the other day Mr. Hoover, the United States food administrator, warned the American people that in spite of a promised bumper wheat crop there would be no relaxation in the regulations affecting the use of this cereal.

What does this mean? It means that conservation of food must continue. There must be no let up in the fight to keep ahead of the threatened famine which is ever stalking close in the rear. If there is to be a constant and steady supply of food for shipment to Europe to take care of the Allies and the American army, there must be saving here.

How near famine comes to the peoples of Europe is pointed out in an editorial in a recent number of the continental edition of the American Daily Mail, pub-

lished in Paris, which declared that England must be "prepared not for the best but for the worst," and then added: "When we are told by those who are best qualified to judge that we may be compelled during the next twelve months to eat potatoes instead of bread, we have got to make sure of the potatoes. In the days to come they may stand between us and starvation."

It is only by conserving during the summer that a sufficient supply can be laid aside for winter use. If there were no looking ahead, if all the crops were consumed as fast as they ripen or allowed to go to waste, grim famine would soon have the entire world in his grasp. Even after the war's end the food situation will be critical for a long time, for it will be many months, years in hundreds of thousands of cases, before the men

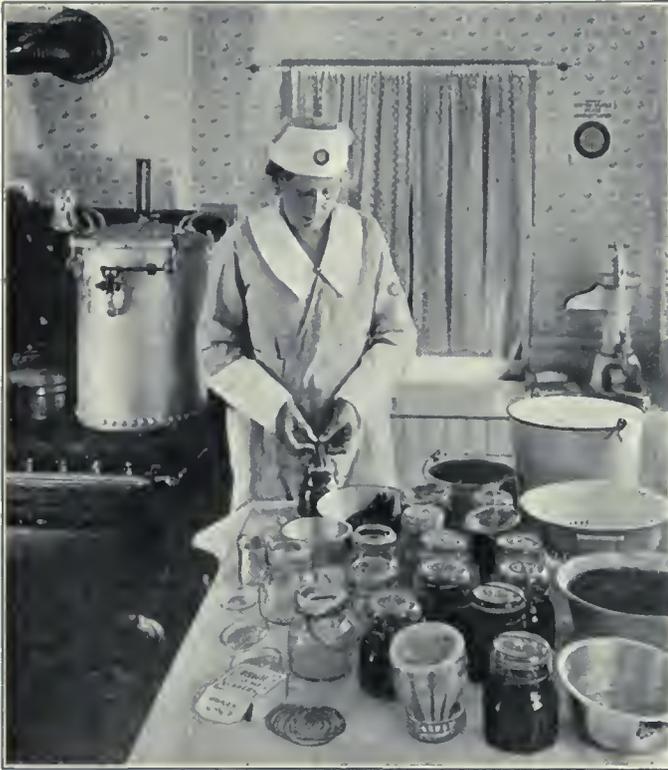


IN THE SECOND LINE OF DEFENSE

In thousands of homes all over the United States strong, true, loyal-hearted women are hard at work helping to win the war. They know that the work they are doing in the "kitchen trenches" is just as important as that which their sons and brothers and husbands are doing at the front. This shows a southern war gardener, Mrs. George Calhoun, of Murfreesboro, Tennessee, preparing for a large supply of Food F. O. B. the Pantry Shelf.

are back in normal channels of productive labor. Conservation must continue not only during the war but after its close, if the needs of the various peoples are to be taken care of.

The people of the United States have had the necessity for conservation called to their attention in many ways. They have not felt the food shortage as have the inhabitants of many other countries. In England, for



SHE HAD NEVER CANNED BEFORE

Mrs. John Totterdale, of Stafford, N. Y., whose husband does the war gardening end of the work, confesses that she had never had any previous experience in canning until the importance of raising and saving food in this way came to her attention through the campaign of the National War Garden Commission. Her case is like that of thousands of other American housewives who are doing their share in spite of previous inexperience to help in the great fight for right and freedom.

instance, so great is the shortage of meat that people buy bones at the butcher shops at the rate of five pounds for one shilling. In the United States bones and even precious scraps of meat go into the garbage pail. But more and more have the people here come to realize the vital part they can take through conservation in helping to win the war.

The demands of Europe have become more and more pressing and with a constantly increasing American army on foreign shores, the call for food has grown. The French army had prepared this summer to take care entirely of its need for vegetables and greens through the war gardens which had been planted back of the line; but these along with a lot of land which the British army was cultivating for a similar purpose were destroyed in the German drive. This meant that the food had to be procured from other sources.

The American army has set a fine example to the people of this land. The soldiers are helping to feed themselves. War gardens have been planted at most of

the camps and much of the food now being grown there will be stored away for winter use. This work was started at Camp Dix, New Jersey, where early in May the National War Garden Commission planted a "real war garden" of 400 acres. Similar projects were soon under way at other camps. With the American soldiers ready to serve their country not only in the fighting line but in the production and conservation of food, the duty of those back home is plain. If the war is to be won there must be continual saving. All the products of the summer gardens that are not needed as they ripen, must be preserved for winter use. There must be "winter gardens" on the pantry shelves as well as "summer gardens" at the kitchen door. The garden can be made to supply a large part of the family's food during the entire twelve months of the year.

In looking back over the four years which have passed since the titanic struggle began, we see how each year there has been less to eat and prices have been higher. It is not a temporary or local scarcity with which we



BACKING THE BOYS "OVER THERE"

This is what all the women in the United States are doing who are helping to save the food which is grown in the war gardens so that the vegetables may be substituted as far as possible for the beef, wheat and other concentrated products which must be shipped abroad. This shows Mrs. E. Guy Mundy, of Mt. Carmel, Illinois, busily engaged in packing away "ammunition" for future use.

have to deal. On that account it is not enough for anyone to conserve merely what may be needed for his own or his family's use. If there is more surplus from the war garden than the individual needs, the balance should be given to some one else, sold or conserved by canning or drying for some future use.

Reports to the National War Garden Commission, which is affiliated with the American Forestry Association through its Conservation Department, indicate that

the big record made last year in the home conservation of food will be far surpassed this season. These reports show that there will be at least a doubling in the amounts of vegetables and fruits canned and dried. Last year there were between 450,000,000 and 500,000,000 jars of garden products stowed away on the pantry shelves. The summer and fall of 1918 will see more than a billion cans thus saved.

are allowed to do their canning in the company's kitchen.

This work can be carried on at little expense, as a small shed somewhere near the factory serves for the purpose and the water needed for the canning is heated by waste steam from the factory. Necessary material is furnished to the home food conservers at cost, and local food conservation committees and others interested in this end of the campaign can co-operate and assist.



A WAR GARDEN CANNING PRIZE WINNER

Mrs. Mary Williams, of Danville, Illinois, was an inspiration to the women of her community in the home production and conservation of food. Fifteen ribbons to her credit attest to the merit of the canned vegetables and fruits which were stored away on her pantry shelves, these being the surplus products of her war garden.

Canning kitchens and plants have been established in many places by large manufacturing concerns who are helping their employees not only to plant war gardens but to preserve all the surplus supply for winter use. Frequently this is being made more or less of a community affair, and as the opportunity offers people in the neighborhood who are not employees of the plant

A quite complete illustration of what industrial concerns are doing in this direction is furnished by Wright Shovel Company, in North Anderson, Indiana. Arthur B. Birge, manager, recently purchased a complete canning outfit and had it installed in a summer kitchen, screened all around, clean, sunny and sanitary. He ordered a large supply of cans which will be furnished

at cost to all those taking advantage of the company's offer to use its canning kitchen.

A capable woman has been placed in charge to instruct those who need help in their work, who will give instructions in the cold pack method of canning vegetables and will teach the wives and daughters of the employees the best way to preserve vegetables and fruits. Food Inspector Teasley, the food conservation committees and others interested have been authorized to participate and assist in this community canning enterprise. A report from Mr. Birge shows that the company feels assured "of well fed, happy, healthy employees for the next winter."

Through the establishment of canning kitchens and community demonstrations and lectures explaining the methods of preserving vegetables and fruits, by the work they are doing in their own kitchens, by the words of patriotic encouragement they are giving to their friends and neighbors, by talks before clubs and at schools, and in various other ways, the women of the country are doing their part in the most essential work of saving the products of war gardens.

Instance after instance is recorded of home gardeners who had never before done a stroke of garden work who not only supplied their summer needs but who put up enough of the surplus to last them through the winter and until well into the summer season this year. The value of this, not only to the individual but to the nation, has been vividly impressed upon hundreds of thousands of other food producers this year.

"Keep the Home Fires Burning" has taken on a new meaning. Over those sacred patriotic fires the women of America are preserving the food which is being grown in their war gardens so that there may always be plenty for the boys "over there" and that they may never go without their "chow." When Pershing flashed his message across the Atlantic to "Keep the Food Coming," the

women responded to the call by getting the home canning outfit ready. While there are many other lines of work in which they are helping to win the war, they have realized that none is more important than that of adding to the nation's food supply. And so they are donning their aprons and caps, getting out the old wash boiler and going in for canning and drying.

"We would never have thought of raising our own vegetables except for the war," writes Mrs. W. C. Norris,

of Youngstown, Ohio, to the National War Garden Commission in a report on her garden and canning work. "It will interest you to know how I used the same space over and over again. It is marvelous the quantity we raised on so small a patch of 'waste ground.' My children and myself won prizes on canned vegetables.

"Our garden tract consisted of a small plot of ground about 50 feet wide by 120 feet long which was formerly a piece of neglected ground covered with wild grass and weeds. From early spring till frost we had a continual and bountiful supply of the following: green onions, beets, white cabbage, potatoes, lettuce, carrots, red cabbage, sugar corn, peas, tomatoes, navy beans, turnips, celery and string beans. We also raised a large quantity of sunflowers for seed to feed the chickens and which added considerable beauty to the garden.

"We put in the cellar the following raised from this garden: 32 pumpkins, 10 bushels potatoes, 1 bushel carrots, 1 bushel turnips and 5 quarts navy beans. In addition I also

follows: 35 quarts tomatoes, 10 quarts cold packed beans, 1 gallon salted string beans, 4 quarts string beans pickled, 6 quarts pickled beets, 6 quarts mixed vegetables for soup. I am very thankful for this opportunity to do something for the welfare of our country."

"I had to learn by experience," writes Mrs. John Tottendale, of Stafford, New York, and then she goes on to tell of the great variety of vegetables she put up



*Official Press Bureau, London*

#### BUTCHERS' STALLS QUICKLY EMPTIED

With only a small quantity of meat on hand to start with, it is not long each day before the shops of the British food merchant are empty. Not a scrap of any kind is allowed to go to waste. It cannot be expected that a country in such straits to feed herself can be expected to contribute to the support of hundreds of thousands of American troops now on the other side; and so the people here must save to "keep the food following the flag."

in one season alone, more than twenty different kinds.

One thousand quarts, including 126 varieties, was the record from the war garden of Mrs. E. M. Hunt, Denver, Colorado.

These are samples selected from among thousands reported to the National War Garden Commission of the way in which the home food producers have been making their gardens supply not only their summer but a large part of their winter needs. Practically all of the women use the cold pack method in their canning. From

Hamilton, who is city director of food production, is giving practically all her time to the war garden campaign, boosting not only the growing but the conservation of garden products.

Two of Mrs. Hamilton's four sons are in the military service of their country; and the only reason the other two are at home is because they are only nine and eleven years of age respectively. In a report to the Commission Mrs. Hamilton states that she has placed more than 11,000 vacant lots, equivalent to 600 acres, free of cost.



Official Press Bureau, London

#### WHY AMERICA MUST SAVE

In England they are selling bones for food. The little boy here shown is looking over a "tempting display" of bones which are offered for sale at the rate of five pounds for one shilling. In the United States bones which could be used for soups and even precious scraps of meat still go into the garbage pail.

coast to coast women are actively engaged in the work and encouraging others.

Mrs. James Hamilton—no it's Major Hamilton, commander of the brigade of women who constitute the Oakland, California, women's army of the national and state councils of defense—offers a fine illustration of the vim and the enthusiasm which is being shown by the women in keeping the food following the flag. Mrs.

Twenty-seven propagating beds were loaned by the City Park Board to help in getting the gardens started. Mrs. Hamilton was well fitted to take charge of this work, having completed three courses in agriculture in the University of California, while she is now completing a fourth.

"Besides having an abundance of fresh vegetables for the table all summer and fall I canned 327 quarts, and

in that quantity I have such a variety that we never tire of them," is the report from Mrs. H. E. Newton, of Mansfield, Missouri. From Fredericktown in the same state comes word that the Union Homemakers' Club canned 5,760 quarts of vegetables and fruits, an average of 378 quarts to each family.

Mrs. Newton goes on to explain that they were only "amateur" gardeners, and that their only expenditure was \$1.85, of which one dollar was for ploughing and 85 cents for seeds. There was not a square foot which did not raise at least two crops; and in addition to the supply for the summer table and the large amount she canned, a considerable amount was sold.

"All of my canning was done in a home-made outfit, a wash boiler with a wire frame made to fit it," she says. And therein lies one of the fortunate features of the work. It is so simple that no house keeper need have any hesitation about tackling it. The few simple rules to be followed are all explained clearly and concisely in the booklet on home canning and drying, of which the National War Garden Commission already has sent out hundreds of thousands and which will be sent free to anyone who writes for it, enclosing a two cent stamp for postage.

Every bit of food that is



MAKING IT HOT FOR THE KAISER

It is the women all over the United States who are doing the bulk of the work in conserving the food which is essential to victory. From her war garden Mrs. E. M. Hunt, of Denver, Colorado, preserved for winter use more than 1,000 quarts of vegetables and fruits, her display including 126 varieties.

soldier artist Verrees, who was wounded in Flanders: "Can Vegetables and the Kaiser Too." When this was written the German troops for the first time had crossed the Marne but were promptly driven back by American



LINING UP THE "AMMUNITION"

A simple home-made canning outfit, a wash boiler with a wire frame made to fit it, can be as successful as any other in the food conservation work. Mrs. H. E. Newton, of Mansfield, Missouri, is here shown getting ready to help "Can the Kaiser." Last season from her small war garden in addition to supplying the family table, selling a considerable quantity and storing a lot, she preserved 327 quarts of various vegetables. "I had such a variety that we never tire of them," she reported.

raised must be saved. What cannot be eaten as it ripens should be preserved, for it would be just as foolish, just as unpatriotic to grow millions of dollars worth of vegetables in our war gardens and then allow a lot of it to go to waste, as it would be for the government to build ships and then allow them to swing idly in our harbors or to manufacture airplanes and guns and ammunition and then not ship them to France where they are needed. We know the women of America are going to do their full patriotic duty in this direction. They will carry out the slogan on one of our posters, drawn by the Belgian

forces fighting by the side of the French. These men are enduring all kinds of hardship and facing death that you may be safe in a land of happiness and freedom. What less can those who stay at home do than to help provide the food needed by the boys over there? Every bit that can be saved should be canned or dried. In this the women of America must take the leading part. They will not fail their country in its day of need.

It has been pointed out that in England an entire ship, complete from keel to steering wheel, could now be turned out by women, without one particle of assistance from men. The women of Europe have gone much farther than the women of America in performing all kinds of service. As the war progresses and as big gaps are created in the industrial ranks by the draft and other causes, it is inevitable that the women of the United States will be called on more and more to take up duties which hitherto have been assigned solely to men. In-

continue a most valuable and essential war work at home. That is in the conservation of food. It is not necessary to point out the importance of this service. That is realized by everybody. Food is the foundation upon which all other activities rest.

And the supply cannot be too great. An editorial in a recent issue of a Parisian daily said: "It is a fact that no country can produce too much." That expression contains a great lesson for Americans. There must be production and conservation "without limit."



*Official Press Bureau, London*

#### WHAT ENGLAND IS FACING

America has not yet seen any such lines as this patiently waiting for the chance to enter a food shop and buy a small quantity of food. The British "bobby" regulates the queue of pinched-faced women and children who stand in front of the scantily supplied store. A few cans of condensed milk and a box or two of corned beef are probably all that are "displayed" in the shop window.

dustry here already has absorbed many thousands of women; and other thousands are ready or in training for other branches and occupations.

But in the meantime until they are summoned from their homes by the urgent call for more war workers to handle lathes and saws, to drive the trucks and tractors and to speed the ships on their way, the women here can

"Even if the greatest expectations are realized," says Henry B. Thomson, chairman of the Canada Food Board, "the fact remains that the world reserves of wheat are exhausted. The greatest care will have to be taken to re-establish these reserves both here and abroad. It will be absolutely necessary to continue conservation and substitution at least until the 1919 crop situation is known."

## THREE WAR SCYTHES NOW HANG IN ONE TREE

BY H. E. ZIMMERMAN

**N**EAR Waterloo, New York, stands one of the most interesting trees in this country. In October, 1861, fifty-seven years ago, James Wyman Johnson, who had a farm outside this city, hung his scythe in the crotch of a tree and went off with a New York regiment to the Civil War.

"Don't touch the scythe until I come back," he told his wife.

He never returned. In deference to his wishes the scythe was allowed to remain where it had been placed. When the scythe was placed on the tree by Mr. Johnson,



THE TREE OF THE SCYTHE

And now two more have been hung on the same tree, by two lads who have gone to fight for Democracy in the present great conflict.

the tree was only 8 inches in diameter, while it is now 13 feet in circumference. Only 7 inches of the scythe now protrudes, and strange to say, points in the direction of Johnson's grave in the South where he was buried. All except the scythe blade was removed some years ago. The local Relief Corps keeps the stars and stripes floating above the scythe.

Now two more scythes keep it company. On the day the United States entered the war Raymond L. Schaeffer, son of the present owner of the place, hung up his scythe and donned the olive drab. Today his brother, Lynn, placed his scythe alongside it and went away from Auburn in the navy's blue.

## NEW PURCHASES OF LAND FOR THE EASTERN NATIONAL FORESTS

**T**HE National Forest Reservation Commission has just approved for purchase 54,672 acres of land for National Forests in the White Mountains, Southern Appalachians and Arkansas. All of these lands solidify the Government holdings and carry out the present policy of the Commission to consider no lands which do not tend to block in with others previously approved for purchase.

The largest tract is one of 31,667 acres in Polk County, Tennessee. It fills out the entire southern end of what is known as the Cherokee Purchase Area. The price approved was \$6 an acre. A large portion of this tract is well timbered; there is more than 20,000,000 feet of merchantable timber on the entire tract.

On the Natural Bridge Area, in Rockbridge, Amherst, and Bedford Counties, Virginia, there were approved 3,990 acres at an average price of \$5.52 per acre. The largest tract included is one of 1,800 acres in Rockbridge County. There were also approved 4,058 acres in Shenandoah, Highland, Augusta, and Frederick Counties, Virginia, and 134 acres in Hardy County, West Virginia, at an average price of \$6 an acre.

In the White Mountains 2,756 acres in Grafton and Coos Counties, New Hampshire, was approved, at an average price of \$10.80. These lands contain considerable valuable spruce timber.

On the Unaka Area, in Unicoi County, Tennessee, the purchase of one tract of 3,000 acres was authorized, at a price of \$4 per acre. There were also approved for purchase 28 different tracts embracing 6,200 acres, in Winston and Lawrence Counties, Alabama, at an average price of \$4.38 per acre, and 2,552 acres in Avery, Watauga, Caldwell, Burke and McDowell Counties, North Carolina, at an average price of \$5.15 an acre. In Arkansas 997 acres were approved for purchase in Pope, Montgomery, Garland, Perry and Polk Counties, at an average price of \$2.86 per acre. These are the first lands to be acquired in Arkansas through purchase. They block in with lands in the Arkansas and Ozark National Forests, which were created by the reservation of lands formerly a part of the public domain.

## CAPTAIN RINGLAND TRANSFERRED

**I**NFORMATION has just been received that Captain A. C. Ringland, Regimental Adjutant for the 10th and 20th Engineers (Forest), American Expeditionary Forces, has been transferred to combatant service with the Pioneer Engineers, after having taken a two-weeks' training course. It is reported that Captain D. T. Mason will succeed Captain Ringland as Regimental adjutant.

# THE HAWAIIAN LEHUA

BY VAUGHAN MACCAUGHEY

PROFESSOR OF BOTANY, COLLEGE OF HAWAII, HONOLULU

THE tree which is known to the Hawaiians as *ohi'a lehua*, or more commonly as *lehua*, is the most abundant of the indigenous Hawaiian trees. The statement that it probably exceeds in number all other arborescent species combined would not greatly err from the truth. It is ubiquitous in its distribution, and remarkably persistent in its growth. It is one of the first invaders of new areas, as for example, regions devastated by lava flows, and is one of the last species to succumb

to unfavorable conditions. Over large tracts of the Hawaiian forests it is a dominant tree; in some regions it forms large and almost pure stands; one of the lesser isles is named for it. Since the earliest times the *lehua* has been closely associated with the life of the primitive Hawaiians. The showy scarlet flowers are among the most beautiful of the Hawaiian blossoms; of these the natives twine lovely garlands; the *lei lehua* is a favorite theme in many Hawaiian chants and love-songs.



A BEAUTIFUL AVENUE OF ROYAL PALMS AND WINE PALMS

This is Beretania Street, in Honolulu, and it is typical, for Honolulu is a veritable palm garden. Here are found representatives of some eighty different species, which have been gathered from all parts of the tropics, scarcely a home or yard being without its palms.

The *lehua* is one of the very few native trees that yields timber of commercial importance, and that has been exploited by lumber companies.

The *ohi'a lehua* is thus seen to occupy a prominent place in the Hawaiian forests and flora, and the present paper is an effort to present the salient facts concerning this interesting tree. During a ten year's residence in the islands, the author has had opportunity to visit and explore repeatedly the *lehua* forests on the various islands. Furthermore, the Hawaiian chants and legends abound with references to the *lehua*, and some of this extremely interesting folk-material is incorporated in this paper, being presented in this form for the first time.

A few words concerning the myrtaceous genus *Metrosideros*, of which *polymorpha* is a prominent member. The name is from the Greek, literally "iron-womb" or "heart," referring to the hard, heavy heart-wood that characterizes members of this genus. There are about twenty species, chiefly confined to the islands of the Pacific, from New Zealand to the Hawaiian group. One species occurs in tropical Australia and another in South Africa. It is interesting to note that eight fossil species have been discovered, one from the Middle Cretaceous of Greenland, the others from the European Tertiary. The living species are mainly trees or shrubs; some of the South Pacific forms are lianas. Several rather remarkable species are climbing during the juvenile state, and later become self-supporting. The Hawaiian *lehua* shows traces of this habit. The leaves are opposite and pinnately veined; flowers usually showy, prevailing red, and strongly marked by their crown of very num-

erous, long, erect stamens; flowers borne in dense terminal three-forked cymes; ovules arranged in many series, horizontal or ascending.

The primitive Hawaiians were excellent botanists, in their way, and had distinctive names for a very large proportion of the wild plants. They knew the forests minutely, and had a comprehensive plant lore. There are many evidences of an incipient Polynesian binomial system for the naming of natural objects, trees, birds, fishes, seaweeds, and the like, and the *lehua* well illustrates this. *Ohi'a* was the generic term, applied to a number of myrtaceous trees in *Eugenia* and *Metrosideros*. To this generic term was added a specific name, as follows:

*Ohi'a ai* . . . . . *Eugenia malaccensis*.

*Ohi'a ha* . . . . . *Eugenia sandwicense*.

*Ohi'a lehua* . . . . . *Metrosideros polymorpha*.

*Ohi'a lehua* . . . . . *Metrosideros macropus*.

*Ohi'a ahiki* . . . . . *Metrosideros tremulides*.

*Ohi'a papa* . . . . . *Metrosideros rugosa*.

Furthermore, varieties within the species were carefully discriminated by the keen-eyed Polynesians, and we find such terms as *Lehua makauoe*, *Lehua kumakua*, *Lehua mamo*, *Lehua lau-lii*, *Lehua pua-kea*, etc. The accuracy with which the ancient Hawaiian used his biological vocabulary, particularly with reference to nomenclature,



THE "MOTHER" OF THE LEHUA

So native tradition has it. This beautiful tree fern, thirty feet high and three feet in diameter, is growing on the Volcano Road, Hilo.

has evoked the surprise and admiration of the Occidental scientists who have visited the islands.

The specific name of the *lehua*, *polymorpha*, is most appropriate. No other plant species in the Hawaiian flora manifests so wide a range of variability, especially as regards habitat, habit, and foliage characters. This species is not endemic to the Hawaiian Islands, but is



DEEP IN THE LEHUA FOREST, ON THE BEAUTIFUL FERN-TRAIL

This is the most abundant, important and distinctive tree of the Hawaiian Islands, and it is one of the very few native trees that has been exploited commercially. Around it are gathered a great many of the old Hawaiian legends and folk-tales.

plentiful in the South Pacific. In Fiji it is called *Vuga*; in Tahiti *Pua-rata*; in New Zealand it is known by the Maori names *Rata* and *Pohutu-kawa*. Its great variability has been a source of much confusion and vexation to taxonomists as is manifest by the large number of names under which it has been described. A thorough taxonomic study of the species will undoubtedly reveal series of variations along well-defined lines, and probably also extensive hybridization.

The *lehua* is the most abundant and widely dispersed tree in the Hawaiian Archipelago. It occurs on all the islands, on both windward and leeward slopes, and at all elevations from sea-level to nearly ten thousand feet. It occupies a wide variety of ecologic habitats, lowlands, valley floors and slopes, summit—and lateral—ridges, precipices, peaks, summit bogs, lava flows both new and ancient, cinder and tufa cones, pit craters, almost every type of station, from extremely hygrophytic to extremely xerophytic, that the islands afford. However, it is never strictly littoral, nor does it thrive in exposed windy places. The finest and largest forests occur in the rain-forest belt along the windward slopes of the island of Hawaii, the flanks of the great volcanic mountains Kea, Loa, and Kilauea. Many of the primitive Hawaiian songs contain references to regions famous for their *lehua* groves. The Puna and Oláa districts, on Hawaii, for example, have magnificent forests composed mainly of this species. The following selections are typical:

"The voice of Puna's sea resounds  
Through the echoing hala groves;  
The *lehua* trees cast their bloom."

This and all the other excerpts contained in this paper have been selected and re-arranged from the scholarly translations of Dr. N. B. Emerson, whose researches in Hawaiian songs and folk-lore have been monumental, and of the highest accuracy. Today there are exceedingly few persons, either white or native, who know the ancient Hawaiian language. The modern language is

degenerate, and most of the old lore is forgotten. The original of the above lines is

"O Puna kai kuwa i ka hala;  
Pae ka leo o ke kai;  
Ke lu, la, i na pua lehua."

Oláa and Hilo, adjacent to Puna, were also heavily forested with *lehua*.

"A woman strings *lehua*-garlands in Oláa." "He wahine kui lei lehua i uka o Oláa."

"At Hilo I rendezvoused with the *lehua*." "A Hilo au e, hoolulu ka lehua." The following lines refer to a difficult passage through the dense *lehua* forests of Hilo, and to the making of a temporary shelter in the woods:

"Ohi'as thick-set must be brushed aside,  
To tear one's way, like a covey of fowl.  
In the wilds of Pa-ie-ie—  
*Lehua* growths mine—  
heart of Mokaulele.  
A breaking, a weaving of boughs, to shield from rain."

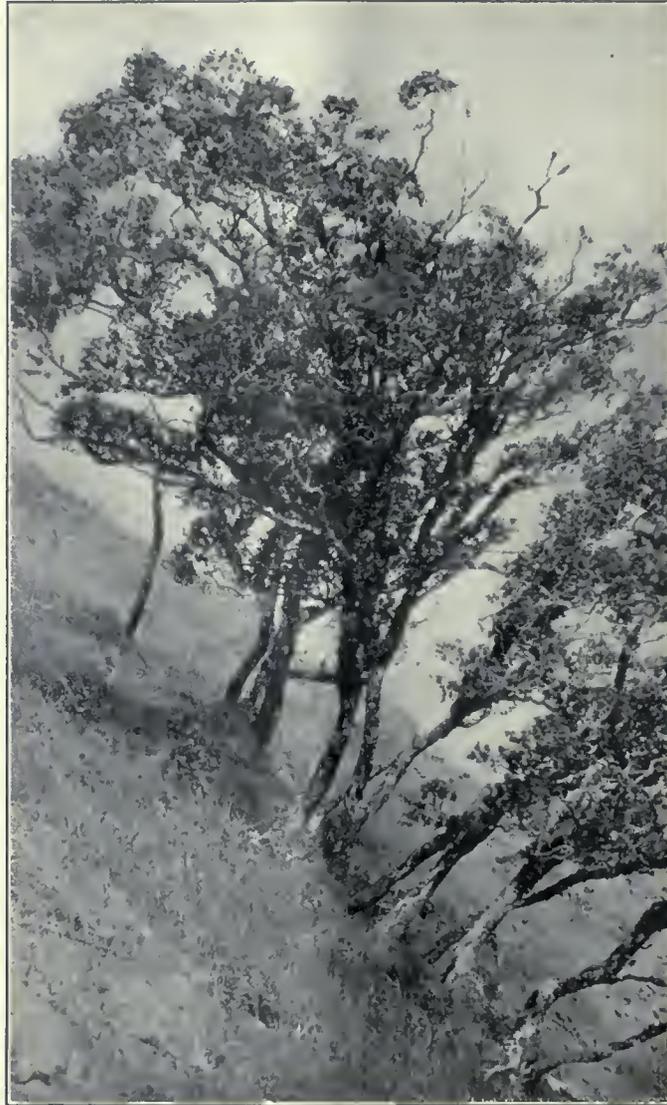
"Ka lae oh'a e kope-kope,  
Me he aha moa la, kapale pa laau,  
Ka nahele o Pa-ie-ie,  
Ku'u po'e lehua iwaena konu o Mo-kau-lele.  
Me ka ha'i laau i pukaula hala'i i ka ua."

Pa-ie-ie is a well-wooded part of Hilo, once a favorite resort of the bird hunters, and celebrated in Hawaiian song. Mo-kau-lele is a wild jungle-cov-

ered region in the interior of the Hilo district. North of Hilo, along the Hamakua coast, are the famous groves of Pana-ewa:

"Pana-ewa's rain beats down the *lehuas*,  
A rain by the sea smites the halas of Puna."  
"He ua kui lehua ko Pana-ewa;  
He ua ma kai kui hala ko Puna, e!"

*Hala* is the native name for the Pandanus. On the island of Kauai, the wilderness back of Hanalei Valley, was a famous region, where the *lehua* abounds, known as Hanalei-*lehua*: "Perilous, steep, is the climb to Hanalei woods, "Ku piliki'i Hanalei-*lehua*, la."



HOLDING THEIR POSITION AGAINST ODDS

*Lehua* trees clinging to a steep slope where they are being gradually undermined by erosion. The tenacity and endurance of this tree is remarkable.

The *lehua* is exceedingly variable in its habit of growth. It ranges from a stunted creeper to a magnificent tree of eighty or one hundred feet. These differences are intimately connected, as is to be expected, with the various habitats of the tree. There are four main types:

1. *Prostrate or creeping plants*, vine-like, and confined to the summit bogs, at elevations of 4000-6000 feet.

sedges, and other characteristic summit bog plants.

2. *Bushes or shrubs*. In this form the plant occurs on the summit ridges, windward precipices, and other steep and unfavorable situations. Many of the arid lava-flow stations exhibit these retarded forms. They rise to a height of eight to twelve feet, and flower freely.

3. *Medium-sized trees*. This is the most character-



IN BEAUTIFUL HAWAII—THE GROUNDS OF THE QUEEN'S HOSPITAL, HONOLULU

This magnificent driveway is colonnaded with Royal Date palms which add an air of dignity and stateliness to an environment already incomparable from the standpoint of tropical beauty.

These have flexible woody stems, about one-quarter inch in diameter, and rooting freely toward the base. Although attaining a length of only six to eighteen inches, they produce numerous flowers. This remarkable dwarf form is called *Lehua makanoe* by the Hawaiians, literally "The *lehua* in the fog," for it grows only in these water-soaked, fog-swept, summit swamps. Heller described the stunted, prostrate summit *lehua* as *Nania pumila*. It grows amidst the tussocks of swamp grasses and

istic form on all the islands except Hawaii, and it is abundant on the latter island. The *lehua*, in protected valleys and slopes, attains a height of twenty to forty feet. This is the habit commonly found in the rain-forests of Kauai, Oahu, Molokai, Lanai, Maui, and parts of Hawaii. The trunk is six to fifteen inches in diameter, and rises clear to a height of fifteen or thirty feet without branching. The crown is small, compact, and high, with the foliage crowded to the ends of the branches.

4. *Veteran trees.* As has previously been indicated, along the windward coast of Hawaii, from Kohala to Puna, but particularly in the latter district, the *lehua* reaches its finest development. This may be taken as



EDGE OF THE NATURAL FOREST

Most of the trees in this section are Ohia trees (*Metrosideros polymorpha*), Olinda Maui, Hawaiian Islands. Note the characteristic light bark.

the normal habit of the tree, the other types representing the direct effects of repressive conditions. In the region just specified are almost pure stands of *lehua*, rising to eighty or one hundred feet, with tall slender trunks, and a dense undergrowth of tree ferns (*Cibotium*). These are the finest forests in the archipelago, both from the standpoint of their beauty, and of the quantity of commercially valuable timber which they contain. In these forests the typical *lehua* has a trunk two to four feet in diameter, with or without aerial prop-roots, and branching at a distance of thirty to sixty feet above the ground. The crowns form a high dense canopy; the trunks are often covered with epiphytic plants and lianas; and the ground is very wet and spongy.

*Lehua* bark is light gray, irregularly fissured, and quite scaly on old trees. The gray color is so characteristic that by it alone the trunk may be recognized at a distance. The bark is relatively thick, even on young twigs and branches; on old trees it becomes an inch or more in thickness. The slow growth of the *lehua* causes the young twigs to be conspicuously marked with the close-set leaf-scars. This and other features give even the young trees an aspect of endurance and senility. Many of the Hawaiian tree species, especially at the upper levels, assume this appearance of great age at a very early stage; this is not wholly a matter of appearance, for most of the species are very slow-growing.

The *lehua* branches are often angular and gnarled; those of trees growing in the rain-forest are ascending and form a flat summit crown. Trees growing in the open, as on lava flows, have the branches more symmetrically disposed along the trunk. The branches are mostly of small size, but are tough and flexible. The

*lehua* tree is rarely wind-shattered, whereas the *koa* (*Acacia Koa*) for example, is often badly disfigured by the wind. The *lehua* is slowly self-pruning, and old trees in the forest have clean smooth trunks rising to forty or fifty feet without a branch.

The wood is known commercially as *ohi'a*, although this is in reality a generic, rather than a specific name. When *ohi'a* timber or wood is specified, the term invariably signifies *ohi'a lehua*. The wood is strong, tough, fine-grained, and very durable. In color it is rich dark reddish-brown; the red tint is pronounced, and gives beautiful effects in hardwood floors and interior trim. In its mechanical and structural properties *ohi'a lehua* is comparable to the best oak, although it cannot be obtained in as large sizes. Occasionally boles of three or four feet in diameter are obtained, but these are rare, and the average diameter of the trunk is about two feet. Timbers cut from the more or less buttressed basal part of the trunk sometimes exhibit a beautiful curly or wavy grain, resembling the famous "curly *Koa*" used in the Hawaiian *ukuleles*. In recent years local companies have undertaken the commercial exploitation of the *lehua* forests, and large quantities of the lumber have been exported, as well as utilized locally. The *ohi'a lehua* is a slow-growing species, and upon the consummation of the present epoch of exploitation, unless conservative principles of forestry be applied, the supply, like that of the ill-fated Hawaiian sandalwood, will be practically exhausted for a considerable period of years.

The wood is used for flooring, paving blocks, railroad ties, bridge timbers, and other purposes in which durability is of special importance. Two drawbacks to



TYPICAL UNDERGROWTH IN A LEHUA FOREST

Tree-ferns are the most abundant and distinctive feature.

the use of *lehua* are, first, it can be obtained only in relatively narrow strips; and second, it requires very careful drying in order to prevent warping and checking, to which it is very susceptible. In laying *ohi'a* floors great care is exercised in fastening the boards securely in place, otherwise they warp and check. The natives used the wood for a great variety of purposes,—fuel; idols; framework of temples and houses; enclosures; spears, clubs and household tools; surf-boards; the poles to unite the double canoes; and rarely for the body of the canoe itself. The trunk was seldom large enough for the latter use. The wood is an excellent firewood, as every Hawaiian mountaineer knows; it will burn even though partially wet, and produces a glowing bed of firm bright embers, like those of hickory or oak.

The roots of the *lehua* may be grouped under two classes, the aerial roots, and the true soil roots. The aerial roots are commonly developed by the *lehua* trees which grow in a sufficiently moist atmosphere. They are much more abundant on the uplands than on the lowlands, and in the dense forest than in the open. These aerial roots vary in size from fine reddish hair-like filaments, a few inches in length, to large bushy masses two feet in diameter and five to twenty-five feet tall. The aerial roots are emitted from the larger branches, as well as from the trunk itself. Although chiefly confined to the under surfaces of the branches, they often arise on the upper surfaces, and grow around the branch in order to point soilward.

The Hawaiians call the aerial root *a'a lewa-lewa*. In rugged mountainous regions the roots often aid the traveler by furnishing him with a sort of ladder. One of the ancient songs, already quoted, begins:

“Perilous, steep is the climb to Hanalei woods;  
To walk canny-footed over its bogs;  
To balance oneself on its ledges,  
And toil up ladder of hanging roots.”



THE BANYAN-LIKE PROP ROOTS OF THE OHIA

Typical Ohia-Lehua with roots high above the ground. The Ohia germinates in the moist woolly trunks of tree ferns and, as it develops, sends its roots down along the fern trunks into the ground. As the tree grows larger the fern is lost in the stilt-like roots of the Ohia, finally dying and dropping away.

Along the steep valley slopes and ridges of Kauai, Oahu, East Molokai, and West Maui where the smaller *lehua*s abound, one often finds trees with numerous banyan-like prop-roots radiating from the trunk and lower branches. These roots are usually two to six inches in diameter.

On the island of Hawaii the *lehua* is commonly associated with the tree ferns. As Rock states:

“ . . . the seeds of the *Ohia* trees fall on the moist woolly trunks of the tree ferns; there they germinate. At first the young tree finds enough nourishment in the humus, dead leaves, etc, which collect in

the axils of dead fern leaves all along the tall fern trunks, but finally it sends its roots down along the fern trunks into the ground. As the tree grows larger and taller, the fern becomes enclosed between the stilt-like roots of the *Ohia* tree, until finally the fern dies and decays, leaving the stilt roots standing some 15 to 20 feet above the ground, after which the real trunk of the tree commences. Such stilt-like *Ohia* trees are very common in the Hawaiian forests, but mainly on Hawaii.”

This interesting epiphytism in the juvenile state accounts for the native tradition to the effect that the tree-fern is the "mother" of the *lehua*. The primitive Hawaiian was a close observer of nature, and he perceived the relationship between *lehua* and fern, without fully comprehending its significance.

The true soil-roots of the *lehua* are as diverse in their extent as is the aerial shoot. In the dense rain-forest the soil roots are relatively shallow and scanty, although there is usually a strong tap-root. Out upon the xerophytic lava flows, however, the roots become very long, often penetrating the interstices of the lava for distance equalling two to four times the height of the tree.

The *lehua* leaves show a considerable range of variation as to size, shape, and pubescence. They are opposite, and usually

crowded towards the end of the branches. The petiole is long or short, as compared with the blade. The blade is lanceolate, oblong, ovate, or orbicular; the apex blunt or acute; the base acute, rounded, or cordate. The venation varies from faint to strongly defined. The leaves may be glabrous throughout, or with varying amounts of whitish or gray tomentum, either on the lower

surface alone, or on both sides. In texture the leaves are firm and coriaceous; the color is a dark green, more or less masked by the gray tomentum. The bracts of the leaf-bud are short, scarlet, and soon deciduous; the buds themselves are copiously clad with gray tomentum.

In the forest the *lehua* is easily recognized by the small, close-set foliage, and even at a great distance its peculiar shade of gray-green distinguishes it.

The young leaves are frequently flushed with crimson, and some early Hawaiian singer, noting this, has compared the beautiful many-hued ocean off the Kona coast to the changing colors of the *lehua* and *noni* leaves:

"Leaf of *lehua* and *noni*-tint, the Kona sea,  
Iridescent saffron and red,  
Changeable watered red, peculiar to Kona."

"*Lau lehua punoni ula ke kai o Kona,  
Ke kai punoni ula i oweo ia,  
Wewena ula ke kai la, he kokona.*"

Any one who has visited the lovely Kona district, and has looked out over the peaceful sea at evening time, when the rich blue and green of the warm Pacific is suffused with the ineffable sunset tints, will fully appreciate the delicacy and accuracy of the poet's simile.

In the flowers in some forms the petals, as well as the sepals, are white-tomentose or woolly, the red color showing through the pubescence. The most common color is bright scarlet, but other tints, such as salmon-pink, orange-yellow, clear yellow, and white, are not uncommon. The Hawaiians recognized these color variations, and gave to them distinctive names, such as *lehua*

*mamo*, the orange-yellow *lehua*, *lehua puakea*, the white *lehua*, etc.

The showy feature of the *lehua* flower, and to which the above color names apply, is not the corolla, but the graceful pompon of numerous stamens. These have long, free, brightly colored filaments, the colors varying as given for the petals, very graceful and delicate, and their bright scarlet clusters were beloved by the Hawaiians.

The name *lehua* means literally "hair," and was applied by the Hawaiians to this tree because of the conspicuous hair-like filaments.

At the base of the flower, surrounding the ovary, are the nectar glands, which excrete a bountiful supply of sweet, fragrant nectar. This is an important item in the food of many of the native birds, as is explained in another paragraph. There is no other indigenous plant in the Hawaiian Islands that produces such large quantities of delicious nectar; its nearest rival is the introduced *kiawe* (mesquite, *Prosopis juliflora*). The *lehua* nectar not only attracts the brilliant-plumaged native birds, but also the wild bees and other insects. A *lehua* tree in full bloom is thus not only an object of great beauty, but also abounds with avian and insect life. The main



A MIXED FOREST OF KOA AND LEHUA

The wood is used for railroad ties, flooring and wainscoting and, to a small extent, in the making of furniture. The trees in the background are *lehua*. The large logs in the foreground are *koa*.

flowering season is spring and summer, but considering all elevations, trees may be found in flower at all times of the year.

One of the most pleasurable and interesting features of the Hawaiian *lehua* forest was its indigenous bird life. In primitive times the groves abounded with highly specialized and brilliantly colored species. The profound changes in the forest, brought about by the influences of civilization, have caused the extinction of many species, and have made many others exceedingly rare. However, even today, in the more secluded woodlands, as those of the Puna and Hamakua districts, Hawaii, and on the slopes of Haleakala, Maui, some of the native birds are fairly plentiful.

erous and generally distributed throughout the *lehua* forests. It nests in the summits of the tallest *lehuas*, and chooses the most inaccessible places, out near the very tips of the slender branches. It may be remarked, in passing, that many Hawaiian birds locate their nests in very protected situations, in the highest trees.

The Hawaii *amakihī* is a nectar-loving species, and is frequently seen with the *i'iwi* and *akakani*. It also feeds upon minute insects, and spends much of its time searching the foliage of the *lehua* and low shrubbery. The crested honey-eater is confined to the high forests of Haleakala, above 5000 feet. Like the *akakani*, it frequents the *lehua* almost exclusively, and derives a large part of its food from the nectar. Its long, tubular,



A PORTION OF THE GREAT LEHUA FOREST ON THE ISLAND OF HAWAII

The earthy hummock in the foreground is a bank of sulfur, near Kilauea Volcano. The trees are 30 to 60 feet high in this particular place. The prevalence of the *lehua* on the mighty flanks of active volcanoes has resulted in its destruction by the fiery lava rivers, a theme often dwelt upon by the native poet—"They are gray from the heat of the goddess." And again, "Consumed by the fire that flows from the pit."

The birds most intimately associated with the *lehua* are those that live chiefly upon the nectar. Several species are exceedingly fond of the nectar, and are usually found in the flowering groves. Foremost among these is the *akakani* or *apapani*.<sup>\*</sup> This is one of the most beautiful and abundant of the native birds, and is found on all the islands. Its food consists almost wholly of nectar and small insects. The *akakani* has a pleasing habit of assembling in small groups in the summits of the lofty *lehua* trees about mid-day, when most of the other woodland birds are silent. The males then join in a subdued lullaby "and literally sing themselves and their mates to sleep." The song is sweet, persistent and monotonous, and is given at all seasons and all times of the day. The *akakani* usually nests in the tall forest *lehuas*, but sometimes chooses the scrubby *lehuas* in more open country. The *i'iwi* is another species fairly num-

brush-tipped tongue enables this species to extract the nectar with great ease. It also feeds upon insects. Like most of the nectar-eating birds, its stomach is remarkably small for the size of the bird; nectar is easily and quickly digested. The *o-o* is a beautiful species, once occurring on all the islands, but now nearly exterminated. This species was one of several trapped by the primitive Hawaiians for the sake of their beautiful feathers, which were used in the manufacture of the priceless feather garments of Hawaiian royalty. The ancient chiefs and kings had regular staffs of bird-catchers, who were very expert. These men commonly made use of the viscid latex of the breadfruit, called *pilali*, or *olapa* (*cheirodendron saudichaudii*) gum, smearing it over the branches of a *lehua* tree, and often fastening there a dead *i'iwi* bird, to which the pugnacious *o-o* would be attracted. The word "*pa-lei*" was used to designate a *lehua* tree in full flower, which had been thus prepared as a trap. Often all the lower branches were stripped from the tree; the upper ones were limed. The dwarf

<sup>\*</sup>Descriptions of these lovely and highly specialized species are not within the province of this paper, but may be found, together with excellent colored plates, in the sumptuous works of Wilson and Scott, "Aves Sandwichensis," and Rothschild's "Birds of Laysan and Neighboring Islands."

*o-o* is restricted to Kauai. It is fairly common at all elevations, and is nearly always found in flower-laden *lehua* trees.

The Hawaiian *akialoa* is confined to the deep *lehua* forests of the Oláa district, and is now very rare. It haunts the tall *lehua* trees, feeding mainly on insects, which it finds in decayed timber, and also around the tree-ferns. The green solitaire is another exceedingly rare species characteristic of the very dense *lehua* forests of the Hilo region, at elevations of 2000 to 4000 feet. It feeds chiefly upon the insects which it gleans from the *lehua* foliage.

It would be wrong to close this section which deals with the birds of the *lehua* groves without some mention of the little *elepaio*, the most abundant and familiar of the native woodland species. Although occurring throughout the forests, and not confined to the *lehua* groves, the *elepaio* is abundant in the latter situations, and, like the other species enumerated, feeds upon *lehua*-nectar in season.

The Hawaiians were exceedingly fond of the *lehua* blossoms, and they are repeatedly mentioned in the chants and songs. These lines from an old chant present a vivid picture of the forests in full bloom:

"Puna's plain takes the color of scarlet—Red as heart's blood the bloom of *lehua*."

"O Puna, *lehua ula i ka papa; I ula i ka papa ka lehua o Puna.*"

Here is another poetic allusion to the *lehua* groves in the Hilo region; Hilo is compared to a beautiful maiden around whose neck are hung the scarlet garlands:

"The neck of Hilo is heavy,—weighted with wreaths of *lehua*."

"*Kaumaha ka ai o Hilo i ka lehua.*"

In the ancient ceremonies of the *hula*, the altar was heaped with flower-laden *lehua* branches. One of the prayers to remove *tabu* during the *hula* contains the following lines:

"Bloom of *lehua* on altar piled; bloom of *lehua* below;  
Bloom of *lehua* at altar's base."

And another song contains the line:

"Provide you wreaths of *lehua* to gladden the heart of travel."

An old song contains the line: "*Kauwa ke aloha i na lehua o Kaana,*" this Dr. Emerson translates "Love slaves for the *lehuas* of Ka-ana" and makes the following illuminating comment: "Ka-ana is said to be a hill on the road from Ka-ana to Oláa, a spot where travelers were wont to rest and where they not infrequently made up wreaths of the scarlet *lehua* bloom which there abounded. It took a large number of *lehua* flowers to suffice for a wreath, and to bind them securely to the fillet that made them a garland was a work demanding not only artistic skill but time and patience. If a weary traveler, halting at Ka-ana, employed his time of rest in plaiting flowers into a wreath for some loved one, there would be truth as well as poetry in the saying, "Love slaves for the *lehuas* of Ka-ana."

In another beautiful verse the native bard compares his

sweetheart to the *lehua* flower, after the manner of many an Occidental poet:

"*Lehua* blooms pale at my flower—O sweetheart of mine,  
Bud that I'd pick and wear in my wreath, if thou wert  
but a flower."

The prevalence of the *lehua* on the mighty flanks of the active volcanoes of Loa and Kilauea resulted in its being the foremost tree to suffer from the ravages of the lava flows. This condition made a deep impression upon the imagination of the Hawaiian bard and nature poet, and we find many references to the destruction of the lovely *lehua* groves by the fiery lava rivers:

"Scraggy the branching of La'a's *ohi'as*;  
The *lehua* limbs at sixes and sevens—  
They are gray from the heat of the goddess;  
Puna smokes mid the bowling rocks."

The goddess refers to Pele, the savage mistress of the lava flows; the bowling rocks refers to the advancing lava flow.

"From the *ohi-a* covered promontory at Papa-lau-ahi,  
To the *lehua* garlands heaped at Kua-o-ka-la,  
The beauteous *lehuas* are wilted,  
Scorched, burnt up, aye, burnt,  
Consumed by the fire of the Woman—  
The fire that flows from the Pit."

One of the most touching fragments of the primitive Hawaiian imagination that has come down to us is the legend of Hopoe, the charming damsel transformed by the jealous fire-goddess Pele into a charred *lehua* tree, standing forlorn on a desolate rocky coast. Along the arid Kona shore, for example, one finds these stunted, gnarled *lehuas*, ten to fifteen feet high, growing on the ancient lava-flows. The *lehua* is often referred to as "the *lehua* of Hopoe."

Directly north of the island of Niihau, and separated from it only by a narrow channel, is a tiny isle named Lehua. It is barren and uninhabited. The natives have the following legend to account for its name. When Pele and her associates first came to the Hawaiian Islands, they passed along the line of islets, reefs, and shoals that stretches to the northwest of the main group. When they came to the tiny isle Lehua, despite "its smallness and unfitness for residence, Pele was moved to crown the rock with a wreath of *kau-no'a*, while *Hi'i-aka* contributed a chaplet of *lehua* which she took from her own neck, thus christening it for all times. "Sailed we away until we found the land we christened Lehua."

A very ancient love-song tells of the difficulties of two lovers, who finally sought shelter on Lehua. This ballad would seem to indicate that at one time the island was really forested:

"Storm sweeps the cliffs of the islet;  
A covert they seek neath the hills,  
In the sheltered lee of the gale,  
The cove at the base of *Lehua*.  
The shady groves there enchant them,  
The scarlet plumes of *lehua*."

# THE USES OF WOOD

## WOOD USED IN ROUGH CONSTRUCTION

BY HU MAXWELL

**Editor's Note:**—This is the third story in a series of important and very valuable articles, by Mr. Maxwell, on wood and its uses. The series will thoroughly cover the various phases of the subject, from the beginnings in the forest through the processes of logging, lumbering, transportation and milling, considering in detail the whole field of the utilization and manufacture of wood.

THE output of the country's sawmills may be placed at 40,000,000,000 feet a year, more one year, less another, but averaging about forty billion. This material goes to its final use in two classes. Rough lumber constitutes one class; the other class is dressed or otherwise further manufactured before it reaches its final place in utilization. The scope of the present article will be restricted so as to include little more than the wood belonging to the first division, the rough material, that finds place in the walls and frames of buildings. The finer work, such as the interior and exterior finish of houses is reserved for discussion in another article.

Probably half of the lumber sawed in the United States, or 20,000,000,000 feet a year, is required to meet the demands of builders. This includes both the rough lumber and that which is further manufactured. The structures which absorb this large lumber supply are of so many kinds that a list is out of the question, but belonging to such a list

are residences, farm buildings, warehouses, stores, factories, educational and religious edifices, cottages and camps, to mention just a few of the most familiar.

It is not wholly certain that one-half of the total lumber supply goes to the builder, but that estimate appears to be conservative in view of the fact that nearly one-third of the entire lumber supply is converted into planing mill products, and that builders are by all odds the largest users of such products which consist of dressed and partly worked material; and there is little doubt that if lumber used in its rough form is added

to this, the total will be fully one-half of the total sawmill output. The two classes, rough material and mill-work, are so mixed in use that they cannot afterwards be itemized separately.

The tendency now is to use more dressed stock than formerly, in proportion to that employed in its rough form. When carpenters were under the necessity of dressing all lumber by hand, or with small and simple machines, or use it without dressing, the temptation to follow the easiest course was strong, with the result that not a great many years ago it was not unusual to

lay floors of unplaned boards in residences and other pretentious buildings; and the weatherboarding or siding sometimes went into place in the same rough condition. It was still earlier that the best cabins had split puncheon floors which had been smoothed with adzes.

To speak of the log houses of the pioneers would be harking back into the past rather than is necessary, were it not that such houses are with us yet.

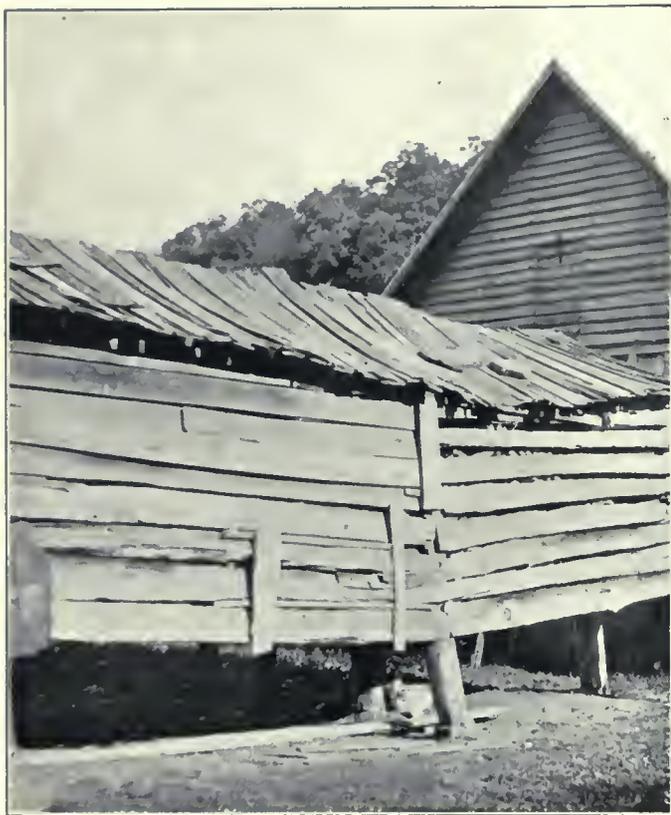
The log cabin did not disappear when the house of sawed lumber came in. Both kinds have existed side by side during three hundred years of American progress, and most people of today would be surprised if told how many log buildings are still in existence. Some are falling down because of age and neglect; some are being cared for and preserved for historical or sentimental reasons; and some log houses, strange as it may seem, are being built at this time. Buildings of this class are quite numerous, if the whole country is considered, but they are confined to timbered regions. Within a distance not



SPLITTING PUNCHEON FLOORING MATERIAL

In pioneer days the best cabins were floored with thick split boards known as puncheons, smoothed with an adz. The process of making them is now nearly a lost art, but occasionally a manufacturer of such slabs plies his maul and wedges as in the years of long ago.

exceeding one day's ride on horseback among the mountains of West Virginia a traveler might recently have passed three log structures each more than a century old and all still in use. One was the Westfall Indian fort at Beverly, built during the Dunmore war in 1774; one was a barn near Parsons, built in 1814, and its original white pine shingle roof kept it dry during 102 years; and the third was a memorial church built prior to 1790 by a pioneer in memory of his child. A Methodist preacher still occupies the pulpit every Sunday, and the church still is known by the name of the child in whose memory



IN EXISTENCE BUT OUT OF DATE

Here is shown an old corn crib built of fence rails and puncheons and a roof of split clapboards. It is a survival of a type of farm buildings common in pioneer days among the southern Appalachian Mountains. This crib was half full of corn when the photograph was made in 1913.

it was built, "Ann Eliza." The building was weather-boarded half a century ago and the logs do not now appear in view. These venerable log structures are interesting chiefly as examples of the substantial character of the material of which they were built. They are not isolated cases, for, without doubt all forested regions of the eastern part of the country have similar old and venerable log houses whose periods of existence extend farther into the past than the memory of any living man can go.

The builders of log houses, particularly those of older date, did not worry themselves over any conservation questions. They used all the logs they wanted and took no thought of the morrow. The trees which they cut were seldom missed from the abundance in the forests. In this connection it may be of some interest to know approximately how much more material is required to

build a log house than a plain board house of equal size. Measurements recently made of the logs in an average log house showed that had they been sawed into plain inch boards, six houses of upright boards (walls only) could have been built of the same material. It is evident that the log cabin builders made a pretty heavy demand on the forests, in proportion to the number of houses they built. They used logs, also, for barns, cribs, and other farm buildings, though in justice to the historical truth of the matter, it must be said that most of the pioneers were shiftless in regard to both residences and barns. Their horses and cattle too often roamed the snowy hills in winter with no other roof than the sky and clouds and no other bed than the snow, while the surrounding forests held enough timber to have shedded every hoof of stock on the place, without missing what might have been cut for barns. The primitive log buildings were seldom large, and nearly always pitifully small and mean. A halo of romance is often thrown round the



MEMORIAL LOG CHURCH COVERED WITH WEATHER BOARDING

This venerable edifice crossed the century mark years ago, and is still served by a Methodist circuit rider. It is claimed to be the oldest memorial church west of the Appalachian Mountains, built by a Revolutionary soldier, and named Ann Eliza, for his dead child. It stands at St. George, West Virginia. It is yet known by its original name.

memories of the frontiersmen, but if an impartial witness should judge them by the houses in which they raised their families, and by the barns that afforded all the shelter their horses and cattle got in winter, some of the enchantment which distance lends to the view would disappear.

Wood is an ideal building material. It has a few undesirable qualities, but it possesses a far greater number

that are excellent. It is strong, stiff and elastic, and in comparison with stone and brick, it is light. It is nearly impervious to water, and wooden houses are dry while those of brick and stone may absorb and transmit dampness. Wood is a nonconductor of heat, consequently houses of this material are warmer in winter and cooler in summer than are those of other common



A LOG HOUSE OF THE BETTER CLASS

This house, overlooking the Shenandoah Valley in Virginia, is about as good an example of a log dwelling as is to be found. The logs are hewed, the chimney is of cut stone, but the sheet iron roof betrays present day repairs. The building suggests a respectable old homestead.

building materials. It is a sound-absorber to a considerable extent, and in respect to quietness, wooden buildings compare favorably with others.

The color of wood is never offensive to refined tastes, nor is it trying on the eyes. That holds true whether it is the wood forming an old wall of logs, weathered by years of sun and storm, or whether it is the dressed and finished panels composing wainscoting, ceilings, or doors. The color rests the eyes and pleases the sense of beauty.

Wood is hard enough to resist satisfactorily the wear which the various parts of a building receive; yet it is sufficiently soft to be readily cut and shaped with tools, and it is in that respect ideal for building purposes. The axman quickly severs or hews a log; the sawyer rips or crosscuts to make every piece fit; the carpenter with hammer and nails fastens parts together with ease and rapidity; the carver finds wood easy to work into artistic designs. Thus every workman who puts tools to wood, from the crudest laborer to the trained artist, finds in it a material satisfactory in nearly every respect.

These qualities have had much to do with the popularity of wood with builders in all ages. The hut of bark, poles, or puncheons, if well roofed and with chinks closed, kept the dwellers as warm and dry as are the occupants of the finest residences of the present time. If those who lived in log houses were not always dry and warm (and they were not always so), it was because they neglected the roofs or permitted too many openings in the walls to remain unchinked and undaubed. The discomforts, if there were any, were not due to the qualities of the wood forming the house, but to the faults of the builder or occupants.

The two qualities most frequently objected to in wood

are its combustibility and its susceptibility to decay. Wood will burn and it will decay; but woden houses have stood hundreds of years, thus furnishing proof that buildings need not burn, and that decay may be prevented. Buildings of any material must be cared for if they are to give long service, and those of wood need little more, if any more, care than those of other materials. Wood set in place by the lake dwellers of Switzerland, and by the cliff dwellers of Arizona, and by the unknown builders of some of the buried cities of Central America, is still in place. That is as much as can be said of stone, mortar, metals, shells, bones, and other building materials associated with the wood by the forgotten peoples. Some of the teak and yew door posts excavated from buried palaces of Mesopotamia are in a better state of preservation than is the brickwork that formed the bulk of the buildings. The black walnut and mesquite lintels were found to be the least weather-worn materials in the old Alamo at San Antonio, Texas, when it was restored a few years ago. From the standpoint of durability, no one should ever feel called upon to apologize for wood.

The builders of log cabins seldom knew or cared much about the principles of architecture, but they were resourceful. They were able to build log houses without



THE "OLD JACKSON" MILL

It was built of yellow poplar a hundred years ago; photograph in 1916. The Confederate general, Stonewall Jackson, worked in this mill when a boy and in front of it he mounted his horse to go to West Point to begin his military career. The mill is 150 miles south of Pittsburgh, and it still grinds grain for the farmers.

the employment of a nail or other scrap of metal, except the crude tools with which they worked. The roofs were held on by heavy poles placed with such skill that no wind ever unroofed such a cabin, no snow ever pushed the poles off. The door hinges and locks or latches were of wood; wooden pegs were employed in making doors, and were the forerunners of the dowels used by door factories today. The wooden peg was an important

adjunct to the log house in more ways than one. It fastened timbers together. Set firmly in auger holes in the wall, such pins formed the stairway in many a cabin that had a loft; and pins in the walls acted the part of wardrobes, for on them the extra clothes of the family were hung.

The early cabin builder wanted nails above everything else, and he frequently found it impossible to procure them. He was willing to go to extremes in their quest, even at times resorting to questionable methods. The Virginia colonists found it necessary to enact laws to prevent the burning of old houses to recover the nails.

in order to get nails, had torn to pieces the outbuildings belonging to the fort.

The builders of some of the old Jesuit missions of southern California, about 130 years ago, fastened timbers together with thongs of rawhide for want of nails; and the Mormons at Salt Lake resorted to a similar expedient. Some of those old buildings are standing yet.

The present day builder uses wood more economically than his ancestors used it. Its cost impels him to take that course. The strength of beams is considered, and the loads they can or must carry are taken into account.



A HAPPY KENTUCKY FAMILY AT HOME

The size of the family is interesting, but the picture is meant to show a typical two-story log cabin, stone chimney, and clapboard roof, except that the roof boards are not weighted down with poles. The builder evidently economized on window glass and did not patronize the sash and door factory.

In Hening's statutes of Virginia a law is recorded, Volume 1, page 291, providing that when land containing buildings was abandoned, the houses should not be burned for the purpose of recovering the nails, but the owner was "to receive so many nails as may be computed by two indifferent men were expended about the building thereof, for full satisfaction." In 1785 the commandant of Fort Harmar wrote to the governor of Pennsylvania complaining that Kentucky frontiersmen,

Pieces larger than are necessary are not employed, nor are pieces used which are so small that they endanger the safety of the structure. Men know more about the limitations of building material than they formerly knew, and this knowledge is put into practice. The expert who understands timber physics is considered essential now, and his advice in matters pertaining to his profession is regarded as a paying investment. Thus there is a saving in the first cost of building material, and a prob-

able later saving by preventing subsequent failures of the structures. The intelligent builder knows the woods which he proposes using, and he takes their differences into account, particularly their variations in strength, stiffness, hardness, and durability, and by putting each where it will serve best, a high-class building is secured at a moderate cost.

Wood in building was not always used so wisely as it is now. Many early houses in the eastern states used too much wood. Some of them were even weakened by the well meant attempts of the builders to make them extra strong. A lavish use of massive timbers, in some cases, increased the weight of the structures until their stability was endangered. Though the limit of safety might not be actually passed, it was quite common to make joists, rafter, sills, and other timbers much larger than necessary. That condition is found in many old buildings yet standing. In addition to employing too much wood, frequently little

judgment was shown in the choice of the woods used. A strong one, like oak, might be put in a position where only a small load had to be carried; and, where the strain was severe, a weak wood, like white pine, may have been given a place. At the same time, the employment of large timbers lessened the danger of failure. Some old churches in the eastern part of the country had roof timbers heavy enough for cathedrals. A study of some of those edifices is apt to convey the idea that the builders were very generous with wood; and they could afford to be, for they had plenty of it.

Some of the fire ordinances in cities are intended to restrict the use of wood for building purposes. Experience has demonstrated that when houses are crowded together, fire is likely to gain headway if it makes a start; and wooden buildings catch fire readily from sparks and heat. For that reason, nearly all town and cities have prescribed limits inside of which wooden buildings may not be erected,



A SHANTY CONSTRUCTED OF RED SPRUCE BARK

This bark roof is held on with poles after the manner of the clapboard roofs of former days on the frontiers. One might suspect that Daniel Boone built this cabin as a hunting lodge, but, in fact, the West Virginia Geological Survey had something to do with it. Such a camp will stand ten years.



A MILL YARD THAT NEEDS CLEANING UP

This plant in the Adirondacks is perhaps too busy to spend time at yard cleaning. Material for many a building has come from places like this where logs, lumber, and waste are mingled in about equal proportions, but what has been left behind is worth little in comparison with what has been hauled away to build houses and barns.

but such restrictions do not usually apply in the suburbs, and there wooden houses are found in largest numbers. Many houses with halls of brick or stone are actually more than half wood, the floors, partitions, ceilings, and stairways being of that material.

Without doubt the fire peril is often overworked to the prejudice of wood. Fire laws frequently go too far in restricting the use of lumber in buildings, and persons who may prefer wooden houses are discouraged from building them. The lumber associations of the country are constantly alert to see that municipalities do not knowingly legislate against the proper use of wood in house building. The suspicion is apparently

timbers are chamfered and the splinters are removed, so that if a fire starts, it will not spread quickly, thus giving the fire fighters a chance to arrive.

Within recent years an important place for the use of wood has been found in a class of buildings designated as "mill construction." The first employment of wood in structures of that kind was not very recent, and it was probably a development from small and crude beginnings; but the style of architecture which now bears that name came into notice quite early in the cotton mills of New England. For that reason it was called mill construction. Buildings of that kind were in existence early in the nineteenth century; but that



THIS IS UNQUESTIONABLY "ROUGH CONSTRUCTION"

Not a stick of this woodwork ever saw a planing mill or a paint brush. Neither would the bunkhouse be a desirable risk for an insurance company. It is an inside view of lumbermen's sleeping quarters and living room in Wisconsin, but is a little out of date, as they have much better layouts now.

well founded that dealers in building supplies other than wood, but which compete with wood, not infrequently instigate by unfair methods the passage of laws intended to discourage the use of wood.

Much has been done to lessen the fire peril in wooden buildings by what is known as the "slow combustion" style of architecture. It is seen oftenest in large warehouses, store houses, and factories. The wood is not made proof against burning, but the corners of exposed

particular style of architecture did not attract much attention until about eighty-five years ago when the owners of a large number of such mills formed an organization for mutual protection of their property against fire. It resulted in fire insurance, and out of that movement grew certain regulations calling for a standard type of mill building which had proved its value in resisting fire, and also in its strength and permanence. The original regulations concerning such structures are largely em-



EXAMPLE OF HEAVY MILL CONSTRUCTION

The factory shown in the cut affords a good view of the interior of a building of large size where wooden beams and pillars take the place of steel. The structure is very strong, pleasing in appearance, and the fire risk is very low. Photograph by the National Lumber Manufacturers' Association, Chicago.

bodied in modern city building ordinances, though time has developed some improvements and has brought changes. A spacing from 20 to 25 feet is not uncommon for columns in this class of framing when the loading is

The mill construction style of building has gained in popularity, and at the present time it is in special favor owing to the extraordinarily high cost of structural steel and the relatively low price of wood. The use of large wooden beams is increasing. They answer all practical purposes as well as steel, within certain limits. The walls of mill construction buildings are of brick. Wood is not necessarily visible on the exterior, but it is employed for floors and their supports, and for the supports of the roofs. Architects have solved the problems of using enough wood to give the requisite strength without occupying too much space or creating dangerous fire conditions. Three general types of mill construction framing are in use and are indorsed in the literature of the National Lumber Manufacturers' Association. Descriptions of the three types follow:

1. Floors of heavy planks laid flat upon large girders which are spaced from 8 to 11

on centers. These girders are supported by wood posts or columns spaced from 16 to 25 feet apart. This type is often referred to as "Standard Mill Construction."

2. Floors of heavy planks laid on edge and supported by girders which are spaced from 12 to 18 feet on centers. These girders are supported by wood posts or columns spaced 16 feet or over apart, depending upon the design of the structure. This type is called "Mill Construction with Laminated Floors."

3. Floors of heavy planks laid flat upon heavy beams which are spaced from 4 to 10 feet apart on centers and supported by girders spaced as far apart as the loading will allow. These girders are carried by wood posts or columns located as far apart as is consistent with the general design of the building.



EXTERIOR VIEW OF MILL CONSTRUCTION BUILDINGS IN CHICAGO

These rows of modern factories furnish a good example of mill construction as seen from without. Floors, pillars, roofs, and all supports are of wood and the rate of insurance is very low. The walls are of brick and glass. This style of building is now popular. Photograph by the National Lumber Manufacturers' Association.

not excessive. This class is more generally known as "Semi-Mill Construction."

Each of these types is provided with a lighter top floor to take the wear and give a finished surface.

Nearly all important cities have large and handsome buildings of this kind, where wood is giving as good service as steel would give and at a much lower cost.

One of the distinctive purposes of mill construction is to obtain strength and stiffness with a minimum amount of timber surface and corners exposed to attack by fire. Large supporting members and flat, smooth, heavy floors provide this requirement. Large timbers do not ignite readily, and if exposed to fire burn slowly and with but a slight penetration after a considerable period of time. Flat, smooth surfaces possess this same

strength, usefulness, and beauty. If a fire does occur, the large beams and posts burn slowly and they never collapse until they are burned through. In that particular they are superior to steel beams which heat quickly and then buckle, bringing down in ruins everything above.

The objection to wood because it is susceptible to decay has been overcome to a considerable extent, so far as the use of this material in buildings is concerned. So long as it is kept dry, it will not decay. It is not always possible to keep it dry, but the intelligent builder sees to it that his wood is exposed to the elements no more than is necessary. The knowledge and practice of treating timbers with chemical to hinder or retard rotting have progressed so far that wood exposed to dampness may be made to last a long period. So far as build-



BILLY SUNDAY'S CHICAGO TABERNACLE

The accompanying cut represents the wooden building erected in Chicago for Billy Sunday's meetings. It is said to be the largest wooden structure in the world, 600,000 feet of pine having been used in building it. The edifice is meant to be only temporary, and the lumber was not dressed. The floor has an area of two acres.

resistance to combustion, and may be reached readily with water from sprinklers or hose.

The resistance to fire which woodwork of this kind offers is remarkable. The architect plans to have as few corners and hidden places as possible in which fire can gain a footing and burn where it is out of reach of the fire department. To that end, small timbers are not much used, nor are they in favor. A few large beams and posts take the place of many small ones, lessening the fire peril and detracting nothing from the building's

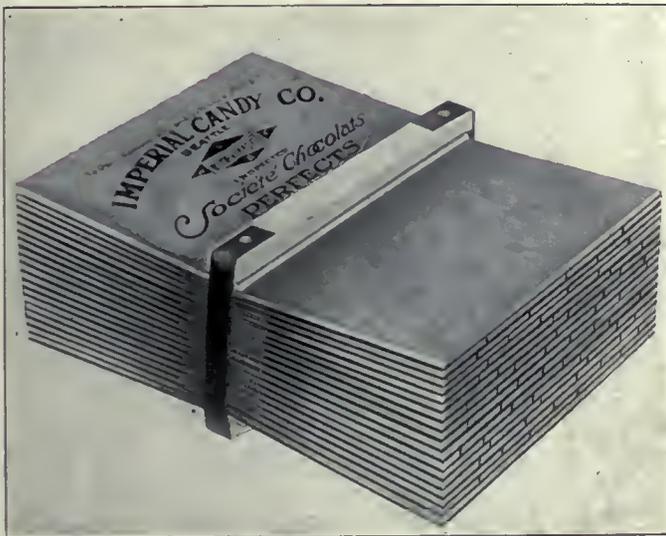
ings are concerned, the most troublesome decay is that known as dry rot, which does its worst work beneath floors and behind the points of junction of heavy timbers where it cannot be readily discovered. The first visible notice of its presence may be the collapse of a beam or a floor. Good ventilation is the preventive and cure for dry rot. Its name indicates that it is active in dry situations, and the popular notion is that its destructive activity is in some way due to dryness, and that in that characteristic it differs from other kinds of decay which

thrive on dampness. The name of dry rot is misleading, for it must have dampness, the same as other kinds of decay, in order to carry on its work of destruction. Dry rot decay is due to fungus, the same as all other kinds of decay. While this species of fungus prospers in situations which seem to be free from dampness, it needs water and it has the power to get it out of the air by absorbing it, and then makes use of it in producing the decay. This fungus, or one of the dry rot funguses,

bears the name *Merulius Lacrymans*, which might be liberally translated into English "tearful" fungus, which name is descriptive and appropriate, for by using its own tears, which it obtains from the dampness of confined air, it produces decay in wood—and the owner of the house has the bills to pay when new floors or new beams have to be put in. Better ventilation drives the damp, stale air away, and the fungus leaves off "weeping," and the wood ceases to rot.

## TWO GOOD THINGS IN A SMALL PACKAGE

ANOTHER use has been found for the justly famous Western Red Cedar Shingle. It is serving now as a container for a popular brand of society chocolates. Through the enterprise of the shingle branch of the West Coast Lumbermen's Association, one of the leading candy manufacturers in Seattle has under-



NOVEL CONTAINER FOR A BOX OF SWEETS

This candy box is built of real cedar, made to represent a miniature bundle of Rite Grade inspected shingles.

taken to pack some of his choicest products in miniature shingle boxes made of Red Cedar. The box has every appearance of a regulation bundle of shingles, even to the band stick and label. By a simple manipulation of the band stick the top comes open and a full pound of delicious chocolate candy is disclosed.

Buying candy in red cedar boxes now has become quite a fad among the gallant youths of the Puget Sound country and the novel idea promises to spread to other parts of the country. Thousands of boxes have been sold for parcel post delivery in the East and the candy manufacturers are receiving inquiries from Eastern dealers. One enterprising confectioner in Seattle recently arranged an attractive display window of cedar candy boxes and was rewarded with a group of admiring people in front of his store all day long, many of whom went inside to buy.

In each package is a little card telling something of the shingle industry of Western Washington and Western Oregon. It explains that the brand used on the package "Rite-Grade Inspected" is the official trade marked inspection mark of the Shingle Branch of the West Coast Lumbermen's Association; that its use is jealously safeguarded, and is granted to a mill only when that mill's shingles have been found, by association inspectors, to comply with the grade under which they are manufactured. The little card also informs the purchaser that the cedar industry is a rich asset to the states of Washington and Oregon. More shingles are produced in the state of Washington alone than in all other states combined. An aggregate of 36,000 carloads are taken out of the forests of Washington and Oregon every year. These shingles placed singly, end to end, would belt the earth 66 times with enough left over to stretch to the moon and back.

The shingle industry produces \$25,000,000 in annual revenue to these two states.

## GENERAL FEDERATION ENDORSES PINE BLISTER LEGISLATION

THE cordial interest of the women of the General Federation of Women's Clubs in the control and suppression of the white pine blister disease, which threatens the extinction of the five-leaved pines of America, is evidenced by the following resolution adopted at the recent convention:

WHEREAS, the white pine blister rust is a destructive disease to native white pine trees; and,

WHEREAS, the disease spreads rapidly and is a menace to the white pine trees of the United States; and,

WHEREAS, the white pine blister rust was introduced into the United States on imported white pine nursery stock; be it

Resolved, That the General Federation of Women's Clubs urge upon Congress the passage of Senate Bill 3344 to prohibit the importation of nursery stock in the United States.

# THE PIGEONS AND DOVES

(Family Columbidae)

BY A. A. ALLEN, PH.D.

ASSISTANT PROFESSOR OF ORNITHOLOGY, CORNELL UNIVERSITY

**I**N these days of world strife, nothing could be less appropriate than a story about doves. The emblem of peace and gentleness finds but scant welcome while forests are devastated while cathedrals smoulder, and while women and children are slaughtered through the barbarism of a so-called civilized nation. From another point of view, however, a few paragraphs upon real doves might be quite timely because, during the past two years, so many vultures have taken flight from German soil in the guise of doves of peace. But this is not an article upon doves of peace, nor German doves, but upon the doves of United States and Canada, and though the American dove will eventually follow the eagle across the sea, it is not the purpose of these paragraphs to trace its flight.

To begin with, there is no real difference between doves and pigeons. The word dove is ordinarily applied to the smaller species but often the two terms are used interchangeably. — Thus the bird from which our domestic pigeon has been derived is most generally called the blue rock pigeon or the rock dove.

In general, pigeons and doves can be distinguished from other birds by their small heads, heavy bodies and compact plumage. They have slender bills which are swollen at the tip and covered at the base by a soft fleshy skin called a cere. Their wings are long and pointed but their legs are relatively short so that while they are extremely strong fliers, they walk with short mincing steps. Their tails are always well developed and may be either square, rounded or pointed. Some confine the name pigeon to the square-tailed birds and the name dove to those with rounded or pointed tails

but this is by no means universal, the passenger pigeon, for example, having a decidedly pointed tail.

There are about 650 species of pigeons and they are found in all parts of the world except Arctic and Antarctic regions, being most abundant in the tropics, especially in the region of the Malay archipelago, where possibly they may have originated.

Because of their defenselessness, pigeons are particularly adapted to island life where enemies are few. This may account for their great abundance in the Polynesian Islands and also for the brilliant and conspicuous plumage of those species. For, while the majority of conti-

Continental species are bluish or brownish, many of these island species are strikingly brilliant and varied in their plumage, reds, greens and purples occurring in wonderful combination.

Isolation likewise accounts for such anomalous pigeons as the extinct dodo and solitaire of Mauritius and Rodriguez. These curious, heavy-bodied birds had entirely lost the power of flight because of the absence of ter-

restrial enemies on the islands which they inhabited. This made them an easy prey for the first explorers that found them, causing their early extermination.

In size, pigeons vary from the tiny ground doves, some of which are smaller than sparrows, to the crowned pigeons which measure from two to nearly three feet in length, or the aforementioned dodo which was described by its discoverers as "bigger than our swans."

Pigeons vary greatly in habits, and in the choice of their haunts. Some species live in large flocks, while others are solitary; some inhabit the dense forests, others the open plains; some are terrestrial and rarely fly while



THE EMBLEM OF PEACE AND GENTLENESS

This shows a mourning dove at its nest. The members of the family have many distinctive characteristics of form and plumage. Indeed the Hohenzollerns are having difficulty in disguising the Prussian Eagle in the plumage of a dove. The feathers are too short to conceal its form.

others are arboreal and among the strongest fliers. Most species disband during the nesting season, but the passenger pigeon nested in colonies of immense size.

Pigeons' nests are crude affairs, with little shape, built of sticks, and without lining. The eggs are pure white and usually two in number. The young are naked when hatched and perfectly helpless. They are fed by regurgitation during the entire time they are in the nest and indeed until they learn to eat by themselves. The food of the parents consists largely of seeds or grain which is stored in an extremely large, two-lobed crop and there softened and partially digested. This curdlike mass, mixed with a secretion from the wall of the crop, called "pigeons' milk," is injected into the throat of the young bird.

The writer once tried to raise a young mourning dove which was partially crippled and deserted by its parents.

All methods of feeding were unsuccessful, since the bird refused to swallow, until by chance, I happened to press on the corners of the mouth when food had been placed in the bird's throat. This was like pressing the magic button for the muscles of the throat immediately began to work and the food was swallowed. It seems nature has taken this method of conserving food and not until the old bird grasps the corners

of the mouth of the young in its bill is it able to swallow, and the old bird, knowing this, does not disgorge the food until it has the right hold. Thus no food is spilled or wasted.

The amount of food which a young dove is given at one feeding is often startling. Its crop is just as well developed as the old bird's and will hold several spoonfuls of seed, so that after each feeding the contour of the young bird's neck changes decidedly. Naturally the young are fed much less frequently than most young.

In drinking, pigeons differ from other birds in that they do not raise the head in order to swallow but keep the bill immersed until the draught is finished.

Pigeons have been variously grouped by ornithologists into families and sub-families but, in general, five large groups are recognized. There are first, the fruit pigeons, of which there are 212 species. They are the most brilliantly colored and are largely confined to the Malayan region. The bleeding heart pigeon, a familiar aviary species, is a typical member of this group but is by no means the most brilliant.

The second group, the true pigeons, number about 120 species and they are found throughout the world. The rock dove and the stock dove of Europe, and the passenger and band-tailed pigeons of North America are typical examples.

The third group contains the ground doves of which there are 312 species. They, likewise, are cosmopolitan but they are most abundant in the tropics. They have shorter toes and somewhat longer legs than the true

pigeons and spend most of their lives on the ground. The mourning doves of North America and the turtle doves of Europe belong to this group, but they are more similar to the true pigeons than are the majority of their kin.

The crowned pigeons, numbering eight or nine species, are confined to New Guinea, and form the fourth group. They are handsome slaty-blue birds, and are the largest of all living



THERE IS NO PLACE LIKE HOME

But young doves are not pampered with unnecessary comforts. A crude platform of sticks suffices for them. Here the mother dove is brooding her youngsters.

pigeons, varying from two to nearly three feet in length. The head is adorned with a large compressed crest, which with the large size of the birds gives them quite an unpigeonlike appearance. In fact one might almost think they belonged with the pheasants or the peacocks.

The last group or toothed pigeons contains but a single species, the so-called red bird of Samoa which has been almost exterminated by the introduction of the domestic cat. Its bill is quite different from other pigeons, being somewhat hooked and notched or toothed toward the tip. A real tooth is, of course, not present.

Of the true pigeons, the domestic variety is naturally the best known. The parent species is the rock dove

which in the wild state, inhabits the rocky coasts of Europe from the Faeroes to the Cyclades, nesting in caverns. In the domestic state, it has been carried to all parts of the world and more than 150 different kinds, which breed true, are now recognized by fanciers. In the United States, the only surviving species of true pigeon is the band-tailed pigeon of the Rocky Mountain region and it is becoming rare in many places. It is a bird nearly the size of the domestic pigeon and somewhat the same color, but with a white band on the back of the neck and a light gray band on the end of the tail. It feeds largely upon acorns, young sycamore balls and wild berries and normally confines itself to the mountains although it sometimes frequents larger river bottoms in large flocks if food is found to be good and abundant.

If we omit the white-crowned pigeon of the Florida Keys and the West Indies, the only other true pigeon indigenous to the United States and Canada is the Passenger pigeon, but it is now extinct. The vast flocks which during the last century darkened the sky for hours or even days at a time, are no more. The last survivor of the whole race died in the Cincinnati zoological park, September 1, 1914. Reward of several thousands of dollars have since failed to bring to light a single living specimen of this splendid bird. Alexander Wilson, writing about 1808 estimated that a flock observed by him near Frankfort, Kentucky, contained over two billion individuals and a nesting colony



AN UNUSUAL NESTING SITE

The mourning dove usually nests on the lower branch of a tree but here its nest is placed on a fallen limb in a marsh. All doves lay two white eggs.

of devastation, as if swept by the resistless blast of a whirlwind." The last wild birds of which we have any definite record were shot in 1898, curiously enough both on the same day, September 14, though one was killed in Michigan and one in New York.

During the ninety years from the time Wilson wrote until the species disappeared, the birds were netted and shot by the thousands and shipped in carloads or even train loads to the markets or fed to the hogs. Not content with netting and shooting the market hunters went to the nesting grounds with clubs and fires and sulphur pots and killed the birds on their nests. At one nesting place in Michigan, 500 netters were at work and their average catch was 200,000 birds apiece



PASSENGER PIGEON AND MOURNING DOVE

When the two birds are side by side the difference in size is very apparent. The pigeon is now entirely extinct; the last survivor of the once abundant species died in the Cincinnati Zoological Park September 1, 1914.

and at another it was estimated that fully a billion birds were accounted for. The laws at that time, gave them no protection because, as stated in some of them, it was considered that they were so numerous that the inroads of man could have no appreciable effect upon their numbers. And now they are gone. The last nesting known in New York State occurred near Olean in 1868, in Michigan in 1881. What a pity that even a few of these splendid birds could not have been spared, and raised in captivity if necessary, that we of the present might better appreciate the wonderful phenomenon witnessed by our fathers. Perhaps, however, we may learn from the mistakes of our fathers and, though we have lost this species, we may yet save others that are following it to extinction.

The mourning dove, though it is put in a different family or sub-family, is like a small edition of the passenger pigeon. Indeed when the rewards were offered for the discovery of a passenger pigeon, numerous claims for it were made by unobservant persons who had discovered mourning doves. Indeed the general shape and color pattern are very similar and differences of size are very difficult to judge in the field. The male passenger pigeon is very much bluer on the back and wings and redder on the breast than the mourning dove, but the female pigeon is scarcely brighter than the male dove. A close examination will always distinguish the mourning dove because it has a narrow black mark below and behind the eye and its belly and undertail coverts are buffy instead of white.

Mourning doves are found throughout the United States and southern Canada from remote deserts to orchards and gardens, but seldom in the deep woods. They usually travel in pairs or small flocks and never nest in colonies as did the passenger pigeon. For this reason they will never meet its fate and while they have become rare in some localities because of excessive shooting, they have now been taken from the game list in most states and are gradually increasing. They are extremely rapid on the wing, cutting the air like bullets, and it is little wonder that they are so widely distributed. They sometimes nest miles from water, and night and

morning fly in pairs or small flocks to drink. In fact, old mountaineers in Arizona sometimes follow their flight in order to discover the water holes. During the breeding season, they indulge in curious courtship evolutions, circling with unnatural short beats of the wings and sailing over the nesting area so that they appear strangely like sharpshinned hawks.

Like all other members of the family, mourning doves build crude platforms of twigs without lining of any sort on which to lay their two white eggs. These are usually on the lower branches of a tree but occasionally they build directly on the ground or on a stump or log fallen in a marsh. They begin nesting early in April in the northern States and raise two or three broods, nests containing fresh eggs being not unusual in late August.

The notes of most wild pigeons are soft cooing sounds and those of the mourning dove are even more gentle and mournful than others. This has given rise to its name.

The turtle dove, a species that is often seen in captivity in this country, is native throughout Europe during the summer, retiring to northern Africa for the winter. It is quite similar to our mourning dove, being fawn color with a larger black mark on the sides of the neck.

The rest of the ground doves are mostly tropical though one species is not uncommon from Florida to North Carolina. It frequents all sorts of situations from the swamps and pine barrens to the quieter streets of the cities and often comes to feeding stations maintained for birds. It is not

much larger than a sparrow and a trifle darker and browner than the mourning dove. It nests on the ground or in a low tree or bush and lays small white eggs. Many of the tropical ground doves are larger and dwell on the ground in the dense forest where they are found only with difficulty. Indeed they are not unlike tinamous in the way they slip through the underbrush and disappear.

A very interesting fact in connection with the growth of the features of members of the pigeon family has recently been pointed out by C. W. Beebe in the appearance of a row of enlarged stiff feathers along the inner margin of the thigh, that are among the first to appear.



PHOTOGRAPHING THE MOURNING DOVE

The camera is concealed in the gray box raised on a 15 foot tripod of poles. The box was in place several days before the picture was taken and gradually moved closer so that the dove became accustomed to it.

These feathers, Mr. Beebe believes, are indicative of a former stage in the development of flying birds from their reptilian ancestors. Before the wings had come to their present perfection and when the tail was still long and heavy, it was necessary to have more support at the rear end of the body to serve the same purpose as

does the membrane between the hind legs of a bat. These stiffened thigh feathers are thought to have served this purpose and today, though they are no longer needed and though they have degenerated to nearly normal proportions, they have not yet entirely disappeared.



Photograph by G. T. K. Norton

### AN INSPIRING SIGHT IN THESE DAYS OF NATIONAL STRESS

**T**HE Capitol dome from the Congressional Library. The most impressive trees were "focused out" so that the picture might be made. An idea of the number and size of the trees in Washington is best shown by the fact that it takes much time to photograph almost any subject from any distance.

### SPECIAL PRIVILEGE TO THE MILITARY

**T**HE large concentration of men at Camp Dix in New Jersey, which is located on the edge of one of the worst wilderness sections of the South Jersey pines, presented an unusual problem from the forest fire standpoint. By an understanding with the authorities in command special emphasis is being laid upon the need for care with fire when the men in training at the Camp have occasion to go into the wooded sections for either recreation or official work. The Department has made a blanket waiver of the necessity for securing permits for building fires to all military parties who are out on official duty in the various sections adjoining the cantonment.

### ITALY'S NEED FOR WOOD

**I**TALY will need unusual quantities of American lumber after the war. Authorities estimate that in the first five years of peace that nation must import from three to five times as much as it imported per year in the pre-war period, and for the ten years succeeding these five years, about double the annual pre-war imports. In other words, Italy will require for the first five years, 3,000,000,000 to 5,000,000,000 board feet of rough and square lumber per year, and 2,000,000,000 per year for ten years following this period. The longer the war is prolonged the greater will be the demand, and another factor will be the price at which lumber can be laid down in Italian ports.

Temporary construction for war purposes has required great quantities of lumber in Italy, while the difficulties attending the importation of lumber and the lack of coal within the country have made it necessary to use enormous amounts of wood for fuel.

State forestry began in Italy about 1877, the country being almost forestless until the state took hold. From forests and wood lots existing at the beginning of the war, it is estimated that approximately 50 per cent of all standing timber has been cut to date.

Before the war except for small quantities of black walnut from the United States and a little cabinet wood, all the imports were of cheap commercial lumber, coming mostly from Austria-Hungary and the United States. The chief source of supply was Austria-Hungary, but since the war none has been secured from that source.

The building situation in Italy has been peculiar for centuries. Scarcity of lumber for hundreds of years has brought about methods of construction in which a minimum of lumber is used.

Beds of excellent clay suitable for brick and tile making, good building stone and limestone capable of yielding fine qualities of lime and cement are found in almost every part of Italy. Added to this a surplus of labor before the war kept wages at a point that made stone and brick construction possible at prices that would seem incredibly low in new countries. Wooden houses are more common along the northern frontier of Italy, in districts near the forests of Switzerland and Austria-Hungary, where wood is plentiful and comparatively cheap.

**W**E have much pleasure in announcing the fact that Major W. B. Greeley, who is attached to the Forestry Section of the Engineer Corps and has been handling very important work in France, has recently been assigned to a high staff position with the rank of Lieutenant-Colonel.

# FLOWER AND OTHER STUDIES FOR THE SUMMER OF 1918

BY R. W. SHUFELDT, M. D., R. A. O. U., ETC.

MAJOR, MEDICAL CORPUS, U. S. ARMY

IN THE issue of AMERICAN FORESTRY for last month considerable attention was paid to the Spiderwort (Fig. 1) and to the edible mushroom known as the delicious morel (*Morchella deliciosa*, Fig. 2). Cuts were made of these interesting species; but owing to lack of space accommodations, they were both crowded out. They are reproduced here in that their histories may be made more complete through placing them on record—taken in connection with what was published about them in the June number.

During the latter part of that month, and in some regions throughout the rest of the summer well up into the autumn, we

meet with a genus of flowers of which there are about a dozen species in the United States, mostly east of the Mississippi River. Reference is made to the Skull-cap of the genus *Scutellaria*, both names being decidedly fanciful; for surely the beautiful flowers of no one of the species in the remotest degree remind us of such a thing as a "skull-cap," any more than the fruiting calyx suggests

a "little dish" (Fig. 3), which is the meaning of the Latin name *scutella*. This name apparently came about from the fact that the peculiarly formed appendage on the superior lip of the calyx opens on pressure and thus exposes the four little seeds in the cavity. This the children have likened to a little dish; and even Linnæus who created the genus seems to have been influenced by the same suggestion when he named it *Scutellaria*. Our vernacular names are equally ridiculous, for one of the best known species of this Mint family (*Labiatae*), the *Scutellaria laterifolia*, has not only been called Helmet-flower and Hoodwort, but also Mad-weed and Mad Dog

Skull-cap,—appellations handed down to us by the old herb doctors, who held that they could cure hydrophobia through its use. One of the most abundant Helmet-flowers is the *Scutellaria laterifolia*, which is usually found growing in damp and wet places in the woods in almost any part of this country, and in not a few localities in the British possessions north of us. It is more abundant in some regions than in others, while in the case of other large areas it is not found at all.

The general form of the flowers of the helmet-flower genus is well shown in Figure 3, which is one of the species that possesses serrated leaves. *S. laterifolia* has

flowers that are usually blue, though in rare instances they may be pink, or pink running to white and even pure white. Generically, Gray characterizes the genus *Scutellaria* thus: "Calyx bell-shaped in flower, splitting to the base at maturity, the lips entire, the upper usually falling away. Corolla with an elongated curved ascending tube, dilated at the throat; the upper lip entire or barely notched, the lateral lobes

mostly connected with the upper rather than the lower lip; the lower lobe or lip spreading and convex, notched at the apex." This much we can easily see in Figure 3, and Gray further informs us that they are "bitter perennial herbs, not aromatic, the short peduncles or pedicels chiefly opposite, 1-flowered, often 1-sided, axillary or spiked or racemed;" they flower all summer long.

*S. serrata* (Fig. 3) has been called the Showy Skull-cap for the reason that its flowers are so beautiful and striking. Other species are the Hairy Skull-cap, the Larger or Hyssop Skull-cap, and the Marsh Skull-cap (*S. galericulata*). Gray describes about thirteen species



NO PLANT OF SPRING AND SUMMER IS MORE ATTRACTIVE THAN THE SPIDERWORT OF THE ATLANTIC STATES

Fig. 1—In the flora of the eastern United States we find two genera of plants in the Spiderwort family (*Commelinaceae*); there are many species of the Spiderwort genus (*Tradescantia*), while the second group contains the Dayflowers (*Commelina*), of which there are several kinds.

and one subspecies of skull-caps for the Central and North-eastern sections of the United States alone.

Many flowers are more or less related to these skull-caps, as Gill-over-the-ground (*Nepeta hederacea*); also the Dragon-head (*Dracocephalum*), and our Self-heal (*Prunella*); some of the nettles, Pennyroyal, Bugle-weed, and others. It is an interesting group, the *Labiatae*, and many of them have already been figured in these articles in AMERICAN FORESTRY.

We may now pass to the consideration of another group of flowers, represented by species of great beauty, which has made them friends and favorites wherever they are found. These are the famous Lady-slippers or Moccasin flowers of the genus *Cypripedium* (*Cypripediaceae*) that fall into the lovely Orchis family (*Orchidaceae*). So well do Figures 4 to 10 inclusive of our illustrations here present the form, leaves, and general character of our Lady-slippers, that no special descriptions are needed. Our north-eastern flora contains quite a number of these conspicuous plants with their showy flowers; but it may be as well to note here, however, that the flowers are either very few on a stem, and generally solitary or single in all the species. Usually the stems are more or less hairy or pubescent, and the roots fibrous and coarse. The leaves can be easily studied in the figures, where, too, other structures are well presented.

Throughout the northeastern section of the United States we meet with some seven or eight different species of the Lady-slippers, and among them the remarkable looking Ram's Head Lady-slipper, which is a very rare and local species found in swamps and rich woods (*C. arietinum*). Passing this species, we have two kinds of these plants that have yellow flowers, namely the Smaller Yellow Lady-slipper (*C. parviflorum*) and the Larger Yellow, which is a lover of the woods and forests, and which many botanists consider to be but a variety of *C. pubescens*. Then there is another in which the lip is white (*C. candidum*), and which is rather rare. It is found in swampy places throughout many regions in the northeastern sections, especially in New York, New Jersey, to southern Minnesota, and

down through Kentucky and Missouri. We should be careful to not confuse this species with the albino form of the Pink or Stemless Lady-slipper (*C. acaule*, Fig. 10).

The Showy Lady-slipper is also a superb species (*C. hirsutum*), as is *C. passerinum*, in which two species the sepals and petals are not twisted; they may either nearly equal the lip or be shorter than it. There are probably other species in other sections of the United States, especially in the South and West. All of our Lady-slippers have a wonderful structure, and the genus has interested botanists all over the world. Most of them are easily naturalized, and they may all be transplanted to our gardens, where, without any special care, they will flourish beautifully.

Speaking of the Large Yellow Lady-slipper, or Yellow Moccasin Flower, also called the Whippoorwill's Shoe, Neltje Blanchan writes of it in this interesting vein: "Swinging outward from a leaf-clasped stem, this orchid attracts us by its flaunted



OLD-TIME HERB DOCTORS CONTENDED THAT IT WOULD CURE HYDROPHOBIA. HENCE IT RECEIVED SUCH NAMES AS "MAD DOG SKULL CAP" AND "MADWEED"

Fig. 3—Besides the above names, however, it is also widely known as the "Helmet flower" and "Hoodwort." It really belongs to the Mint family (*Labiatae*), and botanists know the common species as *Scutella laterifolia*; the one shown is probably *S. serrata*.



#### PECULIAR-LOOKING BUT EDIBLE MUSHROOMS

Fig. 2—This is *Morchella deliciosa*, thus named on account of being considered one of the most delicious of all edible mushrooms. Its average form is well shown here, and it is found early in the season in Maryland and elsewhere; its common name is the delicious morel.

beauty and decorative form from tip to root, not less than the aesthetic little bees for which its adornment and mechanism are so marvellously adapted. Doubtless the heavy oily odor is an additional attraction to them. Parallel purplish lines, converging toward the circular opening of the pale yellow, inflated pouch, guide the visitor into a spacious banquet hall (labellum), such



THE SEVERAL SPECIES OF THE MOCCASIN FLOWER OR LADY-SLIPPER ARE ALL VERY CONSPICUOUS REPRESENTATIVES OF THE ORCHIS FAMILY (*Orchidaceae*).

Fig. 4—This flower is the stemless Lady-Slipper (*Cypripedium acaule*) of Gray, by many called the Pink Lady-Slipper on account of the lively pink color of its lip. Here we see the full flower contrasted with the wilted one (as the seed-pod or ovary forms). The ovary is in plain sight.

as the pink lady's slipper also entertains her guests in. Fine hairs within secrete tiny drops of fluid at their tips—a secretion which hardens into a brittle crust, like a syrup's, when it dries. Darwin became especially interested in this flower through a delightful correspondence with Professor Asa Gray, who was the first to understand it, and he finally secured a specimen to experiment on."

Darwin's description of the fertilization of the Lady-slipper is a truly wonderful story in botany, and it is to be much regretted that it is too long to reproduce in this place, while to abbreviate it would be a great shame; it would surely spoil the lesson it carries.

The solitary flowers of the Pink Lady-slipper or Moccasin Flower are delightfully fragrant, and it is a pleasure to meet with the plant in the deep woods where it grows among the great rocky boulders; in fact, it is a pleasure that remains with one for a lifetime. Unfortunately, our Pink Lady-slipper is be-

coming extremely rare over large areas where it was formerly very abundant. This is due to thoughtless and un-instructed picnickers and joy-riders, who leave their machines to ramble far and wide through the woods where formerly the moccasin flowers grew in numbers. Many of these people cannot forbear picking every pretty flower they can reach, and our beautiful pink lady-slipper, for very obvious reasons, is one that is most often so destroyed. In scores of localities where it once grew plentifully, *Cypripedium acaule* is now no longer to be found.

Popular writers on our flowers seem to have vied with each other in their

which vanquish the offspring of self-fertilization in the struggle for existence, which is distinctly true of these Lady-slippers; for of all others they are, through their peculiar structure, more than protected against the evils of self-fertilization. Through the ages they have finally acquired a structure, in so far as the flower is concerned, that makes self-pollination an almost impossible occurrence.

In this connection one of our most popular writers on flowers says that the "fissure down the front of the pink lady-slipper [see cuts illustrating this article] is not so wide but that a bee must use some force to push against its elastic sloping sides, and enter the large banquet chamber where he finds generous entertainment secreted among the fine white hairs in the upper part. Presently he has feasted enough. Now one can hear him buzzing about inside, trying to find a way out of the trap. Toward the two little gleams of light through apertures at the end of a passage beyond the nectary hairs, he at length finds his way. Narrower and narrower grows the passage, until it would seem as if he



WE HAVE A SMALLER AS WELL AS A LARGER YELLOW LADY-SLIPPER; THE SPECIES HERE SHOWN IS THE LATTER (*C. pubescens*).

Fig. 6—A related species is known as the Ram's Head Lady-slipper (*C. arietinum*), and for a very obvious reason.

fanciful descriptions of these extraordinary plants. Elaine Goodale wrote of the Pink Moccasin Flower: "Graceful and tall the slender, drooping stem,

With two broad leaves below,  
Shapely the flower so lightly poised  
between,

And warm her rosy glow."

Long ago Darwin pointed out that cross-fertilization results in offspring



THIS IS A MOST PERFECT SPECIMEN OF THE PINK MOCCASIN FLOWER IN FULL BLOOM.

Fig. 5—Note the venation on the great, inflated, pink lip, and the curious arrangement of the structures back of it.

could never struggle through; nor can he until his back has rubbed along the sticky overhanging stigma, which is furnished with minute, rigid, sharply pointed papillæ, all directed forward and placed there for the express purpose of combing out the pollen he has brought from another flower on his back or head. The imported pollen having been safely removed, he still has to struggle on



IN THE CASE OF THE LARGER YELLOW LADY-SLIPPER, WE OCCASIONALLY MEET WITH A PLANT WHERE TWO FLOWERS OCCUR ON ONE STEM

Fig. 7—Note the upper one of the twin flowers; it shows very well that, in the passing of the bloom, the withering begins at the toe of the "slipper."

toward freedom through one of the narrow openings, where an anther almost blocks his way.

"As he works outward, this anther, drawn downward on its hinge, plasters his back with yellow granular pollen as a parting gift, and away he flies to another lady-slipper, to have it combed out by the sticky stigma as described above. The smallest bees can squeeze through the passage without paying toll. To those of the *Andrena* and *Halictus* tribe the flower is evidently best adapted. Sometimes the largest bumblebees, either unable or unwilling to get out by the legitimate route, bite their way to liberty. Mutilated sacs are not uncommon. But when unable to get out by fair means, and too bewildered to escape by foul, the large bee must sometimes perish miserably in his gorgeous prison."

In his book entitled, "My Studio Neighbors," William Hamilton Gibson has likewise given us a most interesting account of the fertilization of the Pink Lady-slipper by bumblebees; it is well worth looking up and reading.

F. Schuyler Mathews says of the Showy Lady-slipper

that "This is perhaps the most beautiful plant of the whole genus. The stem is stout and leafy to the top, the flower fragrant; its point is white, more or less blotched or stained with velvety light crimson-magenta, the sepals and petals white, broad, and not longer than the rotund pouch. The sterile stamen, long-heart-shaped, stained yellow at the tip and spotted crimson, crowns the column." His colored cut of the flower and leaves is rather attractive, and gives us a fairly good idea of the original.

One of the quaintest remarks made about the Yellow Lady-slipper comes from the pen of Alice Lounsberry. She says: "The color of this orchis is above all enchanting, while the coyness of its shape and the twirling side strings breathe out the essence of coquetry. There is an alertness, a crispness of expression about the out-turned toe which makes us fancy it is only awaiting the waving of some fairy's wand to spring out with its companions and mingle in a gay woodland dance."



AS PROFESSOR GRAY TELLS US, THE LEAF OF THE YELLOW LADY-SLIPPER IS MANY-NERVED AND PLAITED, SHEATHING AT THE BASE

Fig. 9—This gives the enlarged ovaries of the Yellow Lady-slipper (*C. pubescens*), two on one stem and one on the other. The insect is one of the "true bugs" (*Coreidae*).

What imagination some people do possess! Her figure of the flower is something after the order of the one here reproduced in Figure 8, only hers is colored. But it would seem that there must be many people still left in the world who can complacently gaze upon that picture without having such fantastic thoughts arise in their minds.

When the Pink Lady-slipper is found in very swampy land, where it often flourishes most vigorously, specimens of its flowers may be secured which are bleached nearly white from the excessive moisture of its surroundings.

Mr. Baldwin, quoting a lady who is familiar with this species in the Adirondacks, was informed by her that "it seems to have a great fondness for decaying wood, and I have often seen a whole row perched like birds along a crumbling log." They have also been found growing among the crags high up on the mountain sides, and in such situations, further north, spring up among the reindeer moss.

For several months past it has been the custom to select a zoological picture for the current flower article of the issue of *AMERICAN FORESTRY*. In no instance has the subject so chosen had any special connection with the main feature of the contribution in which it has appeared—although it might have. Often they have been animal forms that the collectors of flowers afield are likely to



OFTEN WE FIND THE YELLOW LADY-SLIPPER GROWING IN LITTLE GROUPS (*C. pubescens*).

Fig. 8—Five perfect plants of the Larger Yellow Lady-slipper (*C. pubescens*), giving a very excellent idea of this species as a whole, apart from a view of the roots.

meet with on their excursions for specimens, and so they have, in this way, been useful and instructive. Many of the subjects have been well spoken of by readers of *AMERICAN FORESTRY*; and it has had the advantage of using material brought in, which might otherwise meet

no useful purpose. Our subject for this issue is an immature specimen of the well-known Red-tailed Hawk (*Buteo b. borealis*), a falconine species occurring in the greater part of eastern North America. This elegant hawk, when adult, has a tail of a bright rust-red, while



WE HAVE ALBINOES AMONG FLOWERS AS WELL AS AMONG ANIMALS

Fig. 10—This rare specimen was found near Hyattsville, Maryland, by Miss Boone, of the U. S. National Museum; it is *C. acaule* bearing an albino flower.

in the subadult it is grayish, and banded across with some seven or eight narrow bars of blackish. The red tail of the parent bird is responsible for its vernacular name; however, it also has received other names, as the Hen Hawk, Chicken Hawk, White-breasted Chicken Hawk, Red-tailed Buzzard, Red Hawk, Buzzard Hawk, and Eastern Red-tail. Such a confusion of names would certainly put any one at sea in the matter of the identification, were it not that its scientific name, given above, stands all over the world. This splendid hawk is of a dark brown plumage above, mixed with soiled white and stone gray. On the under parts, posteriorly, it is grayish or pure white, tinged with buffy as we pass up either side of the breast. Abdominally, it is streaked with a rich brown, approaching blackish. The bill and irides of the

eyes in the adult are brown—the former more of a horn-color. In the immature specimen the bill and eyes are yellow. Legs and feet in all specimens are of a rich yellow. This is one of our largest hawks, often spreading to nearly sixty inches, though three or four inches short of that is the general rule; an adult female will measure some twenty-two inches in length.

Red-tails build big, bulky nests of twigs and bark, with some moss, high up from the ground in large trees.

The same structure is used year after year, becoming more and more bulky as additional material is annually added to it. The three or four eggs vary widely in size, form, and color pattern. An average one may be whitish, blotched with reddish and brown, while others are nearly white, without any markings to speak of; and some are seen where the markings form a wreath encircling the

larger end or butt. There are several subspecies of this famous hawk occurring in different parts of the country, as Krider's Hawk; the Western Red-tail; Harlan's Hawk, and the Alaska Red-tail. All have their subspecific scientific names, and have long been known to ornithologists. Then, too, all of the different forms have been called the "Hen Hawk" by laymen all over North America. On rare occasions they do eat poultry; and for this comparatively slight offense, thousands upon thousands of

them have paid the death penalty at the hands of the farmer and uninformed countryman. At least sixty-six per cent of their food consists of small mammals that are the greatest enemies the farmer has to defend himself from, while hardly seven per cent of this valuable bird's food consists of poultry. The latter has been proven to be either old, useless fowls, or perchance so diseased as to be a good riddance to the farm-yard anyway. In this manner our Red-tail Hawk performs a

service by keeping down fatal fowl epidemics, or destroying those domestic fowls that have been crippled by frost-bite, old age, and accidents. Its chief food consists of various species of ground and arboreal squirrels; all species of field-mice, rats, gophers, rabbits, moles, and a score of others that are the chief enemies of the agriculturists and country residents generally. In fact,



OUR FARMERS HAVE A GREAT FRIEND IN THE RED-TAILED HAWK (*Buteo b. borealis*);  
Fig. 11—Our Red-tail Hawk is an elegant species; this is a subadult specimen taken in northern Virginia.  
This Hawk is a great destroyer of rats and field mice as well as other vermin.

this hawk should receive Federal protection against those who aim to destroy it, and a stiff fine should be imposed upon any unauthorized person killing one impressed with the idea that the bird is a pest and one of the poultryman's enemies. One of the great mistakes constantly being made by such thoughtless people is to destroy any bird that may prey upon a few fowls each year, notwithstanding the fact that it does destroy ten times the number of rapidly breeding vermin.

## SPLENDID PROGRESS OF WOODEN SHIP BUILDING

ACCORDING to the United States Shipping Board, one ship a day is the pace wood ship yards now are setting for other shipbuilding plants.

The first seventeen days of May witnessed the launching of many wooden ships, adding 60,000 tons to the American merchant marine. In four successive weeks, the production of wooden ships has exceeded a launching a day.

Just recently the shipping board received word by telegraph of four launchings in a single day. That was

the banner day in war-time shipbuilding, a total of 14,500 tons going into the water.

The ships launched on the record-breaking day were:

Pascagoula, 3,500 tons, Dierks, Blodgett Company, Pascagoula, Mississippi; Kuwa, 3,500 tons, Grant Smith-Porter Ship Company, St. Johns, Oregon; Blackford, 4,000 tons, Grays Harbor Motor Ship Company, Aberdeen, Washington; Basco, 3,500 tons, Universal Shipbuilding Company, Houston, Texas.

# FOREST RESEARCH AND THE WAR

BY EARLE H. CLAPP

ASSISTANT FORESTER, UNITED STATES FOREST SERVICE

**I**F justification were ever needed for forest research work, the war has amply provided it. Lacking the peaceful gains made by the Department of Agriculture it would not have been possible to increase our food production, our meat supply, our forage resources, and to bring about a more effective use of wood and forest products in the degree in which this has been accomplished in the last few months. There is rarely time during a national crisis to develop a scientific basis for intensive practical application in the field of forestry, and the past work of the Forest Service is making it increasingly possible to aid those of our allies without such a basis and with problems in forest products.

Under the stress of national necessity fundamental scientific principles find application in a thousand ingenious ways, methods are enormously expanded and developed, and the investigative work itself is concentrated on the more pressing problems. This is exactly what is now happening in forest research. Before we entered the war the research work of the Forest Service was too little known outside the profession of forestry and a few wood-using industries. The Forest Products Laboratory carried on its investigations with too little recognition from scientific and technical men in general. Today there are few branches of the Government employing wood which do not utilize the results of Forest Service research. These results, however, would not now be so fully utilized had it not been for the zeal and public spirit of the research organization in systematically bringing them to the attention of every interested agency.

It would take too long, and it is not the time to enumerate, the strides made by our research, or to tell of the place which it occupies in the prosecution of the war. A few facts will suffice to show how useful the results are proving to the country. The Forest Products Laboratory's studies in the properties and uses of woods have practically laid the foundations for all existing Governmental specifications for wood. This is particularly true in the case of aircraft construction, shipbuilding, military vehicle and box manufacture. The demand for large supplies of Sitka spruce brought up prominently the question of rapid kiln drying without lessening the strength and toughness of the material. What the Laboratory has accomplished in its studies of kiln drying has proved an invaluable asset in this field, and hundreds of new dry kilns have been established throughout the country after the pattern evolved at the Laboratory and through its direct initiative, and there is besides a

wide-spread improvement in commercial drying practice.

The large demand for woods of special qualities necessitated the seeking of substitutes for woods previously used or finding new kinds of wood for new uses brought about by modern methods of warfare. The products of wood distillation have been brought greatly into prominence; and here again the research of past years has proved of great value. The possibility of obtaining ethyl alcohol from wood waste promises to be an important measure of national economy. Also of immediate military or commercial value are problems relating to gas warfare, offensive and defensive, extraction of potash from wood ashes, pulp-wood containers as substitutes for glass and tin, substitutes for raffia in camouflage, and impregnation and other treatment of temporary nose plugs for shells, and the like. The staff of the Madison Laboratory is now practically double that employed at the beginning of the war.

It is only because much of the fundamental knowledge was already secured that it has been possible to develop the work to its present state. The same is true of the results of silvical investigations. In finding substitutes for woods of which there is an inadequate supply, our knowledge of the different trees and their distribution has proved of great help. Past studies of the woodlot problem and the methods of handling woodlot timber form the necessary foundation for the present wood fuel campaign. The increased production and use of wood for fuel is at the same time the best means of improving the farmer's woodlot. Without the knowledge of how to handle woodlots the drain upon them might have proved calamitous.

The war, too, is going to leave a marked influence on the character of our research. Under the stress of a national crisis it has become more clear that there is a close interdependence between the different lines of forest research. A wood can be used with the greatest efficiency only when all of its qualities, mechanical, physical, and silvical are known.

For the first time in the history of forestry, scientists much more generally have come to feel that, in the members of the Forest Service engaged in research, the Nation has a body of men as fully equipped as those in the older scientific lines, and that the technical results secured are on the same high plane as those secured in other sciences. Forestry as an independent and generally recognized science has now become an accomplished fact.

## CONSERVATIVE CUTTING FURNISHES FUEL FOR TOWN

**T**HE White Mountain Forest has furnished practically the entire winter's supply of fuel to the people of Bartlett, N. H. Sixty-two families bought a total of 565 cords of wood at the price of \$1 per cord for stumpage. Cutting, which was done under the supervision of

the Forest Service, was carried out in such a way as to improve the condition of the forest. Practically all of this wood was cut by the individual purchasers in their spare time, so that the total cost to the consumer, including stumpage and hauling, was but \$2.50 per cord.



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# FEDERAL HORTICULTURAL BOARD URGED TO EXERCISE DECISIVE POWERS

**S**HALL there be a quarantine against the importation into the United States of plants with earth about their roots? This question was brought officially before the Federal Horticultural Board at a recent hearing and the reply will mean much to the agriculture, horticulture and forestry of the country. The public hearing was held before the Board on May 28, 1918, to determine whether all plants with earth about the roots, together with certain groups of plants from the Orient and other little explored countries, be excluded from entry into the United States. The proposals sent out in advance by the Federal Horticultural Board as a basis for discussion at the hearing follow:

## *Provisional Recommendations of the Bureau of Plant Industry.*

- A. That all foreign grown balled, tubbed, or potted plants, except as noted under B, be excluded in accordance with the following groups and dates:  
*Group 1.*—Azaleas, Rhododendrons, Palms, Araucarias, Bay Trees, Hollies, Ericas, and Acacias, January 1, 1923.  
*Group 2.*—Conifers, dwarf and other kinds, Buxus, etc., usually shipped as specimen plants, July 1, 1919.  
*Group 3.*—Small potted plants, including Roses, chrysanthemums, Violets, tender bedding plants, Ferns, tropical and sub-tropical, plants, etc., January 1, 1919.  
*Group 4.*—Clumps of hardy perennials used in forcing, Japanese Maples, Magnolias, etc., July 1, 1919.
- B. That provision be made for the admission of limited numbers of new varieties or novelties out of pots not exceeding two inches in diameter, this work to be conducted through the Department under rules and regulations prescribed by the Federal Horticultural Board.
- C. That no action be taken at this time toward the exclusion of *all* stock from the Orient, and other little explored parts of the world, but that steps be taken looking toward action in the near future of excluding certain groups of plants, especially from the Orient.

The hearing was well attended by representatives of the nurserymen and importers, and also by state foresters and national and state inspectors of nursery stock, and other state and national officials. Officers of many States who could not appear in person had written their views on the matter to the Board and in other cases Congressmen appeared for their States. The opposition of the importers to these proposals was not very strenuous. They dwelt upon the desirability of being permitted to continue the importation of certain fruit stocks, especially apple and two or three other plants, like palms and manetti rose stocks. Whether this failure on the part of the nurserymen and importers to vigorously oppose these proposals of the Board was due to a conviction of the need for drastic quarantines or to the general sentiment throughout the

country in favor of such action was not determined. On the other hand, the entomologists, pathologists, foresters, horticulturists and other scientists representing their respective States, presented a great amount of evidence in support of the measure.

The quarantines as proposed by the Board were unanimously approved by the representatives of the peoples' interests. Many of the delegates had been appointed by the Governors of their respective States to attend the hearing and conference.

Practically all of the delegates to the hearing representing States signed the following recommendations:

It is agreed to approve "The Provisional Recommendations of the Bureau of Plant Industry" as reported by circular letter May 8, 1918, except in the case of Group I, including Azaleas, Rhododendrons, Palms, Araucarias, Bay Trees, Hollies, Ericas and Acacias, that the exclusion date of this group be not later than the exclusion date of Groups II and IV, which is July 1, 1919.

At this meeting the opinion prevailed unanimously that immediate exclusion of plants from the Orient and other little explored parts of the world—except the Japanese lily bulbs, and sacred lily bulbs from Amoy, China—be urged at this time.

It was further agreed to urge the exclusion of all ornamental and forest nursery stock, not heretofore mentioned on and after July 1, 1919, and that fruit stocks also be excluded as soon as economically practicable.

It is understood that for the purpose of securing new varieties the Department of Agriculture should bring in for propagation purposes such plants under such rules and regulations as it may devise.

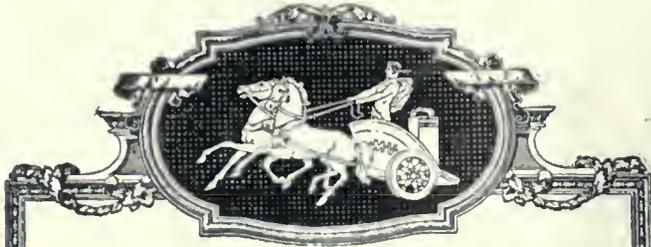
It was shown conclusively, and no attempt was made to rebut the arguments that the Federal and State inspectors of nursery stock, were powerless to properly inspect stock with earth about the roots because the insects and fungi could not be detected in the earth, and no means of fumigation had been found. The danger of bringing in plants from the Orient and other countries which had been little explored for dangerous insects and fungi, came from the fact that new and dangerous pests unknown here could easily escape the detection of inspectors because they did not know what to expect or how to guard against such pests.

The point was made with little opposition that the only way the interests of the farmers, fruit growers, and woodland owners of the country could be safeguarded against these imported pests was to prohibit the importation of all nursery stock. While some pests can be expected to reach here in unusual ways the great danger comes from the importation of their natural carriers.

The decision of the Federal Horticultural Board will be awaited with general interest.

**T**WO large mining and concentrating companies have made small-scale tests on hardwood tar as a flotation oil and both of these have reported very satisfactory results

**T**HE American Forestry Association is preparing a service flag for those of its members who are in the Army or Navy. Names of such members, with military designation, should be sent to this office promptly.—Ed.



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American lumberman, June 1, 1918.—Sawmilling in southern Brazil, by E. F.

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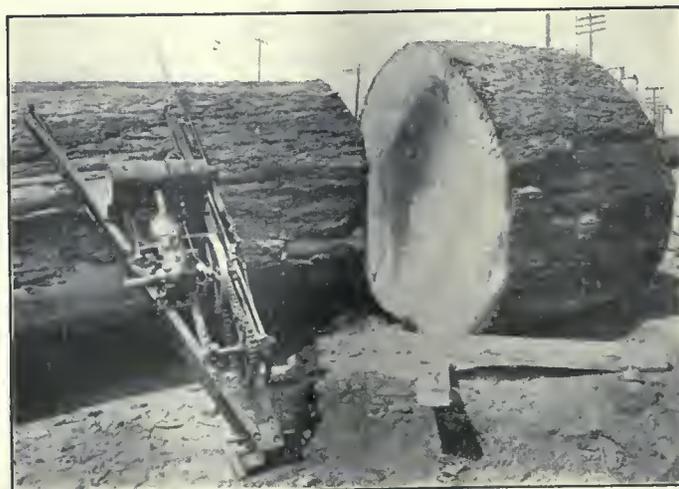
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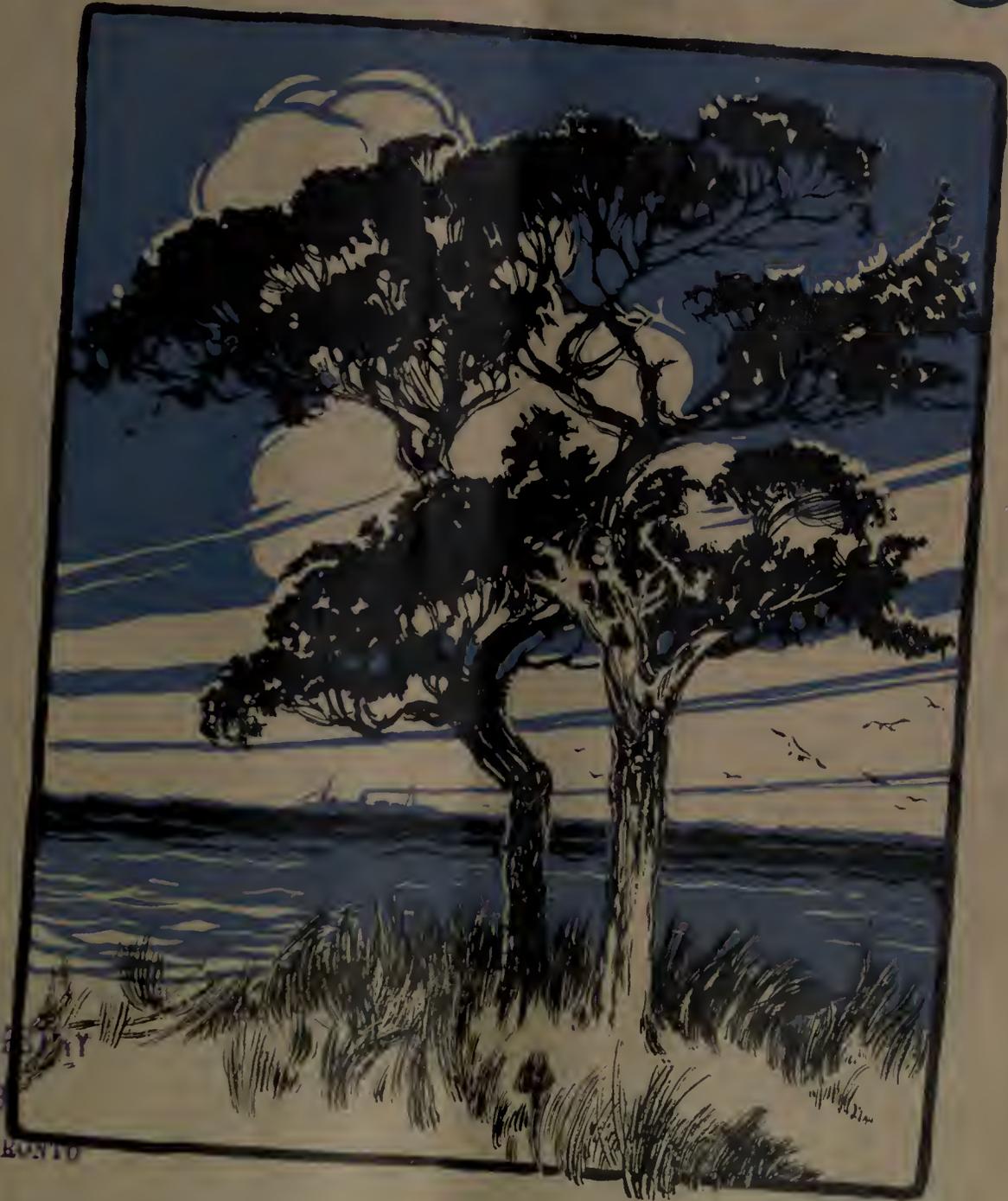
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AUGUST, 1918

NUMBER 296

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THE MAGAZINE OF THE AMERICAN FORESTRY ASSOCIATION

PERCIVAL SHELDON RIDSDALE, Editor

AUGUST 1918 Vol. 24

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No. 296



IN THE FLATHEAD NATIONAL FOREST.

The quiet beauty of this spot at the west end of Stanton Lake in Montana, makes strong appeal. Heavy timber surrounds the lake.

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Entered as second-class mail matter December 24, 1909, at the Post-office at Washington, under the Act of March 3, 1879. Copyright, 1918, by the American Forestry Association. Acceptance for mailing at special rate of postage provided for in Sec. 1103, Act of October 3, 1917, authorized July 11, 1918.

# THE WHITE PINES

**F**OR many centuries the White Pines have shared their divided glory of sunshine and shade, of snow and rain, and the rise and set of sun. They have spread their breadth day and night in the mountain ranges and in the valley plains. The pine seeds that wrought miracles—that gave mankind all there is of perpetual and beneficial force—the fruitage that built homes for humanity 🌲 🌲

Are we giving the greatest prophecy to the future of the pines? Let us lead the younger race of pines over the leagues of idle lands, so that this great step shall cease the starved soils, and make the swaying forests the Mother of every industry and science 🌲 🌲

—Agnes L. Scott



# AMERICAN FORESTRY

VOL. XXIV

AUGUST, 1918

NO. 296

## BATTLING THE PINE BLISTER RUST

BY S. B. DETWILER

**T**HE blister rust battlefield stretches from coast to coast. Introduced into the United States from Germany and other European countries less than a score of years ago, this disease of our white pine trees is well established in the New England States and New York, is attempting to get a foothold in Minnesota and Wisconsin, and without constant vigilance, it will find its way into the sugar pine and white pine forests of the far West.

Fighting the blister rust is less spectacular than fighting the Germans, but it is almost as difficult and necessary. Enormous as are present demands on our timber

supplies, they will be greater in the future. The goal in the fight against the blister rust is the preservation of one of the noblest groups of trees native to American soil—the white pines. Not only are these trees of surpassing usefulness because of the exceptional qualities of the wood, but their comparatively quick growth and adaptability for planting and management make them especially valuable to the forester, who looks to the needs of the future. European experience with the blister rust indicates that its unrestricted spread in this country would be a catastrophe. The native white pine in the Eastern states is valued today at \$186,000,000. The



*Courtesy of W. S. Carpenter, New York Conservation Commission*

### CURRENT LEAVES INFECTED WITH BLISTER RUST

The leaf with the deep rounded notches at the left in the picture is that of a flowering currant, the others are ordinary cultivated red currants. The dark spots (on the under sides of the leaves) are the fruiting bodies of the blister rust fungus. White Pine Blister Rust is caused by a fungus (a parasitic plant) which was brought from Europe on nursery stock. It begins life in the young bark of five-needled pines and produces blisters there that are filled with dust-like seeds called spores. The spores are blown in May and June to currant and gooseberry leaves and grow into a rust on the under sides of the leaves. After a period of growth on the leaves, another form of seed-like spores are developed and are blown in August and September to healthy pines. The life cycle then begins all over again. Spraying will not check its spread. The only preventive measures are the cutting and burning of diseased pines and the eradication of all currants and gooseberries in infected localities.



*Courtesy of W. S. Carpenter, New York Conservation Commission*

#### BLISTER RUST ATTACKS TREES OF ANY SIZE

Fourteen branches infected with blister rust were found on this tree, of which eleven are shown in the photograph. The tree is 35 feet tall, 8 inches in diameter at breast height. The largest branch girdled by the disease is  $3\frac{1}{2}$  inches in diameter at the point attacked. The currant which apparently caused the infection on this tree grew about 300 feet distant.

acreage of young native pine is about twice as great as that of the timber fit for the saw, and lumbermen and land owners estimate it as being equal in value to the merchantable pine, making the total pine value in this comparatively small area approximately \$1,300,000.

The possible loss from this disease in the West is even greater. Mature sugar pine and western white pine timber is valued at \$240,000,000. Both of these pines have been attacked by the rust in Europe and, together with the limber pine of the Rocky Mountains, would provide a means for disseminating the disease over the entire country west of the Great Plains. Up to the present time, however, the disease has not advanced so far, and it is hoped that rigid enforcement of the Federal quarantine against shipment into this region of five needled pines, and of currant and gooseberry nursery stock,

will keep the disease out of the western forests. One striking peculiarity distinguishes this disease of the white pines from most other fungus enemies of trees. It cannot

be communicated directly from one tree to another, but must pass two stages of its life on currant or gooseberry leaves before it can attack the pines. It lives

on currants and gooseberries of all kinds — "spice" or ornamental currants, red, white and black currants, cultivated and wild — and gooseberries of every description. On the pines, however, it is harmful only to those with needles in groups of five — the white pines. To save the pines all that is necessary is to destroy the currant and gooseberry bushes in the vicinity of the trees. This is accomplished without great difficulty where there are only cultivated currants and gooseberries, but where there are wild gooseberries and currants, as there are in most localities where white pine is native, it is often a serious problem. It is important to uproot all of the currants and gooseberries before the disease reaches

the latter if possible, or at least very soon afterwards. Otherwise the pines may become diseased without showing any outward evidence of the fact for a long time.



*Courtesy of W. S. Carpenter, New York Conservation Commission*

THE BEGINNING OF THE BLISTER RUST

The dead branch at the left first became infected, and the disease continued on into the trunk, near the base of the tree. This photograph was taken at Kittery Point, Maine, during the month of May, 1918. Hundreds of young native white pines in this area are similarly attacked.

The blister rust is not an insect as many suppose, but a fungus; that is, a plant which has no leaves and feeds on the live tissues of other plants. When a white pine tree is attacked, the invisible "roots" or mycelium of the blister rust fungus start to grow into the base of the pine needles soon after the spores are blown to them from currant or gooseberry leaves. The disease continues to spread from the needles to the twig below, then into the branch and finally the trunk of the tree. After an indefinite number of years, but usually two to three, the spore bearing sacks push through the pine bark. These sacks are bright orange in color, about the size of a grain of corn, and give the pine bark a blistered appearance, hence its common name. Eventually, the tree dies.

The spores formed in the blisters germinate and grow when they fall on a currant or gooseberry leaf. About ten days later little yellow or rusty brown spots appear on the under surface of the leaf. Late in the summer the currant or gooseberry leaves frequently become so completely covered with these spots that the entire lower side of the leaf has a rusty aspect. During the summer and fall, dark brown horn-like growths, not much larger than a pin point, also develop on the under side of the leaves. These "horns" bear the spores that cause the disease on white pine trees.

Very rarely, the blisters break out on pine twigs a year after they are infected. At other times it takes many years for the disease to become visible. In one instance, trees infected with the blister rust at the time they were brought into this country from Germany in 1902 apparently first produced "blisters" this spring—a period of sixteen years for development. Eighteen years is the longest time on record for the period between the time the disease entered the tree and the first appearance of the "blisters."

Aside from the peculiarity of this disease in attacking the pines only through the medium of currants and gooseberries, the most important point bearing on its control is the distance to which the spores are carried from currants or gooseberries back to the pines. Information on this point is furnished by a careful study of an area of infected native white pines in one of the New England states. This study was made recently by Mr. George A. Root and Mr. H. E. Grupe. The topography of the area is rolling, flattening out into an open river-valley on the north. The low hills are covered with dense stands of almost pure native white pine. Between these stands are open fields and pastures, with here and there scattered pines. All of the pines were carefully examined within a radius of one and one-half miles of the infected area.

The infection was traced to cultivated currants which grew in a garden at the eastern edge of the infected pine area, and which were heavily diseased with blister rust when destroyed in 1917. The individual pine infections seemed to date back to 1912-13. The original source of the infection is not known, but it is possible that it was brought in on the currant bushes from the nursery

where they were purchased. Within a radius of 500 feet of these bushes there were 1360 pine trees, of which 43 out of each thousand were infected. In a zone 500 feet wide outside of the central circle, there were 7840 white pines, of which 33 trees out of each thousand were attacked by the rust. In a 500-foot zone around the second circle (that is in the zone lying between radii of 1000 feet and 1500 feet from the diseased currants), there were 14,710 pine trees, and only 4 trees out of each thousand were infected, or less than one tenth as many as at the center of the area.

The disease progressed westward and slightly south from the currant bushes, following the prevailing winds. Pines growing in the open and along the borders of the woods were most severely affected. Beyond this, to the west, three diseased trees were found, slightly less than 1800 feet from the infected currants at the center of the area. However, as these were close to other cultivated currants, known to be diseased in 1917, it was concluded that these infections probably were not part of the larger infection area.

Trees of all ages and sizes were attacked by the blister rust, without discrimination. In each 100 infected pines, 36 trees were 1 to 12 years old, 45 trees were 13 to 24 years old, and 19 trees were 25 years old and upward. More than half of the youngest age group (1-12 years) were diseased on the trunk, while of trees 13 to 24 years less than one-tenth had the trunk attacked. The trees above 25 years of age had no disease on the trunks, but only on the branches. This does not mean that the trunks of the larger trees will not become diseased, but only that sufficient time has not elapsed for the disease to have run its course. Usually it requires a number of years for the fungus to work its way down the branches of a large pine, girdle the trunk and kill the tree. Small trees succumb to the disease more quickly and even these may live 3 to 6 or more years after the disease is apparent on the branches. But however slowly the disease progresses, death is none the less certain. It is especially important, however, to protect young pines by the removal of currant and gooseberry plants, because a tree 25 years old, though attacked, may live long enough to produce a saw log, but a tree 5 or 10 years old will die from the blister rust long before it becomes merchantable.

Within a radius of 4 to 12 miles of the original infection area just described, there were about 20 secondary pine infection centers. All of these were near cultivated currants and gooseberries, and most of them were small twigs on a few trees, indicating recent attack. The most probable explanation is that the diseased pines in the oldest infection area produced spores in great quantities, infecting nearby currants and gooseberries. As the disease can pass directly from one currant or gooseberry bush to others, the disease thus advanced from the nearby currants to the currants in the surrounding country.

White pine blister rust work in the New England States and in the Champlain Valley in New York is



*Courtesy of W. S. Carpenter, New York Conservation Commission*

**A SEVERE INFECTION**

The base of this native white pine tree is completely girdled by the blister rust fungus, and death will result very shortly. This photograph shows plainly the characteristics by which the disease may be recognized on pine in the spring. According to Mr. Carpenter, the title of this picture should be "Blister rust is beautiful and terrible!"

confined principally to the development of control areas. These areas are especially selected where young native white pine growth is of high value, and the effort is being made to free them from currants and gooseberries of all kinds, thus saving the pines not already diseased. Many new pine infection centers have been found in these states during the past year, and immediate and drastic action is necessary in securing the removal of currants and gooseberries, or serious destruction of pines will result. In New Hampshire 43 towns have voted appropriations to co-operate with the State Forestry Commission and the United States Department of Agriculture in establishing local control areas. Local control in which each landowner is interested, with the help of State and Federal funds, seems to offer the best solution of the blister rust problem.

It would be sufficiently difficult to control the disease if only cultivated currant and gooseberries were involved. The thrifty housewife mourns the loss of her currant jelly and gooseberry jam, and commercial currant plantations that represent a valuable source of income to their owners are not infrequent. However, most people in pine regions realize the greater value of the pines, and when they learn that they must choose between their currants and gooseberries and the trees, they sacrifice their bushes. It is hoped that some harmless substitute may be found to take the place of cultivated currants. Possibly high bush cranberry could serve this purpose, since its fruit makes excellent red jelly. It is a valuable ornamental shrub as well, although it lacks the fragrance of the "spice" currant, dear to the heart of New England because it announces the permanent advent of Spring.

In New England and north-eastern New York, wild currants and gooseberries are generally distributed. In some sections the bushes average only one or two per acre, in other places there are sometimes hundreds on an acre. In moist situations, skunk currants may form

a complete mat, covering the ground. Along stone walls and on dry or rocky hillsides, wild gooseberry bushes are numerous. One such bush was found last year that measured 14 feet in length, but usually they are 1 to 3 feet high. They are usually very firmly rooted, and well protected with prickles. In low, moist ground, wild black currants may be found occasionally, the bushes sometimes being as tall as a man and strongly rooted. It is not uncommon, also, to find cultivated bushes

growing in the woods, where the seeds were carried by birds, or where they remain to mark an abandoned house site.

The general plan of control is to uproot all wild and cultivated currant and gooseberry bushes from the areas in which the pines are to be protected from the rust. A crew of five to seven men, under the direction of a foreman, goes back and forth over the territory, strip by strip. The men work from 6 to 20 feet apart, depending on the density of the brush, and every foot of ground is scanned for gooseberries and currants. When found, the bushes are pulled up and burned, or hung up where they will quickly die and have no possibility of further harm. If the crown or "whirlbone" of the bush, with its attached roots, is removed, the plant is destroyed. If the top of a gooseberry bush is merely broken off, or a portion of the crown remains, vigorous sprouts will soon renew the plant. For this reason, it is best for the crews to be equipped with small picks or light grub hoes, rather than to attempt to pull up the bushes by hand power alone. In the case of skunk currant,



Courtesy of W. S. Carpenter, New York Conservation Commission

#### THE ULTIMATE EFFECT OF BLISTER RUST

This photograph illustrates the statement that a tree infected with white pine blister rust never has been known to recover. The stem of this tree was girdled two feet above the base at the point where it is broken. The tree is a 15-year old native white pine,  $3\frac{1}{2}$  inches in diameter.

each little piece of the root stock that remains in the ground quickly sprouts and forms a new plant, like witch grass.

Pieces of tin about five inches square, dipped in bright red paint, serve well to mark the lines through the woods. A hole about one and one-half inches in diameter is made near one corner of the tin, and a number of markers are carried on a hook attached to the

belt of the man marking the line. They are hung on twigs or stubs of branches, and the same man follows the line on the way back, picking up the markers, while a new line is marked by another member of the crew. Thus no time is lost in looking for the line and no bushes are missed between strips.

In each of the New England states, and in New York, a special control area has been selected for demonstrating methods of eradicating currants and gooseberries and for securing cost data on various types of land, and under varying conditions. These areas will be gone over at intervals of one to three years, to determine how often it is necessary to cover a given territory in order to free it of the bushes. It is inevitable that occasionally a bush is broken off and becomes re-established; also there remain a number of small seedlings, which eventually develop into thrifty plants, but which are too small to be found by the crews. However, necessity has developed methods to control weeds, and there appears to be no good reason why wild currants and gooseberries should not be eliminated at reasonable cost. The results of the work so far give every indication that the cost of this work will be far less than the cost of replanting an area if its present stand of young pine were destroyed by the disease. This does not include the loss of time which replanting would occasion, nor the very considerable loss in money if fine stands of native pine, five to fifteen years old, were permitted to be destroyed before they reach merchantable size. Furthermore, replanting such areas with white pine would not be successful unless the currants and gooseberries first were destroyed.

As in other lines of work, practical experience will develop new methods and increased efficiency. The

recent announcement of the successful progress of citrus canker eradication in the South is gratifying, because it proves that effective disease control can be done on a large scale. In the case of blister rust there is no hope that the disease can be eradicated from the eastern forests, but effective control is another matter. There is no question that with currants and gooseberries absent, the disease cannot attack the pines. The work to date proves that on many areas, at least, the bushes can be found and destroyed. All known facts bear out the statement that the maximum distance to which it is necessary to remove currants and gooseberries to protect the pines from serious infection is not greater than a third of a mile. Any pine owner can apply this remedy to protect his own pines. It requires training to recognize the various kinds of wild currant and gooseberry bushes, and the work must be carefully done or bushes capable of damaging the pines will be missed. A little study will enable each owner to determine for himself if it is practicable to protect his trees.

West and south of New York State the blister rust situation remains about the same as in 1917. Scouting for the disease is being done on an extensive scale. No new infections are reported from Pennsylvania and New Jersey, and the disease has never been found in the states further south. In the Lake States, scouting is being carried on in the native woods. In two states, Minnesota and Wisconsin, the disease has spread to native pines from infected nursery stock. The disease is known at but three places, and is being eradicated as fast as found. Shipments of nursery stock into the far West are being traced, but no indications of infection have been discovered.

### HELP THE TREES!

**I**F every man would be his own city forester and do his bit in taking care of the tree or trees on his own property, it would be a big lift in this time of labor shortage. On this subject the *Washington Evening Star* says:

"Another war service opportunity was presented to Washingtonians in an appeal by the District authorities to property owners to cultivate the young trees which have been planted along the sidewalks in front of their homes.

"Ordinarily about 100 men are employed by the department of trees and parkings for this purpose. On account of the labor shortage there are now but fifteen men engaged in the work. Home-owners are urged to come to the rescue, and it is pointed out that by so doing they not only will reap a benefit themselves but will assure the city of attractive, shady streets in the future.

"By loosening the soil around the young trees, removing suckers and otherwise employing cultivation methods, property owners, say the District authorities, will render an invaluable war service."

AMERICAN FORESTRY applauds this sentiment. The example set by the District should inspire the park and shade tree authorities in other cities to ask for similar co-operation from their people.

### THE TIME TO CUT WALNUT

**D**R. Robert T. Morris, of New York City, a well-known authority, in a recent letter to *AMERICAN FORESTRY*, says:

"No doubt the United States Department of Agriculture has taken into consideration the proper time for cutting black walnut trees reported by the Boy Scouts. The matter, however, is one which concerns us so deeply that I may be allowed to impress the point that these trees so far as possible should be cut between the months of September and April. If the trees are cut at other times of the year the root dies. It is a very important matter to leave living roots which will reproduce the trees rapidly. It is not only a question of future timber supply but the nut growers are at the present time making special effort to locate black walnut trees bearing particularly thin-shelled and well flavored black walnuts with good cleavage.

"The black walnut is destined to play a large part in our agricultural economics, both as a timber tree and as a source of important food supply. For that reason special effort should be made to avoid summer cutting."

# BARRACKS A. R. C.—AMERICAN RED CROSS

BY P. L. BUTTRICK, SECOND LIEUT., A. R. C.

WE are accustomed to think of an army in the field as an institution which lives mostly in tents or occasionally, when nothing much is happening, as when the Northern armies went into winter quarters along the potomac in our Civil War, in log huts banked with earth and roofed with canvas. In peacetime when not on maneuvers an army is supposed to sleep in permanent stone barracks.

Most of our wars have been fought over rather wide stretches of thinly settled country where tents were about the only available means of shelter. In Europe a mental picture of an army in the field does not include long rows of tents, since Western Europe is so thickly settled that its armies have generally been housed, billeted is the regular military term, in small villages, troops being quartered in each house according to its capacity.

In all the tiny villages of the French war zone one sees today signs on each house stating how many soldiers may be quartered there. In the zone of operations of the American army these signs are in two languages so as to be understood by the officers of both armies.

In the present war, it was early discovered that owing to the large size of the armies involved it was impossible to lodge them all successfully in the villages behind the lines. It seemed, therefore, that the country back of the lines must soon be dotted with white, kahki, or horizon blue tents, which would—as time and material became available—gradually be floored over with rough boards and have their sides built up with rough lumber and logs reminiscent of the environs of Alexandria,

Virginia, in the winters of the Sixties. But this development has never taken place, partly due to the fact that it was early realized that most of these shelters would have to be semi-permanent and not often moved, partly because the moist European climate is not so favorable to tent life as our own, partly perhaps because canvas in the enormous quantities necessary was not available at once.

One sees tents in the war zones—lots of them—they are used for the temporary supply depots for housing strictly mobile units and very largely for a

eroplane hangars, but the main problem of shelter for troops behind the lines which cannot be housed in existing buildings has been solved in quite another fashion—by the use of large numbers of portable or semi-portable wooden buildings, *barraques demontables*, as they are called in French.

These are wooden structures built of panels supported on trus-

sed framework. They are built at sawmills or wood-working plants and easily assembled with the aid of a few nails at the point of erection. The French army uses several types of these barracks, some made from its own designs and some from designs of various engineering firms in France. Some are fitted with floors, double walls, ceilings and glass windows, others are simply single walled, floorless shacks with cheese cloth soaked in oil in place of glass in the windows. Generally they are made of pine or spruce—*pin et sapin de bon qualite*, reads the description—but like lots of other things much depends upon the interpretation of the word “*bon*.” In the earlier days of the war the French sacri-



TYPICAL SCENE AT ONE OF THE CAMPS

An earnest worker of the Red Cross at one of the camps in France. In the background may be seen barracks of the standard type of construction.

ficed many of their wonderful road-side lombardy poplars to make barrack lumber, but they have largely stopped that now. The lombardy poplar is a strange looking tree—it has also a strange and wonderful wood. A barrack built of it in a few months assumes an appearance of being an acute sufferer from shell shock. It provides an abundance of unofficial points of ventilation. We say this feelingly, for, as Kipling says in one of his poems, "we can testify for we were there."

After erection, these barracks are roofed with tar paper, and sometimes the sides are also covered with it. Occasionally they are painted and near the Front they are sometimes camouflaged with all sorts of designs. The size varies from 3 x 4 to 8 x 40 Metres, but 6 x 30 (20 x 100 feet) is more or less of a standard for military barracks. Most of the different types have names, often those of the firm which designed or manufactured them. Thus we have HAMMON FRERES barracks, BÉSSANO barracks, ADRIAN barracks, SWISS barracks—because they are made in Switzerland—and many others.

Not only are these barracks used in the war zone for housing troops; they serve individually or in groups for storehouses, field hospitals, canteens, barns, workshops—everything. Outside the war zone they are also used for housing soldiers, laborers, prisoners, refu-

gees, and what not. Often they crop up in the most unexpected places. Once I crossed the drawbridge of a mediæval castle whose keep is used as a confinement place for boche prisoners who have tried to escape and found an Adrian barrack in the middle of the old courtyard—it housed the guard.

In addition to these standard types of barracks, the French are constructing large numbers of small portable wooden houses to replace the destroyed dwellings in the invaded districts.

When the American army came to France it quickly realized the impossibility of carrying on its activities entirely under canvas and in existing buildings and speedily began to purchase barracks and then more barracks. It was planned at first to bring over most of the

lumber for their construction from the United States, but it was soon evident that they could obtain them in sufficient—and that means in very large—number in France and Switzerland. So now at several points in France the United States army has barracks depots, out of which they can ship enough barracks to house an army corps as fast as they can get the railroad cars.

Not only the army itself, but that great auxiliary military service, the American Red Cross, which works with all the allied armies, but especially the French and American, found a need of portable barracks in large quantities. The Red Cross needed them in Belgium for civilian relief works, it needed them at French and American hospitals for recreation centers, it needed them in the American war zone for warehouses for special supplies furnished by the surgical service, it needed them for special hospitals not directly under the control of the army medical corps, it needed them for canteens along the lines of communications of the armies.

To handle this problem and also the numerous other problems of construction, such as turning hotels into hospitals and restaurants into offices, that the Red Cross is constantly called upon to perform, a special service called "Bureau of Construction" was organized. Like the Engineer corps of all armies, its function is to



Underwood and Underwood—British Official Photograph

THE BRITISH PUTTING THEIR CAPTIVES TO GOOD USE

Wood being the essential war material, the Britishers are using their German prisoners in transferring cut wood to small railway trolleys to be sent to construction units.

do all the real work and for its reward to get all the kicks. It numbers in its forces some of the best known American architects.

Last summer (1917) when the plans of the A. R. C. took shape and the need of large numbers of temporary structures was recognized, the Construction Bureau let a few small contracts for existing types of barracks. This started the work. But the types of barracks already designed did not seem quite to meet the needs of the Red Cross. Most of its barracks once in place would remain so for the duration of the war—easy demontability was not therefore essential. It could easily, in fact, be a disadvantage as a strictly demontable building is often less tight and comfortable than a more permanent one. Generally the standard types of bar-

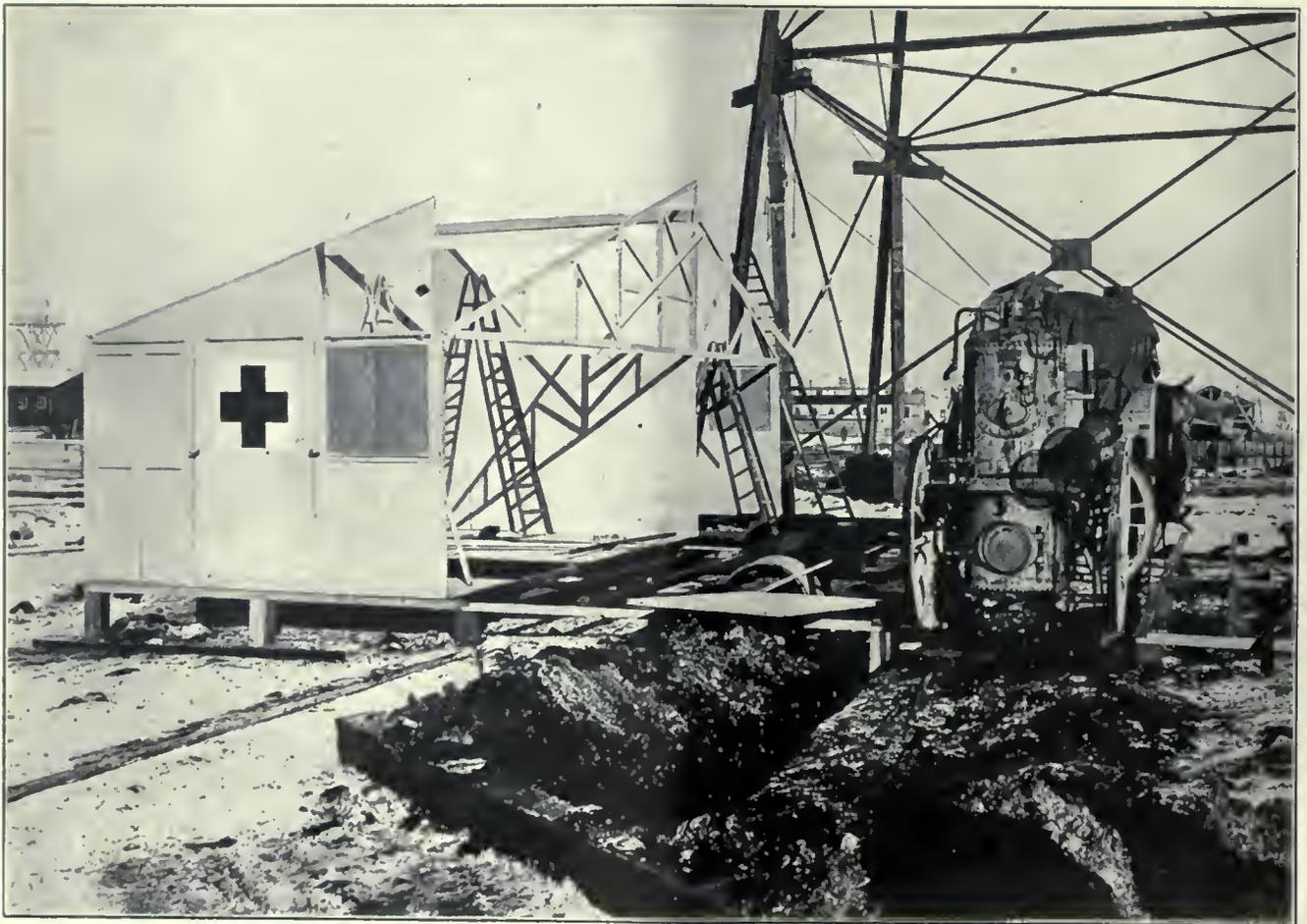
racks employed by the French, while advisable for housing troops, do not have sufficient window space for hospital or recreation purpose. Nor are many of them so constructed as to be easily heated for ordinary living purposes.

So the Construction Bureau architects designed a new design of semi-portable barrack to meet its own needs. It is built in panels, has double walls, a floor and a ceiling, and window space enough to make it practically a sun parlor. When properly erected it is practically a permanent building although it can, if necessary, be taken apart and moved to another site. Its standard dimensions are 6 x 30 metres (20 x 100 feet), but it can be lengthened or shortened to any practicable

them and have a barrack. To facilitate this, an ingenious system of numbering parts was also devised which enables the quick determination of the number of parts necessary to form a complete barrack.

This barrack is now well known over most of France. The French call it the "*Baraque A. R. C.*" They seem to think it a fine barrack and call it "*Joli*"—which does not mean what it does in English.

When the designing of this barrack was complete, it was found that all large firms specializing in this line of manufacture were fully occupied with their work for the French and other branches of the American army, but an American firm claiming to have good French connections agreed to take the first contract for 100 of



RED CROSS CONSTRUCTION WORK AT AN AMERICAN AVIATION CAMP IN FRANCE

This shows the shower baths given to one of the camps by the American Red Cross being put up. The building is of the "demontable" type, a wooden structure built of panels supported on trussed framework. On the right is seen the machine for heating the water.

dimensions by adding or leaving out side wall, floor and roof panels. Partitions can be installed if necessary and all sorts of interior arrangements are therefore possible. Like most of these barracks its roof is supported by trusses rather than by a complete framework such as would probably be used in strictly American practice—for its designers admittedly are indebted to the French for many of the ideas involved. It is designed to have the complete barrack an assembly of a number of absolutely standardized parts like a cheap modern automobile so that we might take a series of parts from half a dozen plants not under the same management, assemble

these barracks. Practically all of it they turned over to a large French engineering firm. They had facilities for only part of the work and so further sub-contracted a large part of it to other smaller firms scattered all over France. In this way a new line of firms, not before engaged in barrack manufacture, were brought into use and pressure taken off those who had all they could do to supply the regular demand of the French army.

At this point the work of supervising the manufacture of these barracks was turned over to the writer. In the months since, it has brought me into the forest regions of France and into touch with its timber industries, and

enabled me to be the first representative of the American army (for in France the Red Cross is as much a part of the army as any of its branches) to enter a dozen or more places in France remote from the war zone; and my reception has everywhere been a convincing testimony to the deep feeling of friendship which the French people have for the Americans. It is greatly to be regretted that my elementary knowledge of the French language has not always enabled me likewise to carry to the people of these remote places the assurance of the profound respect which American people at this time have for their French Allies.

There are a number of conclusions which seem evident to me after more than six months of travel in the forest regions of France which may be of interest to readers of this magazine.

It is said that after Nelson destroyed the French fleet at Trafalgar, Napoleon's chance of invading England was forever gone as there did not exist in France any

ments of forestry troops in the French, Canadian and American armies, besides numerous prisoners of war, mobilized laborers of all kinds under the sun, and French civilians too old or too young for military service, are all found at work throughout the wooded districts of France turning forests into "*Materiel de Guerre*" of all sorts. These operations are largely, of course, on the French national forests and are under strict supervision of the French forestry officials, and the cutting is made entirely on scientific forestry principles.

Most of the timber which is used by various contracting firms is cut from private forests. So great has been the demand for timber for war enterprises not directly under the control of the army that a great deal of speculation in privately owned forests has resulted. The Government exercises no severe control over these private transactions and from a French point of view they are lumbered therefore in a very reckless fashion, but regarding them in the light of some of our own destruc-



Underwood and Underwood—British Official Photograph

WORK OF THE BRITISH FORESTRY FORCES IN FRANCE—STACKS OF CUT WOOD AT A SAW MILL

From such points all over France, timber in all manufactured forms flows in a steady stream to the various construction units, for wood is a vitally necessary thing in carrying on both offensive and defensive activities. Now the American lumber and forest forces are backing up the splendid work of the Allies, with sawmills humming night and day, there is no fear that this need will not be met. The supply of timber needed will be constantly available, until the Hun is brought to his knees.

forests capable of supplying timber for constructing new fleets again to challenge England's sea supremacy. Perhaps that was a convincing argument to the French people of the need of a forest policy. At any rate, one of the sources of strength to France today is her forests. The demands which war makes upon the forests for wood materials, ranging all the way from heavy bridge timbers to poles and pine boughs for camouflage screens, is enormous. If France could not in quite a large measure supply not only herself, but her English and American allies as well with these products, the increased burden placed upon the world's ship tonnage in transporting this material presumably from America might be nearly insurmountable. As it is, several regi-

tive lumbering operations they seem quite conservative.

All through the wooded regions of France new sawmills have sprung up to supply the demand for lumber. Most of them operate on an exceedingly small scale. Many are operated by water power and employ a few old men and boys, and sometimes women work at the lighter tasks. From our point of view these mills are exceedingly primitive. I have not seen anywhere in France a sawmill capable of turning out 75000 feet of lumber a day. Most of them would scarcely turn out 2000 or 3000 feet. Many of them operate by old fashioned water wheels and use "up and down" sash saws—a form of machine all but obsolete in America. Others have circular or light band saws. Many of the carriages are

hand operated and fed against the saw solely by man power. A few rack and pinion carriages are seen, but they are low geared and slow—very slow of operation. The sawyer sets a log on the carriage and starts it on its way through and then goes out to peel the bark off the next log while the first goes through the mill. Automatic set works on the carriages seem to be unknown, the sawyer figuring out with an ordinary metre stick what he can get from the log and where to set his head blocks accordingly.

The surprising thing about it all is the good results obtained with this exceedingly primitive machinery. The lumber is uniformly well manufactured, much better so in fact than from many of our large mills, and the percentage of waste is quite small.\*

Although the French Government seems to exercise

little control over the cutting of private timber it exercises, in numerous ways, a very definite control over the production and distribution of finished lumber. First by its control over the labor supply and second by its control of railroad transportations. The mill

owners can secure as laborers only persons not subject to military duty, and there are very few men able to do satisfactory work at a saw mill who are not so subject. Many also of the owners of the mills have been relieved from the army solely on the understanding that they operate their mills to furnish the French army with a given amount of lumber for

which they are paid a standard price. If they are able to produce a larger amount they may sell it to other parties. In this way the American army and various of its subsidiary services have bought much of its lumber. An amusing site which for a moment makes us forget



*Committee on Public Information*

#### BUNK, NOT BARRACK CONSTRUCTION

This shows the cozy bunk of an artilleryman in France. It is wooden construction of the rough-and-ready but most necessary kind.



#### BARRACK CONSTRUCTION BY THE AMERICAN RED CROSS

The impossibility of carrying on all the activities of the American army in France under canvas, or in available village billets, was quickly recognized and the huge army is being housed in rapidly constructed, but most substantial and comfortable barracks. This same need was met by the American Red Cross in organizing its tremendous forces in the service of mercy, and out of this need grew the "Bureau of Construction." The result was not only the building of hundreds upon hundreds of the "dismountable" and standard type of barrack for the special use of the Red Cross, but the designing of a new, semi-portable barrack, with particular construction specifications and advantages. This barrack is now well known over most of France, and the French call it the "Baraque A. R. C."

the sterner side of war is: a French mill owner offered a high price for his product by the Americans knows that if he fails to deliver the larger part of it to the French at a lower price he will be ordered to again shoulder his musket and go to the trenches.

The French Engineer Corps, "*le Genie*," have representatives, generally officers or non-commissioned officers at all the large mills and other regional representatives who cover the smaller ones. These men keep account of the production and look after the expedition of the material. Under certain conditions they have the

power to requisition all wood supplies for exceptional needs of the French army. It sometimes happens, as it did when the writer was concerned, that a French officer is called upon to commandeer some material in transit for A. R. C. use. Such a situation calls for delicate handling, but with both parties trying to find an amicable way out the difficulty is somehow overcome, as are many others in the complicated inter-relations of the French and Americans.

\* Editor's Note:—This article was written before the American (forest) regiments landed overseas and commenced production, since which time timber of all kinds has been produced in immense quantities.

### THE HUN OF PLANT LIFE

**N**OW we have the Vegetable Boche! This freak of Nature finds its way to the heart of a bulb and bores right through it as Miss M. L. Long, of Enfield, New Hampshire, well knows. Miss Long sent a picture of the operation of the Vegetable Boche to the

"I am sending you under separate cover what I call a Vegetable Boche; a real case of a stab in the dark. The bulb is one of several I brought from Constantinople, where my father was stationed for many years at Robert College. The bulbs, not doing very well this spring, I decided to take them up and dry them for another season. The pushing qualities of New Hampshire witch-grass may not be familiar, but this specimen, which has pierced the heart of the unoffending bulb, may give the uninitiated an idea of ruthless efficiency in the vegetable kingdom."

Another thing the pest likes is potato, so keep your eye out, war gardeners, for the potato is a very important garden article at this moment.



THE HUN OF PLANT LIFE  
This is the photograph of the "Vegetable Boche."

American Forestry Association of Washington with the following letter:

### TREES FOR THE DEAD

**I**N the Passaic "Daily News" we read that the city of Cleveland has hit upon an admirable type of memorial for war heroes. The fallen soldiers are to have living monuments. Their memory will literally be kept green.

A boulevard is to be consecrated to them, bearing some such title as "Liberty Row." It will be lined with "Victory Oaks." There will be an oak tree planted there for every Clevelander who makes the supreme sacrifice. It will bear a bronze tablet inscribed with his name and military record. The planting of the trees will be made a civic ceremony, in which the relatives of each hero will participate.

What more fitting form of commemoration could there be for the boys who give their lives to their country? They themselves would doubtless prefer such monuments to marble columns. The trees will be, in their very greenness and robust strength, reminders of the youths who gave their vigor to win the big war. There will be no gloom about them. They will stand as a continual inspiration for the living who look upon them and are sheltered by them from sun and storm.

Such a fine innovation, one would think, needs but to be mentioned to win universal approval. Why should it not be adopted in this city? Why not be made a national institution?

# PUT THE SUN TO WORK

BY CHARLES LATHROP PACK

PRESIDENT, NATIONAL WAR GARDEN COMMISSION

**O**LD SOL is doing war work! The sun has been drafted! Yes, he's helping Hoover and the war gardeners now! His is no eight-hour day. He has to toil from the time he rises until he sets on food production.

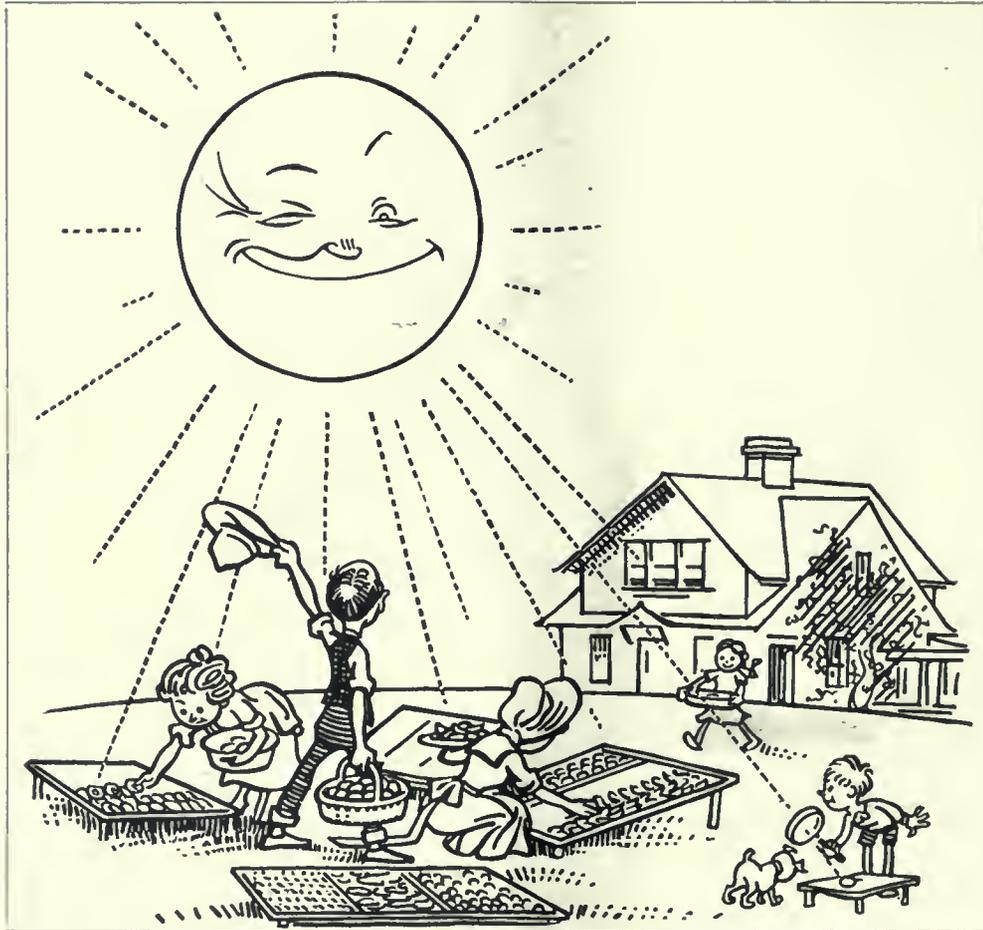
The secret is out now. Have you ever wondered why the war gardeners, among others, were so anxious for the "daylight saving?" Well the answer is:—they are making the sun work overtime for them drying food. Yes, DRYING it.

To be sure it is called "dehydration" now, but don't let that word scare you. It's the same old secret known to our grandmothers, great grandmothers and far more distant forebears, and much practised by our predecessors, the Indians. Why, even the Egyptians knew all about it, as the stores of "dehydrated" vegetables and fruits found in their temples will testify. Our old friend, Joseph, the first food administrator of whom we have any record, got his job through his big idea of having Pharaoh corner all the corn in the year of a big yield and "dehydrating" enough of it to keep the nation going through several years of scarcity. The rest of us can do as well as he did, for the only intelligent co-operation he could get was that of Old Sol who is working just as well now as he did then.

That there will be plenty of vegetables to dry this year is shown by reports to the National War Garden Commission on the number of war gardens in the United States. Much of the vast amount of garden surplus will be canned; but large quantities will also be dried. The saving of sugar and of jars, the ease and cheapness with which the work is done, and the compactness of the resultant product, are among the factors which make this

method of conserving food appeal to the people.

Estimates based on early returns to the National War Garden Commission show that there are more than 4,900,000 war gardens in the United States this year. In nearly every section of the country there has been appreciable and encouraging increases, the greatest percentage of increase being noted in the central western and Pacific coast states, which reported a total of 2,276,000 war gardens. The eastern states including New



AMERICA'S "PLACE IN THE SUN"

This is the way the war gardeners of the United States are harnessing the rays of Old Sol to make him help beat the Boche. Dried vegetables prepared for the British army in South Africa during the Boer War were opened recently and found to be as good as ever. They are only one-third as bulky and weigh only one-sixth as much as fresh products, and hence effect an enormous saving in transportation.

England, New York, Pennsylvania, New Jersey and Delaware showed 848,000 war gardens, while the South, counting in Texas and Oklahoma, has 1,246,000.

Taking these early figures together with the increased canning demonstration work being done by the United States Department of Agriculture in cities and towns, we feel safe in saying that the 1,500,000,000 quarts in tin and glass of canned stuff forecast by the Department will

be reached. Drying of garden products, however, is going to make the amount of food stored away for next winter's use much larger than it would be otherwise.

This old-new idea of food drying has taken forcible hold of the American people. Revived at this time of imperative need and great scarcity, it has appealed to everyone through its practicality. Food so prepared is wholesome, palatable, and extremely cheap. From being the preoccupation of scientists, the subject of food drying has come to be, next to the war itself, the biggest topic of the day.

Individuals and communities are taking it up. Mrs. Oliver Harriman's big food-drying demonstration in the Grand Central Station of New York has attracted large crowds who have gone away, resolved to "go into" the subject more deeply.

John A. Orr, the able and energetic manager of the Bridgeport Home Garden Committee, who has thoroughly investigated the subject, set himself to raise \$10,000 for a dehydrating plant in his community, where there are between 800 and 1000 acres in war gardens, and where potatoes are being produced at a rate that will materially cut the cost of living for the fortunate Bridgeporters next year.

In order to insure themselves of a normal food supply next winter the American people must preserve the excess this summer, and since drying is more economical than canning it is coming to play a larger part this season than ever before. The ease with which it is done is a strong point in its favor and practically all vegetables and fruits may be dried.

In addition to drying by the sun, the simplest method of all, food products may be dried by artificial heat and

by air-blast. Many persons insist that dried products are the coming big factor in food conservation and that they are superior to the canned preserved goods.

Manuals fully explaining the three methods of food drying issued by the National War Garden Commission of Washington have been distributed by hundreds of thousands all over the country. Indeed, the question of food drying has taken the American housewife by storm.

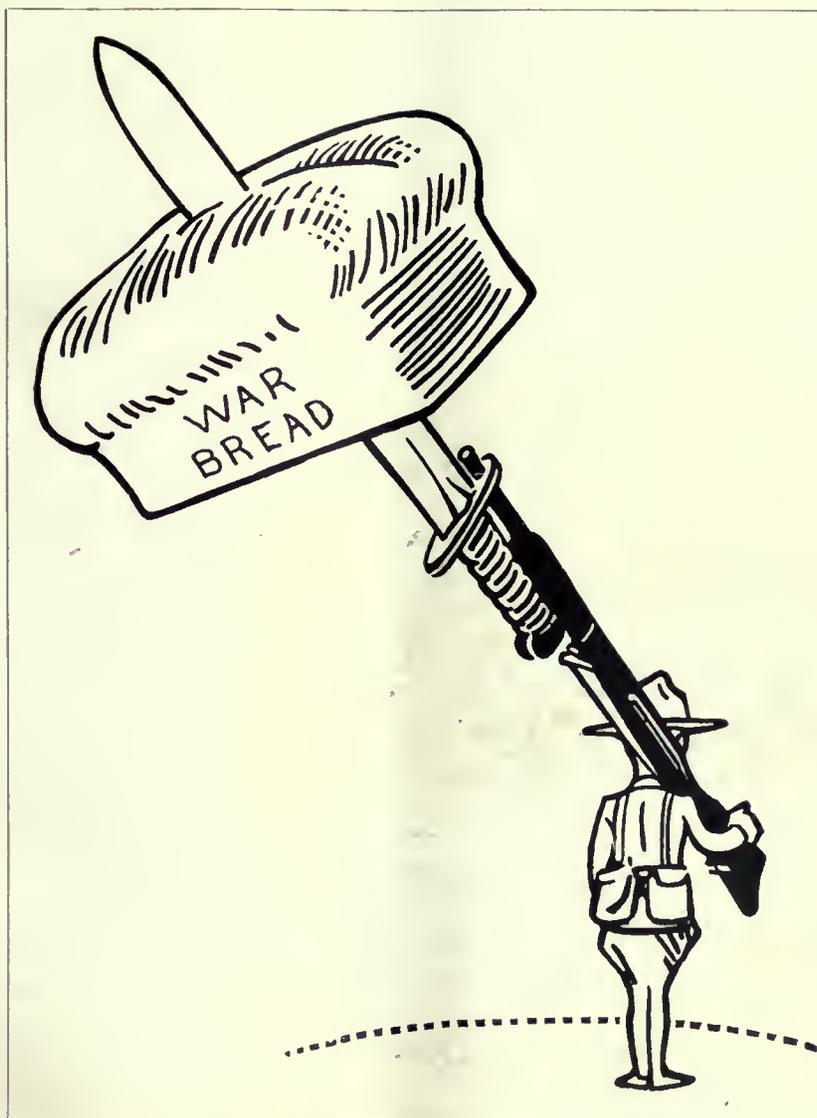
The United States government is taking up the subject very thoroughly and has experts who are making it a special study.

A bill to appropriate money to establish drying plants throughout the country is now before Congress. Community dryers are an old story in France, Belgium and Germany. Were it not for the big food dryers in Germany, where dehydrating plants have been increased from 400 at the beginning of the war to more than 2,000 at the present time, it is doubtful if the Kaiser's wretched subjects could exist at all. The Germans have found this method extremely economical.

The establishment of community canning and drying kitchens is one of the most striking changes which war has brought about and promises to become a permanent feature of our civic life. The plan has been thoroughly tried out in a number of widely separated communities

and has been found to be entirely practicable and a great saving of money, time and labor.

The statement that \$19,000,000 would be saved in transportation each year as the result of the more universal application of the drying process to fruits and vegetables in this country alone was made by Dr. F. F.



**THE WAR GARDENER ANSWERS PERSHING'S CALL**

**Bread and Bayonets will beat the Boche so say the war gardeners of the United States who have, according to reports received by the National War Garden Commission, jumped the number of war gardens 40% over those in 1917. The war gardeners are eligible to compete for the ten thousand dollars in thrift stamps the Commission at Washington is offering for the best canned vegetables grown in war gardens.**

Bowers and George T. Renk, of New York, who made computations. The water in food products adds 100 to 900 per cent extra weight and leads in cold weather to freezing. In New York City last winter thousands of dollars were lost through the freezing of fruits and vegetables. For this reason hotels and other buyers of food in large quantities heartily endorse the new method.

Community canneries and dehydrating plants are the up-to-date American solution of the food problem. "In union there is strength" has been clearly demonstrated in the united effort to rout the foe, Food Shortage. Organization is the watchword of the day and is just as valuable in solving the food problem as in any other difficulty.

Massachusetts has made an enviable record in community canning and drying. More than 80,000 quarts of fruits and vegetables were canned in community kitchens last year throughout the State. In addition to the canning several hundred bushels of products were dried. Thirty-five or more communities were organized to do work along lines of canning and drying. All were very successful in that they increased quite largely the preservation of food materials. Loss from spoilage was very small, in no case being more than two per cent and in most cases running less than one per cent. The cost of doing the work where volunteer labor was used was very low, running from 3 to 7 cents per quart, with an average price for all fruits and vegetables of 6 cents per quart jar. In those communities where all paid labor was used, the prices ran from 7 to 13 cents per quart, with an average for all products of 10 cents per jar. Items included were labor, sugar, salt and rubber rings.

The views of David Fairchild, agricultural explorer in charge of the bureau of plant industry, United States Department of Agriculture, on the important subject of drying vegetables, follows:

"I believe the American public should learn to use dried vegetables, because in so doing great economies can be brought about in this country as they have in Germany and Austria. The dehydrated vegetable saves transportation of both bulky fresh vegetables and bulky canned vegetables, not only those portions which are actually consumed but the waste which forms so large a part of the garbage of our cities. The dehydrated vegetable saves tin, since it can be put up in paper containers. It saves labor in the small home where the convenience of its use is apparent. It saves in wastage at the point of production and in the home. We little appreciate how gigantic the wastage of fresh vegetables is, and this wastage is largely because the vegetables are too cheap on the market to warrant a grower to ship them to it, and it is here that dehydration should play an important role.

There is nothing in the vegetable situation which confronts us today to assure us of cheaper vegetables in the future. We must not forget the small proportion of women gardeners in this country as compared with the women field workers of France and Germany and even England, and vegetables require a large amount of hand labor to produce. Where is the labor coming from?

"Possessing as we do such remarkable food as Indian corn, and having learned as we have to like it, there would seem to be a danger that we depend too fully upon it and, with the increasing price of vegetables, fail to realize that as we increase our corn consumption we require greater quantities of milk, meat, fats or vegetables to supply the food essentials lacking in corn. As the fresh vegetables become scarcer on the markets, it would become more and more difficult to do this, and the result predicted by dieticians is malnutrition among those who think they cannot afford to buy the vegetables. We should learn to use these dried vegetables to supplement the grain ration.

"It is easy to see a hundred reasons why we should not eat

**T**HE attitude of the Food Administration is exemplified by the following letter received by the Commission:

Mr. Charles Lathrop Pack, President,  
National War Garden Commission,  
Washington, D. C.

Dear Sir:

It is highly gratifying to those having food conservation at heart to see the great interest now being taken in vegetable drying in the homes throughout the United States. One of the most vital needs of America and the Allies is that the food supply be developed to the highest extent and that waste of every sort be prevented. If this is done, there will be an abundance, not only for the people of America, but for the suffering countries of Europe as well. Home drying of fruits and vegetables is an important contribution to the attainment of this aim and it should be accepted as a patriotic duty of every household.

It is undoubtedly true and should be so recognized that the home dried products will vary in uniformity and appearance and that the best results of dehydration at the lowest cost of production will undoubtedly be obtained when the process is developed upon a commercial scale. As yet, however, the commercial development of the industry has not been perfected nor has it reached a scale that will meet the nation's needs for this form of conservation.

Before this can be done there must be real demand for products prepared by this method. The success of home drying during the past few years has gone far to acquaint large numbers of consumers with the desirability of foods preserved by this method and warrants the assurance that the home drying movement of 1918 should be expanded as much as possible and so made an important part of the national program for food conservation.

Dehydration has come to stay in this country and while it may still be regarded as in the experimental stage, those who are most familiar with the problems of food production and conservation are firm in the opinion that we are seeing only the beginning of what is sure to expand into an enormous and most important industry.

The impetus given to the process of canning by the Civil War bids fair to be outrivalled by the impetus given to this simpler and more universally applicable method of food conservation and there seems to be no reason why the abundance of one season or one locality should not be made available by this means for periods of scarcity or for regions where fresh fruits and vegetables cannot be obtained.

Every encouragement, therefore, should be given to home drying, in order that the people may become familiar with the excellence of the products which may be prepared by this method, and to save the vast quantities of excellent food which now goes to waste for lack of adequate methods of conservation.

Very truly yours,

LOU D. SWEET,  
U. S. Food Administration,  
Dehydration Section.

dried vegetables, but it is unscientific and unpatriotic to shut our eyes to their possibilities. As a people we should move ahead into the field of dehydrated vegetables, develop it, discard what is not good, hold what is good, and make it a means to stabilize those vegetables the price of which fluctuates now in a most unsatisfactory and dangerous way.

"While I believe that we should consider first our own attitude toward dried vegetables and work out the best methods of using them for ourselves, we are warranted in believing, as conditions are at present in Europe, that there will be need of large quantities of all kinds of foods, including these dried vegetables, in those countries which are now famine stricken. Although it is undoubtedly true that the German troops are using enormous quantities of dried vegetables, it is not demonstrated to what extent they will be employed in the feeding of our own boys. No civilian will take the attitude that the boys should be fed on food which he himself refuses to eat. If we learn to use them extensively, it is a practical certainty that our own armies will employ them extensively, as have the armies of Great Britain, France and Germany."

Drying eliminates some of these items and also the expense of the glass can.

Much enthusiasm was shown at the state-wide conference to promote community drying and canning, called in Horticultural Hall, Boston, by the Massachusetts Board of Food Administration.

"Give me one ship to load with vegetable foods and I will land the same amount for

our boys 'over there' that it takes ten or thirteen ships to carry at present," says Miss Clara Endicott Sears, founder of the Harvard Canning and Evaporating Club.

The Club, organized only last year, was managed by Mrs. Frederick G. Avery. It produced for the consumption of the soldiers at Camp Devens, quantities of peas, corn, blackberries, blueberries, damsons, sweet potatoes, carrots, beets, apples, peaches, all in the form best suited to prevent perishing. The girls of Ayer volunteered for the work and soon developed great enthusiasm. The club hopes to treble its work of last year.

The value of dried vegetables and their keeping qualities are shown by the fact that a lot of this food kept from the time of the Boer War was opened recently and found to be as palatable and as nutritious as the

day it was put up. This had been shipped from Canada to South Africa for the British forces there, but on account of the termination of the war a large supply which was on hand was retained in England.

John Hays Hammond, the famous international engineer and a member of the National War Garden Commission, who knows much of South Africa in Boer War days from his work there in the development of that territory, is authority for the statement that the British soldiers could not tell it from the food they were accustomed to, and they thrived on it.

"It was probably due to its success at that time," said Mr. Hammond in speaking of the subject, "that the British War Office and the French Governments have purchased large quantities of dried food in Canada during the present war for the soldiers in France. Our own

quartermaster's department, I am informed, has purchased several thousand tons of dried vegetables and plans have been approved for the possible purchase of up to 20,000,000 pounds of such supplies. My friend, Dr. Charles L. Lindley, of Lakewood, N. J., an army surgeon during Lord Roberts' campaign, with whom I recently talked, confirmed every claim that can



AND SQUASH IN WINTER

His Highness the Squash may not be much on looks when dried but he makes up for it in taste. Here are shown the difference in size before and after the drying process.

be made for dried food as a valuable portion of the army's ration.

"When we consider the great saving in handling which can be effected, also the cargo space, the smaller number of trucks required for hauling the quartermaster's food supplies and economies in other ways, it will be readily seen that this is an eminently worth while project from a military point of view, and many of the same or similar reasons make the preservation and use of dried foods by our civilian populations of equal value from an economic and patriotic standpoint."

Listen to what Lou D. Sweet, president of the Potato Association of America, popularly known as the "Potato King," whom Mr. Hoover made head of the dehydration section of the United States Food Administration, has to

say on this important subject. In a letter to the Commission he says:

"Dehydration has come to stay in this country and while it may still be regarded in the experimental stage, those who are most familiar with the problem of food production and conservation, are firm in the opinion that we are

seeing only the beginning of what is sure to expand into an enormous and important industry. Every encouragement, therefore, should be given to home drying, in order that the people may become familiar with the excellence of the products which may be prepared by this method, and to save the vast quantities of excellent food which goes to waste for lack of adequate means of conservation."

The saving of transportation space, a vital problem now, caused the United States Army Quartermaster's Corps to buy large quantities of dehydrated vegetables for the soldiers of the American Expeditionary Force in France.

Canada is doing good work in dehydration, according to Joseph D. Bates, of Springfield, who made a tour of the Dominion. "I visited the plant of the Graham Company of Belleville, Ontario," said Mr. Bates, "where they were on an order running about \$5,000,000 worth of dried vegetables, more particularly a soup mixture. They dry by a simple method consisting of cabinets into which wire trays are placed. The drying is done by steam pipes underneath the rows of trays. "Why has so little been done in drying in this country?" Mr. Bates asks. "The preservation of food is vital and the food-drying method is not new, but has been experimented with abroad for many years. The question cannot fail to come; why have we done so very little



YES, THIS IS A TURNIP!

Before and after soaking you can see what happens to the turnip. Dried vegetables are the thing now-a-days. The process is simple and when it comes to putting food away space conditions can always be met by drying.

with it? I put that question to a number of authorities in Washington. They say it is because people do not know about it. It seems to me that this necessary and practical knowledge should be brought to everyone's mind. The great difficulty," he continued, "is that the public is slow to take up new foods and new methods of preparing foods. We must begin in the homes by having all the home dryers necessary, no matter how simple, installed. Get people to know drying as they know canning. Get them to realize what a protection for their families it is to dry food. A drying plant, used much as communities used the old-time grist-mill, should be installed. Families could bring their surplus here to be dried, paying a small sum for the service, or leave a small percentage of their products."

Mr. Bates estimates that a dried pound of vegetables costs about sixteen cents, exclusive of the drying. This is estimated on the basis of an original cost of two cents a pound—a fairly high estimate. Eliminate peelings and there is left a drying weight of about one-eighth. This drying process depends upon conditions. If the owner wishes to leave material in a dryer without moving air it will dry cheaper, but it takes time and space. If current is attached it adds to the expense. Some plants, said to be commercial ones, run as high or even higher than double the cost of the fresh material. Thus if the cost of the fresh material was sixteen cents a pound the total cost of the dried pound will be thirty-two cents. Commercial dryers operating with labor-saving machinery can bring this down

to one cent, one-half cent, and, in Germany, they figure one-quarter of a cent a dried pound.

Buffalo, New York, has taken the lead in establishing a community drying kitchen, which was opened near the city market as a means of utilizing the market waste. Its excellent record has not only given the whole city an object lesson in food conservation, but



THE BEET WILL FOOL YOU

The way the beet comes back to natural size is astonishing and that is one of the virtues of drying the things that take up so little room.

has pointed the way to the whole country to a means of preservings vast quantities of redeemable food. Such kitchens promise to become a city institution throughout the country.

The kitchen was opened last September and has only been operated with full equipment since February 1st. It will dry all summer on shares for farmers and others. It buys produce on wholesale figures. Most of the equipment was donated, a vacant store opposite the market serving as headquarters. It is under the direction of the city conservation agent of Buffalo and her assistants, the actual work being carried on by a drying expert. The output has been principally onions, potatoes, turnips, carrots, cabbage, celery and Julienne soup mixture. Onions have been most in demand but the soup mixture is a great favorite. A quarter-pound package, which sells for twenty-five cents, makes two gallons of soup. There is also a package selling for fifteen cents, enough for one gallon.

Through the efforts of this kitchen the propaganda for dried food is spreading rapidly in Buffalo and the

sales keep pace with the production, averaging about \$25 a week. The saving in transportation, in storage, in labor, in containers and in loss through deterioration is so great as to make it absurd in these days of terrific strain and great need not to exploit to the fullest the possibility of drying.

Mutual dehydrating may be divided into three classes: (1) Two or more families working together with equipment bought or made for the use of all; (2) Neighborhoods organized through a woman's club, church, or some existing organization; (3) Communities, organized through the local Council of Defense, the Mayor's Committee, the Chamber of Commerce, or the Woman's Club. Through neighborhood work any number of families from two to fifty may work along the lines of mutual drying. One set of apparatus will serve for all. The cost thus divided will be small for each household. The results will be of vast value, as each family will be thus prepared to feed itself next

winter and he who feeds himself helps to feed the nation as well.



ALL THE SWEETNESS STAYS

The dried sweet potato answers readily the drying process and loses none of its sweetness.

### LUMBER BRINGS BIG PRICE IN GERMANY

THE Berliner *Boersen Zeitung*, we read in the Pittsburgh *Sun*, states that the prices of all sorts of lumber in Germany have risen to astounding heights. Latterly the requirements of the army on the eastern front have considerably diminished, but orders from the railway car factories have greatly increased. The most serious factor is the scarcity rather than the high price level. Indeed, it is a serious problem to keep the flying machine factories supplied with sufficient wood. Material for these factories is so scarce that none of the wood usually discarded in sawing is now thrown away. Concerns that do not belong to the flying machine syndicate have to pay at least £31 (\$151 at the normal exchange rate) per 1,000 feet at the station in East Prussia; concerns that belong to the syndicate pay £25 (\$122) per 1,000 feet, the price fixed by the war office.

Ash also is very scarce and the price is as high as £45 (\$219) per 1,000 feet of round wood. This figure

is the fixed official price for sawed ash, but it does not even represent the average level of prices paid for "free" ash. Alder costs £22 (\$107) per 1,000 feet, when it is obtainable. Basswood is very much in demand. The demand for oak is especially heavy, owing to efforts to replenish depleted stocks. Undoubtedly prices for oak will increase still further when the furniture industry resumes activity.

OF the 52 ships that went into the water on the Fourth of July, those built entirely of fir have an aggregate of 86,000 tons, and those partially of fir have an aggregate of 52,000 tons, making a total of 138,000 tons out of 185,000 tons that were launched. Including the launchings of the Fourth, a total of 119 wooden ships have been built since the present activity started. Of this number the yards of Oregon and Washington have launched 69—the Oregon district 38 and the Washington district 31.

# A TWO-MILLION DOLLAR GARDEN PLOT IN NEW YORK CITY

**S**TANDING bravely in Bryant Park on Forty-second street in New York City where all may see is the "Little Garden House" of the National War Garden Commission. The Library is on one side and the Y. M. C. A. Hut on the other, while all around are towering buildings. From this vantage point the Commission, through Park Commissioner Grell and A. N. Gitterman, of the War Garden Committee, garden instruction is given out daily to thousands. Here poisonous weeds

"I consider this one of the big things the National War Garden Commission has done," said Mr. Gitterman, who has conducted the campaign for war gardens on Manhattan Island. "We have given out thousands of the Commission's garden books and other bulletins. Park Commissioner Grell has been of great assistance to the garden committee and the planting of a garden on Forty-second Street has placed the message of 'Food F. O. B. the Kitchen Door' before the thousands



THE FORMAL DEDICATION OF THE GARDEN HOUSE IN BRYANT PARK

At the dedication of the "Little Garden House" Park Commissioner Grell, at reader's left, received the key from Russell T. Edwards, director of the educational section of the National War Garden Commission (center) while A. N. Gitterman stands at the reader's right.

are fenced in by Dr. Miller who points out the characteristics to the city farmer.

Early in the spring the first spade of earth was turned by Charles Lathrop Pack, president of the National War Garden Commission, and from that moment thousands have watched with interest the progress of the garden. The ground used to plant this garden is easily worth two million dollars could it be used for mercantile purposes.

who use this famous street. We have had inquiries from people from every quarter of the globe and when the National War Garden Commission built the 'Little Garden House' it soon became known as the place to find out things about gardens."

Now that the canning and drying campaign is on, the war garden committee is continuing to work with the National War Garden Commission and the Commission's canning and drying books are being given out there also.

## SHADE

THEODOSIA GARRISON, IN EVERYBODY'S MAGAZINE

The kindest thing God ever made,  
His hand of very healing laid  
Upon a fevered world, is shade.

His glorious company of trees  
Throw out their mantles, and on these  
The dust-stained wanderer finds ease.

Green temples, closed against the beat  
Of noontime's blinding glare and heat,  
Open to any pilgrim's feet.

The white road blisters in the sun;  
Now half the weary journey done,  
Enter and rest, O weary one!

And feel the dew of dawn still wet  
Beneath thy feet, and so forget  
The burning highway's ache and fret.

This is God's hospitality,  
And whoso rests beneath a tree  
Hath cause to thank Him gratefully.

## WAR DEMANDS THREATEN HISTORIC FOREST OF FONTAINEBLEU

**W**ILL the forest of Fontainebleu have to be sacrificed to military purposes, questions a dispatch of the Associated Press. This matter is agitating French historical, artistic and literary circles. There is little of these questionings in the practical military mind and it is believed probable that before long the ancient forest will resemble a lumber camp on the Ottawa or the St. Maurice River.

The drain of lumber during the present war has been very great. With the difficulty in transportation growing more and more acute the supply of timber has had

It was felled at the request of the king. Its heart was rotten, but it was still bearing foliage and yearly adding new wood. Care had been exercised through the centuries to preserve it, a circular fence screening it from the deer. It was sixty-five feet high, with a wide, branching top. With all their experience with trees the Canadians hardly knew at first how to get it down. Their ordinary crosscut saws are only five feet in length, but for this gigantic oak they needed a saw some fifteen feet in length. Such a saw they ordered, and it was finally delivered, but not until the enterprising Canadian spirit



*International Film Service*

### RUINED FORESTS IN NO MAN'S LAND

Must the beautiful forest of Fontainebleu be sacrificed to meet the exigencies of war? This is a question now agitating many minds, but far better that it should be cut clean and the timber used for necessary construction work than that it should share the fate of this once beautiful bit of woodland in sunny France—now a desolate, shell-torn spot where the naked trees lift gaunt arms to the sky, calling for retribution.

to be obtained from local tracts instead of from the virgin forests of northern Canada.

A cable from London to the New York Globe tells us that one of the most picturesque and memorable pieces of work by the Canadian Forester Corps in England was the felling of the "William the Conqueror Oak," which stood beneath the king's window at Windsor.

For several reasons this was perhaps the most remarkable tree in the British Isles. It was more than 1,000 years old. Authentic records show that it was standing where the Canadians found it as long ago as 900 A. D. The tree was thirty-eight and one-half feet in diameter at the base.

had solved the problem. Into the heart of the trunk a hole was cut and a sawyer placed inside. The sawyer inside working with the fellow outside, cut gradually around the trunk until the ancient monarch fell.

The heart of the tree was cleaned out and the hole filled with cement to avert further decay. The wood is susceptible of the most beautiful polish and doubtless the main portion of the trunk will keep permanently. Some small souvenirs have been given away. Needless to say, they would command large prices if sold at auction. In a typically Canadian log cabin built for the king at Windsor, the mantelpiece is made of wood from the old oak. This cabin structure is of

great interest here. There is not a nail in it. The logs, which are of larch, are fastened with wooden pins. The roof is of bark, the floor logs were hewn by Corporal Mount Ford, a French-Canadian who used only an ax, and did the work so skillfully that a six-pence cannot be dropped between them. The floor logs rest on pillars. No plane was used on any part of the building. The larch, or what is called in Canada and the United States, tamarack, was the only tree that could be found straight and large enough for the cabin.

The Canadian foresters in the great park at Windsor

made the acquaintance of another extraordinary tree. This was a huge beech. Its branches extend in a radius of sixty-eight feet from the centre of the trunk. Beneath its leafy roof on one occasion 2,500 Canadian officers and men assembled for religious services.

There is a pang of regret in artistic circles, but it is remembered that England has sacrificed without murmur the beautiful trees in the Royal Park of Windsor, and it is believed that unless lumber can be obtained elsewhere under as favorable conditions Fontainebleau is doomed.

## A LETTER FROM THE CHAPLAIN OF THE TENTH

THOSE who have given so generously to the Fund for the Welfare of Lumbermen and Foresters in War Service, in response to the appeals made by the committee and to the advertisements published in this and other magazines, will be happy to read the following letter received from Lieut. Howard Y. Williams, the Chaplain of the Tenth Engineers (Forest). This testifies to the grateful appreciation of the men of the lumber and forest regiments, and should bring a warm glow of satisfaction to the heart of every person—man, woman or child—who has sent his dollar to swell the fund.

France, June 10, 1918.

"Dear Mr. Ridsdale:

"The Welfare Fund is surely helping out a great deal. Have been able to buy athletic equipment, etc., for the men, make short loans

for men going on leaves, and help in many little ways. Now that packages do not come over from the States such a fund is even more necessary and we thank you very, very much for your energies in our behalf.

"I am enclosing a letter telling of some of my activities in the Tenth Engineers.

"Trusting that you will pass our appreciation on to the many givers, I am with kindest regards,

"Very sincerely yours,

"HOWARD Y. WILLIAMS, Chaplain."

It is a pleasure to our Committee to receive such a letter, and doubly a pleasure to here reproduce it for the benefit of the readers of AMERICAN FORESTRY. The report of his "doings" to which Chaplain Williams refers is printed elsewhere in the magazine.

## DONATIONS TO THE WELFARE FUND FOR LUMBERMEN AND FORESTERS IN WAR SERVICE

AMERICAN FORESTRY will publish each month the list of those making donations to this fund. Many of the donations from members of the American Forestry Association so far received were made without solicitation and were inspired by reading in the magazine that a relief and comfort fund for men of the forest regiments was being collected. Many substantial contributions are being received from the Forest Service and from lumber companies and lumbermen following requests sent to them by the Secretary of the Welfare Fund for Lumbermen and Foresters in War Service, by the lumber organizations of which they are members, and by the committees of lumbermen which had charge in various sections of the United States of securing enlistments for the forest regiments.

Contributions to the Welfare Fund to July 29, 1918, are as follows:

Previously acknowledged .....	\$19,544.06	Mr. D. Blakely Hoar.....	\$5.00
Carey, Arthur E.....	5.00	In Memory of S. G. B.....	10.00
Delafield, Jr., Marturin L.....	5.00	Kidder, Nathaniel T.....	100.00
Finch, Pruyn & Company.....	100.00	Morse, Miss Frances R.....	2.00
From one of the Amexforce.....	2.00	Nelson, Jr., John M. (district No. 3).....	10.00
Gunnison National Forest.....	18.50	Vickers, Mrs. J. V.....	2.00
Mrs. C. S. Haight.....	5.00	Wollweber, Otis .....	2.00
Haskell, Rev. Joseph N.....	2.00		
		Total.....	\$19,812.06

## BELGIAN FORESTS WANTONLY SACRIFICED BY HUNS

ACCORDING to official reports, says the *Christian Science Monitor*, information has been received at the Belgian Legation from all parts of occupied Belgium which tell of the reckless destruction of public and private woodlands. Whole forests have been destroyed in the Ardennes region, while in the less luxuriant northern provinces, even the roadside shade trees and those bordering the canals have been cut down. This damage is distinct from that inflicted by shell fire, incendiary, and for reasons of military strategy.

It is part of Germany's systematic raid on the economic resources of the nation, with the object in view of eliminating industrial competition after the war.

The forest industry is an important factor in Belgian activity. Statistics furnished by the United States Department of Agriculture estimated the total wooded surface of this, the most densely populated European country, at 17 per cent of the entire territorial area, or 1,300,000 acres (1910).

# THE USES OF WOOD

## THE PLACE OF THE WOODEN ROOF IN CIVILIZATION

BY HU MAXWELL

Editor's Note:—This is the fourth story in a series of important and very valuable articles by Mr. Maxwell on wood and its uses. The series will thoroughly cover the various phases of the subject, from the beginnings in the forest through the processes of logging, lumbering, transportation and milling, considering in detail the whole field of the utilization and manufacture of wood.

**I**F the groves were God's first temples, doubtless the trees were man's first shelters. The canopy of bough and leaf broke the sun's rays and shedded the rain while primitive hunters and root diggers huddled beneath. Nature provided that shelter, but nature did not, in that particular, go far enough to satisfy the wants of men, and they learned to cut boughs and lay rude roofs on crude shanties. In the earliest shelters of that kind, the walls were probably branches also. That was a very old type of human den or domicile, and the period of its

beginning dates farther back in the past than history or tradition goes, and it is left for us to imagine what we like concerning the first builders of brush houses. But our knowledge of later builders of that class of roofs rests upon something more substantial than imagination. It may seem strange, but it is nevertheless true, that such huts and such roofs are still being built, not only in tropical lands where lizard-infested thatches of leaves shelter human beings, but in some instances bough roofs keep the rain and sun off Ameri-



ROOF OF BOUGHS AND WALLS OF BRUSH

This is a twentieth century penthouse in a Michigan forest, but it is doubtless very similar to shelters of limbs and leaves built in many lands during thousands of years of human development. Present day men sometimes go back to primeval conditions, by necessity or for pleasure. In a snow storm this is a better shelter than none at all.



A RELIC OF OLD CUSTOMS AND TIMES

These twin barns have stood a third of a century on a mountain in North Carolina without the expenditure of one dollar for repairs—and they show it. The most prominent feature is the clapboard roofs which, though somewhat tattered, promise to outlast the walls of the buildings. The clapboards are of oak.

cans in the United States at the present day. The writer of this has seen a human abode, intended to be more permanent than a temporary camp, made of brush, both walls and roof, and within three miles of a sawmill with a daily capacity of 40,000 feet of spruce, hemlock, and white pine lumber. Thus have habits of life and methods of using forest resources come down from men of the stone age to their descendants who live in the age of air travel and electricity.

Bark peeled from trees has always been a better roofing material than brush, but not always so convenient. Bark was the Indian's chief stand-by in making shelters, though the tribes of the treeless plains where bark was not to be had, used skins. The redmen were adepts in bark peeling. Most trees peel easily in summer, but few can be stripped in winter without breaking the bark in pieces too small for roofing stuff. The Indians knew the trees which could be peeled in winter, and attacked them with hatchets and wedges to pry the bark off. Basswood was such a tree, and they knew how to heat the trunk of white elm with fire and hot water to loosen the bark for winter peeling. But they usually peeled in summer what bark they expected to need the

following winter, and they kept it under water till they needed it. This was to prevent the bark from drying and rolling up in cylinders. The Indians knew that trees growing on the immediate banks of streams could be peeled later in summer than those trees of the same species which grew on high and dry land. Bark usually constituted both the roofs and the walls of the Indians' flimsy houses.

Bark is still being used exactly as the redman used it. Temporary shelters and cabins are built of it by woodsmen and campers. Nearly every person who has spent much time in the forest, either on business or for pleasure, has had experience with bark houses. In summer when the peeling is good, a man with a hatchet can strip bark, cut poles, and erect a penthouse for a night's shelter in less than one hour, if conditions are favorable.

The camper follows the Indian's

example and makes his bed as well as his roof of bark. It is nearly impervious to water, and protects the sleeper against wet or frozen ground below or rain or snow from the clouds above. Both walls and roofs of bark are more durable than might be expected, particularly if so situated that sun and wind will dry them after each soaking. The bark of some trees is more durable than the wood under similar conditions. The bark of birch logs lying in the forest may remain sound and retain the log's form after the wood within has decayed and fallen to powder. Bark is usually rich in tannin and this may



A ROOF CONSTRUCTED OF COMMON LUMBER

Such roofs are easily put on, and when lumber is plentiful, they are cheap. They give fair service while they last, and they are not expected to last long. They are often seen on portable sawmills, as in this one. Softwoods are preferred to hardwoods because they are less apt to warp and check in the weather.

act as a preservative against decay. Early voyageurs and trappers about the sources of the Mississippi and northward in Canada floored and roofed their camps with basswood bark when they could get it, and, as related in the interesting journals of Alexander Henry, they often put themselves to much trouble to get this bark.

Man was pretty well advanced in the use of tools before he was able to split tree trunks into boards and use them for roofing purposes. The lowest savage could break boughs for thatch; and only a little more skill was needed for stripping bark; but the step was rather long which placed primitive man in a position for working wood into flat boards for roofing his hut. Little of that work was being done by the aboriginal Americans at the time of the discovery, although they knew how to rive northern white cedar, or arborvitae, and make ribs and braces of it to strengthen their bark canoes. They did this more

by beating the wood with stones than by riving it with wedges; but the splitting was made possible by the wood's peculiar texture which caused it to part along the rings of annual growth. Splitting boards for roofs was a much more difficult task and was practically beyond the Indian's ability.

The clapboard for roofing was the white man's invention. No savage gave him any hints along that line, and that was one of the things which the frontiersman did not learn from the natives whom he dispossessed of their forest heritage. Such boards have

been of different sizes and sorts, some sawed, some split, one kind thicker on one edge than on the other. The oldest kind in America was split from bolts with maul, mallet, wedges, and froe, before mills sawed such boards. The clapboard was about three feet long, from five to

ten inches wide, and half an inch or more in thickness.

Such clapboards might be spoken of in the present tense as well as in the past, for they are with us yet; but it is now so much more convenient to make them by machinery than to work them out with wedges, mallets, mauls, and froes, that the handmade article is not often produced now, at least in the larger size. The split clapboards of the pioneers exist in large numbers yet on old buildings which have stood many years. Roofs of that kind are still to be seen in mountainous districts, particularly among the Appalachian ranges, though that peculiar style of roofs in which the boards are held

in place by logs or poles laid upon them, is becoming scarce, even on old buildings coming down from a long time ago. Few have been made in the past fifty years, and decay, fire, and other misfortunes have spared few of these relics.

It is a style of roof that will not be much missed, for it does not belong to our day and generation, but rather to the Daniel Boone state of culture. Modern roofs are better.

The split clapboards were made of sundry woods. Each region used the best it had. Oak was a favorite where it was procurable. It



SHINGLE ROOF 102 YEARS OLD

The roof on the central part of this barn was of white pine shingles, fastened with home-made nails, and served more than a century, when snow broke it down. The walls still stand on Bethel Farm, near Parsons, West Virginia. The nails were made by a negro slave named Titus Walker.



ORNAMENTAL AS WELL AS USEFUL

The architect who has a predilection for geometrical figures, can produce pleasing combinations with roofs and walls by working them into artistic patterns and color schemes. The modern residence shown in the accompanying cut is a good example. It stands at Riverdale, on-the-Hudson, and is built of southern pine and roofed with cedar shingles.

rived well and gave long service. Such a roof did not decay quickly, and the wind, rain, hail, and snow that beat on it required a long time to wear it out. The oak clapboard was much thicker than the oak shingle, and it did not warp so badly as the thinner shingles after a soaking rain. Chestnut and ash were well liked for split clapboards, while southern cypress, in durability and riving qualities, was near the top of the list of clapboard woods, though it was equalled by California redwood, and for splitting, it was no better than sugar pine, though the pine is less durable.

There was a smaller size of split clapboard, but it seldom went by that name. When of cypress and made in the South, it was called a shingle, and in California it was made principally of sugar pine and was known as a shake. These commodities, the clapboard, the split shingle, and the shake, are going out of use, but thousands of buildings roofed with them are still standing.

Any wood that may be had in bolts of sufficient size may be cut in shingles with saws, but the selection of the wood was different when the work of making was done by hand. A wood which did not rive easily was not suitable for shingles. Before the invention of the shingle saw, with its thin edge and gradually thickening blade, the highly satisfactory woods for shingles numbered scarcely a dozen in the whole United States, though some use was made of others. White pine, southern white cedar, and cypress were the favorite species east of the Rocky Mountains, while sugar pine, redwood, and western red cedar held first place in the far western part of the country. Those named are all soft woods. Where the best softwoods were not procurable, many oak shingles were split and shaved by hand. White oak was preferred, because it was considered more durable than red oak, but both kinds of oak were used in various regions. Oak warps badly

when exposed to alternate wet and dry conditions, as it is on roofs; but though changes in the weather produce curling and twisting in the shingles, oak roofs have sometimes served long periods, as much as forty years in some cases. Roofs of black walnut shingles are never put on now, because too expensive, but formerly they held enviable records for long service, some of those in Virginia having records of seventy-five years of satisfactory use.

Rived and shaved southern white cedar shingles were popular in New York, New Jersey, and Pennsylvania from the earliest settlement of the country until the wood became too scarce to meet the demand. Such roofs were light and durable. An early traveler criticized the builders of houses in Philadelphia because they made the walls only strong enough to sustain the light roof of cedar shingles, making no provision against the time when a new roof would be needed, which would have to be of heavier material after no more of the cedar shingles could be had. William Cobbett, an English traveler who visited this country about a hundred years ago, said that most of the good houses in America were roofed with shingles of this cedar, but he had in mind particularly New Jersey and eastern Pennsylvania. It is said that a pipe organ builder, Gottlieb Mittelburger, who visited Philadelphia more than a hundred and fifty years ago, worked out improvements in the construction of pipe organs by studying the musical sounds produced by rain falling on white cedar roofs.

There has long been a controversy, which remains unsettled, whether shingles

of white pine, white cedar, or southern cypress will last longest on roofs. They all have phenomenal records for long service.

Though the days of handmade shingles are not quite over, few are produced now-a-days. Saws cut the



A MAMMOTH SHINGLE TREE IN THE FOREST

Here is seen the process of felling a cedar giant in the forest of the Snoqualmie Falls Lumber Company, Washington. The notch or undercut indicates the direction in which the tree will fall. Six-sevenths of the shingles used in the United States come from cedars of the species shown in the picture. The tree grows near the coast from Alaska to California, and the forests contain billions of feet.

country's shingles and the industry is concentrated in a few regions which manufacture the bulk of the shingles. The state of Washington meets two-thirds of the whole demand of the United States, while Louisiana, which is the second state in the production of this commodity, furnishes only six per cent of the whole. White pine formerly held a high place in this industry, but this wood is no longer important as shingle timber. Cheaper species have taken its place, particularly western redcedar which now furnishes from seventy to eighty per cent of the country's shingles. In this industry, western redcedar is of more importance than all other woods combined. Durability and cheapness are the factors which have given it that commanding place. It has taken the trade away from white pine, but the same processes of manufacture are not in use now as in the palmy days of the white pine shingle. The old shingle makers who plied their trade with froe and drawing knife valued white pine above all other woods because of its fine splitting qualities and its softness. It was not considered orthodox among shavers of white pine shingles to have any sapwood appear on the finished product, and all such was religiously split from the bolts with axes before the man with the froe began to rive the slivers of wood and hand them over to the man with the drawing knife at the shaving horse.

Roofs made of sawed lumber have always been in use in this country, but they have usually been regarded as makeshifts. They are cheaper than shingles and are more quickly put on. Such a roof may be made waterproof, but often it leaks through knot holes, or through cracks due to the seasoning of the wood. If the sawed boards are laid in two courses, or double, the boards do not dry quickly after a rain, and within a few years decay is likely to soften the wood and permit rainwater to soak through.

The roof planks may be laid on in one of three ways: up and down from eaves to comb, parallel with the rafters; or they may be put on parallel with the eaves, each board overlapping the edge of the one next below; or, the boards are laid diagonally. The last method is by most builders considered the best of the three, because the water has two lines of flow. It can follow the grain of the wood, lengthwise with the board, or it may take a direct course toward the eaves; and in neither case is it liable to find its way through where the edges of the boards overlap.



CARRYING A CEDAR LOG THROUGH THE AIR

Here is shown a stage in the work of making shingles. A steam skidder is carrying a log out of the woods and delivering it to the railroad which will convey it to the shingle mill. Nothing is done by hand that machines can do better and more quickly. The scene is near Clear Lake, Washington.

The hardest argument that the advocates of wooden roofs have to meet, relates to the fire peril. That danger is considerable, but it is not quite so great as it has been represented to be by those who argue against the use of shingles. Interests which deal with roofing material other than wood have seen to it that the fire peril has



THE "KNEE BOLTER" DOING HIS WORK

The man operating the shingle machine is called a "knee bolter." With his knee he operates the carriage and rotates the block as it goes against the saw which takes off all the bark and sap. The block is then ready to be passed to the shingle saw. This mill is located at Clear Lake, Washington, in a famous shingle district.

been fully discussed and exploited, so far as it militates against the wooden roof.

The table which follows shows the number of shingles made from the several woods listed. The figures are for 1915:

Wood	Output
Cedar .....	9,500,908,000
Cypress .....	1,311,750,000
Yellow pine .....	578,307,000
Redwood .....	447,197,000
White pine .....	68,806,000
Chestnut .....	45,084,000
Western pine.....	30,308,000
Hemlock .....	24,140,000
Spruce .....	8,003,000
All other woods .....	23,182,000
Total .....	12,037,908,000

Precautions are necessary if such roofs are to be safeguarded against fire, because wood when dry, and particularly when old and weatherworn, is easily ignited. Yet it must be in actual contact with fire, or subject to excessive heat, before it will kindle; and in spite of many dangers, houses with wooden roofs are not burned much more frequently than are buildings which have other kinds of roofs. The roof is not the only source of danger from fire.

Chemists and engineers have carried out many experiments to find ways of rendering wood immune to fire danger. In certain directions, encouraging success has been attained, though no method of making a wooden

roof absolutely unburnable has yet been discovered. Shingles may be treated with chemicals in a way to greatly lessen their inflammability, and that is now being done on a scale which bids fair to become commercial. The high cost of the treatment is the chief obstacle in the way of larger use of such shingles, but that drawback may be overcome in time.

The strength of wood and its light weight in proportion to its strength serve to excellent advantage in the frames which support roofs. When wood is subjected to stresses of certain kinds, it shows as much strength as iron, if compared on the basis of their respective weights.

Most roofs consist of two parts. The covering of shingles, tile or whatever it may consist of, sheds the rain or snow, and keeps out the sun and wind; but this covering must have supports, and these are as important as any other part of the roof. These supports constitute the second part of the roof. In the simplest form of primitive constructed shelters, the brush, bark, or boards composing the covering were laid from wall to wall without supports of other kinds; but that form is not in use on many buildings of the present day.

Not infrequently the supports of the roof are more expensive than the actual covering. That holds true particularly of large buildings, but between the largest and the smallest there are many styles, each calling for supports of different kinds and sizes.

The rafters, ridgepole, and sheathing are sufficient for



PACKING THE RED CEDAR SHINGLES FOR SHIPMENT

The shingles are packed in bunches, about four bunches to the thousand, for convenience in handling and counting. An expert packer will put up 140 bunches in a day of ten hours, if his hand is true and his eye is quick. Above the packer's head may be seen the sticks and the strap irons for binding the bunches.

the ordinary house, and there is no better material than wood for these. When a little more strength is wanted, without the addition of much weight, kingposts give the desired result. As the size of the structure increases still further, and a larger, heavier roof is required, trusses are introduced. The truss is a sort of bridge which reaches



GOOD AFTER TWENTY-SEVEN YEARS OF SERVICE

These shingles of western red cedar show little signs of decay though they have been on the roof 27 years. A few are loose, but that is the fault of poor nails and not of bad shingles. This affords an excellent example of the necessity of using none but the best nails in putting on a shingle roof. Photograph by the West Coast Lumbermen's Association.

from wall to wall, and its function is not only to support the roof, but also to tie the walls together and prevent them from spreading apart by the push of the weight above. The wooden roof truss has been a favorite study with architects, and they have improved old forms and invented new, until roofs of great size are practicable without posts intermediate between the walls to sustain the load. Walls more than one hundred feet apart may be spanned with safety by trusses, and that style of roof is considered economical under certain conditions. The designers of roof trusses have borrowed ideas from bridge builders, and they have also furnished ideas to bridge builders. A single wooden bridge span, without supporting arches, has been found practicable up to a length of 360 feet or more, and if it were necessary to do so, roofs could be built from wall to wall that far apart by a similar use of wood; but that is not necessary, for it is more economical to have midway posts or columns as supports. But such supports or piers are not always practicable in bridge building, and that accounts for bridge spans being longer than roof trusses.

Steel competes with wood as roof truss material, and this

metal can be used wherever wood answers, provided it is not barred by cost, and if excessive weight is not objectionable. Wood is much lighter than steel, and for trusses of moderate length is cheaper, even when the cost of steel is normal; and at this time, when steel is up in price because of the war, the expense of building wooden trusses, unless they are very large, is far below the cost of steel. But, since the strength of material must be increased in proportion to the length of the truss, a limit in size is finally reached beyond which wood cannot compete with steel, even at the present high cost of the metal.

The building of wood roof trusses for large buildings has greatly increased in this country since the beginning of the European war, when the price of steel rose rapidly. It has surprised many people that wood is so well adapted for that high class of architecture; and the stimulus thus given the use of wood may be expected to have results in years to come.

Investigations of the strength of American woods have given valuable assistance in their use in roof supports as well as in other large structures. It is fortunate that some of the strongest and most abundant woods are moderately light, thus affording maximum strength with minimum weight, making wood an ideal material for large roofs and their supports. Old churches and halls in England have enormous beams as roof supports. Some are larger than the situations called for, but the strong woods of England are quite heavy and the builders wanted to be on the safe side and used large timbers. In America, equal strength is secured by using lighter woods in smaller beams and braces, arranged in a more scientific manner. Among the excellent structural timbers of

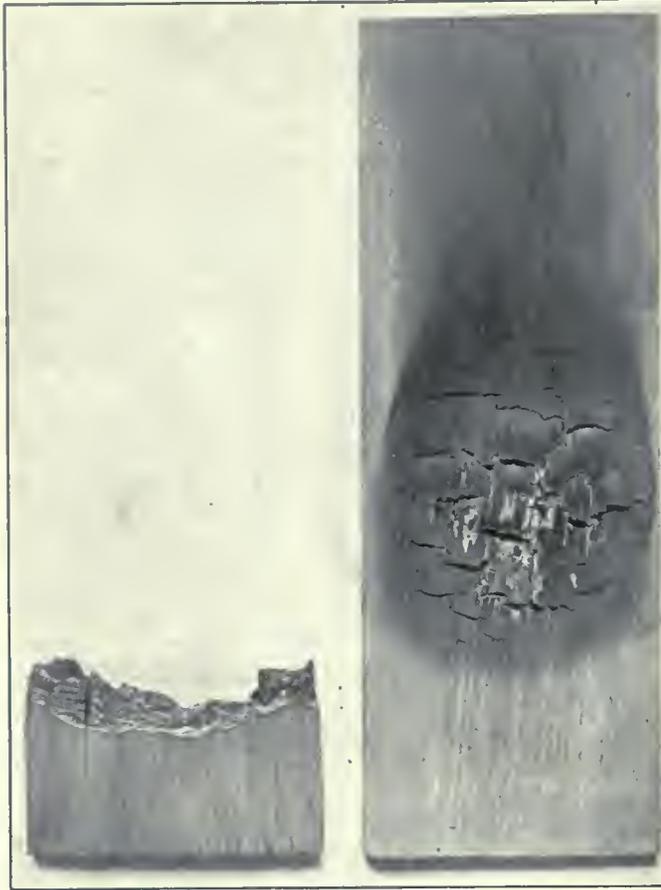


PROCESS OF MANUFACTURING RED CEDAR SHINGLES

The shingles are sawed automatically by the machine on the left of the picture. The workman then trues the edges and cuts out the defects on the clipper saw in the center of the picture, and thus makes them ready to be bunched. Photograph by the Clear Lake Lumber Company, Clear Lake, Washington.

American softwoods are longleaf pine, Douglas fir, western larch, hemlock, and spruce. These possess great strength in proportion to their weight, and there are several others which are little, if any, inferior.

Shingle roofs are lighter than those of most other materials which can properly be regarded as competi-



FIGHTING FIRE BEFORE IT STARTS

Shingles may be rendered partly fireproof by treating them with certain chemicals. Two shingles are shown in the cut. That on the left is untreated, the other is treated, and both were given an equal chance to burn. The photograph is from the U. S. Forest Products Laboratory at Madison, Wisconsin.

tors. The weight per square foot of tile roof is from 12 to 25 pounds; of slate 10 pounds; and of shingles from one to three pounds. If a roof is large, the difference in total weight between a covering of shingles and one of slate or tile is so great that the architect must determine the factors of safety with the utmost caution.

Engineers work out the strength of woods by testing them, and construct tables whereby one wood may be compared with another, all being measured on the same basis. The figures usually given show the "modulus of rupture," which means "measure of the breaking strength." Modulus of rupture is a technical term. The table which follows gives the strength of twelve well known woods, but instead of using the term "modulus of rupture," to express strength, the figures are worked out to show what load in pounds would be required to break a stick approximately two and five-eighth inches square and resting on supports one foot apart. Expressed in that manner, the meaning is clearer to the untechnical

person than it would be if the somewhat cryptic term "modulus of rupture" were employed, and yet precisely the same figures are used.

Wood	Load in pounds
White pine .....	9,600
Eastern hemlock .....	9,700
Douglas fir .....	10,300
Red spruce .....	10,800
Sitka spruce .....	11,200
Southern cypress .....	11,300
Yellow poplar .....	11,800
Western larch .....	13,500
Shortleaf pine .....	13,900
White oak .....	15,200
Pignut hickory .....	22,500

The foregoing figures represent seasoned wood. The strength is much less if the woods are tested green. As wood dries, its strength increases.

If the strength were figured out on the basis of or in proportion to the weights of the different woods, the surprising showing would be made that white oak is the weakest wood in the foregoing list, and Sitka spruce the strongest. Weight for weight, that far western wood is stronger than pignut hickory, and that explains why it is preferred for airplanes where the greatest strength and the least weight are demanded. In a lesser degree, the same requirement must be met in roof timbers, and it is apparent that if heavy woods, like oak, were employed in excessive amounts, a point might be reached where the roof would collapse under its own weight.

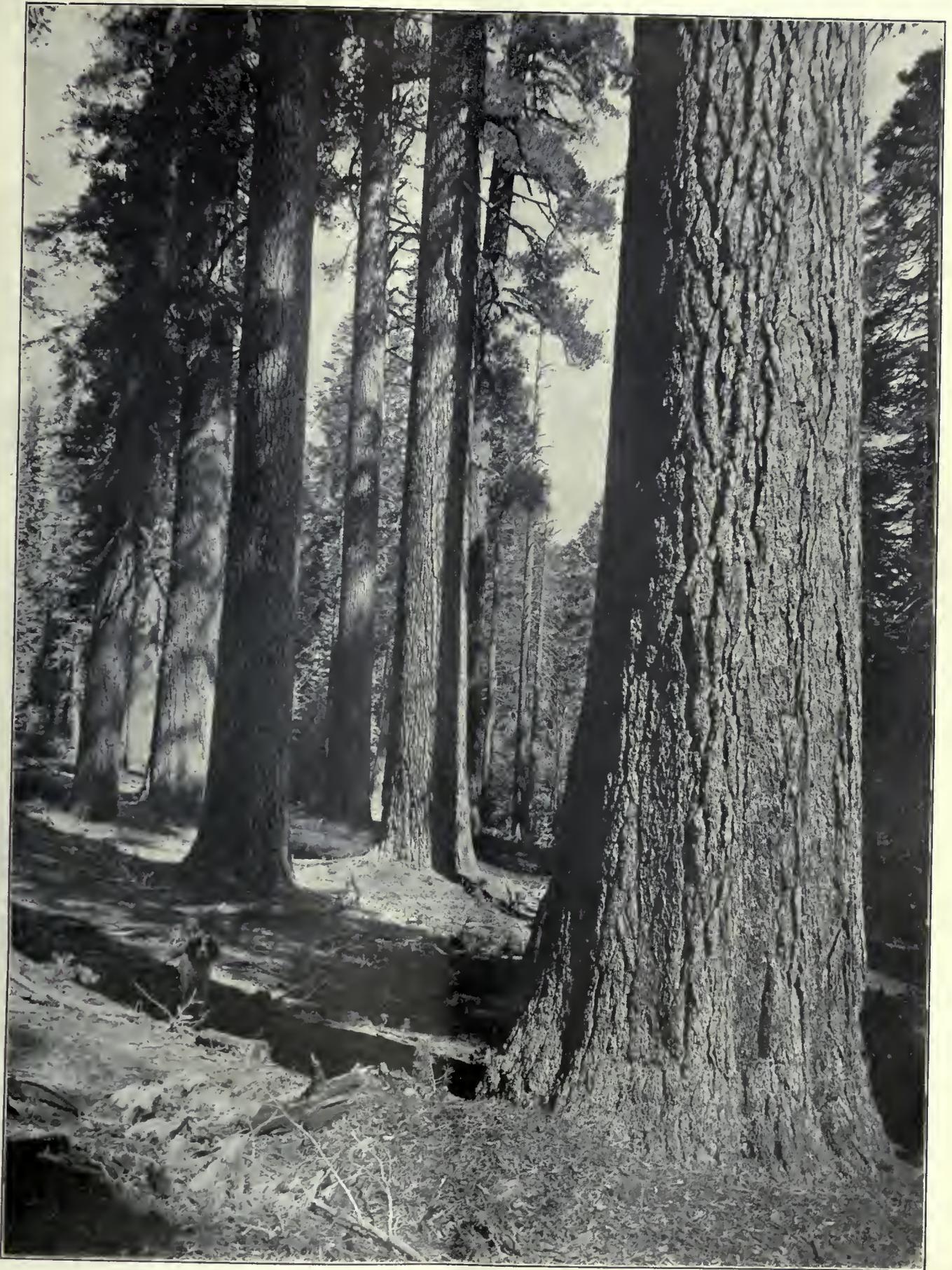
The nail which fastens the shingle on is often not given due consideration, yet it is as important as the shingle



SAWING SHINGLES OF CHESTNUT TIMBER

Shingles of this wood are durable and its use opens the way for utilizing timber of small size killed or likely to be killed by blight, thus saving what otherwise might be wasted. The mill here shown is in Frederick County, Maryland. Photograph by courtesy of the Maryland Board of Forestry.

itself. When the nail rusts through, the shingle is loose and is liable to blow off. There is no economy in buying and laying high grade shingles and fastening them on with low grade nails. First class roofs cannot be made if second class nails are used to fasten the shingles on. The ordinary wire nail may be destroyed by rust in a few years. The zinc-coated nail is recommended, and if



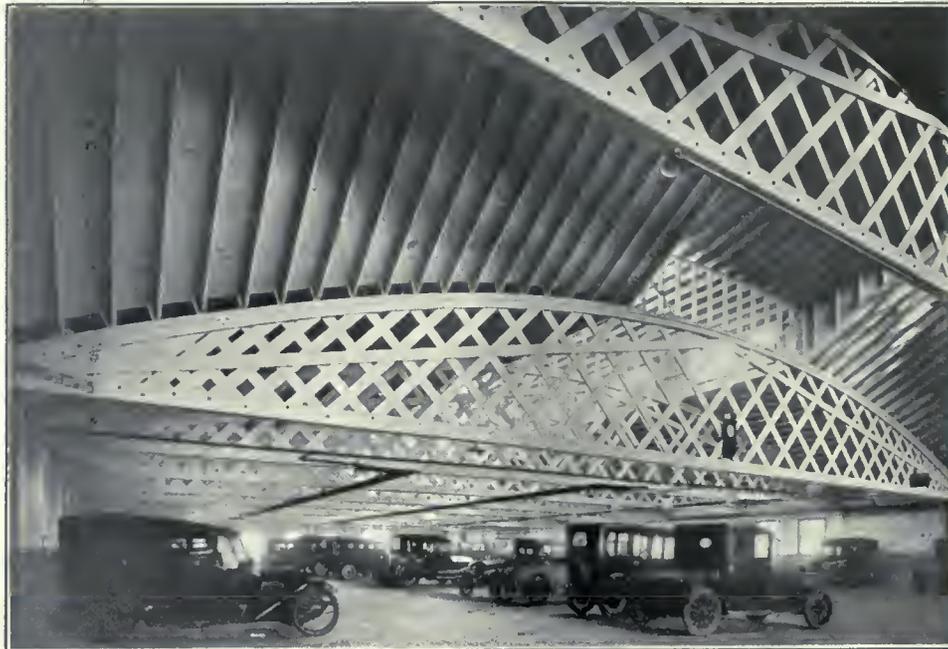
A SAMPLE OF SUGAR PINE SHAKE TIMBER

The cut shows a specimen of the splendid sugar pine of California from which the western pioneers rived millions of shakes to roof their shacks and houses. The wood's cleavage is so perfect that shakes were split sufficiently thin to be translucent. The old-time shake is now almost a thing of the past on the Pacific Coast.

a good one is used, it will nearly double the period of service which a roof of good shingles will give.

In a former article of this series, mention was made of a barn in West Virginia whose white pine shingle roof remained in place 102 years and then collapsed under an extraordinary fall of snow. The original nails were still good, and not a shingle had become loose on account of the nails rusting off. So remarkable was this, that the local historian of the neighborhood investigated the origin of the nails,

and by examining old diaries kept by William Parsons, the builder of the barn, it was ascertained that the nails had been hammered from bar iron in the farmer's blacksmith shop by a negro slave, "during rainy weather." That the work was done during rainy weather probably had nothing to do with the lasting property of the nails; but the fact that wrought iron nails lasted more than a century in the most exposed position imaginable, may contain a hint of value to present day manufacturers of shingle nails.



ROOF TRUSSES REACHING FROM WALL TO WALL

The walls of this building are 120 feet apart and the arched wooden trusses span the space between and sustain the enormous weight of the roof. Such use constitutes a triumph for wood under exacting conditions. This truss is as good as one of steel and much cheaper. Photograph by the National Lumber Manufacturers' Association, Chicago.

## BLACK WALNUT FROM THE GUGGENHEIM ESTATE OFFERED TO THE GOVERNMENT

**I**N offering the black walnut trees on his Port Washington (L. I.) estate to the Government for the manufacture of airplane propellers, says the *New York Sun*, William Guggenheim has aroused greater interest in the value of those trees for commercial use than perhaps has been done for over half a century. The principal source of the black walnut was in the West and before its popularity waned so many thousands of the walnut trees were cut down that today they are almost as extinct as the American buffalo.

Mr. Guggenheim, who is chairman of the Army and Navy Committee of the American Defense Society, said that he had recently had a census taken of his black walnut trees and discovered that he had about 200.

"My black walnuts vary from one foot to three and a half feet in circumference near the ground," said Mr. Guggenheim. "I believe they were all planted many years ago by former owners. As the tree is slow growing, the largest specimens are probably at least 75 years old. Perhaps only a portion will be available for propellers, but if any of them will be of assistance in aircraft production they will be cut down.

"Before the trees are taken I presume they will be looked over by some one designated by the Aircraft Committee. My idea is to have those selected as available for use sold to manufacturers of airplanes and have the money placed in a fund to be divided by the Red Cross and some other organization."

So far as could be ascertained from landscape architects who are familiar with Long Island estates William Guggenheim's Port Washington place contains the largest number of black walnut trees within a single ownership on Long Island.

G. Douglas Wardrop, editor of *Aerial Age*, in discussing the use of black walnut for airplanes, said that next to mahogany it is doubtless the best wood for propellers, but so little of it is to be had that he doubted whether all the black walnuts on Long Island would be sufficient for more than a few score of propellers.

"You must remember," explained Mr. Wardrop, "that for a satisfactory propeller you want a plank eight feet or more in length and wide enough at the ends to give a 14-inch blade. There are usually five layers of these eight-foot propeller blades, firmly glued together, and oak is being used for some of the inner pieces. I do not think there are many black walnuts in the country that would provide many solid eight-foot planks over 14 inches wide. Mahogany, on account of its strength and solid grain, has always been the favorite wood for airplane propellers and, with few exceptions, is being used for all our best airplanes. We have been getting a very satisfactory supply both from South America and the west coast of Africa, the African mahogany being the better for propeller use. The time is coming, however, when our airplanes will probably be equipped with metal propellers. Germany has used them very successfully."

## TUSCANIA SURVIVORS REUNITED ABROAD

**T**HE *American Lumberman* of June 15, published the following interesting story:

"When the ill fated *Tuscania* sailed from the American shore early last February it had on board 800 lads recruited from the woods, sawmills and lumber yards of the country as well as several hundred soldier boys. Most of the boys were fortunate enough to be among the saved, following the 'U' boat attack off the eastern coast of Ireland, and were landed after hours of suffering and mental torture at different points in the Emerald Isle and Scotland. The forestry lads who survived the

southern, in responsible positions, one by one congregated at Morning Hill Camp near Winchester, England.

"Before they departed for France the boys had a group photo taken; an enlargement of it was received this week at the offices of the Long-Bell Lumber Company, in Kansas City. It will be recalled that 164 of the *Tuscania* dead, many of whom were forestry lads, now lie buried near Port Ellen, Islay Island, one of the Hebrides group, but all the Long-Bell boys were among the saved and each one is now doing his 'bit' in France.

"Each one of the Long-Bell boys who are identified in



THESE ARE BOYS OF THE LONG-BELL LUMBER COMPANY WHO WERE ON THE ILL-FATED TUSCANIA

Those appearing in the illustration with their former connections and present assignments with the 20th Engineers are as follows: Standing (from left to right)—J. A. Johnson, Mill at Lake Charles, La., Checker Co. E.—6th Battalion; George B. Oakeson, Assistant Yard Manager at El Dorado, Kan., Sergeant Co. E.—6th Battalion; Max W. Friend, Assistant Yard Manager at Baxter Springs, Kan., Sergeant Major, Headquarters.—6th Battalion; Tom Ashby, Assistant Yard Manager at Augusta, Kan., Corporal Co. E.—6th Battalion; Purl H. Marshall, Yard Manager, Towanda, Kan., Corporal Supply Department Co. E.—6th Battalion; Mr. Rutledge, Mill, Longville, La., Sergeant Co. E.—6th Battalion. Sitting (left to right) William E. Barwick, Sales Office, Chicago, Sergeant Supply Depot Co. F.—6th Battalion; Porter B. Smith, Yard Manager at Leon, Kan., Corporal Supply Depot Co. F.—6th Battalion; Vernon Babcock, Assistant Yard Manager at El Dorado, Kan., Chief Cook, Co. E.—6th Battalion.

*Tuscania* disaster remained for several weeks at army camps in England before they proceeded to France, and it might be described as one of the pranks of fate that the nine young men who previous to enlisting in the Sixth Battalion of the 20th Engineers (Forest) were employees of the Long-Bell Lumber Company, of Kansas City, Mis-

souri, in responsible positions, one by one congregated at Morning Hill Camp near Winchester, England. Before they departed for France the boys had a group photo taken; an enlargement of it was received this week at the offices of the Long-Bell Lumber Company, in Kansas City. It will be recalled that 164 of the *Tuscania* dead, many of whom were forestry lads, now lie buried near Port Ellen, Islay Island, one of the Hebrides group, but all the Long-Bell boys were among the saved and each one is now doing his 'bit' in France. Each one of the Long-Bell boys who are identified in the reading matter appearing below the illustration was in the mill, yard or sales office service of the Long-Bell Lumber Company before enlisting. Those designated as yard or assistant yard managers previously had mill experience and all were well qualified for engaging in woods and sawmill work in France.

"Since landing safely following the *Tuscania* disaster the Long-Bell boys, like the hundreds of other lumber industry lads who belong to the 20th Engineers, have written home to their relatives and families. These letters have been interesting and descriptive of their experiences, treatment accorded them in Allied countries and matters having to do with their work in France, where they are employed in French forests, doing woods work in their own way, which is *a la* American, or at sawmills now having American machinery and operated along the same lines as sawmills in the United States. Herein, as in many army methods, American brains and American pep are exemplified in the lumber industry lads from the States who have revolutionized lumber produc-

tion in the territories back of the fighting zones. There are many things that the Long-Bell Lumber Company organization is proud of, but of none more than that nine of its former employees are serving for the Allied cause in a way that their experience best fits them, and using their brains and brawn in the task engaged in by hundreds of American lads, of getting out lumber and timber supplies needed by the Allied armies. In modern warfare lumber is just as necessary as guns or munitions or food supplies, and armies to wage war successfully must have their supplies quickly and in quantities.

"The nine boys here shown report themselves as hale and hearty and most enthusiastic in the work that now engages them in France."

## A GIRL WHO GUARDS THE FORESTS FROM FIRE

SCATTERED through the vast forests of northern Maine are the numerous watch-towers of the fire-patrol system, where men are on duty with unrelaxing vigilance to detect the first sign of the dreaded forest fires which create such havoc in the valuable timber, if not checked. To be an observer is considered a full-sized man's job. He lives alone, sometimes in the tower itself, sometimes in a little cabin nearby. He is miles and miles from the nearest neighbor. He has a telephone and a part of his duty is to see that the line is kept in working order, a duty which is no small matter as the wire is run almost entirely on trees.

But there is one woman in Maine who is confident that she can do the work as well as a man. She has succeeded in convincing the Forest Commission that she is capable, has been duly appointed, and the first of July began her duties as observer in charge of the station on Mount Kineo, the high bluff which overlooks Moosehead lake. A million dollars' worth of choice timberlands, and more, are in her keeping. This woman is Miss Alice Henderson, of Gardiner, Maine, a self-reliant, bright young woman who says she is twenty-one years old and that she weighs one hundred and thirty pounds, can shoot any kind of a firearm and is not afraid of bears, or much of anything else.

She doesn't mind staying alone nights in the woods on top of a mountain, for while the wild animals of Maine may come around looking for something to eat and be a trifle annoying, they are harmless if let alone. The big, blundering moose sometimes rub their backs against the base of the tower, and timid deer, who are always con-

sumed with curiosity, may wander into the little clearing but they mean no harm. Porcupines are the most annoying for they are not afraid of anything, eat everything they can find and climb upon the cabin roof and rattle and grunt. The black bears are the biggest cowards ever and a shout or shot will send them scampering off at top speed.

As for wicked men—well, Miss Henderson is not afraid of them, that's all. Her duties are to keep a watch in every direction for the first signs of smoke that may mark the start of a devastating forest fire. She has powerful glasses, range-finders and charts and is able to locate the smoke almost to a rod. She can discriminate between the camp fires of a fishing party, or log-driving crew and a fire that's getting away. There are watch-towers all around and information is exchanged over the telephone.

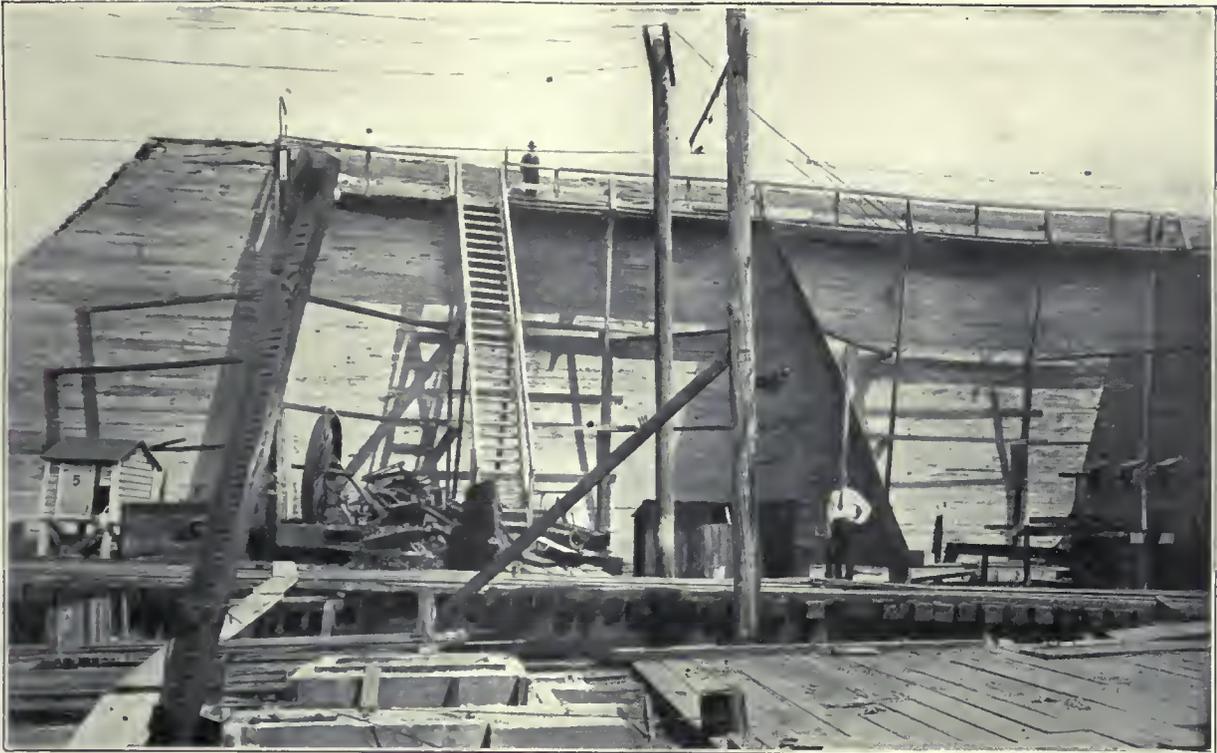
If the smoke grows, the district fire warden is notified at once and he starts with his crew and fire-fighting equipment for the scene. In nine times out of ten he checks the fire at the start. It is estimated that if the warden service and patrols prevent one big forest fire in a season, it saves much more than it costs. The work of the observer

varies from days and days of ceaseless vigilance when the woods are as dry as tinder, to long stretches of rain, fogs and mists when observation is impossible or there is little or no danger of fires.

In these times the observers tend their little garden spots, fix up the telephone lines, do odd jobs or take a long tramp out to the nearest supply camp for provisions. The station of Miss Henderson is the nearest to civilization of any, being but two miles from the Kineo house and settlement.—*The Springfield Republican*.



MISS ALICE HENDERSON  
The first Maine woman appointed to forest fire patrol work.



**A**N excellent example of the fire resisting qualities of an ordinary wooden fire wall was furnished in the fire which destroyed the old plants of the Northwestern Box Company and the West Side Lumher & Shingle Company at Portland, Oregon. The wall is shown above. This wall was all that stood between the fire and the plant of the Portland Lumher Company, one of the largest and most modern mills in the Northwest. While the flames made a clean sweep of the Northwestern and West Side mills the Portland Lumher Company's property was not even scorched.

**T**HE wall is 35 feet high, constructed of 2x6 Douglas Fir planks laid flat on top of one another, and with huttresses on the side toward the Portland plant, to give stability to the wall. It was constructed about 10 years ago. Recently part of it was torn down to make room for a power plant, evidence of which can be seen in pile driver, derrick and steel framing in the foreground.

**T**HE fire raged for three or four hours and, on account of the thoroughly seasoned and oily condition of the timbers of the old mill, was of such intensity that it could not be approached within several hundred feet. Despite this, work on the opposite side of the wall continued without interruption. An examination afterwards revealed that the maximum depth of the charring over the surface of the wall exposed to the fire was less than one inch. Below we see the destruction from the fire, and the *other* side of the fire wall.



## AN ARMY "PARSON" IN FRANCE

WE print a most interesting letter received from Lieut. Howard Y. Williams, the Chaplain of Tenth Engineers, under date of June 10th:

"In the British army he is the 'padre,' but in our American regiment he is the 'parson,' at least that has become my cognomen in the Tenth Engineers, one of the finest groups of men ever assembled. One evening in September last we steamed out of New York harbor with not a soldier to be seen on deck, and very few onlookers aware that one of the first contingents was on its way to France. If our departure was a secret, not so our arrival in Europe. As we wended our way up the Clyde channel, between two endless rows of ships in all stages of construction, we were given as the first American troops to land in Glasgow, such a prolonged reception as we shall never forget. It seemed as though the shipyards had declared a half holiday for the river banks were crowded with the men and women workers who

cheered and cheered. The shout would go out, 'Are you down-hearted?' and like a raging torrent came back the answer of Americans, 'Hell, No!' Some women of Glasgow had cleaned the barracks for our reception, but the R. T. O. had trains waiting and in a few hours we marched to the depot amid shouting thousands. Though on our return to America no one should greet us, we would not be greatly disappointed, for all that we ever shall deserve we received from those Scotch Highlanders.

"These pioneers of American troops in France it has been my privilege to serve as a chaplain. For nine months now they have been working in the forests behind the fighting lines, getting out barb-wire stakes, trench poles, duck-boards, mine timbers, signal corps poles, and lumber of all kinds for dug-outs, barracks, and warehouses. Day and night the men labor sending up their products to the front, often to the tune of the



Underwood and Underwood—British Official Photograph

### ONE OF THE REASONS WHY THE WORK OF OUR FORESTER-SOLDIERS IS SO NECESSARY

In this most remarkable flashlight photograph, taken in a British trench, we see a working party starting out over the top at night. The soldiers are carrying wooden trench mats to an outpost across No Man's Land. In the upper right hand corner a German flare can be seen bursting, while down in the trench troops with bayonets set are on the alert to cover the men who are going over.

heavy guns roaring away in the distance. About one-third of this regiment are college men, a number of them are well-known athletes, some from wealthy families, but here they are all on one basis. What needs to

be done they do, digging trenches, breaking rock for roads, blasting, even to taking the place of horses. I remember censoring a young soldier's letter during the early days here and he had written, 'I have been a horse for the last three days,' and he had, for before our horses arrived ten or twelve men had been hitched to a wagon hauling necessities to the camp. The work is rather monotonous and has not the excitement of trench life, but the men jump into it with a vim and a smile that

cuit takes two months and more. Intensely interesting have been my efforts among these men. Each large post is usually divided into five or six camps some distance apart, and that means that the 'parson' is on the



Underwood and Underwood—British Official Photograph

RUSHING MUCH-NEEDED TRENCH BOARDS TO THE FRONT DURING THE GREAT HUN OFFENSIVE

These duck-boards, called "trench mats" by the Tommies, are a most necessary part of trench equipment, and the demand for them is constant. The lumber and forest regiments are doing splendid work in getting out the timber needed for wooden construction work of all kinds.

be done they do, digging trenches, breaking rock for roads, blasting, even to taking the place of horses. I remember censoring a young soldier's letter during the early days here and he had written, 'I have been a horse for the last three days,' and he had, for before our horses arrived ten or twelve men had been hitched to a wagon hauling necessities to the camp. The work is rather monotonous and has not the excitement of trench life, but the men jump into it with a vim and a smile that makes us all proud of them.

"Such is my congregation of 1600 engineers, augmented by four service battalion companies making about 2500 parishioners in all. The parish is divided into five large posts, scattered over France from east to west, and from north to south. From one camp we can look over into Switzerland and not far from another one into Spain. A western circuit-rider does not compare with an army chaplain as a traveler, for my cir-

jump every day and night. On Sunday I usually hold two and three church services. These have been held in every place imaginable, on a ship's deck, out-of-doors, in half-finished barracks, in old barns, in officer's quarters, in tents, but now mostly in rough recreation halls, or large tents, which we have provided in every camp. Two or three more nights of a week are used to have church services in camps that could not be reached on Sunday. The mid-week services are often preceded by boxing and wrestling bouts, or a baseball game, held out-of-doors. On the remaining nights we have lectures, shows, concerts, moving pictures, in one camp or another. My days are spent in studying, in trips to nearby cities to purchase supplies for canteens and for individual men's needs, in correspondence that shall bring writing paper, athletic equipment, books, magazines, etc.; in personal interviews, visiting the sick, refereeing athletic events and anything that will minister to the well-being of the men.

"How appreciative and responsive these soldiers are. After every service they crowd around to express their gratitude and to discuss and ask questions, but it takes the farewell service when I leave for other posts to truly learn their feeling. After having worked among them for a month and shared their temptations and hardships, their happiness and friendship, it has often been difficult to keep back the tears as I have tried in a final prayer to sum up our gratitude and needs to the Heavenly Father who watches over us and has come very near to us in these days. Traveling among the men in this way I serve to keep the different units of the regiment in touch with one another while we are thus separated, and informed of each other's efforts. Many is the personal greeting I carry from one man to another. I am also the traveling news bureau. On my trips I have the opportunity of seeing the American army progress in all its phases, as well as in getting many personal accounts from the Allied soldiers of the war. Our camps are always near small towns and the news being scarce, no visit of the chaplain is complete without one talk on general observations and experiences. You may well envy the army chaplain his opportunity as preacher, lecturer, educator, athletic promoter, entertainer, buyer, traveler, reporter, regimental historian, but most of all as friend. All one's capacities count, but I think the personal contact perhaps does most. When men have come as individuals in their need and with their difficult problems, then have I had my greatest opportunity, as well as my keenest sense of dependence to Him who is the source of all strength.

"The American army is surely setting a standard here in its care and regard for the men's morals. Our leaders in every way are seeking the highest moral tone. The temptations here are mighty and ever-present, but those in command have co-operated in every way with outside organizations seeking to help our men, and have issued information and orders as would tend to promote

### TREES FOR THE HOLY LAND

**A**N Associated Press dispatch says: "Two principal recommendations which the civilian Commission now in Palestine will make relative to the reconstruction of that country will be a scheme for beginning afforestation, and a proposal for the conservation of water supply by storage and by opening up old springs.

"The greatest of all Palestine's needs is afforestation. For centuries the land has been denuded of its trees, with most disastrous consequences, for the heavy rains at certain seasons, instead of benefitting the soil, over more than four-fifths of the area carry away in rushing torrents much of the little soil that remains on the high lands and valley slopes.

"Palestine has not always been treeless. The Roman Emperors had valuable forests in the country, and Absalom, riding, was caught by the hair among the trees, but today one might gallop from Dan to Beer-sheba without having to duck one's head to avoid a branch."

highest standards. We have plenty of black sheep in our midst as in civil life; some men are falling, but many are climbing upward living stronger and more unselfish lives than in the States. 'Booze' is our greatest enemy. Practically every court-martial case, every difficulty with men in the company administration is due to this evil. It was never so apparent to me what an offender liquor is. This is the verdict of many of our officers and men. Here, again, the army in every way is endeavoring to deal wisely with the situation.

"Most of our regiment are very anxious to get to the front and in the thick of it. Just when our turn shall come we cannot tell, but when it does come we shall be ready to do our part there. In the meantime these engineers plod away at a task which is somewhat monotonous and in the doing of which there is not much glory, but all the same rejoicing to do what their country calls them to do, realizing that the harder they work the more will their brothers at the front have to assist them in their great task.

"The Y. M. C. A. and Red Cross have helped us greatly in camp and hospital, the former having secretaries in three of our camps. Friends of the regiment have made me the treasurer of a Welfare Fund, the money donated to be used in any way for the pleasure and contentment of the soldiers. Thus in every way those with the spirit of the Master of men are making our lives here more happy and useful. All working and fighting together we shall soon have the forces that are incarnated in the Kaiser on the run, victory will be ours, and then the old red flag of war will come down and the white flag of peace shall go up. When that day comes it will be a grand and glorious feeling when General Pershing marches down the line of the victorious hosts and says, 'Army dismissed!' Until that day can come in honor you just watch these men here in France, representing the best land in all the world, giving everything they have to make the world safe."

### A LETTER FROM THE FRONT

**F**ROM Mr. Frank A. Cutting, a prominent lumberman of Boston, and one of our members, we have received the following letter. His boy is with the 20th Engineers and the letter shows that his contingent has been in action since the 4th of June.

SOMEWHERE IN FRANCE,

June 7, 1918.

Dear Father:

Would have written before, but these are busy times, and when I have had the time had nothing to write with.

We have been in the drive for the last three days went in about 10 o'clock Tuesday night, and have been right on the job ever since, and have made quite an advance and we are holding our line at all points. It looks as if the whole German front will have to drop back.

We have had about every kind of an attack that there is, but have not lost a man from my command. I lost both of my horses, one was gassed, and the other shot. The gas is very bad, as it goes right through the clothing, causing trouble, which often results in death. Now that we are getting an army over here, I look to see a big drive, and then the Germans will find out what war really is.

Am well, and send love to all.

Lieut. Spencer A. Cutting,  
Co. A, 9th Bn., 20th Engineers,  
U. S. M. P. O. 731, Francee.

SPENCER.

# MIDSUMMER FLOWER-HUNTS

BY R. W. SHUFELDT, M. D., R. A. O. U., ETC.

MAJOR, MEDICAL CORPS, U. S. ARMY, MEMBER OF THE ANTHROPOLOGICAL SOCIETY OF FLORENCE, ITALY, ETC.

IT matters little where we hunt for wild flowers in the open; in fact, no city is so big but what it has its environs—and beyond. Where the essential part comes in is where the searcher possesses the eyes to see the flowers when they are to be seen. Often little grassy courtyards, fifteen by fifteen feet, are veritable "nature gardens," where a sufficient number of wild flower specimens are growing to furnish material for an hour's talk on urban botany to a class of grown-ups, or to hold a bunch of kiddies under a spell for an equal length of time. There is a courtyard of that kind, and of just such dimensions, within fifty feet of the table upon which this article is being written, of exactly the sort I have in mind. Here it is in the month of August, and this little grassy square, fenced nearly all about with a board fence, overgrown with grape-vine and Virginia creeper, has had blooming in it during the summer some ten or fifteen different kinds of wild flowers. To be sure, some of these have been introduced, while others have grown up from seeds which have either blown in there, or been dropped by the few birds that occasionally light on the telephone wire passing over it. For the most part the list contains daisies, columbine, chrysogonum, dandelions, showy orchids, wild geranium, two species of clover, yarrow, violets, sorrel, Virginia day-flower, trumpet-vine, deadly nightshade, jack-in-the-pulpit and devil's bit. Doubtless there may be three or four others of the tiny kind, which might be found upon closer search. Now, if this be true of a little city yard, what a wealth of nature-stuff there must—and in fact there really is—within twenty minutes' ride upon any of the outgoing trolley-cars to the city's environs. Of this there is no better example than our

beautiful National Capital—Washington. In fact, Washington offers particularly attractive inducements to those who may be interested in our native wild flowers and animals, and desire to study them in nature. Yes, in nature; for almost anywhere within three miles or less of Washington one may readily find beautiful plants and trees and shrubs, thriving and blossoming in all of their pristine wildness, just as they did in the days when our great general of the Revolution had his home at Mount Vernon; or earlier yet, long before the invaders from the Old World came hither, when the red-skinned sons of the soil plied their canoes of bark along the banks of the Potomac.

Where protected by masses of rock and miry marshland, certain stretches of these banks, even on the north side of the river, are in no particular different from what they were centuries ago. To say five centuries ago would by no means be a stretch of the imagination; for amorphous rock is tough, and where it stands amidst the less stable banks of a somewhat rapid river, little change is to be looked for along the water line, or where land and water see their definition during the rise and fall of the tides of the ages.

Along the river, almost directly opposite the city, or short distances either above or below, there are

such places in plenty, either along the banks—be they of marsh, meadow or rock—where old Virginia finds its northern boundary, or on the other side where the District and Maryland terminate on the south. Somewhere in the latter locality there is to be found a place where we may still find growing, in all of its native wildness, the wild senna, with its rich yellow flowers, which, in some specimens, come very close to being of a brilliant



ONE OF THE GREATEST FIGURES IN THE BOTANICAL WORLD

Fig. 4—Carolus Linnaeus, of whom this is a portrait, was a world-famous botanist and zoologist. He was about forty-one years old when this painting was made of him.

orange. (Fig. 1.) Indeed, in Miller and Whiting's "Wild Flowers of the North-Eastern States," although they say that the flowers—that is, petals and stamens—are of a "rich, soft yellow," these parts are of an orange in the beautiful frontispiece of senna in that work. What renders these flowers particularly striking are the deep



WILD SENNA, A BEAUTIFUL SPECIMEN OF WHICH IS HERE SHOWN, STILL HAS ITS USES IN MEDICINE.

Fig. 1—*Cassia marilandica* is the scientific name of this herb, and it belongs in the Pulse family (*Leguminosae*); the flowers are bright yellow and very striking.

ten stamens, which latter are of varying lengths. Although a representative of the vast Pulse family, the papilionaceous type of blossom, which is so characteristic of it, is nearly or quite lost here, as will be noticed in the accompanying cut. The petals, however, are five in number; the flowers in loose clusters, and the leaves compound (12-20, broadly lanceolate), smooth and sensitive to the touch, as is the case with some of its relatives. This herb may grow to become at least eight feet high, and is generally found in swampy lands, though sometimes along roadsides and in alluvial soil elsewhere. It ranges over a good part of the country east of the Mississippi, westward to Nebraska.

In *Nature's Garden* we read that, "While leaves of certain African and East Indian species of senna are most valued for their medicinal properties, those of this plant are largely collected in the Middle and Southern States as a substitute. Caterpillars of several sulphur butterflies, which live exclusively on cassia foliage, appear to feel no evil effects from overdoses." (P. 309.) Both pods and leaves are gathered for this purpose, the former being "hairy" according to Creevey, appearing soon after the flowers die down; the latter drop off on very slight provocation.

brown, almost black, anthers, which are conspicuously in evidence on the outer ends of the



MANY OF THE PLANTS IN THE FIGWORT FAMILY (*Scrophulariaceae*) ARE INTERESTING AND ODD, BUT NONE MORE SO THAN THE COMMON BETONY, SHOWN IN THIS CUT.

Fig. 2—This species of *Pedicularis* occurs on sloping, shrubby banks in copses and open woods, often associated with spiderwort and the giant chickweed. It rarely attracts much attention as it is not a showy plant.

Up on the hillsides, above where we found the wild senna, may be found a great many different kinds of flowers both before and after the month of August. Among these may occur the very inconspicuous Wood Betony (*Pedicularis canadensis*, Fig. 2). The generic name of this plant is derived from *pediculus*, a louse, and Doctor Gray remarks that it has "no obvious application." This is somewhat surprising, for to the general zoologists it is so evident. Take, for example, the flower-head in Figure 2, next to the shortest one, and compare the same with any good figure of the common head louse (*Pediculus capitis*),—that is, compare it with the head, thorax, and legs, or those parts beyond the abdomen in that insect, and the resemblance is quite striking. A good figure for this purpose is to be found in Dr. L. O. Howard's work *The Insect Book* (Fig. 212, p. 316). To be sure, all flower-heads of the Wood Betony do not offer this resemblance,



HERE WE HAVE ANOTHER BEAUTIFUL SPECIES OF THE FIGWORT FAMILY, THE FAMOUS PURPLE GERARDIA THAT FLOURISHES IN THE OPEN SANDY LANDS FROM MIDDLE MASSACHUSETTS TO FLORIDA, WESTWARD TO THE LAKES, AND SOUTHWARD TO TEXAS.

Fig. 3—This genus was named for John Gerarde, the eminent botanist; and *G. purpurea*, when growing in masses, surely presents a lovely sight. It has very delicate stems and buds.

as will be appreciated by comparing those in Figure 2 of this article.

We often meet with Wood Betony flourishing in patches on the hillsides in various suburban parts of Washington. These patches rarely cover more ground than some ten or fifteen feet square, where our plant may be mixed with some of the shorter grasses or even with other plants. In certain sections of its range it is known as the "beefsteak plant" or "lousewort." Why the first is hard to say, but in the

case of the second we may note that there were people who appreciated the pedicularian resemblance, even though our good old Doctor Gray did not.

In plucking a matured specimen of Wood Betony, one of the first things that strikes you is its hairyness—a character well seen in some parts of the accompanying figure. Then we may note its simple stem, and its dull, dark green, soft-hairy leaves, which are multilobed and somewhat feather-shaped. Many parts of the entire plant may be more or less tinged with dull magenta, or deep pinkish purple. It will be noted in Figure 2 that the rather large flower-heads are terminal, with bract-like leaves below them or even mixed with them. As this head grows during the summer, it lengthens, as here shown in the tallest specimen. The superior lip of the two-lipped flowers is conspicuous; is of a dark purple color, the lower three-lobed one being of a dull greenish yellow. There are four stamens, and bees are the principal agents upon which this plant depends for fertilization. It may occur almost anywhere east of the Mississippi, or even westward to South Dakota.

"Few plants have been accredited with greater virtue," says Mrs. Dana, "than the ancient betony, which a celebrated Roman physician claimed could cure forty-seven different disorders. The Roman proverb, 'Sell your coat and buy betony,' seems to imply that the plant did not flourish so abundantly along the Apian Way as it does by our American roadsides." Her colored figure of this plant has the flowers altogether too yellow. The Italian plant is *Betonica officinalis*, and during the middle ages that species was cultivated in cemeteries, and worn around the neck of a person to protect him or her against certain evil spirits. Those ancient Italians made up their high heal-all into all sorts of pharmaceutical preparations, each one having some special virtue, while the lot stood for the cure of nearly every known disease of the time. There are those who believe that the word "lousewort" arose from the fact

that when sheep happen to eat the plant, which it is fair to believe they often did and doubtless do still, it gave rise to a peculiar skin disease in them, and this was followed by a small louse appearing upon them—hence the name. Possibly this may be true for the name "lousewort;" but it will not account for the scientific name of the genus, which doubtless came about in the way described above.

Another plant found in our Figwort family along with the wood betony is the Purple Gerardia (Fig. 3). To

be sure, superficially they do not appear to be much alike, though each possesses botanical characters which connect them. Purple Gerardia, so called on account of its beautiful, bell-shaped purple flowers, is often found growing in flat, sandy meadows, in patches several feet in width. When the plants are all in bloom, they may be recognized some distance off. Then, too, if there be any doubt,—that is, in the case of this purple species,—just note whether it has any little fine spots inside the corolla; if it has, you may be sure that you are one point nearer the correct diagnosis. This Gerardia is also a plant which, in a broad sense, is a coast-wise species, being found from northern United States to Florida from the Atlantic shores inland for a belt some twenty miles or more wide. To some extent, this gerardia is a parasitic plant, its roots drawing upon those of others below the surface of the ground.

There is an interesting paragraph in Neltje Blanchan's account of the purple gerardia, and it runs thus: "Low-lying meadows gay with gerardias were never seen by that quaint old botanist and surgeon, John

Gerarde, author of the famous 'Herball or General Historie of Plants,' a folio of nearly fourteen hundred pages, published in London toward the close of Queen Elizabeth's reign. He died without knowing how much he was to be honored by Linnæus in giving his name to this charming American genus."

Speaking of Linnæus, to whom reference has been so



THE TWO CATERpillARS HERE SHOWN ARE OF THE CHERSIS SPHINX MOTH, A WELL-KNOWN SPECIES COMMON THROUGHOUT THE COUNTRY. (*Hyloicus chersis*.)

Fig. 5—Nearly everyone is familiar with the bunches of pale, tan-colored seeds of the Poison Ivy or Poison Oak vine (*Rhus toxicodendron*). They remain on their stems long after the leaves have fallen. We also have in this picture several seeding heads of the Thimble weed.

frequently made in these articles, perhaps a word about him here would not be altogether out of place. It is, of course, one of the well-known facts in natural history that he was one of the greatest botanists and zoologists that the world has ever seen. Numerous biographies have been published of him as well as portraits, and one of the latter is here reproduced in Figure 4.

Carolus Linnæus, or Karl von Linne, was a Swede by birth, and was born at Rashult, Smaaland, in Sweden, on the 13th day of May, 1707; he died at Upsala on the 10th of January, 1778, or in the 71st year of his age. In botany he founded the "Linnæus System," which is still the one in use, and is ever likely to be, as it is based on the sexual parts in plant structure. He named thousands of species, genera, and families, and some other groups in biology and botany, and the majority stand to the present day. Numerous forms have been named for him, not to mention one of the craters in the moon (Linne). In 1732 he journeyed to Lapland, and three years thereafter took up his residence in the Netherlands (1735-38). He held several distinguished positions as a teacher in Upsala afterwards, and published a number of very formal and still standard works in botany and zoology, especially the "Systema naturæ." Although his life was not an especially long one, it was filled with most interesting incidents and experiences.

In our rambles we often meet with very beautiful caterpillars of moths and butterflies, and two exquisite pale green ones are shown in Figure 5. It is a most interesting study to collect, properly care for, and feed these various forms of caterpillars, until they pass into the pupa stage, some of them being naked, while others spin a cocoon for themselves, as do the *Cecropia*, which was recently figured in one of these articles in AMERICAN FORESTRY (June, 1918). All such studies are most interesting, not to say important.

Growing in the same field with our *Gerardia*, we may sometimes find little colonies of Pink Sabbatia, a very showy and most attractive plant. It may be recognized

by its sharp, square stem and abundant branching. (Fig. 6.) There is no mistaking its light crimson-pink flowers with their faint fragrance. Another character by which we may know them is the star in the center of each flower, which is of greenish-yellow color. The pale green leaves of our Sabbatia are distinctly five-ribbed, and usually more or less sessile. Other names are given to this striking plant, as Rosy Centaury, Square-stemmed Sabbatia, Rose-Pink, and Bitter-bloom, and during the first part of August is the time to be on the look-out for it, the finest specimens being found near the water. In

some localities it is still prized for its medicinal properties, and in this country it has some beautiful relatives of the same genus, as the Rose of Plymouth, also known as the Marsh or Sea Pink (*S. stellaris*), and others.

One of the wonderful places of the suburbs of Washington is its very extensive zoological park, composed of several hundred acres. People are not allowed to pick flowers there, though it may be said that there are but very few to pick or to study, as we pass through its various well kept sections and its wonderful game paddocks. These latter often appear, in some places, more or less like the true wilds, especially if the heavy timber has been left in the enclosed area. In Figure 7 for example, we see a small part of the extensive elk paddocks, and these noble animals live there summer and winter, much as they did in the Medicine Bow Range back in the 70's.

There are many kinds of interesting flowers in the marsh-lands in this part of the country, or even along the old Georgetown Canal. Here, on some scorchingly

hot day in mid-August, we may meet with great masses of that most curious plant growth generally referred to as Strangle-weed or Dodder. As a plant parasite it has no equal. The historians who write books for nature-lovers have vied with each other in picturing the peculiarities of this marvelous criminal of the plant world in this section of the country. "Starting out in life," says Neltje Blanchan, "with apparently the best intentions,



PINK SABBATIA (*Sabbatia angularis*) IS ONE OF THE MOST SHOWY FLOWERS OF THE GENTIAN FAMILY, OF WHICH THERE ARE MANY SPECIES IN THE UNITED STATES.

Fig. 6—This is a fine specimen collected near Washington, District of Columbia, where it is not very common.

suddenly the tender young twiner develops an appetite for strong drink and murder combined, such as would terrify any budding criminal in Five Points or Seven Dials!" The same gifted writer truly says, in *Nature's Garden*, that "Like tangled yellow yarn wound spirally about the herbage and shrubbery in moist thickets, the dodder grows, its beautiful bright threads plentifully studded with small flowers tightly bunched. Try to loosen its hold on the support it is climbing up, and the secret of its guilt is out at once; for no honest vine is this, but a parasite, a degenerate of the lowest type, with numerous sharp suckers (*houstoria*) penetrating the back of its victim, and spreading in the softer tissues beneath to steal all their nourishment. So firmly are these suckers attached, that the golden thread-like stem will break before they can be torn from their hold" (p. 247).

An excellent picture of this plant is here shown in Figure 8, being a specimen collected on the banks of

Speaking of sunflowers, it may be said that there are several beautiful species of them in this region, the Jerusalem Artichoke being one of the handsomest and most conspicuous. (Fig. 9.) Its brilliant orange-colored rays generally number from ten to twenty, as shown in the illustration, where one flower has ten and the other thirteen rays. This species is very abundant in the environs of Washington—in fact, it ranges from northern New England southward to Georgia and westward to Nebraska. Generally it is found growing in more or less extensive patches in low, wet places along sluggish creeks and streams or along canals, and on the skirts of marshy woods with many other flowers, where Bind-weed, Joe-pye weed, and the like flourish in abundance.

This species of sunflower has a long and interesting history, being known under a number of vernacular names, as the Canada Potato, the Girasole, and the Earth-apple. Country people generally call it the Sunflower,



ALMOST AS GOOD AS THEIR NATURAL HABITAT

Fig. 7—This is a small part of the elk paddock in the National Zoological Park, at Washington. Some parts of that wonderful reservation appear much like the pristine forests.

the Georgetown canal. There is another strange thing about Dodder: it no sooner fastens onto its victim than its own roots wither away, and it depends entirely upon the sap of its victim for support and nourishment. Sunflowers and Jewel-weed that also flourish in these marshy localities, are often destroyed in great numbers by this voracious sap-sucker, the intimate structure and physiology of which would easily furnish material for a long chapter. It has no leaves as have all self-respecting plants; those seen in Figure 8 belong to its victim—in this case a sunflower.

and we not infrequently find it growing in gardens. Long, long ago it was considered a valuable food—in fact, it was one of the staples of the early native Indians of Virginia. From America it was carried to Europe and cultivated especially by the Italians, who knew it as the Girasole. This is an entirely different plant from the true artichoke (*Cynara scolymus*), which is indigenous to the south of Europe.

Gray describes more than two dozen different species of sunflowers for central and northwestern United States, and this includes the flower just described above,

which may be easily distinguished by the leaves which are conspicuously 3-ribbed. In the Tall or Giant Sunflower (*H. giganteus*), the leaves are sessile, lance-shaped, and distinctly toothed; they are also rough and firm. Some specimens will be found growing to a height of at least 12 feet or rather more. Our big garden sunflower is



ONE OF THE MOST CURIOUS PLANTS IN THIS COUNTRY IS HERE FIGURED; IT IS KNOWN AS THE LOVE VINE, AND IT HAS OTHER COMMON NAMES.

Fig. 8—Common Dodder or the Dodder of Gronovius (*Cuscuta gronovii*), also called Strangle-weed and Angel's hair (*Convolvulaceae*), is a typical plant-parasite that sooner or later destroys the life of its victim.

the *H. annuus*, and it has a very interesting history. Domestic fowls and parrots, including all the macaws, are very fond of its seeds, and the plant is cultivated for their production. Sheep and pigs will also feed upon them to advantage, but it would seem that this is only customary on the Continent.

Alice Lounsberry has an interesting account of the common sunflower, a paragraph or two of which runs thus: "According to the mythological tradition of the Greeks, the sunflower is none other than the fair water nymph Clytie, who was transformed into the flower.

When she found that her mad love for Apollo was not returned, she grieved greatly and sat nine days upon the ground, neither eating nor drinking, but watching intently the sun. Her head she turned gradually to follow him as he traveled from east to west. At last her limbs became rooted to the ground, and her face became a sunflower.

"Even today the illusion is prevalent that the sunflower, the emblem of constancy, turns its face to follow the course of the sun.

"In ancient sculpture the sunflower has ever been a favorite decoration, and especially has it been looked upon as sacred in those countries that have worshipped the sun."

Originally, all the species of sunflowers, some sixty in number, were confined to North America; but the first



THE JERUSALEM ARTICHOKE IS ONE OF THE SHOWIEST AND MOST CONSPICUOUS FLOWERS OF MIDSUMMER

Fig. 9—We have many species of sunflowers in the country, and this is a very well-known one in some sections (*Helianthus tuberosus*).

settlers in Canada soon learned from the Indians the many uses of the plant. Food, dyes, fodder, and a textile fabric were all obtained from them, and they were not long in sending them to Europe for cultivation. Through

cultivation, it is said, the Indians before that had already improved on the native species.

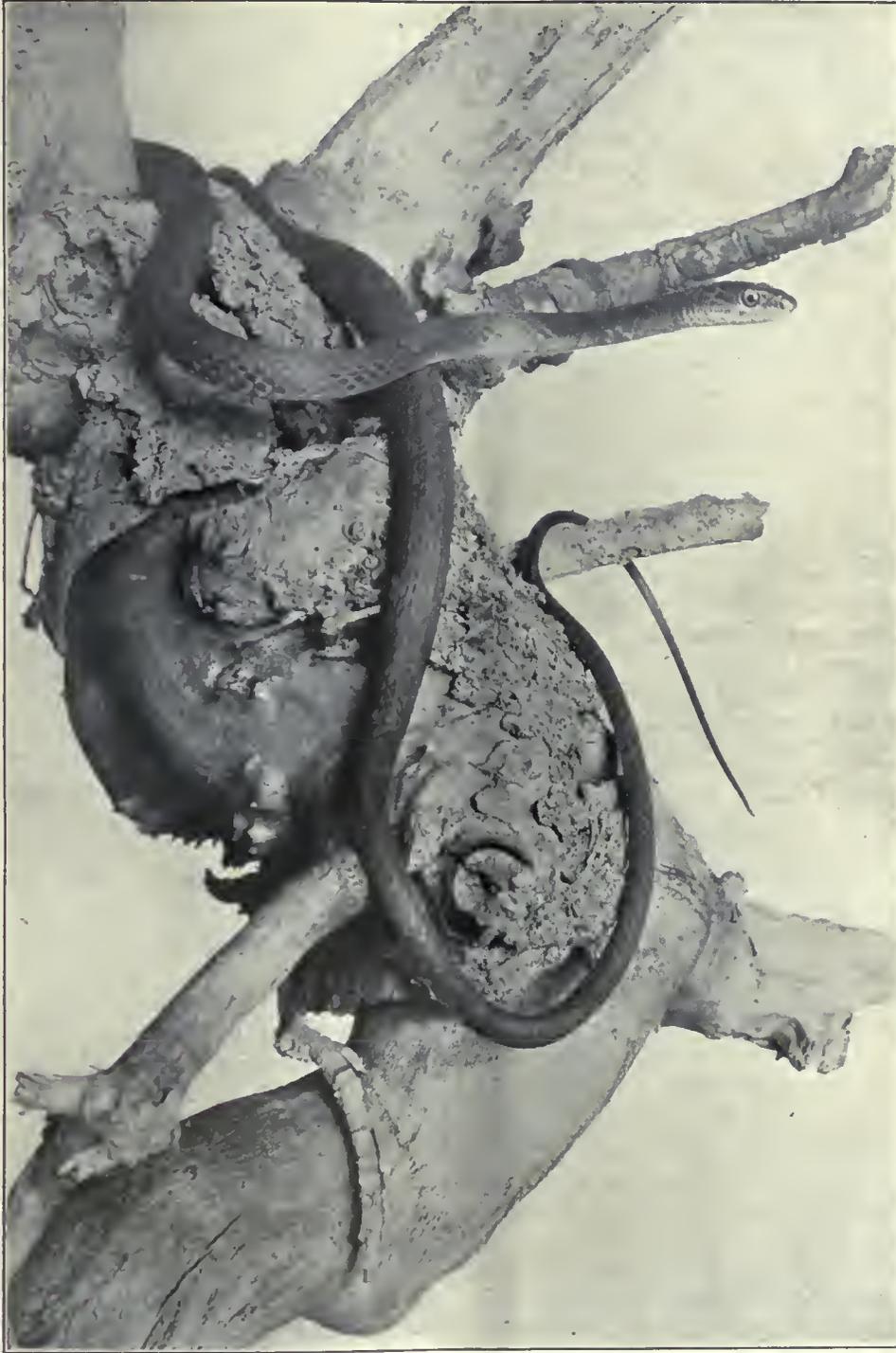
In the various localities where we collect the flowers and plants described in this article, we very frequently meet with different species of our most beautiful and thoroughly harmless little snakes. Of all these there is

no group more entitled to our admiration and protection than the Green Snakes of the genera *Liopeltis* and *Syclophis*, each created to contain a single species, that is, in so far as the herpetology of the eastern United States goes. In *Liopeltis* we have *L. vernalis*, generally known as the Green Snake or Grass Snake; while in *Syclophis* we have *C. aestivus*, which, in different localities, is known by the vernacular names of Green Whip Snake, the Magnolia Snake, and the Keeled-scaled Green Snake—the latter name probably having been coined for it by some writer on snakes. That the dorsal scales of the middle third of its long, slender body and tail are scaled, there is no

doubt, while those of the Grass Snake are perfectly smooth over the entire body. Its form is well shown in Figure 10 of the present article, and it is a truly beautiful reproduction of a photograph from life. The head and

about four inches of the body are standing out in the clear without any support whatever. The entire creature is of a brilliant grass green, with the under parts of a lively yellow. Specimens may be met with nearly a yard long, and they occur from the southern part of New Jersey, southward, throughout the Atlantic States, and west-

ward to the Mississippi in the northern section of its range, and to the Pacific in the southern. Occasionally it is met with in northern Mexico. It has several specific relatives of the same genus in some parts of Asia. Our form feeds on common black crickets, small grasshoppers, and on other insects. In captivity it has been known to eat mealworms, and it is a very gentle little pet. Generally it is found in low bushes and shrubs—in fact, it is distinctly an arboreal species. Its color is a great protection to it; several individuals may be in a leafy bush and escape the observation of one looking for a specimen. When gliding along on the ground, it will keep its motionless tongue rigidly protruding



A REMARKABLE PHOTOGRAPH OF ONE OF OUR MOST FAMILIAR AND USEFUL SNAKES  
 Fig. 10—The little Green Summer Snake (*Liopeltis vernalis*) is one of the prettiest and gentlest creatures we have in our entire fauna; it destroys many noxious insects, and should be thoroughly protected on that account.

from its mouth, with its distal bifurcations drawn together in a single point. This character is easily detected, for the organ is of deep cream color, causing it to be more or less conspicuous as contrasted with the green body.

Our Grass Snake (*L. vernalis*), like its congener, is wholly insectivorous in its diet, and apparently never partakes of animal food in nature. Sometimes, however, it will eat small spiders and caterpillars, provided the latter are of the hairless varieties. Raymond Ditmars, in his most valuable and interesting volume, *The Reptile Book*, says of this genus: "The majority of Green Snakes are the most gentle of serpents and will submit to the most vigorous handling, even when freshly captured, without showing the least sign of anger. Of several hundred specimens the writer failed to note an attempt to bite, except in the case of a single specimen from Long Island. It is interesting to explain that this specimen was very dark olive in color, and in decided contrast to the rich green of the greater number of specimens. It would bite repeatedly at the finger, but the minute teeth failed to produce even a scratch.

"A more innocent and more dainty reptile cannot be

imagined than one of these creatures, and the spectacle of a tiny green serpent beaten to death on the roadside should provoke pity for the human individual who so 'bravely' engaged in combat and succeeded in destroying, with the aid of a substantial club, about twelve or fourteen inches of diminutive body that would have real difficulty in battling with a fair-sized grasshopper" (p. 325).

The enormous, and for the most part invisible army of these gentle little snakes in nature, in the Atlantic States, doubtless number a million or two of specimens—possibly more. This great host consumes annually many tons of grasshoppers; this fact alone should be sufficient, were it generally known, to deter thoughtless country boys—many of whom are sons of farmers—from crushing to death this very useful and entirely harmless little snake whenever and wherever they chance to come across it.

### KAISER BOUGHT WALNUT FOR WAR TEN YEARS AGO

THAT this valuable wood for gunstocks was purchased in large quantities by agents of the German Government years ago is brought out in an article in the *Philadelphia Record*. We quote:

"In his efforts to locate available walnut timber for use for the Government in the manufacture of gunstocks, Walter B. Allen, director of military service of the Blair County Branch of the Council of National Defense and Public Safety, has discovered evidence of the war preparation plans of the German Government in years gone by.

"He has ascertained that a great amount of walnut timber was bought by agents of the Kaiser, representations being made that it was intended for use in the manufacture of furniture. The timber was purchased about 10 years ago, and none of those who sold it had the remotest idea of the use to which it was to be put. Few, in fact, knew that they were selling to agents of the German Government.

"When trees were bought they would be felled and left lying on the ground until they could be sawed into pieces suitable for handling. Later they would be hauled to the nearest shipping point and sent away. Several persons have informed Mr. Allen that they learned that the timber was sent to Eastern seaports and shipped to Germany.

"Great quantities of walnut must have been purchased according to reports received here. H. E. Bodine, manager of the Altoona Chamber of Commerce, whose home is in Tioga county, recalls the German agents' activities in that county, and Attorney J. Banks Kurtz, chairman of the Blair County Public Safety Committee, when at his old home in Juniata county, was informed of similar purchases of walnut there.

"Evidently there is little walnut left in this region, for Mr. Allen has not yet found any considerable quantity for our own Government."

### NEWS PRINT PAPER FROM SAW DUST

NEWSPRINT paper from sawdust is a fact. Not only is the idea being worked out in the United States, but the *London Times* already is using the material. In a recent issue, just received in this country, the *Times* says editorially:

"Sawdust is a by-product produced in Britain. It takes the place of wood pulp, the importation of which is greatly reduced owing to government restriction. Sawdust paper is manufactured by the Donside Paper Mills, Aberdeen, where experiments have been in progress for a considerable time and are still being carried on in the hope of effecting further improvements."

The importance of the new process to the newspaper business cannot be overestimated. Sawdust news print paper, if entirely successful, means alleviation of the threatened famine. The war, as is generally known, had forced news print paper to new high rates, and actually has resulted in scores of small newspapers being forced out of business, either because of inability to buy enough paper for their needs, or inability to pay the prices demanded by paper makers.

### GIFT OF ROAD TO DELAWARE

A ROAD 200 feet wide and extending from one end of Delaware to the other, forming a part of the Lincoln Highway, has been presented to the State by E. C. DuPont. The necessary right-of-way has been purchased by Mr. DuPont and deeded to the State. The roadbed is of cement. Some 40 miles of the southern end of the road have been completed and opened to travel.

The State Board of Agriculture is to be entrusted with the upkeep and control of the road. The necessary funds have likewise been provided by Mr. DuPont. A plan for the improvement and development from a scenic standpoint of the woodlands, forests, and open lands along the DuPont Road has been prepared by Mr. G. B. Sudworth of the Forest Service.

# UPLAND GAME BIRDS: THE GROUSE

Family Tetraonidae

BY A. A. ALLEN, PH.D.

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**T**HERE are many ways in which birds serve man, but none has been recognized for so long as that of food and sport. Ever since man descended from the trees and began throwing stones, the flesh of birds has formed an important item in his food supply. With the coming of agriculture and the domestication of animals, birds became even more useful and today millions of dollars are spent each year in raising domesticated birds so that man can vary his diet of beef and pork and mutton. The strangest part of it is that so few birds have entered into the economy of man. All of our domestic ducks, with the exception of the muscovy, have come from the mallard; all of our breeds of pigeons from the rock dove; all of our turkeys from the Mexican turkey and all of our breeds of chickens from the red jungle fowl of India. Other closely related species, to our eyes apparently the same birds, have given us nothing. It is one of the ways of Nature to select one species for glorification. Why should the species homo have risen so far above all the species of apes, and the red jungle fowl so far above the gray or the green?

Mother Nature is a great specialist. Every organism develops, and becomes specialized or adapted for some particular function. Some organisms are constructionists and others are destructionists, and always the two are balanced. The plants are the builders and the animals are the destroyers. And lest some of the destroyers become too numerous, other animals are the destroyers of them. In the course of ages, this is the only way in which life can exist. Otherwise there would be no progress and each

organism by its own growth and multiplication would starve itself and all others into non-existence.

In this scheme of Nature, there is one group of birds which seems to be designed to be the legitimate prey of the larger carnivorous birds and animals including man. This is the group of game birds. Their habits are such

as to develop the greatest bulk of meat for their size and their food is such as to give to it a tenderness and flavor highly desired. Their food habits are not such as to make them needed in fighting the insects, their colors are usually dull and songs, they have not. Indeed their greatest charm is in their wildness and the subconscious knowledge that they are prized as food. Some of these game birds frequent the lakes and marshes, others the upland woods and fields. The latter include all of the fowl-like or gallinaceous birds of which this paper will treat of the grouse.

Some authorities place all of the gallinaceous birds, the turkeys, grouse, partridges, quail, guinea fowls, pheasants and peafowls, in one family, the Phasianidae, but here in America, we are accustomed to put each group in a family by itself. Thus we have the Tetraonidae or grouse, the Odontophoridae or New World par-

tridges and bob-whites, the Meleagridae or turkeys, etc. There is likewise considerable confusion in the usage of the common names grouse, partridge and quail. These names are applied to quite different birds in different parts of the country and are used interchangeably in others. It would be difficult to convince most hunters that the bob-white is not a quail and that the ruffed grouse is not a partridge, but strictly speaking, the true



Photograph by H. L. Sharp

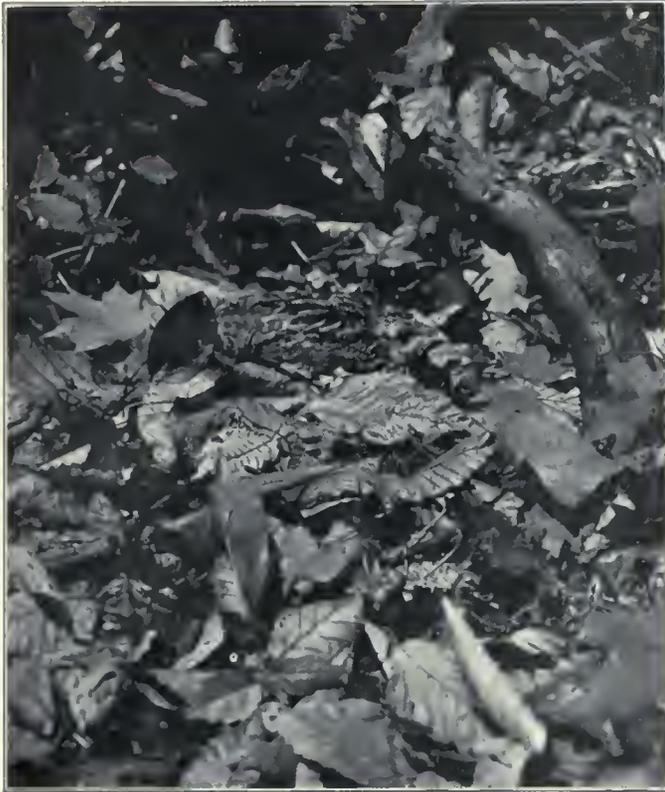
AS THE GROUSE LEFT IT

Had not one of the eggs been left exposed the photographers would never have found the nest. There are twelve other eggs in a depression beneath the leaves at the foot of the tree.

quails and partridges are all Old World, members of the family *Perdidae*. The New World bob-whites, California quail, etc., belong to a different family, the *Odontophoridae* and should be called New World partridges or New World quail. This takes the name partridge away from all the grouse family to still another family, the *Tetraonidae*. Finally the name pheasant is quite as inappropriate for members of the grouse family as turkey would be for the pheasants, and yet, in some parts

buds of trees. They are not shy birds unless hunted continuously, but allow a very close approach, relying upon their protective coloration to escape detection. How complete this is, is shown in the accompanying photograph of a ruffed grouse on its nest. When they do fly, it is with a startling whirl of the wings that is quite disconcerting to the average hunter. Their flight is rapid and direct although they usually follow the arc of a circle and do not fly far. Indeed when flushed several times and driven to the edge of its circumscribed area, a grouse will often double back right over the head of the hunter.

Grouse ordinarily nest on the ground, the woodland species at the foot of a tree or beneath a fallen branch, and lay from nine to eighteen eggs, a provision of nature for maintaining the species against numerous enemies. The young are covered with down when hatched and are able to run about. Their wing feathers are the first to grow and they are able to fly when about a week old though still very small. The male bird does not ordinarily help in their care. Indeed he is usually never seen near the nest or brood until they are full



TWO WEEKS OLD

The wing feathers are the first to grow and young grouse can fly when but a week old and scarcely larger than sparrows. This one is crouching in the dead leaves to escape detection.

of the country, the ruffed grouse is called the pheasant. In general, the grouse can be distinguished by having the tarsus or lower leg more or less covered with feathers, in some species the ptarmigan, extending clear to the tips of the toes. The New World partridges and quail have the tarsus bare and without spurs while the pheasants have it bare but with well developed spurs.

There are about twenty-five species in the grouse family, confined to the northern parts of the Northern Hemisphere, two species of ptarmigan being circumpolar and found both in Europe and America. The majority of species, however, are more or less restricted in their range and the individuals are often sedentary and spend their entire lives within the confines of a small woodland, never migrating. During the nesting season they are solitary but afterwards the young stay with the parents and sometimes different families come together about good feeding spots until good-sized covies are formed. Grouse are ordinarily terrestrial although, when alarmed, they often fly up into the trees and during the winter, they secure a large part of their food from the



Photograph by A. D. DuBois

A "FOOL HEN"

The Franklin's grouse is the western representative of the Spruce grouse and both species are called "fool hens" because of their misplaced confidence in man.

grown. The female, however, is very solicitous for the safety of the young and uses every expedient to distract the pursuer, trailing her wings along the ground, as though severely wounded, hissing like a snake, or even flying into the face of the pursuer. The young crouch at the danger call and do not move until once more called by the mother. Since they are always scattered it is a difficult task to find them, so protectively colored are they. The best known of the grouse family are the ruffed

grouse, spruce grouse and heath hen of the East and the dusky or blue grouse, the Franklyn's grouse, the prairie chicken, sharp-tailed grouse and sage grouse of the West. The northern ptarmigan are represented in Colorado by what is locally known as "white quail," a southern form of the white-tailed ptarmigan.

The most generally known and the finest of all the game birds is the ruffed grouse which, in one or another of its forms, is found in wooded districts from Virginia to Alaska. It gets its name from tufts of large black or brown feathers on the sides of the neck which can be lifted and spread until the head is framed as in an Elizabethan ruff. The broad banded tail is always spread when the bird flies and is one of the simplest ways of distinguishing it from a female pheasant or any other of the game birds.

Before they learn the fear of man and the gun, ruffed grouse are tame birds and merely walk out of one's way along the forest trails, but it takes but very little hunting

from the north of large numbers of goshawks and great-horned owls which are forced out of their normal northern homes by the failure of the rabbit supply which in turn is due to a periodic epidemic. Such an invasion of hawks and owls has occurred during the past two winters. Besides this we might point out that May and June during the past two years have been remarkably cold and wet and thus unfavorable for the rearing of



Photograph by G. C. Embody

NATURE'S METHOD OF PRESERVING GAME

The grouse lay from nine to eighteen eggs, providing for the loss due to their numerous enemies.

before they become shy and tax the utmost skill of the hunter. Owing to excessive hunting grouse have become extremely scarce in many localities and during the past few years, their numbers have been very seriously depleted throughout most of their range. The exact cause for this is not known, but a very plausible theory has been advanced by Mr. John Burnham in the January Bulletin of the American Game Protective Association. He points out that there occurs a periodic diminution of the grouse every ten years owing to the invasion



Photograph by H. L. Sharp

JUST OUT

In getting out of the shell the young grouse remove a neat circular bit from the large end of the egg. The tiny egg tooth can be seen on the tip of their bills. Young grouse can run as soon as hatched and follow the mother like little chickens.

young. Indeed in most places, very few birds of the year have been taken by hunters during the past two years and the inroads made by hunters as well as by vermin on the old birds has quickly shown itself. So much so, in fact, that it will probably be necessary to close the season on grouse for a couple of years so that they can recuperate.

The most interesting characteristic of the ruffed grouse is its habit of drumming. The cock bird selects some fallen log to which he returns often for years. Drumming is at its height during the spring, but even after the breeding season on bright days during the fall and winter the old cock may come back to his favorite log. The drumming sound, which begins with a measured thump—thump—thump—and ends with a loud whirring sound, like the muffled sound of a motorcycle engine, is made by the cock beating the air with his wings. Bracing himself on the log with his tail and standing erect, he first strikes his wings together behind his back producing the thump—thump—thump noise of a big drum. Then as his wings vibrate faster and faster, the whirring sound that can sometimes be heard for half a mile, is

produced. Between his drumming performances and while waiting for the female to approach, he struts up and down the log much like a miniature turkey gobbler with tail spread, wings dropped and ruff erected.

The Spruce partridge of the Northeast and the Franklin's grouse of the West are both inhabitants of the moist spruce forests where their dark coloration seems quite in keeping with their surroundings. The males are easily distinguished from the ruffed grouse by the absence of ruffs and by the largely black underparts. The females are much browner than the males, but have black tails with but a narrow band of brown at the tip. Both species are known as "fool hens" because of their misplaced confidence in man. They seem to have absolutely no fear and will barely get out of one's way in the forest and will often allow themselves to be killed with a stick. For this reason although their flesh is delicious, they cannot compare with the ruffed grouse as game birds.

The dusky or blue grouse is found in one or another of its three forms from the mountains of Arizona to Alaska. It is considerably larger than the other grouse, of a nearly uniform bluish slate color, mottled with brown on the wing. When not hunted it is as unsuspecting as the spruce grouse, but like the ruffed grouse it soon learns to evade the hunter and makes a splendid game bird.

The prairie chicken or pinnated grouse, the sharp-tailed grouse and the sage grouse are birds of the open prairie or sage brush country of the West. With the advance of agriculture into their domain, they have been pushed further and further westward and have been exterminated over a large part of their former range. The three birds, while resembling each other superficially, are quite easily distinguished: the prairie chicken by its pencils of elongated feathers on the sides of the neck and square tail, the sharp-tailed grouse by its similar appearance but pointed tail and absence of the pencils and the sage grouse by its large size, pointed tail and the presence of black on the underparts. All three species have interesting courtship performances in the spring which are quite different from those of the ruffed grouse. The prairie chickens, for example, assemble in small companies on knolls or open places on the prairie where the males compete for the females. Large inflatable sacks are distended on the sides of the neck to the size and color of small oranges, the stiff feathers are erected, and a loud booming sound

is produced by expelling the air from the sacks. They then dance about and fight and rush at the females of their choice in order to win their favor.

The eastern form of the prairie chicken, called the heath hen, which was formerly found throughout the wooded districts of Southern New England and the Middle States is now entirely extinct except for a small flock, now rigidly protected, on the island of Martha's Vineyard.

The ptarmigan are unusual grouse which become pure white in winter, their summer plumage being mottled gray and brown like the lichen-covered rocks. They are birds of the Barren Grounds or the mountain tops above timber line and are always associated with snow and glaciers. The only exception to this is the red grouse of Great Britain which lives on the moors. It has the distinction of being the only ptarmigan which does not turn white in winter and is the only species of bird that is confined to the British Islands. The other well-known

European grouse are the black cock, the large capercaillie and the hazel hens.

All of the different species of grouse seem to offer possibilities for domestication and yet, with the possible exception of the European red grouse, none of them has been bred successfully even as a game bird. With the ever growing number of hunters and the depletion of all game, it is becoming more and more important to devise artificial means of increasing the game supply. So far, in this country, the only birds that have been fully successful on the game farms are the ring-necked pheasant and the mallard duck although better results are



Photograph by G. C. Embody

#### THIS GROUSE IS EASIER TO SEE

They always rely upon their protective coloring, however, and do not flush until nearly stepped upon.

being obtained each year with bob-whites, and some encouragement is offered with the ruffed grouse and a few other species. It is greatly to be hoped that means for rearing the ruffed grouse in captivity will soon be devised so that the depleted covers may be restocked and so that it can be reintroduced into the woodlands from which it has been exterminated. It is to be hoped that other States will follow the lead taken by New York in establishing an experimental game farm where problems such as this can be scientifically approached, for game farming is still in its infancy.

As far as experiments have progressed it seems quite easy to raise grouse from eggs and even to have them lay in captivity in small numbers, but they suffer from apoplexy and will not stand the crowding necessary

to make their breeding on a large scale a success. The captive birds become exceedingly tame, so much so in fact as to make them a nuisance when they are given any liberty.

The work of saving the heath hen has so far been giving complete protection to the survivors on Martha's Vineyard, awaiting a natural increase. This would doubtless be successful were it not for the fires that

occasionally sweep over its breeding grounds greatly decimating its ranks. The few recent experiments of raising them in captivity have thus far been unsuccessful.

The prairie chicken and the sage grouse that are so rapidly disappearing should also be experimented with before too late. It would be a disgrace to let any one of these splendid birds follow the fate of the passenger pigeon.

## LIEUT. DOUGLASS WOUNDED

**J**UST as this magazine goes to press, word has been received that Lieut. C. W. H. Douglass, formerly Associate Editor of *AMERICAN FORESTRY*, of Syracuse, a graduate of the New York State College of Forestry,



LIEUT. C. W. H. DOUGLASS

Attached to the British Expeditionary Forces, Lieut. Douglass, formerly Associate Editor of *American Forestry*, went over the German lines on June 11th, since which time no word has been had of him.

went over the German lines on June 11th, since which time nothing has been heard of him.

Lieut. Douglass, who gallantly enlisted in the Aviation Section for flying work in the earliest period of the war, went through his training in this country, finishing in

England. He was connected with the Royal Flying Corps and assigned to active service with the British Expeditionary Forces. His many friends will feel pride in reading the following letter sent to Lieut. Douglass' father by the Major under whose command he served, under date of June 13:

"I have absolutely no news to give you of your brave son, who was missing on the eleventh of this month. He went out on low patrol in the afternoon and was not seen after crossing the lines. So we may have great hope that, though a prisoner, he is safe. I sincerely hope this will prove the case, as he was the stoutest-hearted, keenest pilot I have ever been privileged to command, and I had recommended him for promotion on joining his own American unit. Please accept my very sincere sympathy and I hope you may soon receive good news of him."

Lieut. Douglass was Associate Editor of this magazine when he enlisted for service, and the American Forestry Association has instituted a close inquiry through the Paris office of the Red Cross, through which it is hoped to receive encouraging information with regard to his present whereabouts and his well being.

Later: Advices just received from the War Department state that Lieut. Douglass was "severely wounded in action June 11th." This is good news for though it indicates that he was badly wounded it is evident that Lieut. Douglass is not missing and that he is not a German prisoner, but is safe within our own lines.—Editor.

## AMERICAN TREES FOR JAPAN

**T**HE United States Department of Agriculture has presented to the city of Tokio ten young *Kalmia Latifolia* trees, native to North America. Dr. Walter T. Swingle, of the Department, was sent with the trees. Eight of them have been planted in Hibiya park, Tokio, and the others in the horticultural nursery at Shibuya. The tree is an evergreen, attaining a height of five feet, and belongs to the azalea family, although differing from the common plant of that name. It bears very beautiful pink flowers, and takes its name from a Swedish botanist, Peter Kalm, who discovered it during travels in North America in 1750.

# CANADIAN DEPARTMENT

BY ELLWOOD WILSON

PRESIDENT, CANADIAN SOCIETY OF FOREST ENGINEERS

(The regular publication of the Canadian Department has been interrupted because Mr. Wilson has been engaged in important work for the Imperial Munitions Board in connection with obtaining airplane spruce. He hopes, however, to continue it without interruption in the future.—Editor.)

ONE of the most important steps toward winning the war is the development of the air fighting forces of the Allies, and as the most important material which enters into their construction is spruce wood, it must be procured on a large scale. Here in Canada this work is being carried on very successfully, more than a million feet of western spruce is being shipped monthly. The work is in charge of Major Austin Taylor, under the Imperial Munitions Board, assisted by H. R. MacMillan, formerly Chief Forester of British Columbia. Before the war broke out the Dominion Commission of Conservation had made a thorough survey of the forests of British Columbia and when the need arose this report showed just where to go for the trees and just about what quantities were available. They also had the man who made the report, R. D. Craig, a forester, and they turned him right over to the Imperial Munitions Board for their work. Mr. MacMillan also brought to this work a thorough knowledge of British Columbia's forest resources and an intimate acquaintance with the lumbermen, whose confidence he had gained in his work as Chief Forester. Major Taylor's executive ability, coupled with the technical knowledge and local experience of these foresters has made the work of producing western spruce a great success. We have, therefore, in this work, the results of preparedness and the technical skill of trained foresters.

There is in the present stage of airplane manufacture practically no other section that can supply the factories with the material which they want except the Pacific Coast, and it is of the utmost importance that the present stands should be most carefully cut and protected from fire. The manufacturers, working, as always, along the easiest lines, are practically using only solid beams and parts for the planes, and the long lengths required can be cut only from western stock. This entails quite a lot of waste, and the parts are not as strong as those built up, or laminated from smaller pieces glued together. The manufacturers do not seem to realize that it has taken several hundred years to grow this material and that the supply is not unlimited, and that it may easily be much impaired by forest fires. It cannot be replaced for centuries. There is a lack of co-ordination between the forest and the factory which should be eliminated, the manufacturer should make his plans for constructing airplanes and the designer his plans and specifications, so as to use to the best advantage the material at hand. The lumberman should be instructed as to how the material he supplies will ultimately be used and the sawmill man too. Each of the big trees should be cut up so as to yield the largest

amount of stock and there should not be a particle of waste anywhere along the line. The war may last for several years more and the airplane has come to stay and will play an increasingly large part in the development of our civilization after the war is over. There is no other material known which can take the place of spruce and we should husband our store and should begin to plan for the future. Spruce should be planted in favorable localities and regularly be cultivated for the production of airplane material.

Every precaution should be taken to protect the western spruce stands from fire, logging debris should be cleared up and an efficient patrol maintained to absolutely prevent fires. Production is of prime importance, but nothing should be allowed to endanger the standing trees.

It is reported that a borer has appeared on the south shore of the St. Lawrence River which is doing quite a lot of damage to the spruce. The Quebec Limit Holders Association has asked the Quebec Forest Protective Association to investigate and see what steps can be taken to combat the pest. The Dominion Entomologist is said to have stated that this insect breeds on the logging debris. If this is the case, steps must be taken to dispose of this by fire at the time of logging. It is coming to be realized more and more that we must dispose of our slash to reduce the fire hazard and to insure the health of the standing and growing timber.

The writer has just been making rather an extensive tour of the sawmills of New England and Quebec, and has reports from New Brunswick and Nova Scotia. He has been struck anew with the view point of the saw mills that quantity production is the only end sought. Quality is a very secondary matter. The waste is very large, although steps are being taken at many mills toward closer utilization. The quality of the trees left in the woods is growing poorer and poorer and this makes the output worse. The supplies of soft wood are dwindling rapidly and it is high time that the whole question of our future timber supply should receive careful study and a plan worked out for the future. Mr. Phillip T. Dodge of the International Paper Company is reported in the New York Times as saying: "Most serious is the matter of pulp wood, from which paper is made. The forests of the United States are in great measure exhausted, but in Canada there is a vast supply, largely on Crown Lands. For years this came freely to the United States, being cut under extensive leases, but exportation from the important sections is now prohibited and the mills of this country are placed at a great disadvantage. "If the wood supply for the making of

paper is practically exhausted in the United States how long does anyone think it will take to place Canada in the same position if all the American mills are allowed free access to her supplies? The uses of wood pulp are rapidly increasing, the consumption of paper is not likely to diminish and while Canada has a large supply it is by no means 'vast.'

The study of the cut over pulp wood lands undertaken last year by the Commission of Conservation, at the instance and with the co-operation of the Laurentide Company, Ltd., is being continued this year and the co-operation of the Department of Lands and Forests of the Province of Quebec and of the Riordon Paper Company, Ltd., has been obtained. The final results of this work will show just what the future has in store for us and give a working basis for the intelligent formulation of working plans and proper utilization of pulp wood lands so as to insure a perpetual supply. The whole subject is a matter of practical common sense and sound business judgment. This is demonstrated by the fact that the two most successful paper companies are those which are taking the greatest interest in this investigation, showing that the policy of looking to the future, which has made them successful, will now be applied to their forest properties.

A visit of the members of the Newsprint Association to the nursery and plantation of the Quebec Government and to those of the Laurentide Company is talked of for the second week in August. This is the idea of Mr. Kellog, Secretary of the News Print Service Bureau.

The forest fire situation in Eastern Canada has been most favorable this year. Some small fires set by farmers clearing land in districts where the permit law has not yet been thoroughly understood have occurred, but they have done little damage.

A letter issued by Mr. H. B. Cassidy is a model well worth the study of other railroad officials. This was issued to all section foremen and urged them to co-operate with the forest fire rangers in every possible way and to try and learn from the rangers the best methods of putting out fires, burning brush and other debris.

The formation of a Lumbermen's Association in New Brunswick, which will co-operate with the Crown Lands Department in the handling of the forests of that Province marks a new era in co-operation. This Association will act in an advisory capacity and will ensure harmonious action and a common sense handling of forestry problems.

#### TREES SURVIVE YEARS OF FIRE

THE orchards in Hebuterne Wood are in full foliage, despite the heavy and continuous shelling. Philip Gibbs, in a special dispatch from the front to the *Detroit Journal*, says:

"With some New Zealand officers I went up to three places yesterday and saw how the wood at Hebuterne and the orchards are in full foliage again in spite of all the years of shell fire.

"Gommecourt Park and Rossignol Wood are as dead as when I went to them last, with only naked trunks like masts, and not a leaf on any shell-slashed branch. The enemy has been shelling about here very fiercely during the last few days, for several miles on the way the ground was all overgrown with flowering weeds pitted with shell holes.

"Not any square yards of soil in this neighborhood could be called really 'healthy,' and there were some ugly sounds about as German shells burst with terrific long-drawn echoes, but the New Zealanders sat among the shell craters and outside the entrances to their dugouts with no outward sign of uneasiness, cleaning their rifles, writing letters, playing cards, keeping a lookout over the enemy lines or working about their guns and paying no more attention to the ugly noises than if they had been the buzzing of gnats. We made the most of the noise a little later when our guns opened on to the enemy lines beyond Rossignol Wood.

"I stood watching the bombardment with a young gunner observer behind a hummock of earth, while flocks of shells passed over our heads and burst with monstrous many-colored clouds into the long dip of ground just below the wood."

#### RUSSIA'S ENORMOUS FOREST RESOURCES

THE astonishing statement is made by A. J. Sack that Russia, including Siberia, has 1,125,000,000 acres of timber which is 63 per cent as much as the whole world possesses. This resource is being set aside by Russia economists as a fund to pay the country's debts. The timber must be manufactured and marketed and the work will require years; but while it is being done, the world's markets will be flooded with Russian timber.

The effect on America's business should be considered, observes the *Hardwood Record* in discussing the article. Except oak, it continues, which is generally known in the market as the Japanese oak, it is not probable that much Russian timber will reach the United States; but it will compete with American lumber in other markets, notably those of Western Europe, and perhaps those of Eastern Asia, western South America and the Pacific Islands.

"To that extent," says the *Hardwood Record*, "our lumber business may be hurt

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### OLD WOODEN CHURCH TO HOUSE HISTORIC RELICS

"DAVID'S TEMPLE," a church built early last century in York County, Ontario, has been purchased by the York Pioneer and Historical Society to be used as a museum for historic relics. The old church, erected by the late David Wilson, head of a religious sect known as the "Davidites," took six years to build, is entirely of wood and today is in a remarkable state of preservation. The lasting qualities of wood never were better exemplified than in this structure. White Pine in the main was used and the wood today is the admiration of all sightseers.

Many years ago remarkable religious ceremonies were celebrated in the Temple by the "Children of Peace," but for a long period the building has been sadly neglected. Work on the church was started in 1825. It is three stories high, surmounted by a gilded ball on which is inscribed the word "Peace." The church contains nearly 3,000 panes of glass in the windows and spires and has a symbolic meaning attached to all its parts. One feature is an altar that took 365 days to build. It stands on twelve gilded pillars representing the twelve apostles, and is emblematical of the religion of Christ.

The building was intended to be used fifteen times during the year; never at any time for Sunday worship. Services were held on the last Saturday of each month, when the members made contributions for charitable purposes. The first service was held October 29, 1831. The church was painted white with green facings.

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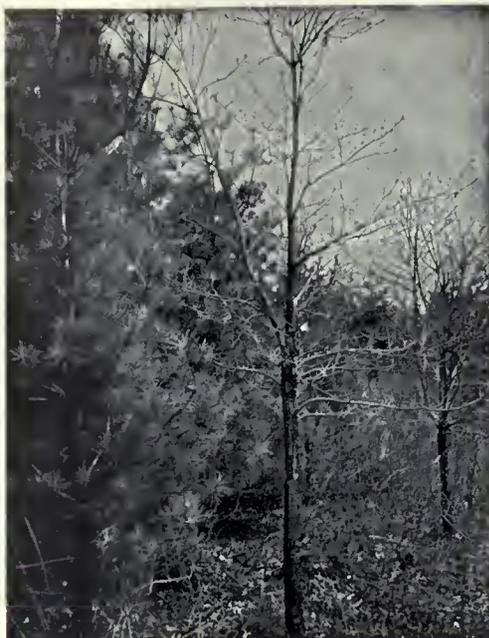
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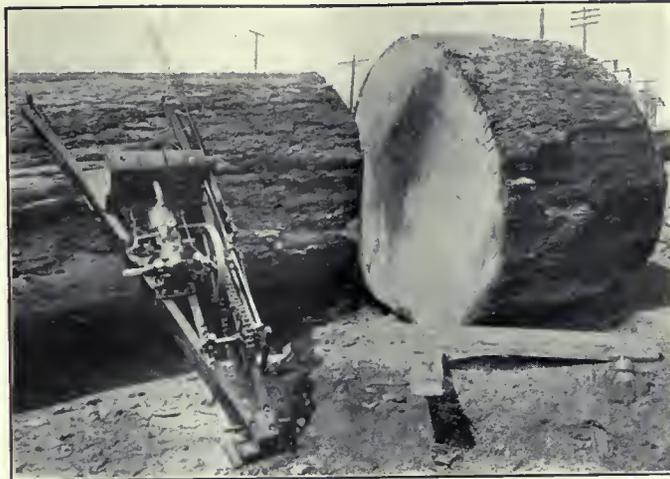
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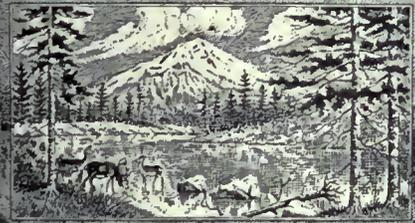
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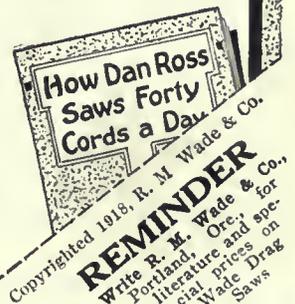
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Up to this time there has been a lack of definite data on this subject, although concrete and iron manufacturers had a mass of material available for bridge builders. The booklet can be had on application, free of charge, by addressing the National Lumber Manufacturers' Association, Chicago, Illinois.

**LOGGING CONGRESS MEETS IN DECEMBER**

The tenth session of the Pacific Logging Congress will be held in Portland during December. The exact dates will be announced later. The reason for the date being later than customary is to permit as large an attendance as possible of logging operators and superintendents. At this season of the year their enjoyment of the Congress proceedings will not be marred by fear of forest fires at the camps during their absence. Then, too, at this period of the year a large number of the pine logging operations have closed down for the winter, thus permitting the attendance of delegates who must necessarily come greater distances than the fir men.

The welfare dinner which has always been a feature of the Congress will be given as usual under the direction of John A. Goodell, of Portland, industrial secretary of the Y. M. C. A.

President W. W. Peed and Secretary George M. Cornwall are preparing a program which they believe will excel all previous efforts. The Congress now has a membership of nearly 300 and continues to grow year by year. The membership list includes operators in British Columbia, Washington, Oregon, California, Idaho and Montana.

**HOW TO USE WOODEN SHINGLES**

A recent free booklet issued in pamphlet form by the National Lumber Manufacturers' Association, with headquarters in Chicago, is "Why and How Wooden Shingles Should be Used." This booklet was compiled by R. S. Whiting, architectural engineer, and H. H. Isherwood, trade representatives, respectively, of the association. It is devoted principally to the refutation of the idea that wooden shingles are fire-breeders, and any fair-minded person who will weigh the arguments presented will realize that there are "two sides to every story." As a matter of fact, wooden shingles are far superior to any artificial shingle material produced.

**PICTURES OF GAME BIRDS**

A set of very beautiful pictures, in natural colors, of the game birds of America has recently been issued by the publishers of *The American Shooter Magazine*. They are by Lynn Bogue Hunt, the well-known nature artist. Printed on heavy paper, in natural colors, the pictures are 13 by 14½ inches, and on the back of each is the story about the bird, telling its range, habits, etc. The distribution of these prints is, however, limited to the subscribers to *The American Shooter Magazine*.

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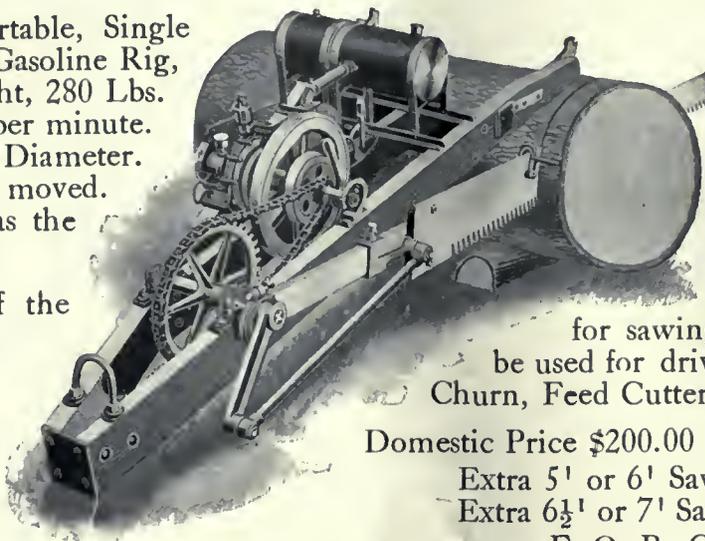
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ACULTY OF FORESTRY Magazine about Forestry and Kindred Subjects Published Each Month by the American Forestry Association, Washington, D. C.

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# AMERICAN FORESTRY

THE MAGAZINE OF THE AMERICAN FORESTRY ASSOCIATION

PERCIVAL SHELDON RIDSDALE, Editor

SEPTEMBER 1918 VOL. 24

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Entered as second-class mail matter December 24, 1909, at the Post-office at Washington, under the Act of March 3, 1879. Copyright, 1918, by the American Forestry Association. Acceptance for mailing at special rate of postage provided for in Sec. 1103, Act of October 3, 1917, authorized July 11, 1918.

# GIVE

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OF THE

# Lumber and Forest Regiments

IT WAS THEODORE ROOSEVELT WHO SAID—

**W**E FIGHT NOT ONLY TO PROTECT OURSELVES BUT TO BRING NEARER THE DAY WHEN JUSTICE AND HONOR AND FAIR DEALING BETWEEN NATION AND NATION, AND MAN AND MAN SHALL EXIST THROUGH ALL THE CONTINENTS. WE LOVE LIFE, BUT THERE ARE THINGS WE LOVE EVEN MORE THAN LIFE, AND WE FEEL THAT WE ARE LOYAL TO ALL THAT IS HIGHEST IN AMERICA'S PAST, WHEN WE ACT ON THE BELIEF THAT THOSE ONLY ARE FIT TO LIVE, WHO ARE NOT AFRAID TO DIE.

CITIZEN SOLDIER No. 238, OF THE NATIONAL DRAFT ARMY, WRITES:

**T**HEY say, who have come back from Over There, that at night the troubled earth between the lines is carpeted with pain. They say that Death rides whistling in every wind, and that the very mists are charged with awful torment. They say that of all things spent and squandered there young human life is held least dear. It is not the pleasantest prospect for those of us who yet can feel upon our lips the pressure of our mother's goodbye kiss. But, please God, our love of life is not so prized as love of right. In this renaissance of our country's valor, we who will edge the wedge of her assault make calm acceptance of its hazards. For us the steel-swept trench, the stiffening cold—weariness, hardship, worse. For you for whom we go, you millions safe at home—what for you? *We shall need food.* We shall need care. We shall need clothes for our bodies and weapons for our hands. We shall need terribly and without failure supplies and equipment in a stream that is constant and never ending. From you who are our resource and reliance, who are the heart and hope of that humanity for which we smite and strive, must come these things.”

The American foresters who are doing such valiant work in France deserve the hearty support of their friends back home—the members of the American Forestry Association and all others interested in the subject of forestry.

To these men, the members of the Forest Regiments, has been assigned the important task of supplying for the American army and the fighting forces of the Allies the timber needed for a thousand uses in construction work. *BACK UP OUR FIGHTING FORESTERS!*

---

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# AMERICAN FORESTRY

VOL. XXIV

SEPTEMBER, 1918

NO. 297

## HOW THE WAR GARDENERS ANSWERED

BY CHARLES LATHROP PACK

PRESIDENT, NATIONAL WAR GARDEN COMMISSION

**H**AS the "city farmer" made good? That is the question which thousands of people not only in the United States but in other countries have been waiting to have answered for them. They have watched the war garden movement as it grew from a mere nothing—a dream—at the beginning of the war into a nationwide effort; and they have wondered at times how much it was actually adding to the strength and the fighting resources of the Nation.

In order to answer this question it is well to make a survey of what has been accomplished and take a bird's eye view of the home food production and conservation situation as it presents itself from coast to coast.

Three facts are of prime importance in establishing the worth of the war garden as a resource of inestimable value to the United States and the Allies in this time of food shortage.

One of these is the overwhelming number of patriotic Americans who have taken up the hoe to help fight the foe.

Another is the number and variety of organizations that have assisted in making the work a great success.

And the third is the enthusiasm which has been manifested in carrying through this new project.

Many other reasons might be mentioned to prove to anybody who still might have lingering doubts, that war



A YOUNG PATERSON PATRIOT

This is Elwood Clair Shelby, age 12, of Paterson, New Jersey, and the garden which he grew this summer. The country owes much to these youthful "soldiers of the soil" who are digging in with the hoe at home while their fathers and elder brothers are going at the Boche with the bayonet.

gardening in the United States has accomplished even more than the most rosy anticipations of its founders. Reports to the Commission from all parts of the country and the requests which have come from many foreign countries for advice and information on the subject, bear a weight of testimony as to the intrinsic merit and the inspiring helpfulness of this widespread movement. The great value of these reports in judging of the worth of the whole proposition, lies in the fact that they have come not only from all over the country but that they have come from all sorts and conditions of people. They have included simple letters from the unlettered and striking testimonials from presidents of big banking institutions and large manufacturing concerns. The factory worker and the college professor have united in their utterances of satisfaction and praise over a plan of increased food production which is of benefit to rich and poor, to the individual and the community, to the employer and the employee, to the single war gardener and to the nation as a whole.

The vast numbers of war gardens which have been cultivated in the United States this year bespeak the success of the scheme. This only tells part of the story, however, for numbers alone do not always spell victory. An army may count millions of men in its ranks but if they have not the fighting spirit, they might retreat without a single victory to their credit. The war gardeners of America have not only grown into an army of millions; they are instilled with the determination to win. The final estimates of the National War Garden Commission show that there are 5,285,000 home "soldiers of the soil" in this mighty force. But the best part of the reports which the Commission gathered from all parts of the United States, is that they confirm the conviction that America is fighting with nothing but the winning spirit. The war gardeners are heart and soul with the boys in France.

No one class of people has gone into this work to the exclusion of others. It has been participated in and given the hearty backing and support of all sorts of organizations, women's committees and business men's associations, insurance companies, railroads and banks, village improvement associations and commissions on beautifying our cities and towns, school teachers and church societies, Red Cross chapters and park departments, army camps and hotel managers, boys' and girls' clubs and community groups, mayors and recorders of

deeds, factory welfare departments and home demonstration agents, in fact, it would be almost impossible to mention any kind of organization or official which in some place has not given assistance and helped to stir up local enthusiasm in this garden enterprise.

The enthusiasm which has been shown by the home food producers cannot be measured in quantity or in terms of dollars and cents. But it has manifested itself in the eager desire to help and in the seeking for information which would help to make the task a success. This was expressed in innumerable forms in the letters of request which came to the Commission all during the campaign. The demand for gardening books and for instruction was constant. During the past season the Commission distributed millions of copies of booklets on war vegetable gardening and storage of vegetables, on canning and drying of vegetables and fruits and pamphlets and other literature on the subjects as well as inspiring posters which were put in conspicuous places in banks and stores, factories and railroad sta-

tions, and elsewhere. The newspapers of the country were filled with the same patriotic desire to help, and their assistance in getting the message to the people has been invaluable. Hundreds of them have carried daily garden and canning lessons and other material of a helpful and instructive nature. They deserve the Nation's



HERE IS A REAL WAR GARDENER

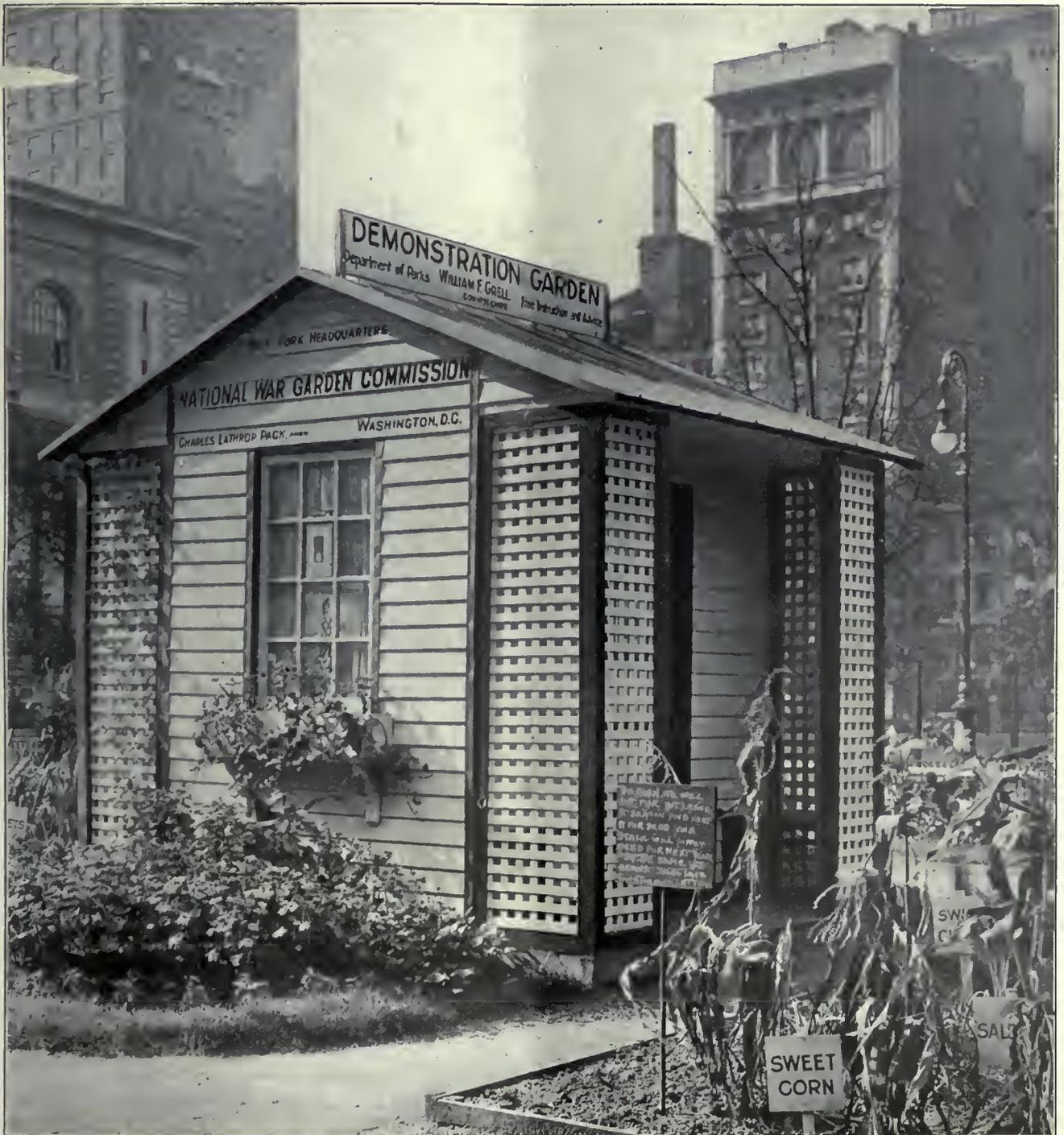
He works early and late in the gardens of the Oliver Chilled Plow Company.

thanks for what they have done in furthering this movement.

The canning "drive" which has followed the garden campaign this year has assumed unprecedented proportions. It seems to have carried all before it, and the women of the United States who have been largely responsible for this phase of the work seem to have taken literally the slogan on the Commission's famous canning poster and to have "canned the Kaiser" with such an immense supply of "food reserves" that he will never be able to escape from this overwhelming army now lined up on the pantry shelves.

Community canneries established in numerous places throughout the country testify to the universal favor of the garden conservation undertaking. Supplemented by individual workers who have preserved a considerable portion of their summer garden crop, these community canneries have added much to the food wealth of the Nation which will help to keep the supply always needed in order that there may be no shortage for our men who are in France and for the Allies.

Not only was the value of the garden product grown this year far in excess of that raised last year when the work of the Commission was getting under way, but the



IN BRYANT PARK THE CORN STALKS BLOOM

This is the "Little Garden House" in the "Million Dollar Garden" in Bryant Park on Forty-second Street, New York City. The National War Garden Commission distributes thousands of pieces of literature here to all who ask.

canned vegetables and fruits have surpassed in like proportion the amount saved from the 1917 crop. The estimates show that there was an increase of fifty-one per cent in the number of war gardens, or 1,785,000 more than last year when there was a grand total of 3,500,000 planted. And the value of the product this year is estimated at \$525,000,000, exceeding by more than fifty per cent that of 1917. It is estimated that as a result of the garden campaign and the consequent conservation movement, the women of the United States this season have stored away 1,450,000,000 quart jars of canned vegetables and fruits.

The war garden has come to stay. This is the testimony which has come to the Commission from many

game. It is true that the rules are comparatively few and simple; but there are many fine points about the proper care of vegetables which have to be mastered before the war gardener's efforts can be crowned with success. But the new tillers of the soil have studied. They have gone to those who knew more of the task than they themselves. They will continue to learn and as they do so their results will be greater and greater.

There is one branch of the work which was comparatively new this year. That was drying of vegetables. It has made a good start this year, however, and by next year no doubt much more attention will be paid to this important phase of food conservation.

Although drying is almost as old as the world itself,



#### ON HISTORIC GROUND

School boys under supervision cultivated this exceptionally fine demonstration war garden on the Boston Common. Thirty-five varieties of vegetables, practically everything that can be grown in a garden except corn, was raised. R. P. Simmonds (standing at left) guided the boys in their work. In the background are women from the "Food Facts" and canning demonstration cottages around the garden.

sources. Those who have seen the work progress in various parts of the country and the gains made this year over last, have written to the Commission stating it as their firm belief that the back yard and vacant lot will continue to blossom and that more and more the waste places will be made to yield their abundance of food.

The opinion of experts is that the city farmer "has made good." He has proved his worth. His work this year has been far better than last because of the experience gained. When he began in the first year after America's entrance into the war he was an amateur. In most cases he had to learn even the rudiments of the

although the ancients are known to have practiced this form of food preservation and the aborigines of America laid by their winter supplies in this shape, although all of our grandmothers always had dried apples to last through the cold months, the art of drying has become practically a lost art, virtually unknown to this age and generation. There is no doubt, however, but that as its advantages and merits become better known, it will continue to increase in importance and use. It has so much to commend it that it is almost unnecessary to say this will be so. Excellence of quality, compactness and ease with which dried products can be kept, saving of space in

transportation—these and other reasons will tend to make drying a more and more desirable method of conserving vegetables and fruits for future use.

Reversing the orders to the German army to "DESTROY EVERYTHING," which the Huns have carried out with faithful barbarity, the home food producers of the United States have made their motto; "SAVE EVERYTHING." This they have carried out by canning and drying all surplus products.

When it is remembered that more than 4,750,000 people in Europe have died of starvation since the beginning of the war—more than have been killed in the fighting—the necessity of raising and saving food so as to reduce this suffering to a minimum is realized. The war garden is a big ally in this great humanitarian work; and it will continue to be so after the war, for it will be years before the hunger of the world will be appeased. There will be a universal demand for food the day peace is declared which it will be impossible to fill.

The food controllers of Great Britain, France and

Italy and the food administrator of the United States had a recent conference in London to discuss the food situation, at which they set forth in a resolution the following: "It is absolutely necessary that rigid economy and elimination of waste in the consumption and handling of all foodstuffs, as well as increased production,

should be maintained throughout the European allied countries and in North America. It is only by such economy and elimination of waste that the transportation of the necessary men and supplies from North America to the European front can be accomplished, and that stocks of foodstuffs can be built up in North America as an insurance against the ever-present danger of harvest failure, and the possible necessity for large and emergency drafts to Europe. We cannot admin-

ister the food problem on the basis of one year's war. We must prepare for its long continuance if we are to ensure absolute victory."

The Canada Food Board in a recent statement called attention to the fact that some of the war gardeners in the Dominion had expressed themselves as unwilling to sell their surplus vegetables, thus putting themselves in the position of growing garden truck for money. The Board was afraid that a considerable amount of the food grown might be allowed to go to waste; and so it called on the war gardeners "to forswear their delicacy in this

matter" and to dispose of their surplus "either by sale or by gifts to their less well-situated neighbors." The statement concluded: "The community is being closely knit by the necessities of war. Food production, food storing, food conservation and food distribution are all patriotic services of utmost importance to the whole



WHERE IT COMES FROM

Here is one of the thousands of girls who are working in the gardens of the Oliver Chilled Plow Company to produce food to fill the pantry shelves.

community." Community canneries and kitchens in the United States have been of wonderful assistance in helping to care for the surplus garden crops and have prevented waste. In some cities "moving kitchens" have been established in automobiles and have traveled about from one section of the city to another, and into the suburbs or nearby villages, giving demonstrations to the war gardeners and housewives on the conservation of food by canning and drying and distributing helpful literature. One of these trucks which was used in Boston as a flying Mercury of conservation, was equipped with every kitchen convenience and necessity, including a four-burner stove with detached oven.

In school houses and church kitchens, in buildings provided by manufacturing concerns for their employees and in temporarily fitted up store rooms, as well as in "plants" of many other descriptions, community canning of vegetables has

been practiced this year. In Dallas, Texas, they put up 17,500 cans in the first few weeks after the cannery was opened, while at Temple in the same state, they canned one ton of black-eyed peas the first week the community cannery was in operation.

The women who are doing the canning and the drying this year will be taking a more active part next season in the production end of the war garden work. They have given their support and their encouragement to this part of the movement; and in a number of cases have actually gone out into the garden and done the cultivating. One of the most interesting instances which will lead to increased development in 1919, was that of a group of school teachers and girls who worked in offices who went up to

northern New Hampshire and raised the vegetables in a three-acre war garden for a large summer hotel, "The Balsams," at Dixville Notch. So well-satisfied was the

### HOW THE WAR GARDENERS ANSWERED

War Gardeners of the United States have run up a total of five million, two hundred eighty-five thousand, home food-producing plots according to revised figures tabulated by the National War Garden Commission after a nation-wide inquiry. This is an increase of fifty-one per cent over 1917. The figures show an increase of 385,000 gardens over the preliminary figures given out by the Commission in July. As compared with figures of 1917 the increase is estimated to be 1,785,000 gardens.

The value of the product of these war gardens will be \$525,000,000, exceeding by fifty per cent that of 1917 which was valued at \$350,000,000. This increase is due to two things; the experience gained in last year's work, which was the first for many people; and second, the intensive campaign this year and the fine co-operation between employer and employee. In thousands of cases acres and acres of gardens were planted with the help of business concerns which turned the land over to their employees.



IN THE WINTER THEY TEACH SCHOOL

Way up near the Canadian border in New Hampshire these girls cultivated a big war garden this summer which supplied vegetables to "The Balsams," a big hotel at Dixville Notch. So well satisfied was David B. Plummer, manager, with the work of the girls that he is planning to extend it next year. Thus a new field is opened for women who teach school and work in offices.

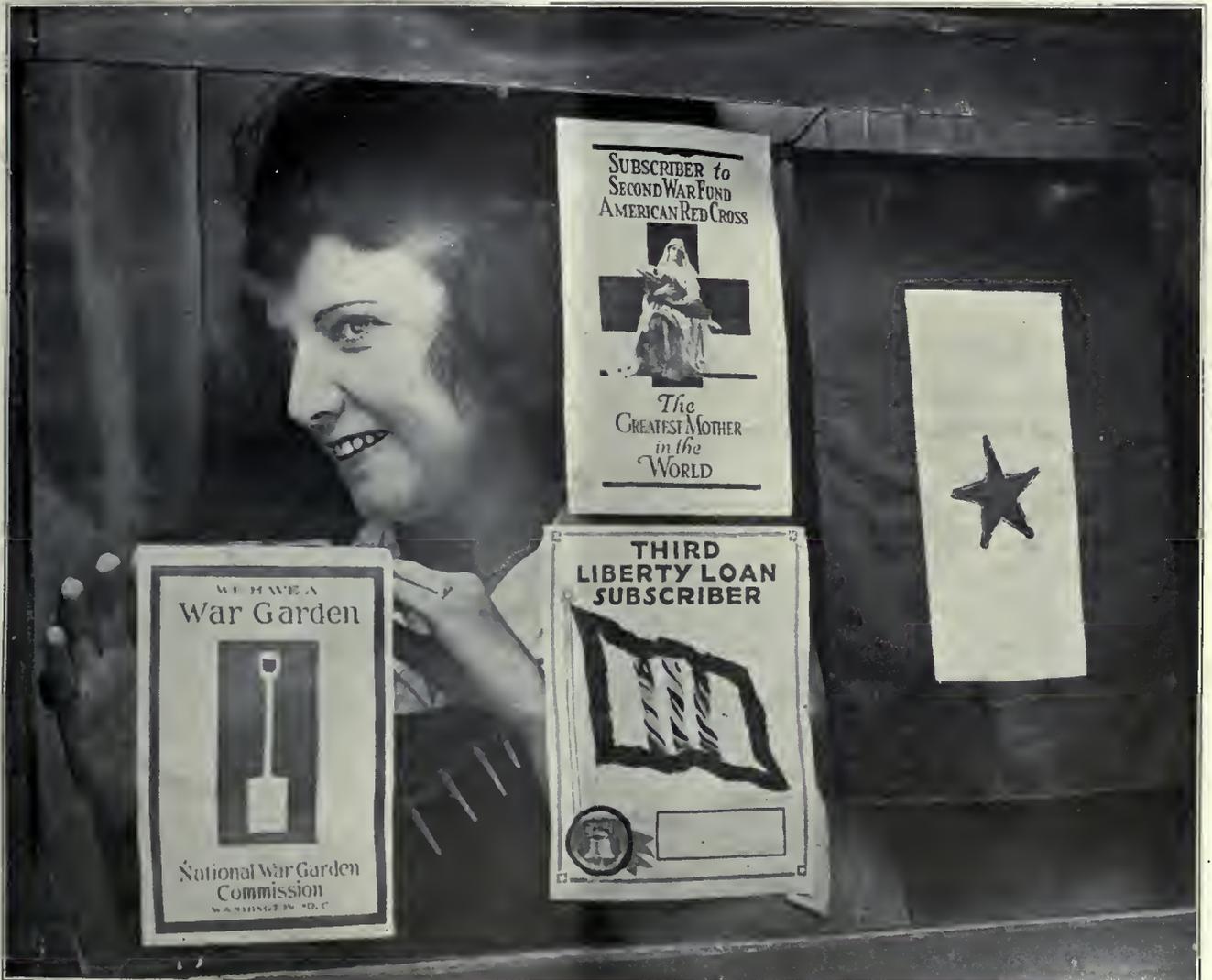
manager, David B. Plummer, that he promptly planned to enlarge the work next year. This hotel had been in the habit of transporting a large part of its vegetables from a considerable distance, so that the saving in freight was a prime consideration.

The girls who went up to Dixville Notch had brothers and sweethearts and friends in the service "over there." They worked earnestly and faithfully. There were eight of them and the "war garden" did not require all of their time, so that they frequently helped in the hay fields or in other work on one of the hotel farms. This they did voluntarily and cheerfully. While they did not go up to

will continue to can vegetables. They will learn the value of drying which is comparatively new.

Drying will commend itself more and more for its conveniences. It means a saving in time, an economy in materials and containers, and is the least expensive means of saving food. It will supercede to a certain extent the present method of canning. In a most enlightening letter on the subject received by the Commission from C. H. Gensler, superintendent of the Havasupai Indian School, Supai, Arizona, which needs no comment, is the statement:

"In reply to your letter relative to canning contest. We



NO WONDER SHE SMILES!

With a window display like this any girl can afford to be proud. While her brother, Alva Morning Starr, was serving his country in the army. Miss Jane Starr, of Los Angeles, California, was backing him up at home by doing Red Cross work, buying Liberty Bonds and by cultivating a war garden. She was the first girl in the city to receive and put up her window hanger.

New Hampshire with the idea of having a "summer lark," nevertheless they enjoyed themselves, for they were a happy and cheerful group. They lived in a little cottage on the sloping side of a hill, looking off to beautiful mountain and valley scenery, with clear, cool lakes interspersed. Next year doubtless will see other girls follow their example.

In war gardening women are learning much that is new. The same applies to conservation of food. They

are not conducting a contest. Our Indians do no canning. They preserve all their food by drying."

The people of the United States will follow some of the good practices of the aborigines who dried their corn and other vegetables for winter use. They will go back to this good old method of saving food in constantly increasing numbers.

The war garden campaign in Canada this year, which received active and enthusiastic support from the Na-

tional War Garden Commission, has resulted in the production of a crop valued at \$50,000,000 or more, according to the estimate of Frederick Abraham, honorary chairman of the war garden and vacant lot section of the Canada Food Board.

It is interesting to note that among the industrial and manufacturing concerns throughout the country which have encouraged and helped their employees to plant war gardens and to reap the harvests therefrom, were a large number of lumber companies. From the far Northwest where the lumber jacks are turning out the big firs which are going into ships and the spruce which is being converted into airplanes, down to the Gulf Coast where the cypress which also is going into the ships is being cut, the men are serving in every way they can. On this account they are producing part of their own food. No one realizes better than these men the demand for every railroad car for essential war work; and they know that the more food there is grown close to the place of consumption the greater will be the relief to the country's transportation facilities.

The West Coast Lumbermen's Association, with headquarters in Seattle, through Robert B. Allen, secretary, wrote to the National War Garden Commission: "Our purpose is to encourage the raising of fresh vegetables at the mills and logging camps of this state and Oregon where employees are engaged in the production of essential war material for shipping and aircraft purposes."

And here is what they are doing down in Louisiana. Listen to what C. S. Williams, vice-president of the F. B. Williams Cypress Company, of Patterson, Louisiana, says: "Practically every available piece of land that we own around the plant is being used for war gardens by our employees.

We are also glad to advise that there seems to be great interest in home gardening throughout this entire territory. We have never seen the land so entirely cultivated.

Hardly a family is without a garden of some sort. Almost every one of our men have gardens, a large number of them around the open space of the plant. The people are now planning a great canning campaign."

Many other manufacturing plants, both large and small, have helped to swell the vast total of home food producing plots in the United States this year; and on account of the many benefits of war gardening are planning to enlarge their efforts in this direction next year. Among other advantages war gardening helps to stabilize labor. Here is what Lewis F. De Wolfe, secretary of the Marion, Indiana, War Garden Association, reported to

the Commission: "Workers here refused to leave the city to take work at higher wages elsewhere because they had planted fine war gardens and were so proud of them they would not leave them."

Marion, with 27,000 people, boasts 14,800 war gardens. Surveying the work of the past season there is much to be grateful for. The American people have gone into the home food production and conservation work with an industry and an enthusiasm which is worthy of the country's best principles. Justice and the world's freedom depended to a great extent on the efforts which they put forth in this direction. They have answered the call of bleeding Belgium, throttled by a merciless tyrant, with a sincere purpose to wipe the monster responsible for that crime and for many others from the face of the earth. They will continue to the end until military autocracy never more will dare to lift the sword in a fruitless effort to shackle the world at its feet.

**WHY AMERICA WILL WIN THE WAR**

**National War Garden Commission,  
Washington, D. C.**

Please send me recipes for canning and drying or any other books that will help a mother with nine little boys and girls who do all kinds of work on our farm home. Thanking you,

**MRS. IDUS TAYLOR,  
R 1, Box 28, Cuthbert, Georgia.**

(This letter has a little United States flag in the corner.)

\* \* \* \* \*

**National War Garden Commission,  
Washington, D. C.**

Will you send me your book on canning and drying. I have a small garden and want very much to preserve all surplus vegetables and save a little for the coming day. I have two sons, all the children that I have, at the front and I must do all I can to help our boys who are fighting in a just and right cause.

**MRS. ROBERT C. THOMPSON,  
54 First St., E. Norwalk, Connecticut.**

(This letter has a service flag on the front page.)



**FIRST AID TO THE WAR GARDENERS!**

These youngsters have fine gardens and are taking a minute off in their work.

## THE RACE FOR AIRPLANE SPRUCE AND SHIP TIMBERS.

IT'S a strenuous race that's in progress along the Oregon and Washington Coast. Spruce forests are the goal. Building new railroads is the task. These new lines will tap the spruce tracts this fall, and over them will come the giant logs from whose white flesh will be stripped the tough, clear stock for airplane beams to win the war. Speed is the essential. It's the most vital race that ever was run in Oregon. The welfare of the world is at stake where soldiers labor on the grade with pick and shovel, according to *The Oregon Voter*.

The railroad part of the spruce program is by itself the most ambitious transportation project ever attempted in one year in the Pacific Northwest, this empire which transportation enterprise has made celebrated for initiative and daring. It is true that there have been more miles of railroad completed within several single years in the Northwest than this one year of 1918 will see completed, but never have there been so many miles of railroad conceived, located, surveyed, cleared, graded, constructed, and completed all

within one season—all as part of the race for spruce.

Some of these railroads will each carry as much tonnage daily as is carried by a transcontinental railroad. This tonnage will be the logs from the spruce forests to the water at the sawmills.

This means that the railroads have to be built stout enough to handle the traffic. They will have to be ballasted—simply rails on ties in the winter mud won't do, especially under weather conditions such as prevail in the mountains of the Oregon coast.

Think what this ballasting means. Take the great project centering around Yaquina Bay, for instance.



CHAIN SKIDWAY LIFTING LOGS

The Seattle region is the main source of the lumber supply in the West, the State of Washington leading all other states in lumber production.

Photograph by Underwood and Underwood



LOGS PASSING THROUGH THE LOCKS

These are the locks of the Lake Washington Canal at Seattle. Note the variety of the logs. Washington, the leading lumber state, turns out three-fifths of the nation's shingles alone. Her annual production is over a hundred million dollars a year.

Photograph by Underwood and Underwood

It stretches from the celebrated Blodgett spruce tract on the Yahats, south of Alsea Bay, to the equally celebrated spruce forests in the Siletz Basin to the north. To reach these two districts there are sixty miles of railroad being built this year—

37 miles of main line and 23 miles of spurs within the tracts.

To ballast the 37 miles of main line will require 4,800 carloads of gravel—about 200 train loads of 25 cars to the train. Neither gravel, nor any rock that can be used as a substitute, can be found in the Yaquina region. It is necessary to go away over the coast mountains into the Willamette Valley near Corvallis to Yaquina Bay—nearly 100 miles of curving mountain line. Quite a transportation problem in itself.

This project tributary to Yaquina Bay is only one of nearly a dozen projects being conducted by the Spruce Production Division with soldier labor through contractors on the cost-plus system. Here are some facts about this one operation:

Seven miles of railroad were completed north of Toledo in two months this spring to reach one tract of spruce. Logging now is in operation there—about half the logs being cut up in the revamped sawmill at Toledo and about half the bigger logs shipped by rail to Portland, where they are sawed in a Portland mill.

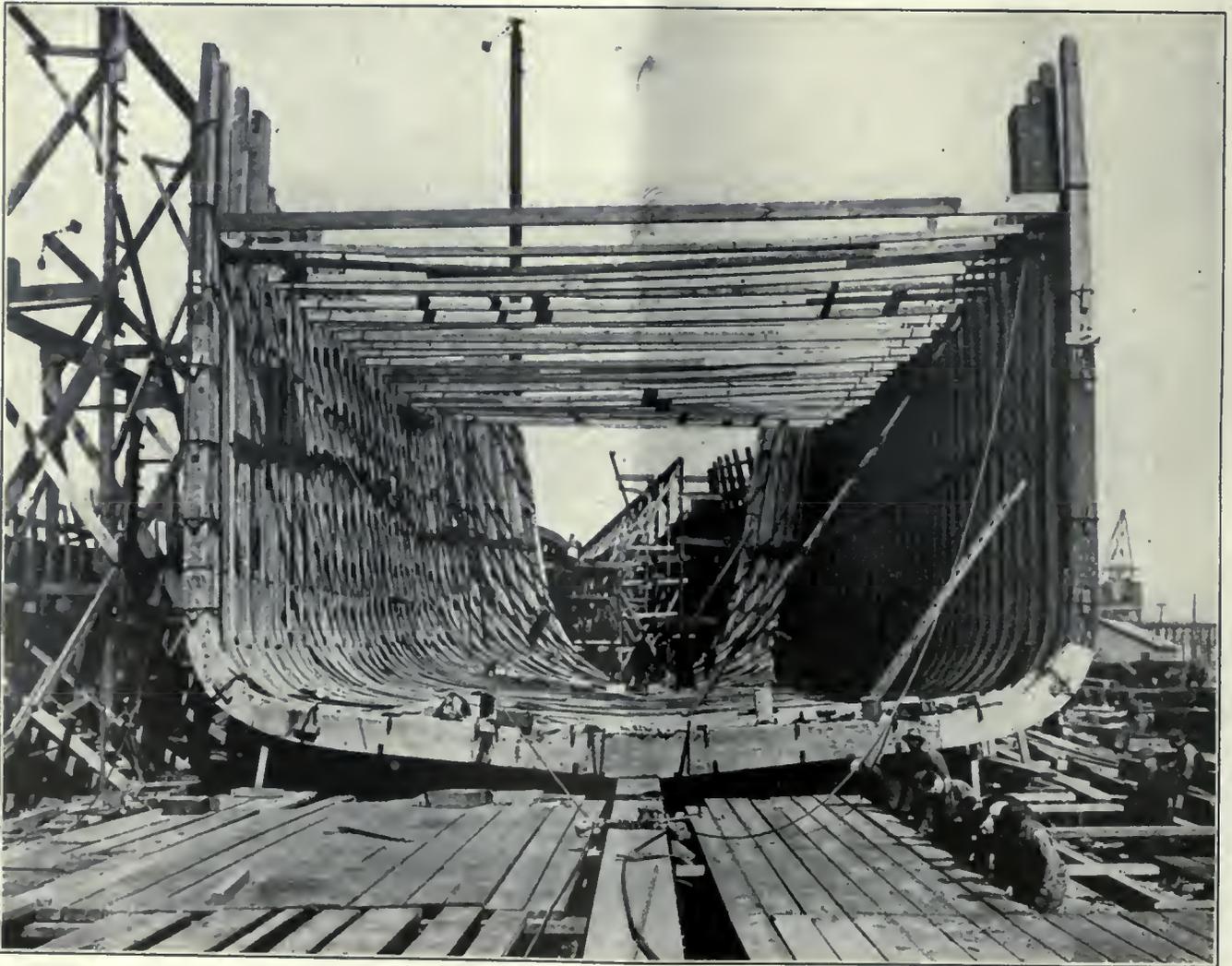
The flitches or cants of airplane spruce are cut off from the clear outsides of the logs at both mills and sent to the Government's new cut-up mill at Vancouver, Washington.

Already 1,800 soldiers are working in railroad construction alone, the south railroad being graded to Alsea Bay and the Blodgett tract of spruce. There will be 2,150 soldiers on the job soon.

More than 200 soldiers already are working on the north line in railroad construction toward the Siletz tracts, and there will be 1,200 men there shortly. Soldiers are coming in by the trainload. There are twenty-two soldier camps, established, with from fifty to 150 men in each; there will be 29 camps.

These camps were operating within 62 days of the time the line was roughly located.

Two hundred and fifty teams of horses now are on the grading job; seven pile drivers; two steam shovels. The horses are being taken in by the carload. New pile drivers and crews are going in; also new shovels. The job of finding this equipment in competition with all



*Underwood and Underwood*

CANADA IS BUILDING MANY WOODEN SHIPS OF A NEW TYPE TO REPLACE U-BOAT SINKINGS

Standard wooden vessels of great strength and unique construction are being built at many points in Canada, helping to meet the necessity caused by the war. Yards are ringing with the sounds of the saw and the ax, mingled with sharp rapping of pneumatic riveters. Structural engineers have evolved a new type of wooden ship that astonishes the shipbuilders of past years, who see new and hitherto undreamed of strengthening devices at all points from keel to poop deck and at the same time witness modern construction devices utilized in wooden shipbuilding for the first time. This photograph shows a ship when about half of the frames are in place and fastened to the keel, with the workmen laying the platform for the construction and erection of other frames.

the other projects and all the other public and private work now in progress is a big one.

A hospital has just been built, five big warehouses have been built, and four miles of trestle are under construction, scattered over nearly every mile of the project.

Shovels, scrapers, picks, axes, tools, and equipment are literally fought for, being assembled from all parts of the Pacific Northwest as far as Montana. The markets of

#### PASSING UNDER THE BRIDGE

A raft of logs passing under a bridge over the Lake Washington Canal at Seattle. This canal, connecting Lake Washington with Puget Sound, makes a part of the great Seattle harbor, and is especially useful just now in the transportation of logs and lumber.

*Underwood and Underwood*



Seattle, Portland, and San Francisco are combed for supplies.

Rail for the railroad has already arrived and is being bent at Yaquina to the curve needed.

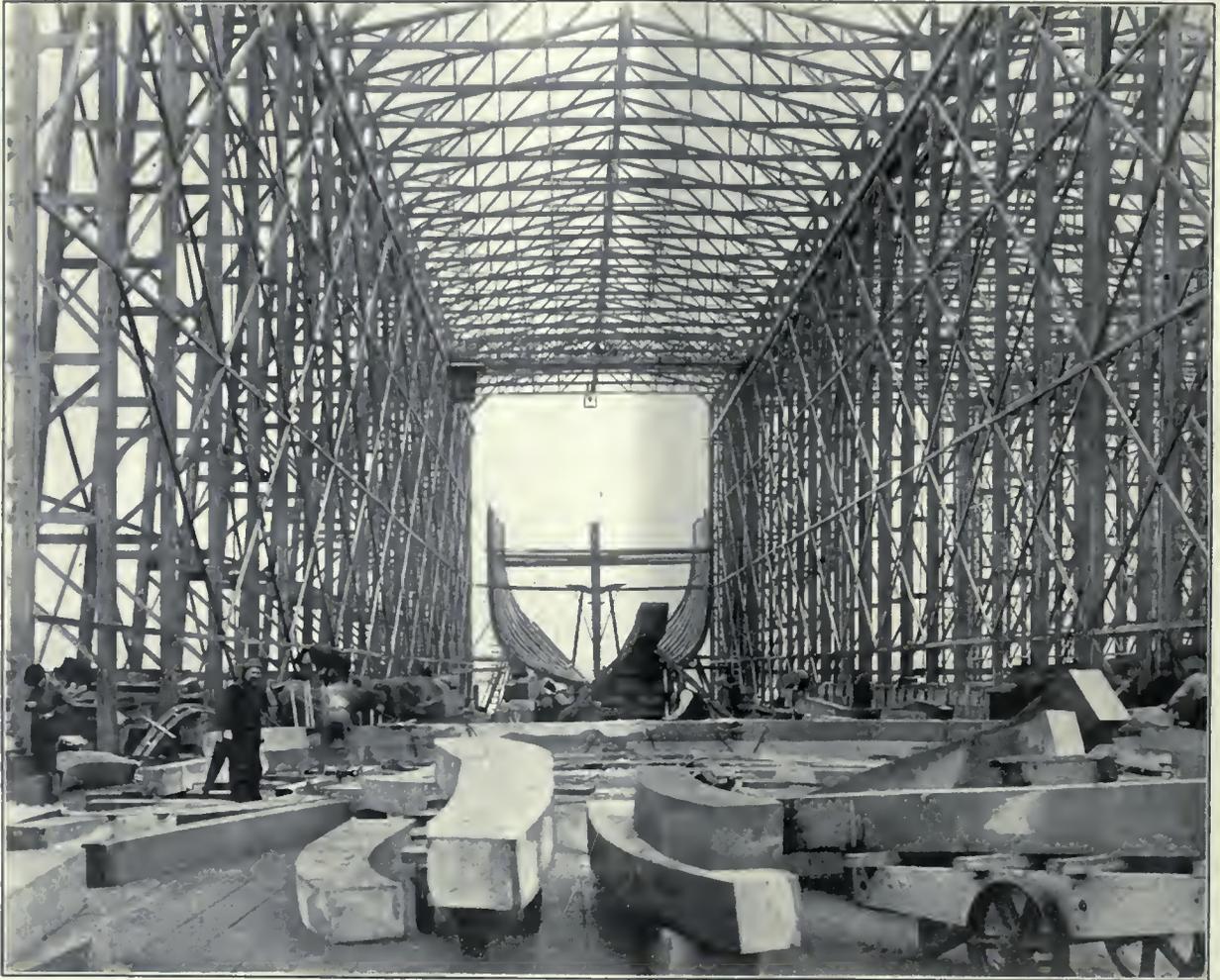
The railroad is 60 per cent on curves, so difficult is the country.

With the completion of the last mile of spur into any tract, a train arrives with donkey engines and heavy

#### IN THE SPRUCE FOREST

Loggers in western Washington, photographed just after they had felled a big spruce for one of the sawmills in the Puget Sound region. The lumberjacks in the northwest, and in all other lumber regions as well, are working at high speed, and ten of thousands of additional men are wanted for the industry.

*Underwood and Underwood*



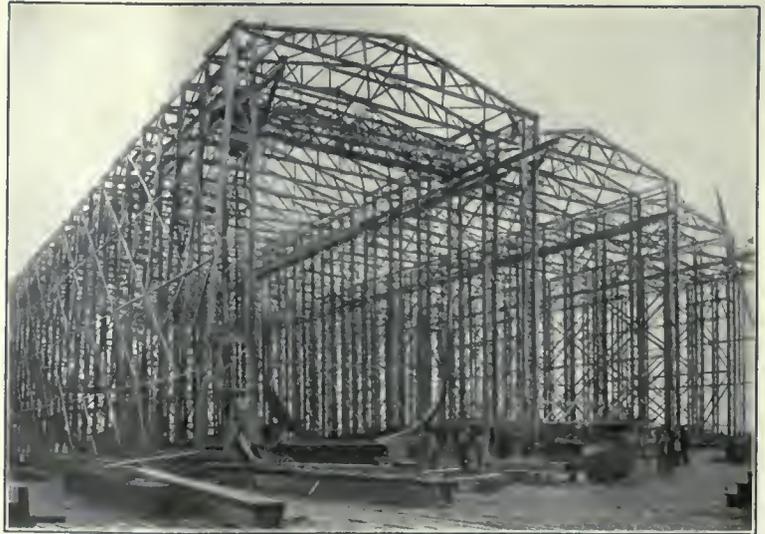
*Courtesy of the Seattle Times*

machinery, and within a day takes logs back with it.

Construction of a two-band sawmill has been begun at Toledo, to be finished as soon as the railroad, so logs can be sawed there instead of hauling them by rail all the way to Portland. The new mill, being built by soldier labor, will cut from 500,000 to 750,000 feet of lumber a day. Only 30,000 feet a day is being cut by the present mill at Toledo.

Twenty million feet of logs will be cut in readiness for the completion of the railroad and mill, so as to give the mill a good start for the winter. The logging will continue all winter in spite of the high water. The winter rainfall averages 70 inches, the annual rainfall 90 inches. The camps are being built substantially to provide winter comfort.

Some of the railroad right of way had 1,000,000 feet of timber per acre on it. All this had to be felled and rolled



**THE GREAT SHED FRAMES AT THE ELLIOTT YARD**

These pictures are of the great shed frames which the new Elliott Bay Shipbuilding Company is erecting over the building ways in its plant in the Duwamish Waterway. Each of the shed frames is 300 feet long, eighty feet high and sixty wide in the clear. The structures support the great overhead traveling cranes with which each ways is equipped. In bad weather, canvas can be stretched over the tops of the sheds. The upper picture shows the interior of the shed frame over No. 1 ways in which a vessel is being framed. The lower picture shows the three great shed frames already finished

to one side of the right of way by hand power. The brush was so thick over much of the right of way that it was

impenetrable except as cut into with axes. Engineers in the winter surveying actually had to scramble on top of the brush, eight feet above the ground, to reconnoiter the line. It was so wet they had to keep fires alive to dry their instruments every little while.

Five million feet of lumber are being bought for the trestles, bridges, and ties. Very little of this is cut locally—it must be taken in by rail from Willamette Valley or by boat from Astoria. The piling for trestles is unloaded into the open sea near the place needed for the railroad, and then is captured by the soldiers and hauled in.

Dual control of the soldier workers presented a problem. The contractors of necessity had to direct the operations, for they were the experienced men. Few of the soldiers had any experience either in railroading or logging. There are clerks, farmers, bootblacks, thirty-second degree Masons, language teachers, masters of arts, Americans all, lamenting the fact that they were not in France, but appreciating that spruce had to be cut to win the war.

The contractor's job was to use this untrained aggregation of men in construction work, much of which was skilled, and in logging work, which involved even more skill. The officers' problems were many. Military training had to be undertaken. The military spirit had to be developed. There was

room for friction between foremen and officers. That things are moving smoothly and with a will is convincing testimony of the patriotism, tact and energetic spirit of both officers and contractors, soldiers, foremen and all others concerned.

It's a big job, but the boys are making good. They are getting the spruce that will win the war, and this is verified by the recent report of Mr. John H. Kirby, President of the National Lumber Manufacturers' Association, who declared that the spruce necessary for the thousands of airplanes which are to materially aid the United States and its Allies in winning victory over Prussian militarism, will be produced—that production has already reached 1,000,000 feet a day at the

government "cut-up" plant in Vancouver, Washington. Not only that, but strenuous efforts are being made to raise this production to 2,000,000 feet a day, and its accomplishment is practically a certainty.

Mr. Kirby, in company with other officials of his organization, recently had a series of conferences with western lumbermen at Seattle, Portland, and San Francisco, and his information was secured directly from army officials in charge of the plant in Vancouver.

Some idea of the enormity of the work being done by the United States Government on behalf of the world war for democracy may be gained from these statements. Perhaps a few simple figures will help to elucidate the situation. It is estimated that the average timber footage for the smaller types of airplanes is approximately 1,000. Of course, the larger types such as the bombing planes require around 10,000 feet. If the latter figure is taken it will be seen that material for 100 planes a day is being manufactured in this one government plant in Vancouver, Washington, with the brightest sort of

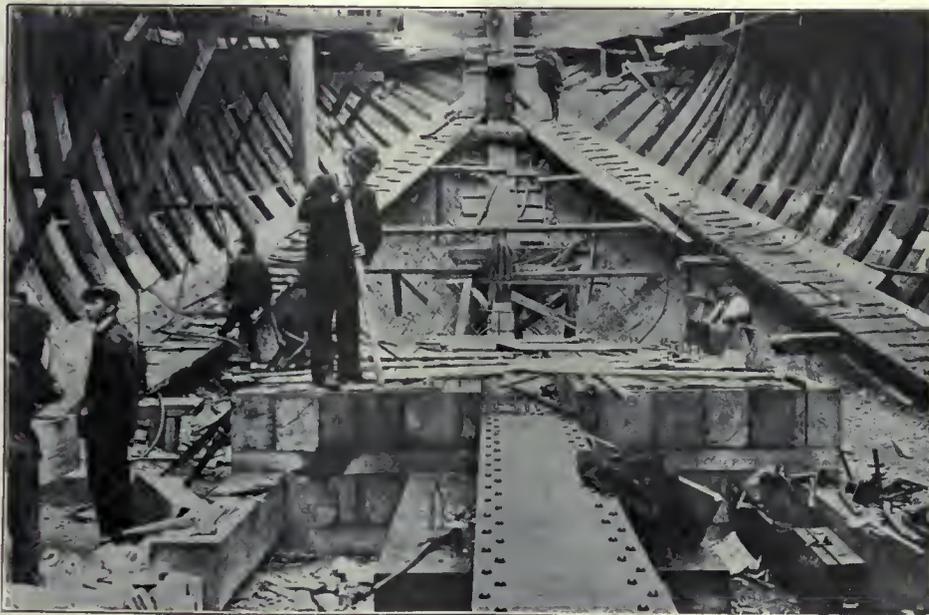
prospect for raising that production to material for 200 planes a day.

If the average footage for the smaller types of airplanes is taken, a little figuring will show that the production of a million feet of lumber a day by the Washington mill is in fact supplying material for 1,000 airplanes every day, with the prospect here

also of increasing that figure to 2,000 airplanes a day.

Another thing to be learned from the figures, is the fact that the United States Government is preparing for a war which may last possibly two or three years longer. The air-craft program apparently calls for production on this enormous scale because it is an absolute necessity. The figures, of course, take in one government plant only. Scores of other plants are turning out huge quantities of timber for the same purpose.

The urgent Government demands for ship timbers and airplane material are causing the fir and spruce producing mills to speed up their operations to the highest point, with the result that the production is slightly exceeding the normal capacity of the mills.



*Underwood and Underwood*

#### CONSTRUCTION ON ONE OF THE NEW CANADIAN SHIPS

This shows a view of the engine base in one of the standard wooden ships of the new type now being built in Canada, and gives an idea as to the size of the immense bolts with which everything is clamped solid from the skin to the plate on the base.

# MOTOR CAR HOUSE BUILT OF ONE PIECE OF REDWOOD WEIGHING THREE TONS

BY ROBERT H. MOULTON

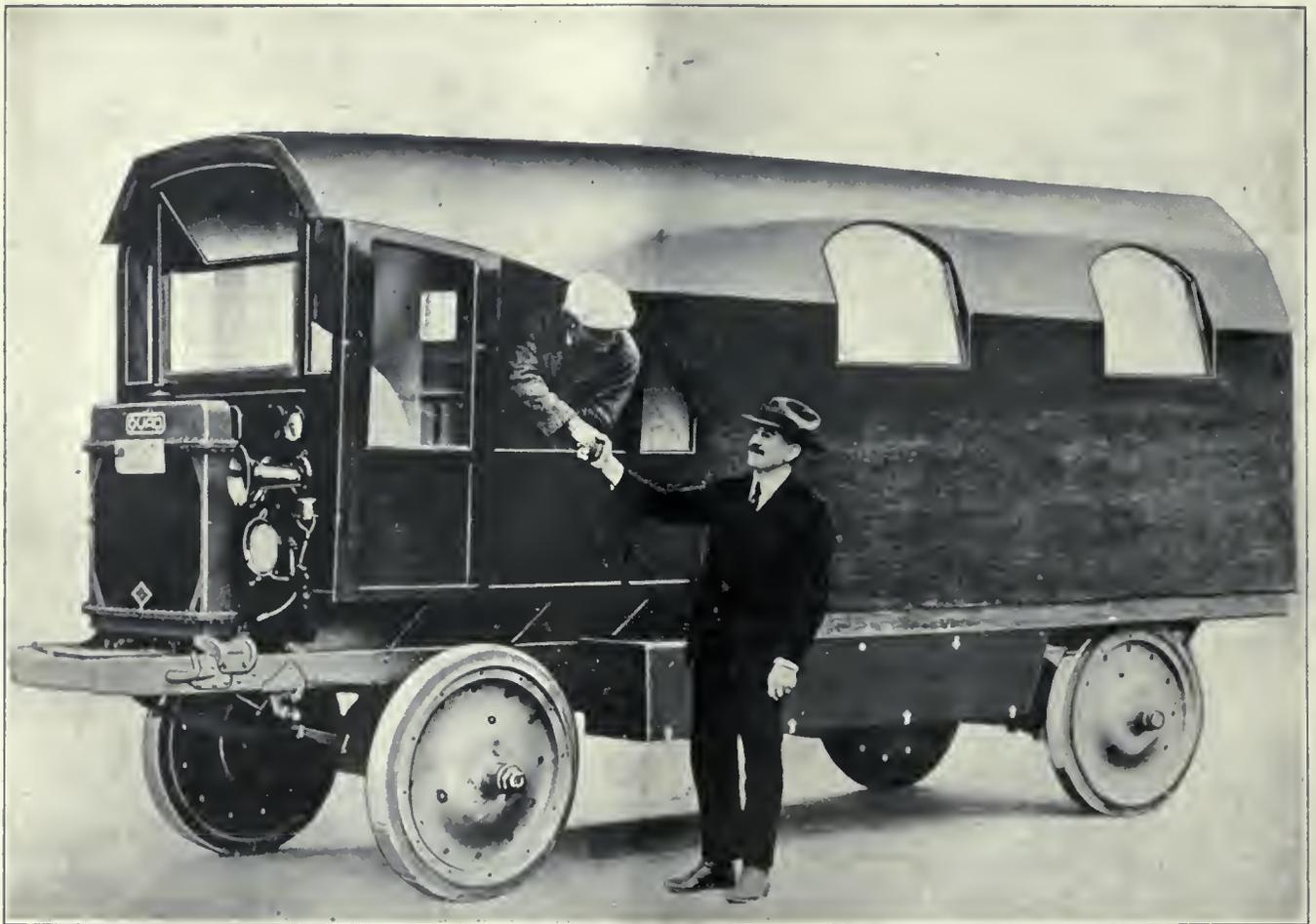
**H**ERE is the story of the modern tree man. He lives in the trunk of a huge redwood tree on top of a motor truck. Not only one man, but his wife and his chauffeur live there. Most of us are key-ring persons, this man says, and are afraid to leave our houses unlocked, but he has set out to be different. Hence his remarkable automobile, which he built himself, and which has no counterpart in this or any other country.

Charles Kellogg was born in a little log cabin in the Redwood Country, a land of big trees, tall and straight.

open for nine months of the year ever since.

Do we hear any objection to the meatless days? The animals, birds and fish were all such friends of Mr. Kellogg that he has had over 17,500 meatless days; not only meatless days, but in the whole of his life he has never tasted fish, flesh or fowl of any kind.

When he grew older he began to travel and became a naturalist. He roamed from Alaska to Africa, through France and Switzerland and the islands of the sea. The out-of-the-way places of the globe are to him what Broadway is to the New Yorker. He travelled with



THE LAST WORD IN LUXURY AND INGENIOUSNESS—A PRIVATE PULLMAN BUILT OF SOLID REDWOOD

The habitat of the modern tree man. The idea of a man who was born and bred in the wonderful redwood country—who has known and loved these trees all his life and who decided to build himself a home in the heart of one of them.

with cathedral aisles through them, lit by shafts of sunlight. At his birth his mother died, and for two years he was carried around by an Indian squaw, who strapped him on her back and took him wherever the Indians went, and so he grew up with the Digger Indians in California. A huge, hollow, redwood tree was his playhouse. He learned to know all the beasts, birds and creeping things of the forests, and they became his friends. The ground was his bed. He has lived in the

John Burroughs through the East Indies. John Muir was one of his best friends.

The man himself is like a breath of the wind. He comes into the room bringing the air of tall trees and the spaceless deserts with him. He is strong and broad, with keen, far-seeing blue eyes and a humorous mouth. He wears a rough tweed suit, a soft gray flannel shirt and a gray silk tie. In the city he wears shoes, but for the nine months of the year that he is tramping through

the hills and deserts he wears the moccasins of the Indians. By intimate study of the birds he has been able to reproduce their notes perfectly. He can sing in the highest pitch ever attained by a human being, and his voice has a range of eight octaves. He can put out the flame of a candle with the rapid vibrations of his voice at an extremely high pitch.

Down on the Mexican border last year Mr. Kellogg was lying on top of a hill in front of his camp, watching the American troops transporting their supplies overland. Wagonload after wagonload drawn by mules went to the mudhole at the foot of the hill and were stuck there in the mire and with great difficulty pulled out. Finally a light truck came along and went through the hole without any trouble.

Here was Mr. Kellogg's tip: He would build a house on one of these trucks and travel through the country in it, for this would enable him to continue his habit of living out of doors. The result was that he bought a truck and took it into the heart of the Redwood Country of California in search of a suitable body. He remembered the hollow redwood tree in which he had played in his boyhood and decided that such a piece of wood was the ideal material. After a time Mr. Kellogg found his tree, a fallen redwood 360 feet long and 11 feet in diameter. From this he cut a 22-foot section, and after seven months of arduous toil fashioned the huge piece of timber into an automobile body that is a work of art.

The tree from which the body was made was a fallen giant that had been lying on the ground for perhaps a hundred years without any sign of decay. As a matter of fact, it was found that the wood was full of sap notwithstanding that it had been uprooted for a century. The 22-foot section when first cut, a 14-foot

saw being used for the purpose, weighed over 40 tons.

The first step after the section had been cut was to remove the bark. Then the task of hollowing out the trunk was begun. This was found to be a most difficult task. A couple of expert axemen first tried to chop out the center, but at the end of three days were worn out and gave up the job. Oxy-Acetylene was then tried, but this also failed, as the redwood proved impervious to the flame, the wood carbonizing in a wall.

Mr. Kellogg then put some of his own ideas into operation. He first drove a gas-pipe through the heart of the log by using the truck as a hammer. This small aperture was enlarged by a pepper wood chisel, which was fastened to the truck with chains. Then the

hollowing out process was completed with a 22-foot chisel. This left a shell 1 foot thick and Mr. Kellogg trusted to his eye alone in smoothing out the log and modeling it as a sculptor would into a beautifully shaped body for the truck.

It was estimated that the shell in its unfinished state weighed in the neighborhood of 6,000 pounds. To mount it on the truck appeared to be almost a hopeless task. But the problem was solved by cribbing the

corners with slabs and digging a passageway beneath in the soft forest floor. The truck was then driven under the great log and the latter slowly lowered into place.

Next came the task of drying out the great piece of timber without "checking" to get rid of the surplus weight. It was thought at first that it might be placed in a big kiln at Scotia and dried with steam, but the master mechanic finally decided that the temperature could not be properly regulated and refused to take the risk. Finally Mr. Kellogg solved the problem by covering the outside with a mixture of oil and distillate and



TAKING THE LOG FROM ITS FOREST HOME

The first step was the removal of the bark. Then the task of hollowing out the trunk was begun, and it proved to be most difficult, two expert axemen giving up the job of chopping it out after a trial of three days which wore them out.

letting the log dry from the inside. As the drying out process was not sufficiently rapid, all the apertures were sealed and a sprinkler turned in for two weeks, day and night. This washed out the sap and hastened the seas-



A SECTION OF THE COZY INTERIOR

Who could ask for more comfortable sleeping quarters? This shows the bedroom—six feet square, airy and cool and electrically lighted.

oning process. At the end of two weeks the log had lost 1,180 pounds in weight.

Mr. Kellogg himself cut the windows and planned the interior, which contains three rooms, each six feet square—a living room, a bed-room and the chauffeur's room. They are not ordinary rooms, but are furnished in a luxurious manner throughout. A fire place is built on one side of the living room; the beds are wonderful creations, with soft mattresses that fold down at night. The toilet appurtenances are exquisite; there are clever little drawers, folding arrangements and plate glass windows, and the whole car is lighted with elec-

tric light. The finished body is 19 feet long, the whole trunk being one solid block of polished redwood of exquisite grain. The rear door is also a solid block of redwood weighing 400 pounds. The hinges were fashioned by Mr. Kellogg from the rim of a wheel from an old prairie schooner, and the window shades are of yucca bark, stamped in Indian designs.

Mr. Kellogg has now driven "Travel-log," as he calls it, more than 5,000 miles, covering many of the famous mountain roads of California, notably the Rattlesnake



THE BACK DOOR—WHICH IS ALSO THE FRONT ENTRANCE

Please notice the door itself—a solid block of polished redwood of exquisite grain, weighing four hundred pounds! A door which would bring a thrill of pride to many an owner of a mansion were he its fortunate possessor.

grade, a 40 per cent incline for 9 miles, without any difficulty, and this in spite of the fact that the truck, which was designed to have a capacity of 2 tons, carries an overload of more than 1,500 pounds.

### WALNUT LOG PRICES

**W**ALNUT log prices that the Government considers fair will be published soon, and owners of trees or logs should wait for these prices, unless they are satisfied with what they are offered. Representation that the Government is buying walnut is false. Neither is there any move by the Government to commandeer walnut. Walnut trees or logs are being bought by private concerns having contracts with the Government for gunstocks or airplane propellers. It is a patriotic duty to sell walnut trees or logs, but owners should be reasonably satisfied they are getting fair prices. The Government has announced that it will publish a list of fair prices, both for logs f. o. b. cars and on the stump.

### FREE WOOD FOR FUEL IN ARIZONA

**F**REE use of dead wood for fuel has been granted the residents of Flagstaff, Arizona. This brings the policy for the Coconino Forest in line with that adopted on the Santa Fe and Carson where the use of green timber is prohibited under free use, but dead wood may be taken without permits by residents of Santa Fe and Taos.

**A**MERICAN FORESTRY is indebted to Dr. R. W. Shufeldt, of Washington, District of Columbia, for the photograph of the "Vegetable Boche," published in the August issue, which he was good enough to make from the unusual botanical specimen sent in by Miss Long.

# OUT IN JERSEY—CATCHING FROGS AND THINGS

BY GAYNE T. K. NORTON

**A** LONG the Morris and Essex canal, "somewhere in New Jersey," the boys have found a way to earn their guns and fish-poles without doing much work, or spending any money to make the amount needed. They catch frogs and sell the hind legs in the Paterson markets, getting from forty to eighty cents a pound for them. Sort of hard on the frogs, but the "natives" claim they can sleep now, even if the mosquitoes are a bit worse.

The methods of getting the frogs vary with the boy. Some, the prosperous ones who have been in the business more than a single season, use a .22 caliber rifle, shooting B. B. caps; others, less fortunate, use the time honored bent-pin-and-red-flannel system. Some prefer a canoe paddle, while a few are partial to the bean-shooter.

The youngsters old enough to be "allowed out after

The "day workers" do not get a chance at the 'coon and 'possum, but they even things up by snaring an occasional pickerel or two. They get good-sized fellows that are readily sold with their hands, too, but at a cost of patience only a boy with an idea possesses. They wade kneedeep into the water, squat down, with both hands submerged, palms up, and wait. Many fresh water fish do not mind being touched on the underside—they are constantly rubbing against the bottom of the stream, so are used to the sensation. When Mr. Pickerel comes along and stops dead still, facing the current, a strong brown hand is slyly slipped under him. The hand grips—sometimes water—and comes up with the prize. But the fish is slippery, and if he is not immediately thrown well up on the bank he will flop free. The sides of the canal are steep, and of slippery clay. The grab for the



Photograph by G. T. K. Norton

A SPOT WHERE MANY A BEAUTIFUL HOUR MIGHT BE WHILED AWAY

In the frog country "somewhere in New Jersey" along the Morris and Essex Canal. Who wouldn't be a boy again to catch frogs and things in such country as this?

dark" get "the big croakers," the prizes; a lantern or electric flashlight with a forked stick is the best in this case. Of course, they are bare-footed and once in a while it happens that a swamp black snake gets in the way of the stick, but money-mad boys don't mind a little thing like this. If a stray 'coon or 'possum happens along he is also bagged and the night is doubly profitable.

fish is disconcerting, and likely as not the fisherman will lose his "toe-hold," wildly wave his arms, fall with a splash, and come up fishless, so even if grabbed the fish has a run for its freedom.

Who wouldn't be a boy again and catch frogs and things, and have a goal, a gun or fish-pole, to be worked for and anticipated?

### "BATTLE OF THE TREES"

A SPECIAL cable to the Cincinnati *Times Star* says: "With the American Army in France, August 3.—The French speak of it admiringly as the Charge of the Rouge-et-Blanc. It was one of the most magnificent, desperately courageous charges of this period of the war. In it were Indians, lumber jacks and farmer boys, hence the French Red and White.

"The Red men and their white brothers had moved stealthily toward the Meuniere woods, bayonets set. Hidden in the cover of the woods were the renowned Two Hundredth Jaegers and the Two Hundred and Sixteenth Reserve division. German machine gunners had been planted in trees. Behind sandbag ramparts were other guns. Not a sound came from the advancing Americans until they had pounced upon their prey and were in bayonet-lunging position.

"Then a bedlam broke loose. Every American within a mile knew that Indians were in battle; that the tremendous-voiced white men of the American forest lands, too, were up and atop of the enemy. In the medley of battle sound, mingled in equal power the wild war-whoops of the Redskins, piercing, blood-curdling, the war yells riding high over the thunder of gunnery; the war-shouts, in deeper voice, of the American woodsmen engaged in the fighting they love most, the hand-to-hand struggle, and the hurraing of the farmer boys, who gave tongue after the manner of their city cousins.

"Never in the history of this war were the picked fighting men of Germany beset in such fearful array. The sharp eyes of the Indians marked out the machine gunners in the trees for dead men. Some were dropped by the unerring bullets of Indian, lumberjack or farmer lad. Others found the lithe Indians swarming up the very tree trunks after them. A brief affray, a knife expertly thrust, a dead German, an eager Indian leaping panther-like to the ground and racing for another occupied tree. That, in substance, is the story of the tree-fighting."

### USE WOOD—SAVE COAL

USE wood—in this way you will aid in conserving coal this winter.

Wood is being urged as conservation material in practically all industries by the War Industries Board. This is indicated in a recent letter by George R. E. Day, director of the Oil Well Supply Division, United States Fuel Administration, addressed to the managing heads of oil and gas producing companies.

Mr. Day, of course, urges the co-operation of the oil companies in the conservation of steel, but in a list of "Don'ts" he puts wood first as a substitute for steel in storage tanks, roofing and in building operations.

For instance he says: "Don't use steel tanks for any purpose where wood or concrete is available." Also, "Don't use steel for roofing when wood will answer the purpose."

### NATIONAL FORESTS RECEIPTS INCREASE

RECEIPTS from the National Forests in the fiscal year 1918, ending June 30th, exceeded those for 1917 by almost \$120,000 and totaled over \$3,574,000. The increase does not come up to the big increase of the year before, which was more than \$600,000, but still shows a healthy growth in most lines of business on the Forests. The cost of operating the Forests was about \$4,000,000, and was practically the same as in the previous year. This is exclusive of the additional expenditures caused by the very serious fire situation and for which a special deficiency appropriation of over \$700,000 was made by Congress.

This year's increase in receipts, according to the forestry officials, came mainly from the larger number of livestock grazed, although every revenue-producing activity on the Forests except timber business and permits for water power contributed its share. The timber business fell off in consequence of the general let-up in private building activities on account of the war, the dislocation of transportation facilities during much of the year, and the labor situation, especially in the Northwest, where the timber business is ordinarily largest.

The falling off in receipts from water-power permits was caused, it is believed, by the uncertainty created by pending legislation. Many prospective permittees are holding back until final action has been taken on the legislation now under consideration.

Timber sales yielded over \$1,500,000 and livestock grazing over \$1,700,000. Slightly less than \$100,000 was brought in from permits for water power development. Other forms of land occupancy, including leases of land for summer homes, hotels, club grounds, apiaries, fish hatcheries and canneries, brought in about \$120,000. The sale of turpentine privileges on the Florida Forest brought in a little over \$8,000.

Much of the use of the National Forests is free. Settlers and residents of the small communities in and near the Forests are allowed without charge reasonable amounts of wood for fuel. In addition, the settler may obtain timber for use in the improvement and maintenance of his farm and is given the privilege to graze free not to exceed ten head of milch and work animals.

Considerable co-operation was also given the Forest Service by grazing permittees in the construction of drift fences and the improvement of watering places. Although the range is being used to the limit the forestry officials are regulating the use carefully, with a view to preventing any permanent damage to carrying capacity.

PLANTED when General U. S. Grant was a lieutenant stationed at Fort Vancouver, a cherry tree on the farm of Grant Farmer, on Ford's Prairie, Washington, is still bearing at the age of 84 years. It has a spread of 65 feet and its trunk measures 10 feet 11 inches in circumference.

PLANT WALNUT TREES

# THE USES OF WOOD

## WOOD IN THE MANUFACTURE OF BOXES AND CRATES

BY HU MAXWELL

Editor's Note:—This is the fifth story in a series of important and very valuable articles, by Mr. Maxwell, on wood and its uses. The series will thoroughly cover the various phases of the subject, from the beginnings in the forest through the processes of logging, lumbering, transportation and milling, considering in detail the whole field of the utilization and manufacture of wood.

**M**ANUFACTURERS of boxes and crates in the United States consume more than 4,600,000,000 feet of lumber a year. One-tenth of the country's entire output of lumber goes into this product. The making of boxes and crates is regarded as a single industry. All boxes are not made of sawed lumber, though most of them are. The use of veneer boxes is increasing. In some boxes the single veneer sheets are employed and in others the single sheets are superimposed to form compound sheets of two, three, or more plies. The tendency is to use thinner lumber than formerly in the production of boxes. That commendable economy is induced by the increasing cost of raw material, but it is promoted by better workmanship in box making than was customary years ago. The package must be strong enough to carry the commodity it is meant to contain; and improved devices in manufacturing have made it possible to produce stronger boxes with less lumber.

Most boxes are held together with nails. If extra service is exacted, screws may be substituted for nails; or strands of wire or bands of strap iron may bind the package and add greatly to its strength without much increasing its weight. Other strengthening devices consist of lock corners or of dove-tailing; or there may be reinforcing braces, slats, or cleats. Manu-

facturers who make a point of securing extra strength, work toward that end by employing strong lumber to begin with. Some woods are more than twice as strong as others, though as a rule, there is a ratio between the strength and the weight of dry woods, so that what is gained in strength may be lost in the disadvantage of added weight. Nevertheless, much choice may be exercised, from the box-maker's viewpoint. A wood's nail-holding power may be of more importance than its strength.

The manufacturer of boxes must take many factors into account in the selection of lumber. It is said that the box maker accepts what others cannot use, and thus makes a clean sweep of the refuse piles in the mill yard. While true in a general way,

the maker of boxes selects wood carefully for particular kinds of packages but he produces so many kinds that what he cannot use for one, will do for another.

If it is a shipping box, the shipper may want to print, paint, or stencil his name and his advertisement on the outside, on one, two, or possibly on all six sides. Advertising of that kind is of much value to the shipper, and he is particular to secure a suitable wood. It must be of light color so that ink and paint will show clearly on the surface. Excellent woods for painting, printing, and stenciling are white pine, spruce, basswood, cotton-



DRYING RAISINS IN THE SUN

No artificial heat is needed in curing California raisins. They are placed on trays made of thin boards and the pure air and hot sun do the rest. The accompanying picture represents a typical vineyard scene. The vines lie flat on the ground and the trays are placed between the rows. Photograph by courtesy of the California Pine Box Distributors, San Francisco.

wood, holly, tupelo, and yellow poplar. Red gum is not quite so white as some of the others, but it is highly satisfactory and is much used by makers of boxes which display lettering.

Every freshly-cut wood gives off an odor, but the intensity of the odor diminishes as the wood seasons. The man who expects to ship food products in wooden containers, must choose the wood carefully to make sure that no injurious odors will be imparted to the contents. All foods will not absorb odors from the wooden containers, even when such odors are strong; neither are all odors considered objectionable. Judgment on each must be passed separately.

In some instances a wood's odor adds value to the article shipped in the package. Cigars in Spanish cedar boxes afford a good example. The cedar's odor is very pronounced, and for that reason the wood is sought by manufacturers of cigars. Nearly half of all the cigar box wood used in the United States is Spanish cedar. Southern red cedar and incense cedar of California possess strong odors, which have never been popular with smokers though they are liked by users of lead pencils.

Certain woods possess taste as well as smell, and the box maker must bear that fact in mind or run the risk of displeasing shippers, particularly those who handle plug tobacco. That article has an exceedingly rank smell and taste of its own, and it is also highly colored; yet it is easily injured by the stain, taste, or odor absorbed from the caddy in which it is packed. Dealers once

were of the opinion that plug tobacco should be shipped in no box that was not made of sycamore; but several other woods are accepted now, among them being red gum. Two hundred years ago in Virginia and Maryland, it was believed that cured tobacco should be shipped or stored in no wood except yellow poplar. At the present it is quite widely believed that butter is better if it touches no wood but ash; and a similar notion obtains regarding tea, which, it is claimed, ought to be shipped and kept in the Chinese wood in which the orientals pack it, and which bears the Chinese seal and stamp as a guarantee that both tea and wood are genuine. The notion might lose some

of its popularity if it were generally known that the wood of which the tea boxes are made did not grow nearer China than several thousand miles. Some of it comes from Russia, some from Maine, some from elsewhere, but the boxes, or the material of which they are formed, is sent to China by European or American tea merchants, and all that the Chinese have to do with them is to paste paper on and in them and stamp them with cryptograms, and fill them with tea for foreign markets.

Food products are only one of several

classes of commodities which go to market in wooden containers. Large quantities of dry goods are so shipped, including clothing, cloth, millinery and shoes. The boxes are usually large and the contents only moderately heavy, and woods which are relatively light and weak, such as white pine, spruce, cottonwood, fir and



FRUIT TRAYS IN CALIFORNIA

This product belongs in the category of boxes, and their manufacture is a big business in the far western states where the sun furnishes heat for drying fruit. Rains are unlooked for, but if a suspicious cloud appears, the trays of fruit are hurriedly stacked, one on another as a protection against a wetting.



FORERUNNER OF THE BATTLE TANK

This caterpillar tractor is hauling a load consisting of 190 raisin "sweat" boxes, weighing approximately fifteen tons, in the Paul Driver Vineyard, Dinuba, California. The boxes are for curing raisins, not shipping them. This motor was the model after which the battle tanks in Europe were patterned.

basswood, suffice for the boxes of that class. The tendency is to substitute veneer for lumber, and three-ply sheets are much used, with reinforcing strips at the edges of the boxes to protect the exposed parts. Less advertising is done on the outside of boxes of that class than on those carrying food; yet stenciling and other lettering are employed, and the colors of the woods should be light enough to show contrasts with the ink or paint. Formerly nearly all boots and shoes were carried from factory to market in wooden boxes, largely of white pine, but boxes of fiber board have now displaced many wooden boxes for shoes.

The distinction between boxes and baskets is not always apparent, when both are of wood, but the shape often helps to determine whether a container is a basket or a box. The basket is usually lighter and is of more open construction and it is generally preferred

as a shipping container by truck gardeners and the growers of berries and small fruits. Veneer is in much use either as sheets for berry cups or in splints for baskets. Wood of almost any description, provided it is sound, can be used in basket making, because pieces are small. Nearly any wood is strong enough, and color is not important, nor is odor usually an objection or an advantage. The articles range in size from the banana crate which holds more than a bushel, down to the berry cup of a capacity of a pint or less.

Along some lines baskets are not clearly distinguishable from crates, but elsewhere the distinction is complete. Furniture, hardware, slabs of stone, as well as innumerable other articles and commodities which are liable to injury in transportation, are shipped in crates. The finished crates may be made in quantities in factories, or they may be put together one by one, as needed,



CHIEF BOX TIMBER OF THE PACIFIC COAST

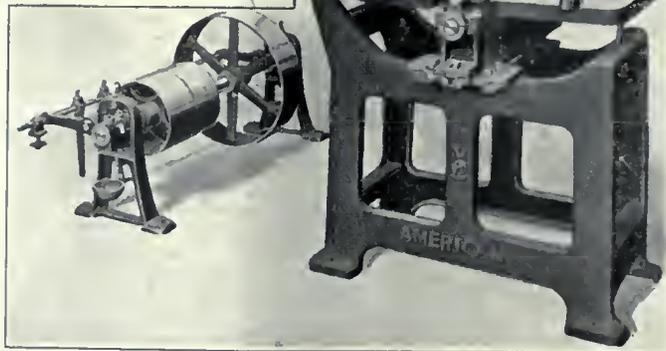
Western yellow pine is often marketed as California white pine. Botanically, it is yellow pine, but is very soft and white. It supplies more box lumber than any other species west of the Rocky Mountains, though Sitka spruce bids fair to be a strong competitor in the near future, and sugar pine has long been a competitor.



**NAILING MACHINE FOR BOX MAKING**

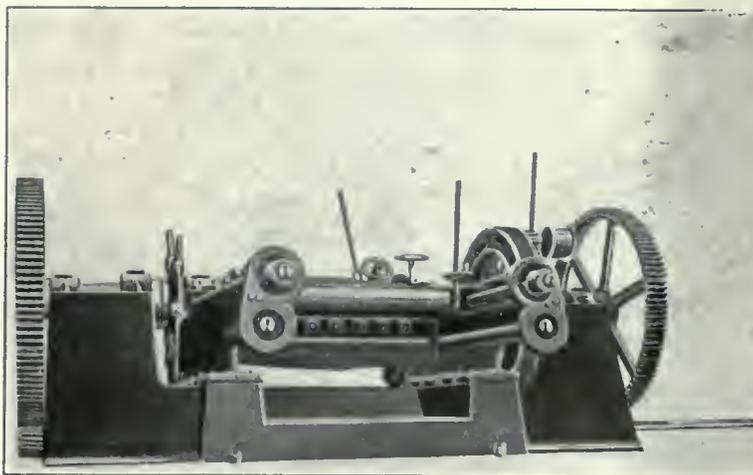
Driving nails by hand and with hammers is entirely too slow a process for modern business. Machines for doing the work have been constructed under various patents. The nails are fed from hoppers, and so accurate is the adjustment that a nail seldom goes wrong though the work is very rapid.

by cutting and fitting the slats and strips about the article to be protected. The so-called "knock-down" crate is a sort of box made of sticks or slats. One of



**SCREW DRIVING MACHINE**

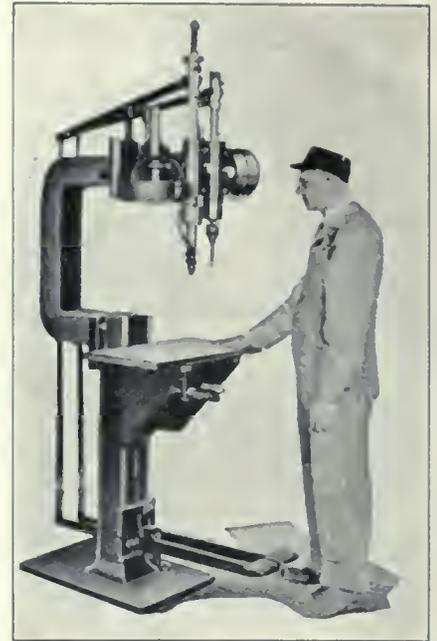
When boxes of extra strength are wanted, screws are sometimes used instead of nails, and machines for driving the screws are in use in factories which produce boxes of certain kinds. Machines hold records of driving more than 15,000 screws a day. They are not hammered in like nails, but are revolved as in hand work.



**MACHINE FOR CUTTING BOX VENEER**

Large numbers of boxes are made of thin sheets of veneer. A machine for making such veneer is represented in the above cut. The photograph for the cut was furnished by the Merritt Manufacturing Company, of Lockport, New York.

that kind is much used in shipping onions from Texas. It is of lattice work which is intended to give better ventilation to the contents than could be secured if a box were used instead. Articles like sewing machines are shipped in standard crates which may be easily put on and taken off, and they are commonly returned to the factory for use again and again. Even articles as large as buggies, canoes and farm implements are carefully nailed up in crates for protection during

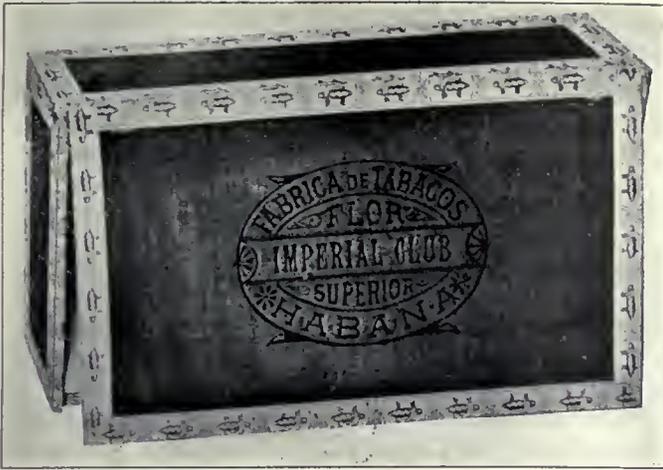


**BOX BOARD MATCHING MACHINE**

Nothing about a box factory is done by hand that can be done by machinery. The above cut represents a machine that is employed in working up waste materials, stock of any width and up to two inches thick. The picture is from the American Woodworking Machinery Company, Rochester, New York.

shipment. Many articles must have crates of special form to fit their inequalities. The bicycle is an example. Very tough, thin lumber serves best for crates of that kind. The long, thin slats must curve round the object that is to be enclosed. Elm and hickory serve best in work of that sort.

Trays are closely related to boxes and crates, at least so far as the manufacturing goes. Kinds and uses are almost innumerable. Fruit trays on the Pacific coast, particularly in California, are in much demand where the heat of the sun is utilized in drying peaches, apricots, prunes, raisins and nectarines. Some mills make nothing but fruit trays, while others make both the trays for drying the fruit and the boxes for shipping it. Trays for that purpose vary in size from about two feet wide and three



A REDWOOD CIGAR BOX

Most cigar boxes are of Spanish cedar which wood is not native of the United States; but many attempts have been made, and with some success, in substituting our own woods for this use. Among those so used are southern red cedar, yellow poplar, tupela, and red gum. The box shown in the above picture is of California Redwood.

long, up to three or four times those dimensions. In California where summer and early autumn rain is not expected, the trays with their fruit are spread upon the ground, perhaps covering acres, with the fruit exposed ready for the sun to finish the work.

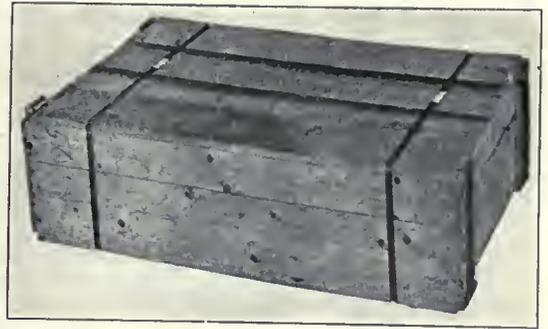
Occasionally an unexpected shower does great damage to the half-dry crop; but the working force is drilled in the art of protecting the fruit by piling the trays one on another, in ricks six or seven feet high. A native rhymster drew the picture with local color thus:

There's not a cloud comes o'er the sun  
In these ambiguous autumn days  
But that the raisin growers run  
And scally-whoop to stack their trays.

The fruit trays in the foregoing category are made of sugar pine, western yellow pine, fir and incense cedar, and many millions of feet of lumber are consumed in manufacturing the annual output.

Many two-piece boxes are produced. They are quite small and consist of a body and a lid, each bored from a solid block of wood and fitted to the other ready for service. They are used as containers for drugs, pills, tablets, capsules; and hardware dealers employ them as containers for

tacks, brads, screws, little hinges or other kinds of small hardware. Containers of this kind are often called wooden novelties



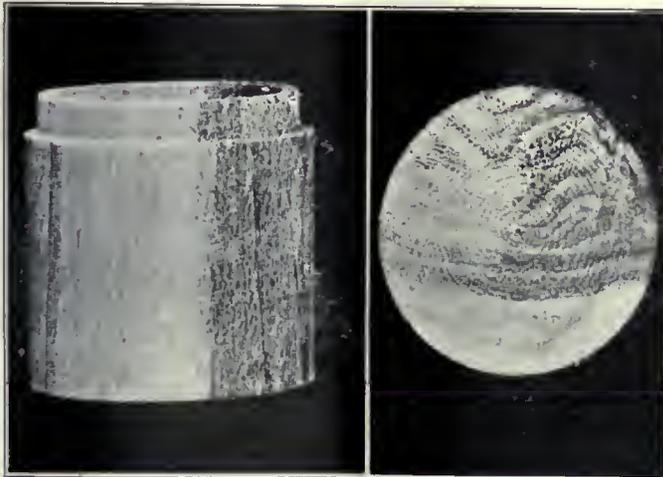
BOXES STRAPPED WITH IRON

Many shipping boxes are bound with strap iron or with wire to give additional strength. Boxes containing heavy articles are so bound because the nails might not stand the strain alone; and other boxes of thin lumber have the same bands as a precaution against the breaking of the wood.

or woodenware. They are produced in enormous numbers and carry numerous articles to market. The boxes vary in size from those little larger than a thimble to others holding

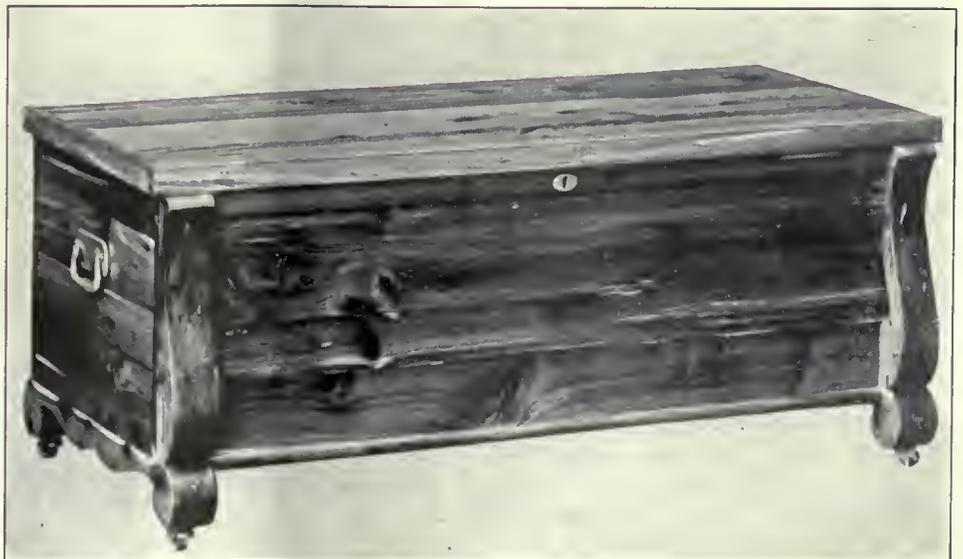
a quart or even more. They are strong and they carry with safety what is placed in them, whether it be brass screws, ivory buttons, hair-pins, bottles of ink, powdered paint, pills, plasters, corn medicine, or other small articles or commodities. These containers are of many woods, but more are of paper birch, yellow birch, and white pine than of any other woods.

Artistic finish is given to certain kinds of small boxes intended for jewelry, handkerchiefs and toilet articles. The boxes are meant to be



SMALL TWO-PIECE BOXES

These consist of a body and a lid and they are the product of a lathe. Druggists and packers of small hardware like tacks, brads, screws, and hinges are the largest users. Birch, maple, and pine are the common woods for these boxes. They are produced in various sizes and by the million.



RED CEDAR SHIRT WAIST BOX

This article may be classed either as a box or as a piece of furniture, for it is both. The box shown in the cut is of red cedar, but similar boxes are made of the incense cedar of California and of Port Orford cedar of Oregon. The odor is reputed to drive away or kill moths and other injurious insects.

ornamental as well as useful, and the tops and sides are frequently decorated to increase their beauty. Hand-painted lids are not unusual, and the decorative work frequently more than doubles the cost of the plain box. Choice woods are preferred, among them being Circassian walnut, mahogany, rosewood and ebony. If the ornamentation is pro-



duced by phyrography, as is frequent when that style is in fashion, the wood that behaves best under the point of the burning needle is selected. No moderate priced wood is superior in this work to basswood, but cottonwood does not fall much below it. For the finest grade of work the pyrographer often selects orange wood or some other that is very hard, dense and fine grained, with absence of distinct growth rings.

Most manufacturers of boxes would welcome standardization in the output; that is, regular established sizes and shapes, and the elimination of so many sizes and special patterns. If boxes could thus be standardized it would be practicable to employ machinery to better advantage. Some progress in that direction has been made and further advance is promised; but to reduce all boxes to fixed sizes and shapes is a problem beset with almost insuperable difficulties. Articles to be shipped are of dimensions so various and of shapes so different, and of kinds so numerous that a box suitable for one will not answer the needs of others. If such a thing as regular sizes were established, it would at once become necessary to have two specials to one regular to accommodate the trade. The manufacturer of an article insists upon a box that will fit, protect and carry his article, and he will take no other kind. A box too small cannot be

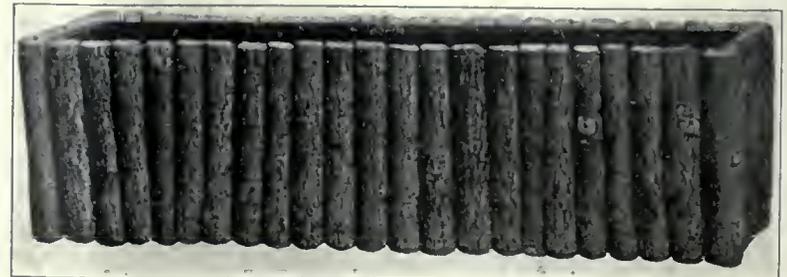
used, and one too large is wasteful in space, packing material, drayage, and freight charges. Because of this, no great success has attended the efforts put forth to standardize packing boxes.

The thickness of box lumber can be no more standardized than the size and shape of the box can be; because woods vary so much in their strength and their ability to hold nails. One wood of a certain thickness might be sufficient to meet all demands, but another cut to the same standard of thickness would be wholly unsatisfactory.

Much consideration is given to the weight of the material of which boxes are made, because most boxes are sent to market by freight or express, and carrying charges are levied according to weight. That holds true whether the lumber is shipped before being made into boxes, or whether the shooks or the empty boxes are transported, or whether the boxes are weighed and are figured in the freight bill as they carry merchandise to market. Freight must be paid on every pound, box, contents, and all. At a very moderate estimate, the boxes manufactured annually in the United States weigh 3,000,000 tons; and if an average freight rate is six dollars a ton when these boxes are shipped, the total bill is \$18,000,000 a year.

By using a light wood for boxes, many tons can be saved by large shippers. White pine exceeds any other wood in the quantity made into boxes. It is only a little more than half as heavy as oak. Red gum exceeds any other hardwood in amount converted into boxes, and this wood is moderately light. Weight is, of course, only one of the qualities considered in selecting woods for boxes, but it is an important consideration.

Of the annual consumption in the United States by boxmakers of 4,600,000,000 feet, board measure, more than 3,000,000,000 feet are softwoods and the hardwood is about half as much. Pine contributes more than half of all. Every species of pine

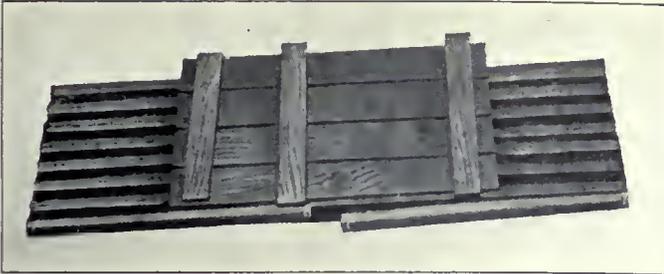


**HICKORY AND SASSAFRAS IN RUSTIC BOXES**  
 Flower and fern boxes for porches and window sills belong in a class to themselves. Fashion and custom require that they be ornamental, odd, and attractive. Boxes of this kind are shown in the accompanying cut, copied from the catalogue of the Old Hickory Chair Company, Martinsville, Indiana.

that occurs in commercial quantities in this country goes to box factories, a score of species at least;

but official statistics group all pines under four names as shown in the following list:

Northern white pine	1,131,969,940	Sugar pine	24,686,000
Southern yellow pine	1,044,993,123		
Western yellow pine	288,291,927	Total	2,489,939,990



THE COLLAPSIBLE CRATE

It is commonly understood that a box or crate, when it has been used once, is never sent back to be refilled. The return freight charges are too high. But if the container can be "knocked down," and shipped flat to economize space, the transportation cost will be one-third to one-fifth as much as if the article were shipped in the bulky form.

Other softwoods which contribute material to the box industry are shown in the list below, the figures representing the number of feet reported yearly:

Spruce	335,935,643	White fir	3,142,080
Hemlock	203,526,091	Cedar	2,512,150
Balsam fir	40,172,700	Redwood	2,439,500
Cypress	38,962,895	Red fir	1,328,330
Larch	7,470,300	Alpine fir	500,000
Douglas fir	7,349,840		
Noble fir	6,653,500	Total	649,994,990

The list of hardwoods is longer but several of them are employed in relatively small quantities as the following table shows, the figures, as in the preceding tables, representing the annual amount in feet:

Red gum	402,121,640	Magnolia	5,499,000
Cottonwood	210,519,509	Buckeye	3,174,028
Yellow poplar	165,416,737	Hickory	767,920
Maple	96,831,648	Butternut	578,000
Birch	90,787,900	Cucumber	524,000
Basswood	86,979,611	Hackberry	315,000
Beech	77,899,280	Cherry	170,500
Tupelo	74,982,910	Black walnut	163,250
Elm	63,726,458	Silverbell	91,308
Oak	56,362,111	Mahogany	13,000
Chestnut	36,216,700	Ailanthus	5,000
Sycamore	16,451,693	Mountain ash	5,000
Ash	10,004,600	Yucca	3,500
Willow	10,507,600		
		Total	1,410,117,611

It has long been the custom to regard the manufacture of tobacco boxes separate from others, and the table



VEGETABLE BASKETS STACKED TO DRY

Persons who compile statistics of the wood-using industries have never reached an agreement whether baskets belong with barrels or boxes. They seem to come in between as to construction and also as to use. The baskets in the above picture are the output of a factory in South Carolina and are made of pine.

below gives the consumption of wood in the production of such containers. Most of the output is for cigar boxes, the remainder being for plug tobacco. The figures represent feet per year:

Spanish cedar	30,203,068	White pine	199,425
Tupelo	10,376,217	Mahogany	161,200
Yellow poplar	7,358,919	Maple	96,450
Red gum	6,898,217	Magnolia	75,000
Basswood	4,206,250	Redwood	61,000
Elm	1,809,000	African cedar	36,600
Cypress	1,559,127	Cottonwood	6,750
Sycamore	430,000	Circassian walnut	250
Oak	403,200	Rosewood	100
Red cedar	246,750		
		Total	64,127,423

Spanish cedar supplies nearly half of all the cigar box lumber. The wood comes from the West Indies and Mexico, and possesses peculiar qualities which

fit it for cigar boxes, chief of which are its odor and its handsome appearance. It is not a softwood in the sense of being a needle leaf species.

The leaves and the general appearance of the growing tree suggest black walnut, while

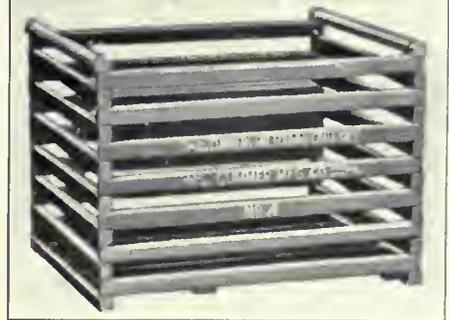
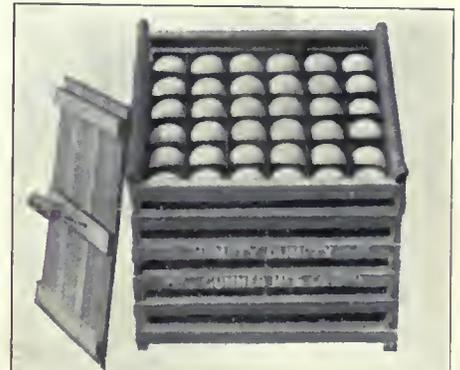
the wood resembles mahogany in color and grain. That listed as African cedar is probably one of the so-called West African mahoganies.

Cigar boxes are usually the product of factories which make

nothing else. Some of the boxes are of solid cedar, but most of them

consist of thin sheets of this wood glued upon thin boards of tupelo, yellow poplar, red gum, or basswood. The cheaper grades of cigar boxes are of imitation cedar, that is, other woods stained or printed to look like cedar. A few costly woods are listed in the tobacco box industry, among such being mahogany, rosewood, and Circassian walnut. They are for fine cigar boxes and cost is a matter of minor importance in consideration of the high sales price.

How widely the box industry is dispersed is shown



THE EGG CRATE'S PECULIAR PLACE

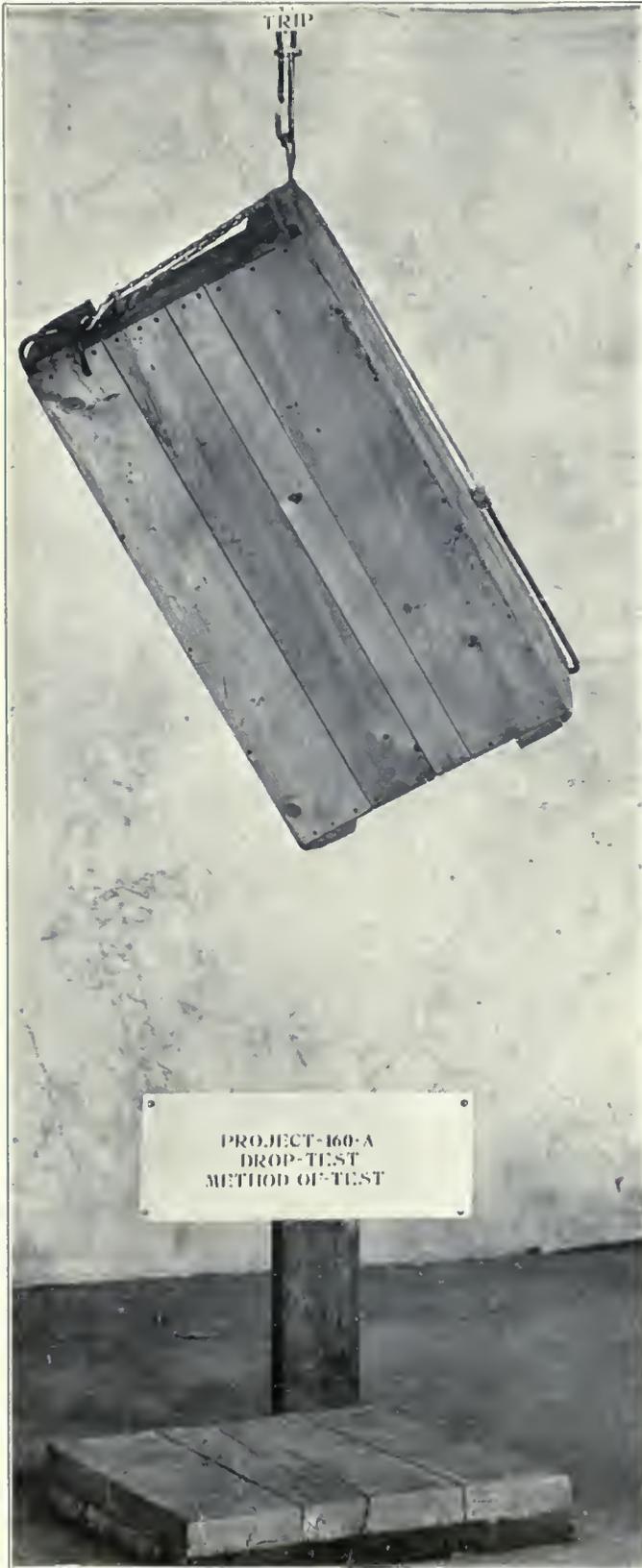
More planning is put into the manufacture of an egg crate than into most other shipping containers, because its value depends wholly upon its ability to deliver the goods undamaged. Eggs break easily. Crates have been devised for this particular line of shipping, and competition is keen among makers.

by the following list of states with the number of feet of box lumber consumed in each annually. Each of these sixteen states requires more than 100,000,000 feet

of lumber a year to keep its box factories going, and the aggregate is 3,594,000,000 feet yearly, 78 per cent of the whole box production of the United States.

Virginia .....	434,000,000	Ohio .....	158,000,000
New York .....	400,000,000	Maryland .....	147,000,000
Illinois .....	391,000,000	Wisconsin .....	124,000,000
Massachusetts .....	353,000,000	Missouri .....	117,000,000
California .....	310,000,000	Kentucky .....	114,000,000
Pennsylvania .....	286,000,000	Arkansas .....	111,000,000
Michigan .....	234,000,000	Maine .....	109,000,000
New Hampshire .....	200,000,000	New Jersey .....	106,000,000

Most boxes are broken up and destroyed after being used once, yet the trade in the second-hand article is quite large. Dealers in cities make a business of collecting them and making repairs, then selling them to manufacturers and other large shippers who refill the



TESTING BOXES BY DROPPING THEM

The accompanying cut represents an apparatus built by the United States Forest Service to determine how much dropping certain makes of boxes will stand. It is too well known that during transportation many boxes are pitched from drays, cars and boats, and the shipper wants to know in advance whether his boxes are strong enough to stand the punishment.



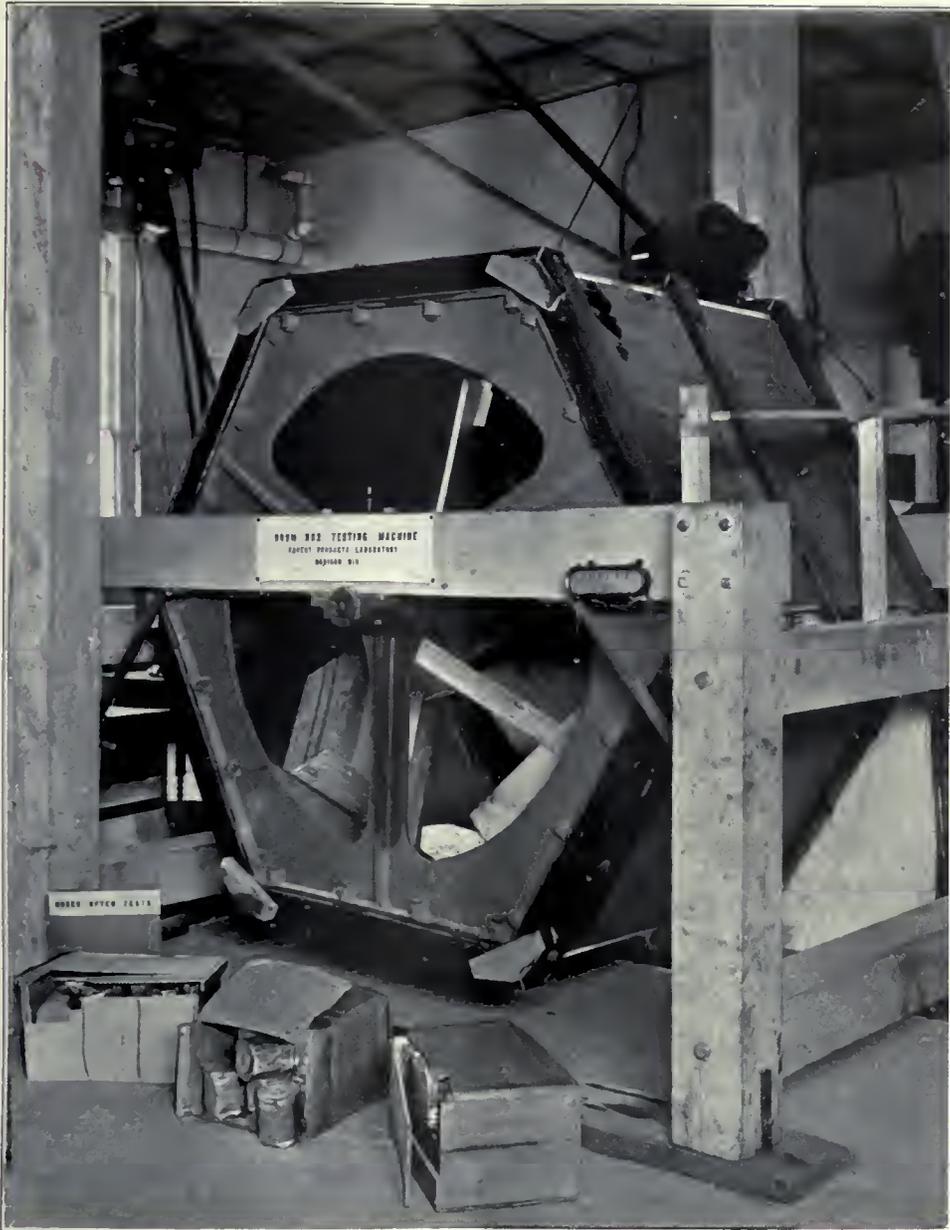
THE CRUSHING STRENGTH OF BOXES

If packed boxes are stacked high, one upon another, those near the bottom may be crushed by the weight of those above. It is important to know how much a box of a particular kind will stand, before the risk of having it crushed is assumed. The testing machine in the above cut was devised in the Government laboratory at Madison, Wisconsin.

boxes and send them out again as carriers of merchandise. Sometimes large department stores systematically collect and repair boxes and shipping cases for their own use. They operate sanding belts for removing all lettering and scars, after which the boxes are restenciled and go out, looking like new. However, the journey's end for most boxes is in the kindling wood shed. Attempts have been made to draw the nails and salvage the lumber, but no great success has attended such efforts, because the pieces are too small for gen-

eral use, and buyers are too few and far apart.

The box-making business is carried on in every state, though in Wyoming no statistics are available to show the size of the industry. Figures can be had for all other states. Two factors, profoundly influence the manufacture of boxes in a region; timber, and demand for the boxes. The latter is the more important, for if the demand is strong, lumber will be brought in and boxes will be made. Illinois affords a good example of this economic tendency. The state has little timber of its own, yet Illi-



THE TUMBLING TEST FOR BOXES

Makers and users of boxes wish to avoid risks of breakage in shipments and the attending losses and delays. Consequently, they test the kinds of boxes they expect to use to determine how much they will stand. Above is a cut of a machine for giving the tumbling test. The apparatus was designed by the Forest Service Laboratory at Madison, Wisconsin.

nois leads all other states, except Virginia and New York, in the manufacture of boxes, and it brings 98 per cent of its box lumber from beyond its borders. Virginia affords an example of the opposite condition—where boxmaking is influenced by abundance and cheapness of timber. Virginia box factories send shocks and empty boxes to manufacturing centers further north, because cheapness of timber and favorable freight rates permit it. Nevertheless, the orchards and truck gardens of Virginia are large users of boxes made in the state.

### YOUR WALNUT WILL HELP WIN THE WAR

**T**HE War Department authorizes the following statement from the Bureau of Aircraft Production:

More American walnut is needed for airplane propellers and gunstocks. During the four years' test in the present war this wood has proven to be the best material for the manufacture of the above articles.

The Government needs all the walnut that can be secured during the continuance of the war, but it does not buy the wood direct, as not all of it can be used for the above purposes. Mills holding Government contracts for gunstocks or propellers are anxious to purchase walnut trees and logs, and the Government urges the owners of trees or logs to sell them to the sawmills. Owing to their inability to purchase sufficient walnut logs, the sawmill proprietors have not been able to supply the

present requirements of this Government and the Allies.

#### *And Every Tree Counts*

"Fight with your walnut trees," is the new slogan of the Hardwood Section, Bureau of Aircraft Production, and the Small Arms Section, Ordnance Department. Half a dozen trees will provide lumber for a propeller and supply gunstocks for a platoon of infantry. The lack of one plane in the air or a platoon in the front line might lose a battle. Every tree counts.

If you have walnut trees 12 inches or more in diameter, write to Capt. R. L. Oakley, Production Division, Small Arms Section, Ordnance Department, Sixth and B Streets, Washington, District of Columbia. He will advise you where you can sell your walnut at a fair price.

# A SHASTA LEGEND

BY LUCY HUGHES DOAK



There's a legend full of magic  
Which the Indians love to tell,  
How from leaves the Mighty Spirit,  
Formed the birds we love so well.

When the world was in creation  
Mountain tops did first appear,  
And His steps here first descending,  
Blessed the heights since held so dear.

From the dome of Shasta Mountain,  
On that new creative morn,  
Viewed He every vale and fountain,  
In the silence of the dawn.

And, wherever fell His footprints,  
Sprang a tree in virgin soil;  
Clothed were they in shimmering green tints,  
Casting shadows over all.

As weeks spread they grew in beauty,  
Changed as if by magic spell;  
But as still they glowed more brightly,  
Softly to the earth they fell.

"Stay, O, stay—you must not leave me—  
You're too beautiful to die;  
Into feathered sprites I'll change you,  
Giving wings that you may fly."

Paused the leaves as if to listen,  
Floating buoyantly along—  
In the sunshine, rose and fluttered—  
Bursting into joyous song.

When you see bright plumage darting  
In and out among the trees,  
Think of Shasta Indians dreaming  
That the birds were formed from leaves.

This is why in trees they're building,  
For here's guarded safe the nest;  
Strong arms fold them as if shielding  
Close up to the mother breast.

Guard ye well the trees of forest,  
Give protection to the bird.  
Twixt these there has been close kinship  
Since the forming of the world.

# UPLAND GAME BIRDS: TURKEYS, QUAILS AND PHEASANTS

(Families Meleagridae, Odontophoridae and Phasianidae)

BY A. A. ALLEN, PH.D.

ASSISTANT PROFESSOR OF ORNITHOLOGY, CORNELL UNIVERSITY

WHY our Thanksgiving bird bears the name of turkey will always be a mystery. So long ago was it christened that we can never expect to learn whether the nom-de-plume originated in some mistaken notion of the bird's native land or whether it was given it in an effort to translate its call of "turk-turk-turk." At any rate, turkey it is and always will be, to the small boy with a drumstick in each hand or to the scientist who writes after it *Meleagris gallopavo*.

There are two species of wild turkeys, but the second, called the ocellated turkey, will doubtless never become of importance outside of museums because it is restricted to the peninsula of Yucatan and a small portion of the adjacent parts of Guatemala and Honduras and shows no propensities for domestication or artificial extension of its range. Nevertheless it is a beautiful bird, smaller than the common wild turkey with purplish reflection on its back and with eyelike spots on its tail in addition to the typical bands. The body feathers are tipped with brilliant golden and coppery bronze and the head and wattles are deep blue covered with orange tubercles. In its brilliancy, it is quite suggestive of some of the pheasants.

The common wild turkey which was originally found from Maine and Southern Ontario to Southern Mexico, varies to such an extent in different parts of its range that five recognizable forms or sub-species have been

described; one from Southern Mexico, one from Northwestern Mexico and Colorado, one from Northeastern Mexico and Texas, one from Southern Florida, and the common wild turkey, found from Georgia to Maine and Ontario. It is from the South-Mexico bird that our domesticated turkey is descended, the tail coverts and bands in the tail of each being gray while corresponding

parts of the common wild turkey are a rich chestnut. It is supposed that birds domesticated by the Indians were brought back to Europe by the Conquistadores because they had become established in many parts of Europe as early as 1530. Domesticated birds were brought to Eastern North America by the early colonists and many of them, it is believed, hybridized with the wild turkeys, as they still do where



THE PHEASANT IS AN ORNAMENTAL BIRD

It is easily naturalized and is very attractive on spacious lawns.

opportunity offers, until in some places, where the wild turkey is still found, it is rather difficult to find pure wild blood.

The wild turkey was originally an inhabitant of the open woodlands of all the Eastern States and those as far west as Kansas and Oklahoma. Today it has been exterminated in New York and New England and is confined to the rougher and more remote portions of Pennsylvania and Virginia, the larger swamps of the Southern States and the thinly settled portions of the Mississippi Valley and is everywhere fast following the passenger pigeon and Carolina parrot into history.

It is possible, however, to breed the wild turkey in captivity and several wild turkey farms are in existence. The State of Pennsylvania is trying to restock its wilder game coverts with these magnificent birds and has released numbers of them obtained from these game farms. It is to be hoped that the experiment will be a success and that New York and New England will follow the lead and bring back the noblest of American birds.

In their habits, the wild turkeys are not very different from the domestic birds. Except during the breeding season, they live in small flocks of from six to twelve individuals of both sexes, feeding upon acorns, nuts, etc., and ordinarily roosting in the same trees each night. At the beginning of the breeding season in March, the flocks disband and the males begin to gobble. Gobbling takes the place of the drumming of the grouse or the crowing of the rooster and usually is heard only early in the morning before the bird leaves the roost. When he has been successful in attracting a female, he struts and displays like the domestic bird. Turkeys are polygamous and frequently rival males engage in fierce battles, the victor becoming lord of the harem. After incubation begins, the males lose their animosity toward each other and again flock together leaving the cares of the family entirely to the females.

The wild turkey is our largest and finest game bird. With the increase of agriculture and the disappearance of our forests, it is to be expected that its range will be greatly restricted, but as long as we have National and State forest preserves and rough country that the plough cannot turn, we should have wild turkeys. Greater effort should be made by the National Government and the various state conservation commissions to save the remnant of these splendid birds and to reintroduce them into our game refuges and sanctuaries. Let our children's children feel the thrill that stirred our forefathers when they heard the distant challenge of the old gobbler, heard his rush of wings as he made off through the forest, or came suddenly upon a troop of them picking beech nuts in some forest glade.

#### The American Quail (Family Odontophoridae)

At the other extreme in size from the turkeys among the upland game birds are the quails. Some of the Old World species are no larger than sparrows and

none of our American quails are as large as pigeons. The American quails, which differ uniformly from the true quails and partridges of Europe in that the cutting edges of the bill are serrate or finely toothed instead of being smooth, and likewise in the entire absence of spurs on the legs, number about 100 species. The majority of these are confined to the tropics, but seven species are known north of the Mexican boundary. Of these, the bob-white is the best known in the East and the California quail on the Pacific coast.

The bob-white is native as far west as Colorado, but has been introduced into New Mexico, Utah, Idaho, California, Oregon and Washington. It has always been a favorite game bird and throughout the South has been fairly well able to hold its own. Of recent years, however, because of its destruction of the cotton-boll weevils and other destructive insects, a sentiment has been growing up in favor of removing it from

the game list and some states are now giving it complete protection. Its cheery call of bob-white, is the most musical of any of the notes of the game birds, which, together with its confiding habits and insectivorous diet, is almost enough to put it on the song bird list. When hunted, however, it becomes almost as wary as the grouse and in the many states where there are no grouse and pheasants do not seem to do well, there is nothing to take its place as a game bird.

Except during the breeding season, bob-whites are found in covies which are usually members of one family though sometimes where food is abundant,

the different covies join forming large flocks. They feed about open fields, hedgerows and even about gardens. When alarmed, they usually run together before taking wing and then get up with a rumble that is quite confusing. At night they form a close circle, their little tails together and their heads pointing out, a veritable bomb ready to explode at the approach of an enemy.

The bob-white is not polygamous as are the grouse and turkeys, and the male bird is a conscientious father and helps incubate the eggs and care for the young. The nest is a mere depression in the ground beneath a fallen branch or any place where the dried grass is thick enough to help form the arch or roof which usually conceals the eggs from above. The eggs num-



PROUD AS A PHEASANT

The peacock is a member of the pheasant family and all its members seem to have considerable family pride. The Ringnecked pheasant is a hybrid between the English pheasant and the Chinese ringneck and was brought to this country from England where it originated.

ber from ten to eighteen and are the whitest and most pointed of any of the gallinaceous birds.

The "bob-white" call is seldom heard after the eggs are hatched for in its place another is given that helps keep the family together. They remain together, unless scattered by hunters, until the following spring, never migrating but often moving in from the fields to the wooded bottom lands and alder thickets for the winter. The winters in New York and New England are often too severe for them for the deep snows cover all the weeds and fruit-bearing shrubs and the bob-whites have not learned to mount into the trees and live upon buds as do the grouse.

The male bob-white can be distinguished from the female by the white throat and band over its eyes, the markings of the female being buff. The bob-whites of Florida are considerably smaller and those of Texas are grayer and they have been separated into different races. In Southwestern Arizona and adjacent Mexico lives a curious bob-white with a throat that is black instead of white and with chestnut underparts. It is called the masked bob-white.

In the Rocky Mountain region and the Pacific States, the bob-white is replaced by the California quail. It is a very different looking bird, being bluish-gray rather than brown and having its head



AS THE PHEASANT CONCEALED IT

Here is shown a hen pheasant on its nest in the meadow. None of the surroundings have been disturbed and the bird is very difficult to see on its nest.

adorned by a few curious recurved feathers that are bare at the base and swollen at the tip so as to resemble a jet ornament rather than a crest. In the interior of California and Oregon, the birds are paler and grayer and have been separated into a different race and called the valley quail. In the arid parts of the West from Texas to Southern California, there is a quail quite similar to the California quail but with chestnut flanks. It is called the Gambell's quail. The plumed or mountain quail is a larger bird with a crest of a few straight feathers. It is a shyer bird, seldom coming near habitations, and preferring the open forest or chaparral growth on the mountains. As with the California quail, the birds inhabiting the humid coast region are much darker and those on the more arid ridges grayer. To distinguish them, the name mountain partridge has been given to the former and plumed partridge to the latter.

Two other quail are found in the West, the scaled partridge and the masked quail. They are found in the desert country from Western Texas to Arizona but the former is much the more abundant. The scaled partridge, blue quail or cotton-top as it is variously called is gray in color, the feathers of the neck and breast edged with black giving it a curious scaled appearance. Partially concealed on the crown is a tuft of white feathers that give it the name of cotton-top. The masked or Mearn's



AS THE PHOTOGRAPHER REVEALED IT

The same bird as shown in the preceding picture, but the grass has been pressed down all about it.

quail is smaller than the bob-white and has its black under parts spangled with white spots and its head curiously striped with black and white.

All of these quail, with the possible exception of the Gambell's, have been giving way before the advance of agriculture and the ever increasing number of hunters. In spite of their great reproductive capacity, the laws regulating the open seasons and the number that can be killed will have to be stiffened to make up for the increasing number of hunters and their decreasing range. One encouraging feature is the fact that they



Photograph by G. C. Embody

#### AT HOME IN THE GARDEN

The male Bob-White stays at home by the garden gate while Mrs. White goes to a garden party.

are now being bred in captivity and each year sees the methods employed on the game farms reaching greater perfection and larger and larger numbers being raised. It is with the pheasants however, that game farming has reached its greatest perfection and succeeded in adding a valuable bird to the faunas of many states of the Union.

#### The Pheasants (Family Phasianidae)

Were it not for the game farmer, we would not be considering the pheasants in this series of articles, for none of them are native to North America. There are about 100 species of true pheasants found through Central and Southern Asia to the Malayan region. The majority are brilliant birds, though the females are dull, and many species are seen in the aviaries in this country. The resplendent golden and Lady Amherst pheasants, from Western and Southern China, with their wonderful capes and arched tails are perhaps the most brilliant of all. The golden pheasant has been released in Western Oregon and on Protection Island, Washington with some success, and the silver, the

copper, and the green pheasants, also, but the only one that has been really successfully naturalized is the ring-necked pheasant which may now be considered a member of the famous of at least 25 states.

The ring-necked pheasant is not a real species but is a hybrid between the English pheasant (*Phasianus colchicus*) and the Chinese ring-neck (*P. torquatus*) and was brought over from England where it originated. The male is a very ornamental bird with a bright metallic green head and a more or less continuous white ring around the neck. Its breast is a rich coppery chestnut, its back marked with gold and chestnut, the rump being greenish gray and the long tail banded with rich brown and buff. The female is light brown, spotted with darker on the back and were it not for her long pointed tail, might be confused with some of our native grouse.

Naturalizing a foreign bird or animal in any land is



#### NOT A TURKEY TROT—BUT A PHEASANT STRIDE

All the gallinaceous birds make a track similar to this—the toes spreading more than 90 degrees—and the hind toe barely recording. The grouse and bob-white, however, usually drag their toes and seldom make a clean track like the pheasant.

a risky undertaking as evidenced by the English sparrow and the starling in this country which have increased far beyond control and instead of functioning, as intended, in the destruction of insects, are rapidly replacing more valuable native birds. The naturalization of the pheasant seems to present no such difficulties, for although it is likely to become destructive to crops when too abundant, it will always be such a valuable addition to the food supply that the slightest re-

laxation in the laws regulating its capture would result in its extermination. Each bird weighs about three pounds and would always market for a price that would pay for considerable effort on the part of hunters. If it ever should be necessary to reduce its numbers quickly, there would be no difficulty in doing so. The problem of the smaller sparrows and starlings is quite

there any danger of the pheasant replacing any of our native game birds. It is a bird of the open fields and



LEADING HER CHICKS AWAY

The little fellows are sneaking through the grass and cannot be seen, but the old bird is alert to every danger.

different for they are not large enough or good enough to repay the hunter even for his ammunition. Nor is



JUST OUT

This young pheasant was but three days old, but it had learned a lot in those three days and it was almost impossible to get his picture.

hedge rows and might in a measure compete with the bob-white except that it does not do so well in the South where the bob-white does best. In the northern states it does not compete with the ruffed grouse because they live in different habitats, so that all in all, it is surely a valuable addition to our upland game birds.

## DONATIONS TO THE WELFARE FUND FOR LUMBERMEN AND FORESTERS IN WAR SERVICE

**A**MERICAN FORESTRY will publish each month the list of those making donations to this fund. Many of the donations from members of the American Forestry Association so far received were made without solicitation and were inspired by reading in the magazine that a relief and comfort fund for men of the forest regiments was being collected. Many substantial contributions are being received from the Forest Service and from lumber companies and lumbermen following requests sent to them by the Secretary of the Welfare Fund for Lumbermen and Foresters in War Service, by the lumber organizations of which they are members, and by the committees of lumbermen which had charge in various sections of the United States of securing enlistments for the forest regiments.

Contributions to the Welfare Fund to August 22, 1918, are as follows:

Previously acknowledged .....	\$19,544.06	Mr. M. H. Lewis, New York City.....	10 00
Basilan Lumber Company, Isabela, Basilan,		Mrs. Barrington Moore, New York City.....	10 00
Philippine Islands .....	50.00	Mr. C. R. Pettis, Albany, New York.....	10 00
Mr. Harry K. Eckert, Niagara Falls, New York	3 00	Mr. Julian E. Rothery, New York City.....	5.00
Gunnison National Forest, Gunnison, Colorado	7 50	Contribution from Philippine Islands and adja-	
Mr. Ralph S. Hosmer, Ithaca, New York.....	10 00	cent territory, sent in by Mr. Arthur	
Mr. W. G. Howard, Albany, New York.....	5 00	Fischer, Director of Forestry.....	723.50
Mr. W. H. B. Kent, Caznovia, New York.....	10.00		
		Total.....	\$20,428.06

SHOW YOUR PATRIOTISM BY SELLING YOUR BLACK WALNUT TIMBER—BADLY NEEDED  
BY THE GOVERNMENT FOR PROPELLERS AND GUNSTOCKS

## WILL FORESTS BE PLANTED ON OLD BATTLE FIELDS?

**I**N A special dispatch from the front to the *Chicago Daily News*, Paul Scott Mowrer asks: What is to be done with the zone of vast chaotic battle fields in France after the war? It has been said that this land will be eminently proper for cultivation, as its complete upheaval by shell explosions will have served to renovate the soil. Unfortunately, the matter is more complex than this. The war belt, varying in width from one to several kilometers, reaches right across France, from the sea to Switzerland. Most of this belt, being encumbered only with barbed wire entanglements, several net works of trenches and a scattering of shell holes, can probably be put under cultivation again within a year or so after the war. The work of cleaning up the ground will here not be insuperable. But in other places, such as Verdun, the Aisne

nants of trenches—a labor in itself nothing less than Herculean—there remains the danger of striking unexploded shells, which, lying just out of sight under the surface, might explode at first touch of the plow. There are thousands of such shells, all primed and needing only a slight jar to go off, buried in every one of the great French battle fields. As for the soil being rendered more fertile by the upheaval it has undergone, there is reason to think that in too many spots just the reverse will have occurred; instead of being more fertile, it will be less so, for the upper soil has been completely covered over by a thick scattering of subsoil blown up by the deep plunging shells. In short, it is doubtful if these regions can be brought under cultivation again.

It has been proposed to turn these regions into forest



International Film Service—French Official Photograph

### A TYPICAL FIELD OF BATTLE AFTER HEAVY BOMBARDMENT

In the region of Moulin de Laffaux, this field, over which the line of battle has passed—expressing now only barrenness and destruction—may one day be clothed again in forest green, and know once more “the peace of quiet aisles.”

plateaux and the Somme—regions which include thousands and thousands of acres of what was once farmland and pasture—the chaos is such that to restore it to agriculture seems almost out of the question.

In these regions, the shell holes touch one another, and some of them are ten or fifteen feet deep. The ground is kneaded with bits of hashed up barbed wire, and shell splinters, human bones and debris of every kind. Even granting that it would ultimately be possible to clear up this ground and level the shell holes, dugouts and rein-

lands. The proposal is not without merit. It would solve many difficulties, and would be more practical, as many of France's rich forest reserves have been diminished greatly since the beginning of the war, to obtain wood for military purposes. The owners of land in the regions in question would doubtless object to turning these fields, some of which were formerly so rich, into forests, but when they begin to realize the practical difficulties in the way of attempting to begin cultivation again, and especially if they are offered suitable compen-

sation by the Government, they will, doubtless, see the wisdom of the proposal. Sentimentally, also, there is a reason for turning into forests these ever memorable

houses, carrying off furniture, tools, farm implements, livestock and poultry, and destroying what they had to leave behind.



*International Film Service*

#### RUINED FORESTS IN NO MAN'S LAND

A scene of desolation, shell-torn and ghastly, the remnants of a once beautiful forest. There are thousands of acres of such devastated territory utterly unfit for agricultural development which may be replanted to forest after the war.

regions of death, where rest the shattered bones of so many thousands of brave men.

An effort was to have been made this spring to begin to cultivate the land again in the region wasted last March by the retreating Germans. The latter, it will be remembered, made a clean sweep of everything, burning the

One month after the German retreat the first horses for domestic use appeared in the devastated regions. The refugees who returned to their homes—and they were at first very few—brought about thirty horses in all. Two months elapsed before the arrival of the first cow. But now in the department of the Somme alone,



*Underwood and Underwood—British Official Photograph*

#### ANOTHER STRIKING EXAMPLE OF THE RUTHLESSNESS OF THE HUN

This is an official photograph and shows another stroke of German vandalism executed on the beautiful fields of France. Here the Boches have cut down the fruit trees so that nothing may interfere with their dastardly manoeuvres.

there are 800 cows, over 500 horses, thirty or forty oxen, 785 sheep, forty-five pigs, 250 poultry and three shepherd dogs—not a vast animal population for such a large region, yet a good beginning, everything considered. A number of goats have also been distributed, and a co-operative society of peasants has acquired fourteen additional cows. In respect to farm machinery, there were in the Somme region in February 150 reapers, 15 binders and reapers, 100 thrashing machines, 100 harrows, 28 farm wagons and 35 sowers. The army also

had established a repair center where expert workmen tried to piece together machines destroyed by the Germans and where they expected to turn out 1,500 divers machines in this way. There have also been distributions of tools and small implements, such as churns. The emergency has served, among other things, to introduce American tractors. The peasants of the region of Nesle, Ham and Roye have acquired seven of these, and the ministry of agriculture has sent sixty to the department of the Somme.

### A BOTANICAL APPRECIATION

OF THE many letters received by AMERICAN FORESTRY telling of the high appreciation in which the articles on botany, by Dr. Shufeldt, are held, the following is a recent example:

Branchport, New York, July 24, 1918.

Dr. R. W. Shufeldt,  
Washington, D. C.

Dear Sir:—I want to tell you how I enjoy your articles on the



Photograph by Verdi Burtch

THE SHOWY LADY-SLIPPER

and I note that in yours the background is eliminated. Dr. Allen is now using some of my bird photographs in AMERICAN FORESTRY.

Yours truly,

VERDI BURTCHE.

wild flowers in AMERICAN FORESTRY. That in the last number is especially interesting as I am very familiar with the form of the Lady-Slippers mentioned, *acaule, pubescens parviflorum* and *spectabile*. As you did not show a photograph of the latter, I enclose one from my collection. I visited a swamp June 19th last where we found more than fifty blossoms of this superb flower and there is another swamp near here where there are as many more plants.

Perhaps I might have some wild flower photographs that you would like to use in your articles, though mine all have the natural background

### ONE MILLION DOLLARS FOR FIGHTING FIRE ON NATIONAL FORESTS

THE President has authorized a loan of one million dollars to the Forest Service for fire-fighting expenses, to meet the serious emergency conditions in the National Forests of the Northwest and the Pacific Coast States. The loan was made from the special defense fund of fifty million dollars placed at the disposal of the President by Congress. It is recognized that the protection of the National Forests is an important and essential war activity.

Forestry officials regard the present fire season in the Northwest as in some ways the most serious with which the Government has ever had to cope. Early drought, high winds, electrical storms, labor shortage, and depletion of the regular protective force as a result of the war have combined to make the fire conditions unprecedentedly bad.

Necessity for resort to the Presidential fund is due to the fact that the appropriation bill for the Department of Agriculture for the current year has not yet been passed.

### GENEROUS DONATION FROM THE PHILIPPINES

UPON noticing the appeal in the AMERICAN FORESTRY Magazine for donations to the Forest Regiments Fund, Mr. Arthur F. Fischer, Director of Forestry for the Philippine Islands, secured permission from the Governor-General of the Islands to stir up sentiment and solicit subscriptions to the fund among the Islands and adjacent territory. Mr. Fischer's work was most effective and resulted in the collection of \$723.50 from a list of contributors whose names we shall have the pleasure of publishing a little later on. The Committee deeply appreciates this substantial co-operation from friends so far away and their good wishes for the success of the welfare work for the boys of the lumber and forest regiments.

SELL YOUR BLACK WALNUT TREES AND HELP WIN THE WAR

# GRASSES, SEDGES AND SOME SEPTEMBER FLOWERS

BY MAJOR R. W. SHUFELDT, R. A. O. U., ETC.

MEDICAL CORPS, U. S. ARMY

THERE are two great families of plants of which hundreds of species occur all over the world, far up towards either Pole, and which are especially numerous in the temperate zones. The first is the Grass family (*Gramineae*) and the second the Sedge family (*Cyperaceae*). Some of the species of these run very close together; though as a rule, after a little study, one finds no great difficulty in making them out. They have been studied in all countries by botanists for ages past with the utmost care, and as a consequence we find descriptions of them carrying a wonderfully extensive terminology. Not only do the species occur in great numbers, but we find a marvelously rich glossary of terms to name their various parts and characters. All this should not, however, frighten us away from the collecting and consideration of these most elegant, often dainty, and highly artistic representatives of the plant world.

In the United States there are many hundreds of different kinds of grasses and sedges, and the month of

September is a fine one in which to collect and study them. As a matter of fact, we may commence such studies almost as soon as the spring opens, continuing with it the entire year round. For ordinary investigation, and for the purpose of identifying species, we have an excellent text book in the seventh illustrated edition of Gray's New Manual of Botany, which is a handbook of the flowering plants and ferns of Central and North-eastern United States and adjacent Canada. (1908.) In this very useful work, the Grass and Sedge families have been revised and illustrated by Prof. A. S. Hitchcock. Nearly every genus has a typical species, or rather its essential characters, figured, which greatly facilitates the matter of identification; while additional and very essential assistance is rendered by the voluminous glossary at the

end of the volume. The illustrations are especially helpful, and through them we may, in most cases, identify almost any species of grass or sedge of the New England or Middle States' flora.



THE LAW FORBIDS THE PLUCKING OF WILD FLOWERS IN ANY OF THE PUBLIC PARKS IN WASHINGTON, DISTRICT OF COLUMBIA; THEY FLOURISH HERE IN THE NATIONAL ZOOLOGICAL PARK.

This scene is just above Pierce's Mill, Rock Creek, and it is a favorite resort for the people of the National Capital.

When fine specimens are collected, suitable for pressing and properly mounting in a botanical album, the study of these beautiful plants is most fascinating, not to say useful and important. Either family is divided



THIS GRASS IS KNOWN AS LYME GRASS OR WILD RYE

Fig. 1—All the grasses of the genus *Elymus* are, for the most part, of this dainty order; this is probably the species known as the Canadian Lyme Grass (*Elymus canadensis*).

sively into this subject; but on the other hand it will be of interest to present a few specimens, in that the reader may appreciate not only what beautiful pictures we may obtain from such by the use of the camera, but also to illustrate their wide variation, delicate structure, and attractive appearance. The species figured are all abundant types in many parts of the eastern United States, and we may collect, in an afternoon's ramble, scores of other species equally beautiful.

One group or genus of the grasses are known as the Wild Ryes or Lyme grasses (Fig. 1); there are some ten or a dozen species of them in the northeastern section of the country, and they have been grouped in the genus *Elymus*—a term derived from the Greek, and which was applied in ancient times to some sort of grain or other. The Canadian Lyme grass shown in Figure 1 flourishes generally in sandy soil from Nova Scotia, westward to Manitoba, and southward to the Gulf. A subspecies of it, known as *E. c. glaucifolius*, has been described, but it is difficult to distinguish it. Some of the species of *Elymus* are very distinct and readily recognized, as the prairie species known as Macoun's Lyme grass (*E. macounii*), which is found to

be more or less abundant in Minnesota and Iowa and from thence westward.

Another exquisite and very abundant species of sedge is found, with many others, in the extensive genus *Cyperus*, and a pretty illustration of it is shown in Figure 2, it being *C. hystricinus*, described by Fernald. It may be known as the Spiny galingale—Galingale being the common or vernacular name applied to these sedges, the species of the genus *Cyperus*. As a rule, the various species are found growing during the summer in sandy barrens, waste fields, or dry woods. Only a few grow in rich soil, as *C. echinatus*, found in Virginia to Missouri and southwards. The sedges of this group are very striking and not difficult to identify, notwithstanding the fact that some of them run pretty close.

Very frequently we find a number of different species of sedges and grasses growing together in the same area; in fact we may often gather half a dozen of either group in an area of an hundred square feet, if the soil and conditions be favorable; this renders their collecting especially interesting and attractive. For example, where we met with the just-described species growing luxuriantly, we may often find the related species known



SEVERAL OF THE SEDGE FAMILY (*Cyperaceae*) HAVE THE FORM OF THIS ONE

Fig. 2—An example of *Cyperus hystricinus* from Maryland; it is more or less nearly related to such sedges as *C. lancastriensis* and *C. dipsaciformis*. The beautiful caterpillar shown is the larva of our well-known Io moth (*Automeris io*). It was in this exact position when the plant was collected.

as *C. ovularis* flourishing; it is shown here in Figure 3. It is readily recognized by its globular heads and the distinctive character of its other structures. In fact, in this part of the United States we have no other sedge wherein the heads are as globular as in this species. In waste ground around the city of Philadelphia we meet with a species that appears to have been



NEARLY EVERYONE IS FAMILIAR WITH THIS CHARACTERISTIC SEDGE (*C. ovularis*), A MOST ABUNDANT SPECIES.

Fig. 3—Sometimes the heads are double, as is here seen on the largest ray to the left.

introduced from the tropics; it is the Yellow Cyperus (*C. flavus*), and it may be easily identified by its ovoidal heads, three or four-clustered, and sessile at the point where the leaves spring from the upper end of the stalk. All of the so-called "Rushes" fall in this great sedge family, as the bulrush or club rush; the bald rush, and the numerous spike rushes. There are many handsome species of them, perhaps none are more so than the ones grouped in the genus *Uniola*, as *U. latifolia*, a most graceful spike-grass found growing, according to Gray, on "shaded slopes and in low thickets from Pennsylvania to Kansas and southward, appearing in August and September," as we see it in Figure 4 of this article. This particular specimen was collected on the low land, close to the water's edge, of the Potomac River, on the District side, not far from Chain Bridge nor more than a mile from the Washington Monument. It is not abundant in this part of the country, and some of our botanists hardly believed that it grew in this section of the country at all. A species closely resembling it (*U. paniculata*), known as Sea Oats, is found growing along the Texan coast where the sand dunes occur. This species extends its range into Mexico and South America, and is sometimes collected



SPIKE GRASS IS ANOTHER BEAUTIFUL SPECIES OF SEDGE, OF WHICH THERE ARE SEVERAL KINDS KNOWN

Fig. 4—*Uniola latifolia* is the name that has been given to this spike, and it is not a very abundant species.



THERE ARE SOME CURIOUS PLANTS IN THE LILY FAMILY (*Liliaceae*), AND THIS IS ONE OF THEM

Fig. 5—Our False Spikenard (*Smilacina racemosa*) is generally found growing on banks where considerable moisture is present, and its flowers are sometimes faintly fragrant.

by travelers and brought to northern homes in ample bunches, on account of its highly decorative value.

Often, while rambling through the woods in Sep-

shade. The leaves are of a fine green, and remind one of those of the lily of the valley—another attractive plant, to which this one is more or less related. Observe that their venation is arranged horizontally, and that the leaves spring above another from the stem. This plant is a fruiting specimen of the Wild Spikenard, and a brief study of it will throw light upon some very striking species. Wild Spikenard is also called False Solomon's



THESE ARE THE BEAUTIFUL GLOBULAR BERRIES OF THE SPIKENARD SHOWN IN FIGURE 5

Fig. 6—Note how very closely the leaves resemble those of the lily of the valley, to which plant it is nearly related.

Seal—and for a reason which will soon be made clear. We usually meet with it in moist woods, sometimes on hillsides, and occasionally in thickets. Rarely does it flower later than in July in the Mid-Atlantic States; and should we pull up one of these plants, it will be noted that it has a rather thick, more or less fleshy rootstock. A rich terminal raceme of faintly fragrant, pale greenish-white flowers characterizes

the flower-head of the Wild Spikenard, and by the use of a hand-lens we may see that any one of these flowers possesses six stamens and a single pistil. Usually the plant has a height of about a foot and a half, while still other specimens may grow to be more than a yard high. Sometimes the head is quite small, as is shown in Figure 7, in the right-hand plant, and occasionally the stem is zig-zag, so that country people often call it the Zig-zag Solomon's Seal.

In the matter of flowering, the true Solomon's Seal differs widely from the plant just described as the False Solomon's Seal—a most stupid name, as the plants are very distinct and easily told apart; this may be appreciated by a study of Figure 7. They may frequently be

September, one comes across such a plant as is shown in Figure 6. Note the beautiful bunch of berries it bears; they are quite aromatic, as round as bird-shot, of a rather pale reddish color, and exquisitely speckled with a darker

found growing near each other; so that, in September, we often have an opportunity to compare their different berries right on the ground. When the berries of the true Solomon's Seal are of full size, they are dark green and very round. Usually they are suspended in pairs below the leaves, as we would naturally expect to find them from the position of the flowers. Once in a great while we meet with a plant wherein the first two or three berry-bunches are in threes instead of twos, and I have a beautiful picture of a plant showing this. Many species of birds feed on the fruit of the False Solomon's Seal, and in this way contribute to the wide distribution of this species. There is also a Small Solomon's Seal



HERE WE HAVE SOLOMON'S SEAL COMPARED WITH THE FALSE SPIKENARD, BOTH PLANTS BEING IN FLOWER

Fig. 7—Solomon's Seal, of which there are two species, is shown to the left in this picture; the other plant is the Spikenard, being a specimen with a very small head.

(*Polygonatum biflorum*), which occurs on wooded hill-sides over the greater part of the eastern United States, and as far westward as Texas and Kansas. Besides being related to the lily of the valley, these plants run into the Wake Robin (*Trillium*), of which we have many species. They are also related to the Green-briars and Carrion flowers, described in previous issues of AMERICAN FORESTRY. *Clintonia borealis* and *C. umbellata* are also related to it, as are several other plants, such as the bellworts (*Uvularia*), also described in these pages. In-

deed, taken as a whole, it is a most interesting group, and well worthy of careful study. Alice Lounsberry says: "There is no doubt but that the round scars, left on the rootstock of the Solomon's Seal by the dead stalks of the preceding year, do resemble the impressions made by seals upon wax; but wherein these seals resemble those



THIS IS THE TERMINAL SHOOT OF THE SAME PLANT SHOWN IN FIGURE 8. NOTE THAT THE SEED PODS ARE ERECT

Fig. 9—In the Atlantic States we have but eight or nine species of these wood sorrels; the abundant species here shown has yellow flowers. In the common Wood Sorrel they are rose colored or purple.

used by Solomon, is still a mystery to many." There is probably no truth whatever in it; hundreds of such fanciful names have been bestowed upon the structural parts of both plants and animals without the slightest foundation in fact, as may be noted by skimming over some good work on human anatomy.

Another pretty group of September flowers—indeed they may be in bloom from May to September—are the Wood Sorrels. They make up the Wood Sorrel family (*Oxalidaceae*), and different species of them occur in various parts of the world. They are related to the Geranium family (Cranesbill) on the one hand, and to the Flax family on the other (*Linum*). For the central and northeastern parts of the United States and Canada Professor Gray describes some eight species of Wood Sorrel, and a very characteristic one is here shown in Figures 8 and 9. Note, in the first named figure how

three separate plants have sprung, at considerable intervals, from the same pale-colored, slender runner; in Figure 9 the terminal one is given enlarged. This is the Lady's Sorrel or Yellow Wood Sorrel, the delicate little flowers being deep yellow. It is our most abundant species, and this one was collected in a wood-lane in southern Maryland. They do not grow in the shaded woods but flourish best in the broiling sun by the roadsides. Many are also found in fields and gardens. Children are fond of chewing the leaves and seedpods on account of their delicate sour taste, and many call the plant the

"Lady's Sour-grass"—a name bestowed, too, on a few other species. It will be observed that the leaves are very long-stemmed, each stem bearing three heart-shaped leaflets. The plant shown in Figures 8 and 9 is fruiting, and the leaves are closed up for the day. The flowers run from two to six on the distal ends of

delicate stems, and any single flower rarely exceeds half an inch across. As pointed out by Gray, "several species produce small, peculiar flowers, precociously fertilized in the bud and particularly fruitful." Each seed-pod is generally hairy, and large-sized ones may be found that possess a length of half an inch. In *O. stricta* they make an acute angle with their stemlets in each case, and this species may be readily identified by a peculiar character—taken in connection with other characters: Each of the yellow petals may have, near the base, a reddish spot. This abundant species occurs in southern Maine, extending westward to Dakota, and thence far southward.

In the common Wood Sorrel (*O. acetosella*), which

flourishes in dark, shaded woods, we have a creeping plant with white flowers, the petals of which are veined with rich purple, or, in some instances, a distinct rose. *O. violacea* has violet flowers, and grows among the rocks in wooded places, while the cosmopolitan species, *O. repens*, has small flowers. This species is a very low, creeping one, and generally regarded as a "weed" by florists, who find it in abundance about their greenhouses. There are other species in eastern districts, as *O. priceae*, *O. filipes*, and so on. Neltje Blanchan truly remarks that "every child knows how the wood-sorrel 'goes to sleep' by drooping

its three leaflets until they touch back to back at evening, regaining the horizontal at sunrise—a performance most scientists now agree protects the peculiarly sensitive leaf from cold by radiation. During the day as well, seedling, scape, and leaves go through some interesting movements, closely followed by Darwin



ONE OF THE DAINTIEST AND BEST KNOWN LITTLE PLANTS OF THE WOOD SORREL FAMILY

Fig. 8—The Oxalidaceae with us contains but one genus of plants; it has been named *Oxalis* as the leaves are sour to the taste. The species here shown is the Lady's Sorrel (*O. corniculata*).

in his 'Power of Movement in Plants,' which should be read by all interested." On the other hand, the superstitionists in the Old World have woven about the sorrel many a fable; and, coming down from the Irish of yore, it is found to be the true shamrock of Saint Patrick and the "alleluia" of the Saxons.

The whole question of the method of fertilization in these sorrels is of extreme interest and importance; while additional researches are, in the future, sure to be conducted upon the peculiar "activities" of these curious plants, which not only "go to sleep"—a state even extended to the seedlings and rudimentary leaves—but which, during the daytime are in a state of perpetual movement.

## OUR BIG COLONIAL EAGLE—TERROR OF THE WILD MONKEYS OF THE PHILIPPINES

A very interesting history attaches to this great Monkey-eating Eagle of the Philippine Islands, being one of the largest, if not the largest bird of prey known up to the present time. It was first described by Mr. Ogilvie-Grant at the meeting held in London on the sixteenth of December, 1896, of the British Ornithological Club. Taking its habits and anatomy into considera-

tion, as far as these were known, Mr. Grant created a new genus to contain this magnificent bird, and it is now known to science as *Pithecophaga jeffreyi*. Those who have thus far had the opportunity to examine the material in hand, or any part of it, seem to be impressed with the fact that its nearest living ally is the Harpy Eagle of South America (*Harpy-haliaetus*). Mr. John

Whitehead, the famous traveler and collector, obtained the type specimen in the forests of Samar during his travels in the Philippines in 1894-97.

Probably the vernacular name of Monkey-eating Eagle, which has been bestowed upon this bird, will be universally adopted, and carried from now on in popular and scientific works on ornithology. In passing, it must be noted here that Mr. Whitehead has, in one place or another, referred to the "Great Philippine Eagle," a name in some respects more acceptable than the one mentioned above. Then, too, it is now a well-known fact that this bird does not always confine itself to a monkey diet, but will, when from any cause monkeys are scarce, resort to the yards of the natives, and make off with an occasional small pig or some of the poultry. This has happened so often that the natives now regard this especially

Smith, F. Z. S., M. B. O. U., which appeared in *The Ibis* (Lond.) for 1910, p. 285; papers are cited in it which will enable one to locate and consult the few articles that have been written, up to the present time, on the discovery and life history of this remarkable bird. Through the same source one may also find the various cuts and colored plates that have appeared figuring *Pithecopaga*, and one of these illustrate the article just cited, having been produced by H. Gronvold. It is, however, difficult to believe that the eagle appeared *en face* as is there shown on page 290, where both eye and eyelids face directly to the front, as we find them among typical owls.

I am told that Captain Joseph Clemens published a photograph of a Monkey-eating Eagle in the *Condor*, with its history, but that the picture is a very indifferent one. In this article the author says: "I have since skinned



HEAD OF THE MONKEY-EATING EAGLE OF THE PHILIPPINES—THE LARGEST OF LIVING BIRDS OF PREY

Fig. 11—Combined drawing and photograph of the right lateral aspect of the head of *Pithecopaga jefferyi*. By the author from the specimen sent him from the Bureau of Science, Manila; natural size.

handsome and powerful raptorial robber as an enemy, and as a consequence rejoice whenever one is captured or killed.

On account of the mountainous character of the country and the great density of the forests where this eagle is found, it is no easy task to either find or collect specimens of them; therefore but few skins or mounted examples occur in museums in any country—probably less than eight or ten. We have one here in the mounted collection of the United States National Museum, received from Mr. Fletcher L. Keller, of Davao, Mindanao. Several of the others are mentioned by Mr. D. Séth-

and have in my collection another specimen, and in this one I found a monkey not yet digested. The paws were torn off and swallowed whole, then the next joint, and so on. It was eaten hair and all.

"Mr. Richard C. McGregor refers to these two specimens in *The Journal of Science* for October, 1907, and to a third specimen procured by Mr. Ickis, Geologist of the Bureau of Science, on May the 11th, 1907. This was apparently the first that was recorded from the Island of Luzon. The head, one wing and foot only were brought to Manila."

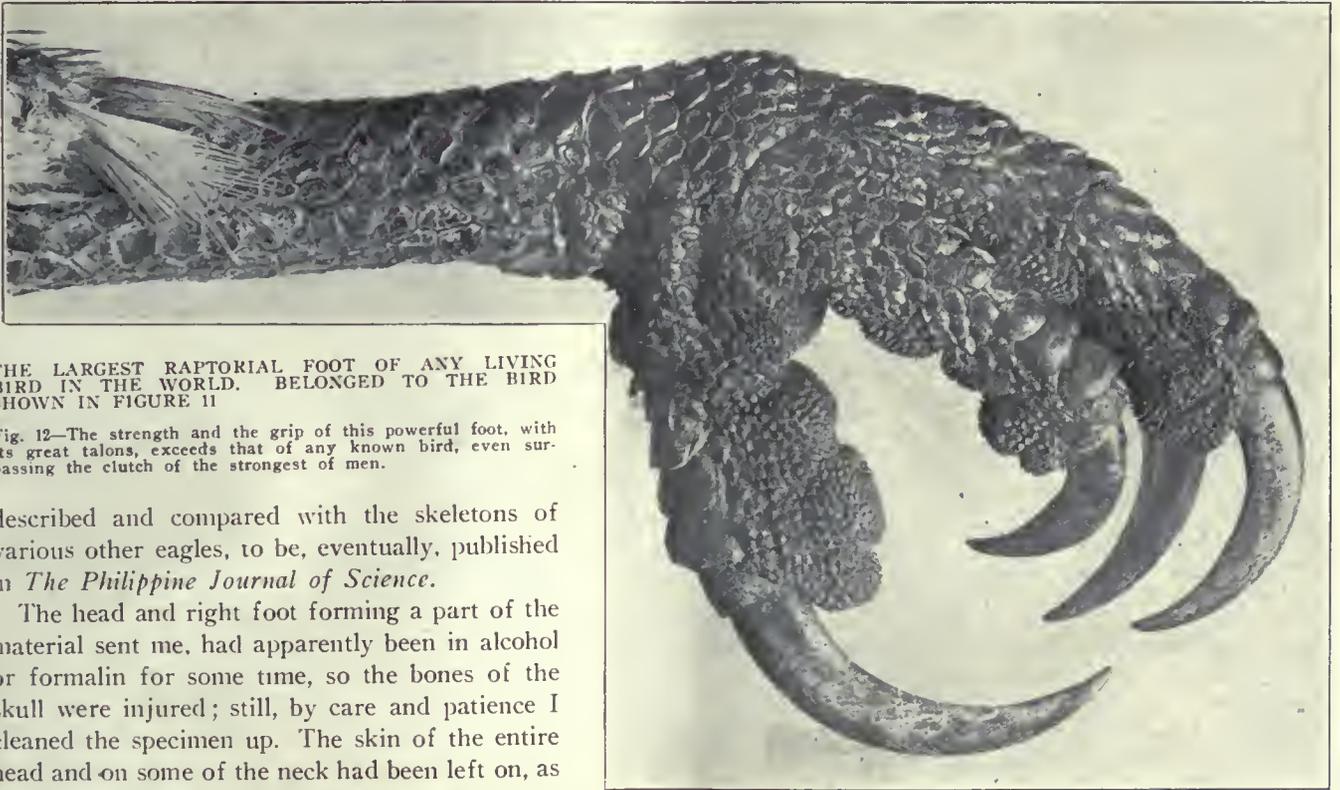
On the 17th of April, 1918, Mr. McGregor sent me

the better part of two skeletons of this eagle, and in his letter of transmittal he says: "Of the material that I send you now, the head and foot belong to the Ickis specimen from Argus River, eastern Rizal Province, Luzon, May 11, 1907 [recorded by me in *Phil. Journ. Sci., Sec. A* (1907) 2, 297]. All the other material is from the Nueva Vizcaya specimen (lacks head, feet, and wing bones left in the skin). [Recorded in *Phil. Journ. Sci. Sec. D* (1918) 13, 14]. In separating the anterior vertebræ, to make the thing short enough to go in the box, I broke the anterior dorsal process of the anterior vertebræ left with the trunk—otherwise the specimen is in good condition. It is not likely that the osteology has been described unless some one has worked up the material from the Seth-Smith specimen."

All of the above mentioned skeletal parts of this eagle I prepared and photographed; it will soon be

mentioned by all describing this great bird is its very striking, full crest. Most of the feathers composing this are very narrow and elongate, of a medium tan shade, and each has a median longitudinal stripe of rather deep russet brown. These feathers are decidedly drawn out to thin, sharp points posteriorly, and are not blunt and rounded as Gronvold has drawn them. A Monkey-eating Eagle may weigh as much as twenty pounds.

Grant tells us that the bill is extraordinary in shape and size, the culmen being a true arc of a circle, while its depth is greater than that of any known bird of prey, except Pallas' Sea Eagle (*Haliaeetus pelagicus*), in which it is sometimes a trifle greater, while such extreme narrowness, compared with the depth, is quite unique in birds of this order." To be sure it is approached by the Black Cockatoo (*Microglossus aterimas*); but in none of these is it laterally compressed to the same extent.



THE LARGEST RAPTORIAL FOOT OF ANY LIVING BIRD IN THE WORLD. BELONGED TO THE BIRD SHOWN IN FIGURE 11

Fig. 12—The strength and the grip of this powerful foot, with its great talons, exceeds that of any known bird, even surpassing the clutch of the strongest of men.

described and compared with the skeletons of various other eagles, to be, eventually, published in *The Philippine Journal of Science*.

The head and right foot forming a part of the material sent me, had apparently been in alcohol or formalin for some time, so the bones of the skull were injured; still, by care and patience I cleaned the specimen up. The skin of the entire head and on some of the neck had been left on, as well as the feathers. This afforded me an opportunity to secure lateral views of the head, and, by erasing and restoring, I produced the head as it appears with this article. All the forepart of it, from the eye on, is as we find it in the living bird, the feathers being copied from the ones on the feathered head sent me by Mr. McGregor and referred to above. The foot was found to be essentially perfect; so two photographic negatives were made of it; a print from one of these is here reproduced. The podotheca, or scaly covering, is, in life, of a deep orange yellow. This last does not agree with Mr. McGregor's description in his "New or Noteworthy Philippine Birds. II. (*Phil. Journ. Sci.*, Vol. XIII, No. 1, Sec. D, January, 1918, pp. 14-16), where he states that the iris is pale blue—"a very unusual color for the eye of a raptorial bird; bill dark green-blue gray, distal half black; tarsus and feet pale dirty yellow, nails black." One character

Further, those who have examined the external characters in this bird, have noted the naked tarsi and feet, the scutellation of which more or less nearly approaches that of the Harpy Eagle (*Thrasaetes harpyia*). Both are birds of unusual strength and size; and, taken all in all, naturalists have been led to believe that these two birds are more or less nearly related; in fact, that the Harpy is its nearest relative.

It was to settle this important point in ornithology that the Bureau of Science of Manila sent me such parts of the skeleton as they possessed, in that what is now suspected may either be made more certain, or refuted entirely. My account of the osteology of this most remarkable bird of the Philippines will appear later on in the *Philippine Journal of Science* and I trust it will prove to be of use to students of bird anatomy and classification.

# CANADIAN DEPARTMENT

BY ELLWOOD WILSON

PRESIDENT, CANADIAN SOCIETY OF FOREST ENGINEERS

ON Monday, the fifth of August, a meeting was held at La Tuque, Quebec, to discuss the handling of the forests of Quebec from the standpoints of assisting natural reproduction and a sustained yield. Dr. Fernow and Dr. Howe, of Toronto University, Clyde Leavitt, of the Dominion Commission of Conservation, and the writer, were present. Messrs. Piche, Chief Forester of Quebec and Mr. Sorgius of the St. Maurice Forest Protective Association were invited to attend, but were unfortunately prevented. The studies of cut-over lands, logged in accordance with the diameter limits fixed by the Provincial Government made by Dr. Howe last summer and continuing this year, show such a poor outlook for the future that some steps must be taken immediately to improve conditions if we are to have any adequate supply for the future. Destruction of trees by insects and fungus diseases is taking a place but little behind that of forest fires and it is evident that some policy of cutting must be adopted which is economically practical and silviculturally sound. Absolutely no advantage inheres in a diameter limit. The supposition on which such a policy is based is that all the trees below the limit set will be left to grow and produce a second crop. Very good in theory, but not true in practice. Dr. Howe's studies show that most of the trees left under the legal limit are in reality old trees which have been suppressed and probably will not grow any larger. Spruce is very shallow rooted, as is fir, and when the larger trees are cut out and the stands thinned, a very large percentage blow down and are lost. Then, too, when the debris from logging is left in the woods, insects and fungi use it for breeding places and it helps to increase their numbers. It is, in a way, like leaving the bodies of the dead to lie and decay among the living. It would seem, therefore, that the rational policy to be adopted would be to cut everything that was large enough for pulpwood and to pile and burn the logging debris, or to burn it broadcast, in small patches. It has been shown that a light fire is probably advantageous for reproduction, although this has not been definitely settled. Of course, steep slopes subject to erosion could not be so cut and each section should really be treated on its own merits and the methods of cutting decided by a technically trained man with practical experience. Sample plots should be laid out and treated in different ways so that the best methods may be learned by experiment. Such plots are already laid out and are being variously treated on the lands of the Laurentide Company, Ltd., at Grand Mere and the Provincial Government in co-operation with the Commission of Conservation is laying out others this summer. The Province of New Brunswick will also co-operate in this work.

A new association which will be of great help to the Province in forestry policy has just been formed in New Brunswick. It is the New Brunswick Lumberman's Association, with headquarters at Fredericton, and it will have for its objects the protection of the rights and the promotion of the interests of the lumber industry, the formulation of an efficient system of fire protection, co-operation with the Government and other lumbermen in the protection and conservation of the forests and the promotion of legislative and educational measures to conserve forest resources in general.

The Imperial Munitions Board is advertising for lumbermen in the Province of Quebec to go to British Columbia to work in the logging camps getting out airplane spruce. The wages

offered are four dollars and a half a day and free transportation if the men remain six months. They must pay their own board, which is promised at \$1.20 per day.

A very interesting bulletin has just been issued by the Dominion Forestry Branch on "Wood-using Industries of Quebec." This was compiled by Messrs. R. G. Lewis and J. A. Doucet.

Mr. J. N. Stephenson, Editor of the Canadian Pulp and Paper Journal, has just returned from a long trip to the west where he visited the pulp and paper mills of the Pacific Coast and also the various Forest Superintendents of the Dominion Government throughout the west. He says that pulp and paper making is being undertaken on a large scale, especially in British Columbia, and bids fair to become one of the most important industries, as it has already in the east.

The progressive Secretary of the Canadian Forestry Association, Robson Black, has thought out a good scheme for propaganda in forest protection work, and through the courtesy of the Canadian Pacific Railroad has obtained the use of a car which will be fitted up with a moving picture machine, fire pump, models of fire fighting apparatus, posters, pictures and a lecturer, speaking French and English. This car will be sent into all the woodland districts where meetings will be held.

A special exhibit by the Canadian Pulp and Paper Association will be made at the coming Toronto exhibition and will include a good deal of forestry material. Sections showing the growth of trees and seedlings of various ages will be shown to give the public some idea of the time it takes to grow trees and the necessity for an early start being made at reforestation. Mr. A. L. Dawe, the Secretary is giving much attention to such propaganda work among his members and the public at large.

The application of the co-operative idea has revolutionized the whole aspect of forest fire protection in the province of Quebec. The four co-operative forest protective associations in that province now furnish protection to more than 44,000,000 acres of forest land, including about 80 per cent of the Crown timber lands under license.

Mr. E. G. Poole, Superintendent of the Ontario Fire Protection Service has had good results with the portable fire pump which he has among his equipment and can be transported on his automobile and railway motor car. He has the pump working at Norembega where danger threatened from the burning of the bark at the rossing plant and it is perhaps not too much to say that the pump has saved a forest devastation in that neighborhood. What can be really accomplished through careful burning is instanced around Charlton, where under the supervision of the fire rangers recently a territory of 800 acres was successfully burned over with the fire being kept in control.

# AMERICAN FORESTERS IN MILITARY SERVICE

This Roster is compiled from various sources. Every effort has been made to make it complete and accurate, but in the nature of things there are necessarily omissions and errors. The list, which has heretofore been printed in every issue of AMERICAN FORESTRY, will be printed quarterly, or in every third issue of the magazine, and all foresters and others who can supply additional names, report casualties, or note corrections are urged to communicate with American Forestry as promptly as possible, to the end that the list may have full value as a record of the men who have gone to war

**A**DAMS, George (Ohio State Univ.), 10th Eng. (For.).  
 Ade, Harry G. (Univ. of Montana), 23rd Casual Cantonment, Vancouver, Wash.  
 Adolph, Raymond D. (N. Y. State Col. For., '15), 19th Cavalry, Ft. Ethan Allen, Vt.  
 Agee, Fred B., 1st Lt., Engr. Corps (For.); U. S. R., A. E. F., P. O. 702, via N. Y., deputy forest supervisor, U. S. F. S.  
 Alhano, Jack, forest ranger, U. S. F. S.  
 Alden, Phil. E. (Mich. Ag. Col., '18), 10th Eng. (For.) A. E. F.  
 Aldous, Tura M., grazing, U. S. F. S.  
 Aldsworth, Donald (Univ. of Minn., '14), Off. Tr. Camp, Presidio, Cal., San Diego, Cal.  
 Alexander, Ben. (Bilt. For. School), 2nd R. O. T. C.  
 Alexander, J. B., 1st Lt. Aviation Corps (Univ. of Wash., '17).  
 Allen, E. Whitman (N. Y. State Col. For., '19), 104th Bat., Camp Wadsworth, Spartanburg, S. C.  
 Allen, Raymond, New Jersey.  
 Allmendinger, E. J., 1st Lt. (Univ. Mich., '16), National Army, Camp Taylor, Ky.  
 Almy, L. K. (N. Y. State Col. For., '16), 11th Eng. (Railway), France.  
 Amen, Alhert, 6th Bn., 20th Eng. (For.), fire guard, U. S. F. S.  
 Ames, F. E. (Yale For. School, '06), Capt., Co. B, 7th Bn., 20th Eng. (For.) U. S. F. S.  
 Anderson, A. C., 2nd Lt. U. S. A., Ft. Leavenworth, Kan. (Univ. of Wash., '17).  
 Anderson, Albert T. (Ore. Ag. Sch. For.), 2nd Lt., Univ. Idaho, '12, Co. E, 6 Bn., 20th Engrs. (For.), A. E. F., National Army.  
 Anderson, Emil A. (Univ. of Idaho, '12), C. E. 6th Bn., 20th Engrs. (For.) A. E. F., deputy forest supervisor, U. S. F. S.  
 Anderson, Parker O. (Univ. of Minnesota, '16), 10th U. S. Eng., France, U. S. F. S.  
 Anderson, S. D. (Univ. of Mich., '17), Sec. 590, U. S. A., A. S. Allentown, Pa.  
 Andrews, A. K. (Ore. Ag. Sch. For.), Sgt., 116th Eng.  
 Andrews, J. C. (Univ. of Mich., '18), Co. E, 10th Bn., 20th Eng. (For.), American University Camp, Washington, D. C.  
 Aney, John L. (N. Y. State Ranger Sch., '13), Second Officers Training Camp.  
 Archer, Frank L., Engr. Headquarters, France, forest clerk, U. S. F. S.  
 Archibald, H. (Ore. Ag. Sch. For.), Sgt., 116th Eng. Armsby, E. M. (Penn. State, '13), Ord. Dept.  
 Armstrong, Carroll W. (Bilt. For. School), Quartermaster's Dept., Fort Dodge.  
 Armstrong, L. J., Lt. (Univ. Mich., '13), Rainbow Division, A. E. F.  
 Armstrong, Ralph H. (Bilt. For. School), 104th Inf., Expeditionary Forces, France.  
 Arnold, Alan F., Sgt., Camp Dix, N. J.  
 Atkinson, E. S. (Yale For. School '16, and Biltmore), 2d Lt., Ft. Grant, Canal Zone.  
 Atwood, C. R. (Univ. of Maine, '15), manager, Unit 1 New England Sawmill Units.  
 Aylward, F. N. (Univ. of Calif.), Amb. Corps

**B**ACKUS, Romyne L. (Univ. of Minn., '18), 20th U. S. Eng., U. S. F. S.  
 Badertscher, Ed., temp. clerk, U. S. F. S.  
 Bacon, J. M. (Univ. Mich., '18), Co. B, 5th Bn., 20th Eng. (For.), France.  
 Badke, Frank C. (N. Y. State Col. For., '19), Navy.  
 Baker, Hugh P. (Yale For. School, '04), Capt. 46th U. S. Inf., Camp Gordon, Ga., Dean N. Y. State Col. of Forestry.  
 Baldwinburg, Max B., clerk, U. S. F. S.  
 Balderee, E. W. (Ore. Ag. Sch. For.), Corp., 116th Eng., A. E. F.  
 Baldwin, Donald A. (N. Y. State Col. For., '17), N. A., Camp Devons, Ayer, Mass.  
 Baldwin, H. C. (Penn. State, '14), chief carpenter's mate, naval aircraft factory, Navy Yard, Philadelphia.  
 Ballard, Dean (Univ. of Wash., '12), American Lake Encampment.  
 Ballew, William Murray (Yale, '15), 5th Bn., 20th Eng. (For.), A. E. F.  
 Balmer, Joseph D. (Univ. of Wash., '18), Sgt. Bat. D, 346th Fld. Art., American Lake Encampment.  
 Ballou, F. C. (Penn. State, '16), 20th Eng. (For.), 3rd Bn., Co. C.  
 Bannister, Fred., 20th Eng. (For.), fire guard, U. S. F. S.  
 Bar, Warren, 20th Eng. (For.), fire guard, U. S. F. S.  
 Barbur, Hal (Ore. Ag. Sch. For.), 1st Lt.  
 Barker, S. Omar, Co. D., 502nd Service Bn., Camp Merritt, N. J., U. S. F. S.  
 Barlow, Harold (Yale For. School, '14), 1st Lt., Ordnance, Coe Brass Bldg., Ansonia, Conn.  
 Barnes, Leonard G., Cadet of the U. S. School of

## THE ROLL OF HONOR

IN THIS ROLL OF HONOR WE WILL PUBLISH EACH MONTH AS THEY ARE RECEIVED OR REPORTED TO US, THE NAMES OF FORESTERS WHO MEET DEATH IN SERVICE.

**AUGSPURGER, STANLEY R.**, Dayton, Ohio. (Univ. of Mich., '17). Field assistant, U. S. F. S., District 6. Enlisted Dec. 7, 1917; was assigned to Co. D, 6th Battalion, 20th Engineers (Forest), and was lost February 2, 1918, from the transport *Tuscania*. His body was recovered, identified and hurried on the Scotch coast.

**COOK, MARCUS**, Como, Montana (Univ. of Mont.), Co. D, 6th Bn., 20th Engrs. (For.), was lost from Transport *Tuscania* and hurried in Scotland.

**CROSS, ROBERT P.**, Lt., Huntington, Mass. (N. Y. State Col. For., '17), Aviation Section, Signal Corps, A. E. F., killed in aero accident, May 2, 1918.

**DALRYMPLE, THERON K.**, Sergt., Rochester, N. Y. (N. Y. State Ranger Schl., '14), Co. A, 1st Engrs., A. E. F., died in France of wounds received in action May 10, 1918.

**LEVEAUX, COSMER**, Corp., Ludington, Michigan (Mich. Ag. Col., '18), Battery A, 11th Field Artillery. Killed in action August 10, 1918.

**MUNCASTER, ROY** (Univ. of Wash., '17), Ranger, U. S. F. S., Olympic National Forest. Enlisted in December, 1917; was assigned to the 20th Engineers (Forest), and was lost from the *Tuscania*. He is reported by the War Department as among the missing or the unidentified dead.

**REES, H. S.** (Univ. of Wash., '14), Canadian Contingent, killed in battle in France.

**REES, L. A.** (Univ. of Wash., '14), Canadian Contingent, killed in battle in France.

**SHARP, MILTON K.** (Univ. of Ohio, '16), Bat. A, 134th Field Art., killed December 5, 1917, Montgomery, Ala.

**SIMPSON, C. E.** (Penn. State Col., '16), 10th Eng. (For.), died in Scotland October 3, 1917.

**SMITH, A. OAKLEY** (Yale For. School, '14), killed while training for aviation, drowning in Delaware River by fall July 21, 1917.

**YOUNG, DOUGLAS E.**, private English Army, killed in France April 10, 1917, was State Forest Warden, Maryland.

Military Aeronautics, Signal Corps, Princeton, N. J.  
 Barnett, William L. E. (Yale, '15), Section Sanitaire, U 70, Convois Automobiles, par B. C. M., Paris, France.  
 Barr, John B., forest ranger, U. S. F. S.  
 Bartlett, E. F. (Univ. Mich., '16), N. A.  
 Barton, Robert M., 20th Eng. (Forest), Amer. Univ., Wash., D. C.; forest ranger, U. S. F. S.  
 Bassett, Richard, Lt., (N. Y. State Col. For., '16), Spec. Demolition Detail, Ft. Niagara, N. Y.  
 Bastian, Clyde E., Corp. 20th Eng. (For.), Univ. of Mich., '16). A. E. F.  
 Bates, Raymond B. (N. Y. State Col. For., '20), 104th F. A. Camp Wadsworth, Spartanburg, S. C.  
 Batten, R. W. (Yale For. School, '16), 10th Eng. (For.), A. E. F.  
 Bay, Helmut (Mont. For. School), 20th Engineers.  
 Beal, Cecil R. (Univ. of Wash., '17), 2nd Lt. 20th Eng. (For.), American Univ., Washington, D. C.  
 Beals, James B., 20th Eng. (For.), forest ranger, U. S. F. S.  
 Beam, Donald (Iowa State Col. ex, '20), C. A. C., 1st Co., Ft. De Bussey, Honolulu, Hawaii.

Beaman, Clarence W., Sgt., 10th Co., Puget Sound, Ft. Casey, Camp Lewis, American Lake, Wash., Messenger, U. S. F. S.  
 Beaman, La Vaughn, Co. A, 5th Bn., 20th Eng. (For.), U. S. F. S.  
 Bean, Russell, National Army, present address unknown.  
 Beatty, Homer Milo (Mich. Univ., '13), Sgt. 10th Eng. (For.) A. E. F.  
 Beatty, J. Eugene, forest ranger, U. S. F. S.  
 Bedell, Walter R. (N. Y. State Col. For., '18), Corp., 79th Aero Squad., France.  
 Bedwell, Jesse L., forest ranger, U. S. F. S.  
 Beebe, P. (Mont. For. School), 20th Engineers.  
 Behre, C. Edward (Yale, '17), Co. F, 4th Bn., 20th Eng. (For.), A. E. F., U. S. F. S.  
 Bell, Ernest (Univ. of Minn., '16), Lt. Rainbow Div., Camp Mills, N. Y.  
 Bell, Franklin V. (N. Y. State Ranger Sch., '17), Co. C, 29th Eng.  
 Bell, George R. (Yale For. School, '18), 2nd Lt., 12th Fld. Art., A. E. F.  
 Bell, H. Waite (N. Y. State Col. For., '19), 10th Eng., A. E. F.  
 Bellue, A. (Student Univ. of Cal.), 10th Eng. (For.).  
 Reltz, H. C., 1st Lt. (Mich. Ag. Col., '18).  
 Benedict, M. S., 1st Lt. 10th Eng. (For.); forest supervisor, U. S. F. S.  
 Benedict, Raymond E., Major 10th Eng. (For.), For. Br. B. C.  
 Bennett, Edwin L., Co. H 157th Inf., Camp Kearney, Cal., forest ranger, U. S. F. S.  
 Bennett, Harry C., forest ranger, U. S. F. S. 39th Co., 164 Depot Brigade, Detention Camp No. 2, Camp Funston, Kansas.  
 Bennett, William W. (Univ. of Nebr., '12), Co. B, 20th Engrs. (For.), A. E. F., Funston; dep. for sup. U. S. F. S. Benson, A. O., (Univ. of Minn., '10), U. S. F. S.  
 Benson, A. O., (Univ. of Minn., '10), forest examiner, Co. F, 337 Inf., 85th Division, A. E. F., forest examiner, U. S. F. S.  
 Bentley, George A., Capt. Quartermaster's Dept., purchasing agent U. S. F. S.  
 Beresford, Harry Y. (N. Y. State Ranger Sch., '14), Co. E, 4th Bn., 20th Eng. (For.), A. E. F.  
 Bergquist, S. G. (Univ. Mich., '15), 20th Eng. (For.), A. E. F.  
 Bergstrom, Bertle (Mich. Agr. Col., '19), Co. A, 9th Bn., 20th Engrs. (For.), A. E. F.  
 Bernhardt, Carl L. (Univ. of Wash., '18).  
 Berry, John K., scaler, U. S. F. S.  
 Berry, Swift, Capt., Logging Engrs. (For.), A. E. F., forester, U. S. F. S.  
 Betts, E. G. (Iowa State Col. ex, '15), 1st Lt., 20th Eng. (For.), Camp American Univ., Wash., D. C.  
 Betts, Floyd, Co. D, 2nd Bn., 20th Eng. (For.), A. E. F., field asst., U. S. F. S.  
 Betts, Fred H., forest ranger, U. S. F. S.  
 Betz, Carl M. (N. Y. State Ranger Sch., '15), Squadron 5, Camp Dick, Dallas, Texas.  
 Bevan, Arthur (Univ. of Wash., '17); Canadian Eng., France.  
 Revan, Jesse T., Co. E, 10th Eng. (For.), A. E. F., France, U. S. F. S.  
 Beyers, Walter F. (Univ. of Minn., '12), Capt., Camp Dodge, Iowa.  
 Billin, R. T. (Penn. State, '20), 10th Eng. (For.), Co. C.  
 Billings, R. W. (Mich. Ag. Col., '17), Co. A, 10th Engrs. (For.).  
 Billingslea, James H., Jr (Univ. of Wash., '11), Sgt. Co. C, 10th Eng. (For.), forest ranger, U. S. F. S.  
 Bird, Charles A. (N. Y. State Ranger Sch., '14), 4th Co., Coast Artillery.  
 Bird, R. G. (20th Eng. (For.); (Cornell, '16).  
 Bird, Vern A. (Univs. of Minn. and Utah), 20th Eng. (For.), forest ranger, U. S. F. S.  
 Black, H. B. (Univ. Mich., '13), 2nd Officers Training Camp, Fort Sheridan, Ill.  
 Black, John J., Naval Res., draftsman, U. S. F. S.  
 Black, S. R. (Univ. Mich., '16), Co. F, 4th Bn., 20th Eng. (For.), A. E. F.  
 Blair, Alhert W., 20th Eng. (For.), forest ranger, U. S. F. S.  
 Blair, Earl M. (student Univ. of Cal.), 20th Eng. (For.).  
 Blake, Philip (Univ. of Minn., '16), Marine Barracks, Quantico, Va.  
 Blankman, Harold J. (N. Y. State Col. For., '16), 303 Engrs., O. T. C., Camp Dix.  
 Bliss, James (Ohio State Univ., '14), Capt., Chillicothe, Ohio.  
 Bloom, Adolph, Ensign U. S. N. Train. Sta. (Univ. of Wash., '16).  
 Blount, Henry F. (N. Y. State Col. For., '20), Naval Aviation Corps.  
 Blouse, Joseph R. (Mt. Alto, '16), Pa. Dept. For.

- Boatman, S. A. (Mich. Agr. Col., '16), O. A. & A. E., S. S. L. Equip. Div. Signal Corps, U. S. A., Detroit.
- Bodine, R. C. (Ore. Ag. Sch. For.), Co. B, 20th Eng. (For.).
- Boisen, Rev. Anton T. (Yale, '05), Secretary, Y. M. C. A., 31 Ave., Montaigne, Paris, France.
- Bond, W. E. (Univ. Mich.), 20th Eng. (For.), Washington, D. C.
- Bonner, James H., Capt., 1st Co., E. O. T. C., Camp Lee, Petersburg, Va., acting dean Mont. For. School.
- Bonney, Parker S., sub. lt., Br. Navy (Univ. of Wash., '13).
- Bonta, Charles W., forest ranger, U. S. F. S.
- Booy, Henri (Minn. For. Sch.), 10th Eng. (For.), A. E. F.
- Bosworth, James H. (Univ. of Mont.), 4th Bn., 20th Eng. (For.), A. E. F., U. S. F. S.
- Bothfeld, Harry Julius (Yale, '12), Corp., 302nd Inf., Co. H, Camp Devens, Mass.
- Bourner, C. Kingsley (N. Y. State Col. For., '20), 20th Eng. (For.).
- Bowcott, William H., Corp. (N. Y. State Ranger Sch., '14), 7th Eng., France.
- Bowen, James H., 20th Eng. (For.), forest ranger, U. S. F. S.
- Bowen, John S., 20th Engrs. (For.), A. E. F., Sgt., U. S. F. S.
- Bowen, Jos. B. (Yale For. School, '17), Royal Flying Corps, Camp Everman, Field 2, Fort Worth, Texas.
- Bowman, J. A. (Penn. State, '14), 20th Engrs. (For.).
- Boyce, C. W. (Univ. Mich., '14), Photographer, Aviation Section, S. E. R. C.
- Boyce, W. H. (Penn. State, '17), Timber inspector, 814th Depot Aero Squadron, New York.
- Bracy, Elbridge J., Co. B, 3rd Bn., 20th Eng. (For.), A. E. F., fire guard, U. S. F. S.
- Bradfield, Lloyd E., Corp. (N. Y. State Ranger Sch., '14), Co. F, 303rd Eng., Camp Dix, N. J.
- Bradley, Tom O. (Student Mt. Alto), 3rd Bn., 20th Eng. (For.), A. E. F., Pa. Dept. For.
- Bradner, M. J., Corp. (Univ. Mich., '15), Bat. C., 10th Field Artillery, Douglas, Ariz.
- Brady, Charles C. (Univ. of Wash., '18); Battery A., Wash. Signal Corps.
- Brady, Seth C., messenger, U. S. F. S.
- Brandborg, Guy M., Co. 59, 15th Bn., 166th Depot Brigade, Camp Lewis, Wash., forest ranger, U. S. F. S.
- Branson, H. W. (Univ. Mich., '18), Aviation Section, S. E. R. C.
- Brayton, Shirley (Univ. of Minn., '18), 20th U. S. Eng., A. E. F.
- Brebner, J. N., Co. A, 10th Engrs. (For.), A. E. F.
- Breneman, Howard E. (Mt. Alto, '17), Co. C, 1st Bn., 10th Eng. (For.), A. E. F., Pa. Dept. For.
- Brennan, Frank E., forest ranger, U. S. F. S.
- Brett, S. E. (Ore. Ag. Sch. For.), Capt., 20th Inf., A. E. F.
- Brinckerhoff, H. E., 1st Lt. Inf.
- Brindley, Ralph, 2d Lt., Bat. C, 340th F. Art., R. O. T. C. (Univ. of Wash., '17), American Lake Encampment.
- Brockway, M. (Univ. of Me., '15), checker, Ten Saw Mill Units.
- Broderick, Martin J. (Univ. of Minn., '16), 1st Sgt. U. S. Engr., Co. C, 501 Bn., Engr., 20th Eng., A. E. F.
- Brooks, James F. (Montana For. School, '17), Co. D, 10th Eng. (For.), forest ranger, U. S. F. S.
- Brown, Bascom H., forest ranger, U. S. F. S.
- Brown, George H. (N. Y. State Col. For., '20), Bat. A, 104th F. A., Spartanburg, S. C.
- Brown, Harold B., 20th Eng. (For.), forest ranger, U. S. F. S.
- Brown, H. Vivian, Forest Ranger, U. S. F. S.
- Brown, R. A., Co. D, 23rd Eng. (Highway), Camp Meade, Md., U. S. F. S.
- Brown, Thomas (Univ. of Minn.), Marines, A. E. F., France.
- Brown, Robert C., asst. forest ranger, U. S. F. S.
- Brown, V. S. (Univ. of Cal., '14), 10th Eng. (For.).
- Brown, Vance, scaler (Univ. of Wash., '17), Bat. A, Wash. Sig. Corps, U. S. F. S.
- Browning, Harold A., Signal Corps, Co. A, Ft. Severns, Ga., forest ranger, U. S. F. S.
- Broxton, Donald (Univ. of Wash., '14).
- Bruce, Donald (Yale For. School, '10), Capt., 10th Eng. (For.), assigned in charge of timber reconnaissance in France. (Prof. of For. Univ. of Cal.).
- Bruce, James, U. S. F. S.
- Brundage, Marsden R. (Mich. Ag. Col., '17), 20th Eng. (Forest).
- Bryan, Lester W., Co. C, 9th Bn., 20th Engrs. (For.), A. E. F.
- Bryant, Edward S., Capt., 10th Eng. (Forest), for. inspector, U. S. F. S.
- Buch, John Edward (Mt. Alto For. Acad., '17), Co. C, 1st Bn., 10th Eng. (For.), Pa. Dept. For.
- Buck, Shirley, Capt., Camp Joseph E. Johnson, Jacksonville, Fla., National forest inspector, U. S. F. S.
- Budelier, C. J. (Ore. Ag. For. Sch.), 2nd Lt., 347th Light Fld. Art.
- Buhler, Ernest (Univ. of Minn., '13), Sgt., O. T. C., Camp Dodge, Ia.
- Bullard, Herbert (N. Y. S. Col. For., '17), spruce Reg., Vancouver Bar., Wn.
- Bullerick, Ray O., Sgt., 209 squad., Camp McArthur, Waco, Texas., Asst. Forest Ranger, U. S. F. S.
- Bunker, Iage, city forester, Fitchburg.
- Buol, E. M. (Ore. Ag. Sch. For.), Corp., 20th Eng., Co. D.
- Burgess, John, Corp., 60th Co., 164th Depot Brigade, Camp Funston, Kan., surveyor draftsman, U. S. F. S.
- Burleigh, T. D. (Penn. State, '18), 20th Eng. (Forest).
- Burnett, O. P. (Univ. Mich., '18), Co. D, 10th Bn., 20th Eng. (For.), American Univ., Washington, D. C.
- Burnham, Carl F. (Univ. of Wis., '14), 1st Lt., U. S. Army.
- Burnham, Roland P. (Univ. of Wash., '17); 2nd R. O. T. C., Presidio, San Francisco, Cal., U. S. F. S.
- Burrall, Harrison D. (Yale, '07), 29th Eng., Camp Ayer, Mass., forest examiner, U. S. F. S.
- Burt, E. H., Lt. (Mich. Ag. Col., '14).
- Busteed, F. Gordon, 2nd Lt. (N. Y. State Col. For., '18), 50th Inf., Camp Greenc, Charlotte, N. C.
- Buttrick, P. L., Lt. Am. Amb. Serv. (Yale For. School, '14).
- Byrne, Geo. J., Jr. (Univ. of Cal.); Amb. Corps.
- C**ALKINS, Hugh G. (Yale For. School, '09), 2nd Lt., F. A. N. A., 160th Depot Brigade, Camp Lewis, Amer. Lake, Wash., forest supervisor, U. S. F. S.
- Calloway, G. A. (Univ. of Mo.); 10th Eng. (For.).
- Calloway, Joseph R., forest ranger, U. S. F. S.
- Calvert, Gerald F. (Univ. of Wash.); Canadian Contingent in France.
- Cameron, J. F. (Univ. of Wash., '19); Av. Training Camp, San Diego, Cal.
- Campbell, J. (Ore. Ag. Sch. For.), Medical Dept., 13th Inf.
- Campbell, John W. (Biltmore), 2nd Lt., Bat. C, 330th F. A.
- Campbell, Tom (Ore. Ag. Sch. For.), U. S. S. Northern Pacific.
- Canfield, Arduis (N. Y. State Ranger Sch., '13), Co. C, 1st Bn., 20th Eng. (For.), A. E. F.
- Cangiamila, Joseph (N. Y. State College, '18), Royal Flying Corps, Canadian Aviation Camp, Texas.
- Cappel, Frederick, Headquarters A. Schools, U. S. A. P. O. 715, A. E. F., clk., U. S. F. S.
- Carmer, Henry S. (N. Y. State Col. For., '18), Bat. A, 104th F. A., Spartanburg, S. C.
- Carney, Thomas, Sgt. (Mont. For. School), 20th Engrs.
- Carpenter, Herbert M. (Bilt. For. School), 20th Eng. (Forest).
- Carvey, Matthew (Ohio State Univ.), Aviation.
- Carey, N. Leroy (Univ. of Mich., '16), 405 Squad, A. S. S. C., North Cantonment, Vancouver, Wash., Forest assist., U. S. F. S.
- Casey, James W. (N. Y. State Col. For., '17), 10th Eng. (For.), A. E. F.
- Cassidy, Hugh O. (Iowa State, '16), Co. C, 1st Bn., 20th Engrs. (For.), forest ranger, U. S. F. S.
- Cecil, Charles L., Officers Training Camp, Deputy Forest Supervisor, U. S. F. S.
- Cecil, Kirk P. (Kan. Ag. Col., '07), Lt. Coast Art., Ft. Stevens, surveyor, U. S. F. S.
- Chamberlain, Harry (Penn. State, '14), 20th Eng. (Forest).
- Chamberlin, W. J. (Ore. Ag. Sch. For.), 1st Lt., Aviation, A. S. S. C., U. S. R.
- Chandler, Chas. O. (N. Y. State Col. For. ex., '18), 10th Eng., A. E. F.
- Chapman, Charles S., Major, (Yale For. Schl., '02), 10th Eng. (For.), A. E. F., District Forester, District 6, U. S. F. S.
- Charlson, Alex. (Univ. of Wash., '10); Canadian Contingent in France.
- Chatrand, Lee F. (Univ. of Wash., '16), Co. D., 4th Bn., 20th Eng. (For.), forest ranger, U. S. F. S.
- Chartrand, L. J. (Mich. Ag. Col., '14).
- Cheatham, J. W., Corp. (Mich. Ag. Col., '10).
- Chipperfield, Albert, 10th Engrs. (For.), A. E. F.
- Chipperfield, W. A. (Univ. of Mont.), 10th Eng. (For.).
- Christensen, Alfred C., Hdqt. 10th Engrs., A. E. F., forest clerk, U. S. F. S.
- Christman, R. J. (Ore. Ag. Sch. For.), 2nd Lt., 16th Eng.
- Chubb, S. W. (Penn. State, '12), U. S. F. S.
- Chudderdon, Harold A., forest ranger, U. S. F. S.
- Clancy, J. P. (Ore. Ag. Sch. For.), 20th Eng. (For.).
- Clark, Donald H. (Univ. of Wash., '17), 1st Lt., Bat. F, 348th Field Art., American Lake Encampment.
- Clark, E. V., 1st Lt. R. O. T. C., Camp Funston, Kan., forest supervisor, U. S. F. S.
- Clark, F. L. (Ore. Ag. For. Sch.), Co. D, 20th Eng. (For.).
- Clark, John C. (N. Y. State Col. For., '17), Camp Hancock, Augusta, Ga.
- Clark, Robert C., forest ranger, U. S. F. S.
- Cless, Jr., George H., (N. Y. State Col. For.), 1st Lt., R. O. C., 332nd Inf., Camp Sherman, Chillicothe, Ohio.
- Clements, Harold, 2nd Lt. (Mich. Ag. Col., '17).
- Clemmons, Walter C., 20th Eng. (For.), A. E. F., forest ranger, U. S. F. S.
- Clifford, C. J., Sgt., 10th Eng. (For.), A. E. F., France, forest clerk, U. S. F. S.
- Cline, Albert C., 1st Lt. (N. Y. State Col. For., '18), Aviation, France.
- Cochrell, Albert N., forest ranger, U. S. F. S.
- Colburn, Clayton J. (N. Y. State Ranger Sch., '13), 10th Eng., A. E. F.
- Colburn, H. C., 10th Eng. (Forest), Co. B., Expeditionary Forces, France, U. S. F. S.
- Cole, Paul, 10th Bn., 20th Engrs. (For.).
- Colgan, J. G., 1st Lt. (Mich. Ag. Col.).
- Colledge, Edward W. (Bilt. For. School), Am. Amb. Serv., France.
- Colter, Charles S., U. S. F. S.
- Colville, L. F. (Mont. For. School), 10th Engineers.
- Coman, E. S. (Ore. Ag. For. Sch.), Corp., 116th Eng., Co. F.
- Coudon, H. R., 1st Lt. (Penn. State, '12), Co. C, 10th Eng. (For.), Pa. R. R. forester, Phila., Pa.
- Cone, Theodore (Univ. of Minn.), U. S. M. C., 71st Co., 7th Eng., Santiago de Cuba, care of Postmaster, N. Y.
- Conklin, J. (Univ. of Cal., '10), 20th Eng. (For.).
- Conklin, W. Gardiner, 1st Lt., 20th Eng. (Forest), Co. D, 4th Bn. (Pa. State For. Acad., '08); Pa. Dept. For.
- Connor, Frank W., 12th Aero Squadron, Wright Branch, Dayton, Ohio, forest guard, U. S. F. S.
- Conrad, H. H. (Penn. State, '21).
- Cook, Arthur M., Lt. (Yale, '08), Camp Laurel, Md., Co. B, forest supervisor, U. S. F. S., 601st Engrs.
- Cook, G. D. (Mich. Agri. College), 1st sergt., 10th Eng. (Forest).
- Cook, John W., clerk, U. S. F. S.
- Cook, H. O., Capt., 2nd Forest Regiment, Mass.
- Cook, Samuel (Mont. For. School, '18), 1st Bat., R. O. T. C., Camp Lewis, Wash., forest ranger, U. S. F. S.
- Cookingham, Kenneth (N. Y. State Col. For., '17), R. O. T. C., Madison, Barracks.
- Coolidge, Philip T. (Yale, '06), Signal Corps Office, 816 Consumers' Bldg., Chicago, Ill.
- Cookston, Roy, Capt., 10th Engrs. (For.), A. E. F.
- Cool, Frank J., master Engineer, 655417, 603rd Regiment of Engrs., A. E. F., U. S. F. S.
- Cool, W. C., 2nd Lt. (Cornell, '10).
- Coolidge, Lieut. Joseph (Harvard, '12), 20th Eng. (Forest), consulting forester.
- Cooper, Carl B., 2nd Lt. (N. Y. State Col. For., '16), Artillery.
- Cope, H. Norton, forest ranger, U. S. F. S. (Penn. State, '15), Sgt.
- Copsey, C. N. (Student Univ. of Cal.), 10th Eng. (For.).
- Corbitt, Willis G. (Univ. of Wash., '18), Co. C, 3rd Bn., 20th Eng. (For.), A. E. F., U. S. F. S.
- Cormany, Conrad P. (Iowa State Col. ex., '19), Corp., Co. D, 41st Inf., Flat River, Mo.
- Cornell, H. H. (Iowa State Col., '18), R. O. T. C., Camp Dodge, Iowa.
- Cortright, J. J., 2nd Lt. (Mich. Ag. Col., '11).
- Covill, L. L. (Univ. of Mont.), 10th Eng. (For.).
- Cowan, Talmadge D. (Mont. For. School), 20th Eng. (For.), forest ranger, U. S. F. S.
- Cox, Windsor G., U. S. F. S.
- Coykendall, William W. (Yale ex., '14), Co. B, 10th Eng. (For.), A. E. F.
- Coyle, William J. (Univ. of Wash., '18), 1st Lt., Inf., American Lake Encampment.
- Crane, Leo (Univ. of Minn., '16), A. E. F.
- Crawford, C. B. (Mich. Ag. Col., '13).
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- Hawkinson, Carl (Univ. of Minn., '15), 10th Eng. (For.), A. E. F., U. S. F. S.
- Haworth, Robert (Univ. of Minn., '13), Co. E, 10th Engrs.
- Hawley, Myron F., 153rd Aero Squad., A. S. S. C., A. E. F., patrolman, U. S. F. S.
- Hayslip, E. E. (Ore. Ag. Sch. For.), 20th Eng. (For.), Co. B.
- Hayward, C. R., Sgt. (N. Y. State Col. For., '20), 5th Pioneer Reg. Spartanburg, S. C.
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- Henry, A. S. (Iowa State Col., '17), Aviation.
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- Howe, George (Ore. Ag. Sch. For.), 116th Eng.
- Howe, John, 10th Engrs. (For.), A. E. F.
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- Johns, Walter Ridgley, Co. D, 163rd Inf., A. E. F., U. S. F. S.
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- Johnson, W. R. (Mich. Ag. Col., '12).
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- Kelly, F. A. (Univ. Mich.), 10th Eng. (For.), A. E. F.
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- Kobhe, William H. (Yale For. School, '04), Capt., 30th Eng. (For.), A. E. F.
- Koch, Elers (Yale, '03).
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- Lyle, Ben, 10th Eng. (For.), A. E. F., U. S. F. S.
- Lyman, L. G. (Ore. Ag. Sch. For.).
- Lyman, R. R. (Penn. State, '18), 10th Eng. (For.).
- Lyon, A. C. (Mich. Ag. Col.).
- M**ACKECHNIE, A. R., 2nd Lt. U. S. A. (Univ. of Wash., '18).
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- Mahoney, Joe, Corp., Co. C, 43rd Engrs., A. E. F.
- Maloy, Thomas P., 20th Eng. (Forest), Co. B, 5th Bn., Wagoner Co. C, 10th Engrs. (For.), A. E. F., U. S. F. S.
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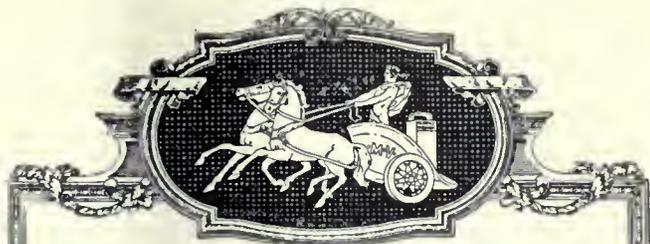
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- Weber, C. G. (N. Y. State College of Forestry, '16), 20th Eng. (For.), A. E. F., U. S. F. S.
- Weiner, H. C. (Penn. State, '14), Lt., U. S. Cavalry.
- Weis, Warren (Minn. For. Sch.), U. S. Marine Corps, 71st Co., 7th Reg., Santiago de Cuba.
- Weitknecht, Robert H., 1st Lt., F. Art., U. S. A. P. O. No. 718, A. E. F., forest assistant, U. S. F. S.
- Weibel, R. W. (Iowa State Col., '19), Amb. Driver, Camp Bowie, Ft. Worth, Texas.
- Welby, Harry H. (Biltmore), 10th Engineers (Forest).
- Weldin, Neil (Iowa State Col. ex, '18).
- Wemple, E. C., Capt., 20th Engrs. (For.).
- Welty, Clarence, 20th Eng. (For.), Co. F, 4th Bn., American Univ., Wash., D. C.
- Wells, Arthur B. (Mt. Alto, '11), Bat. E, 76th Fld. Art., Camp Shelby, Hattiesburg, Miss., Pa. Dept. For.
- Wentling, Floyd, 10th Engineers (Forest), state forest warden.
- Westveld, Marinus (Yale, '16), forest examiner, U. S. F. S.
- Wheeler, Levi (Ore. Ag. For. Sch.), 20th Eng. Co. B.
- Wheeler, R. C. (N. Y. State Ranger Sch., '16), 10th Eng., A. E. F.
- White, Arthur B., Navy, Labor Helper, U. S. F. S.
- White, G. O. (Univ. Mich., '17), Officers Training Camp, Camp Stanley, Texas, 8th Inf.
- White, Martin E., forest ranger, U. S. F. S.
- White, Sylvester J., Co. B, Marine Barracks, Mare Island Vallejo, Calif. (Forest Ranger, U. S. F. S.).
- White, William E. (Mich. Agr. Col., '10), 10th Engr. (For.), Co. D, 2nd Bn., A. E. F., France, forest examiner, U. S. F. S.
- Whitehead, Edw. D. F. (N. Y. State Col. For., '19), Aviation in France.
- Whitehead, Gustavus A., Shipping Board, Forest Ranger, U. S. F. S.
- Whitney, Raymond (Yale, '15), 20th Engineers.
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- Wilcox, J. M., Corp. Inf. (Univ. of Wash., '20).
- Wilder, Raymond T., 20th Engineers (Forest), Mass. For. Dept.
- Willeger, Sigmond (N. Y. State Col. For., '20), Aviation Corps.
- Wilford, J. E. (Penn. State Col., '14), 10th Engrs. (For.).
- Wilkerson, Alvin E., Co. D, 10th Bn., 20th Eng. (For.), Reg. Hdqrs., A. E. F., U. S. F. S.
- Williams, Harold T., 20th Eng. (For.), forest guard, U. S. F. S.
- Williams, Hubert C., (Yale, '08), 1st Lt. 10th Eng. (For.), A. E. F.
- Williams, I. A., 1st Lt. (N. Y. State Col. For., '14), 104th U. S. F. A., Spartanburg, S. C.
- Williams, Jack, 665 Aero Squad., Aviation Field, Hempstead, L. I., N. Y.
- Williams, Robert C. (Wyman Sch. Woods, '17), Corp., 2d O. F. A., Battery A.
- Wilson, D. M. (Ore. Ag. For. Sch.), 2nd Lt., Cav., Troop B, 8th U. S. Cav.
- Wilson, F. G. (Mich. Ag. Col.).
- Wilson, Robert (Univ. of Minn., '18), Capt. Co. F, 1st N. D., Charlotte, N. C.
- Wilson, S. A. (Ore. Ag. Sch.), Army and Navy Y. M. C. A.
- Wilson, Stanley F. (Yale For. School, '14), Bat. C, 19th Fld. Art., Camp Stanley, Texas, forest warden, Jonathan S., forest ranger, U. S. F. S.
- Wingett, Charles V. (Univ. of Mont.), 10th Engineers (For.), forest ranger, U. S. F. S.
- Winter, William (Yale ex., '07), Adjut., Aero Genl. Supply Depot, Garden City, L. I.
- Winn, Courtland S., Jr., 20th Engineers (Forest), A. E. F., Forest Ranger, U. S. F. S.
- Wirt, William (Univ. of Wash., '18), Amb. Corps.
- Wise, Lloyd (Ohio State, '17).
- Wisner, Victor, (Syracuse, '17), Corp. 20th Eng.
- Wissink, Walter C., clerk, U. S. F. S.
- Withington, George T. (Biltmore), New England Saw Mill Units, Scotland.
- Wohlenburg, E. F., 1st Lt., Co. C, 10th Engrs. (For.), A. E. F., forest examiner, U. S. F. S., France.
- Wold, Henry, Sergt., at present instructor in the Ordnance School at the Univ. of Chicago, formerly forest clerk, U. S. F. S.
- Wold, Henry F., Ord. Corps, N. A. Supply Div., Rock Island Arsenal, Rock Island, Ill., clerk, U. S. F. S.
- Wolf, A. L. (Mich. Ag. Col.).
- Wolfe, Kenneth, Sgt., Co. D, 10th Engrs. (For.), A. E. F.
- Wolfe, Stanley L. (Penn. State, '12); 1st Lt. 10th Eng. (For.), A. E. F., France, U. S. F. S.
- Wood, Arthur P. (Yale ex., '18), Provisional Co. No. 1, Amer. Ord. Base Depot in France.
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- Wood, Homer (Ohio State Univ., '17), Quartermaster's Dept., O. N. G.
- Woodburn, Howard (Ore. Ag. For. Sch.), 116th Eng.
- Woodman, J. E. (Univ. Mich., '18), Aviation Section, S. E. R. C. Ground Sch., Princeton, N. J.
- Woodruff, James A., Lt.-Col. commanding 10th Eng. (For.), France.
- Woodruff, Wynne B. (N. Y. State For. Sch., '17), Coast Art. 3rd Co., Ft. Hamilton, N. Y.
- Woodschlager, Theo. P. (N. Y. State Col. For., '20), Army.

Woodward, Ward N. (Univ. of Mont.), 20th Eng (For.).  
 Woodward, William M. H., 1st Lt., O. T. C., Camp Humphrey, Belvoir, Va., mineral examiner, U. S. F. S.  
 Woods, J. B., 1st Lt., Co. A, 10th Eng. (For.).  
 Woods, L. R. (Ore. Ag. Sch. For.), Sgt., Light Art.  
 Woolsey, Theodore S., Jr. (Yale, '02), Maj., 10th Eng. (For.), Am. Exped. Forces, France.  
 Work, Herman (Penn. State, '10); 1st Lt. 10th Eng. (For.), deputy forest supervisor, U. S. F. S.  
 Wright, Clifford A. (Univ. of Wash., '17), Sgt., Quartermaster's Corps, Camp Johnson, Jacksonville, Fla.  
 Wright, Mark (Ore. Ag. Sch. For.), 30th Eng.  
 Wulff, Johannes (Yale For. School, '17), Co. C, 504th Engrs., Serv. Bn., A. E. F.  
 Wyatt, Robert L. (Wyman Sch. Woods, '16), Co. B, 10th Eng. (For.).  
 Wycoff, Garnett (Ohio State, '13), 10th Engineers  
 Wylie, L. P. (Iowa State Col. ex, '14), Co. D, 20th Eng. (For.), A. E. F.  
 Wyllie, James A., Co. F, 10th Eng. (For.), A. E. F., France, U. S. F. S.  
 Wyman, Hiram (Univ. of Minn., '15), 10th U. S. Eng. (For.), A. E. F., France.  
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 Zeller, R. A., Co. E, 161st U. S. Inf., Camp Mills, L. I., N. Y., forest assistant, U. S. F. S.  
 Ziegler, E. A. (Direc. Penn. State For. Acad., Mt. Alto), Capt. Coast Art. Serv., Box 129, Fortress Monroe, Va., Pa. Dent. For.  
 Ziegler, Robert H., 10th Engrs., forest ranger, U. S. F. S.  
 Zimmerman, Conrad W., Signal Corps, Engr. in Forest Products, U. S. F. S.



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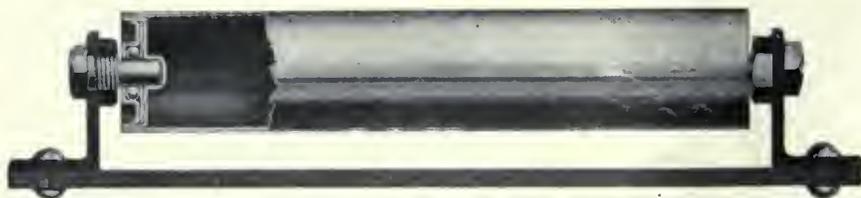
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## MEMORY OF DEPARTED FORESTERS HONORED

**U**NUSUAL and lasting honor to the memory of former district ranger, Roy Muncaster, who lost his life when the *Tuscania* was torpedoed, has been paid by the United States Geographical Board, according to notice received by District Forester George H. Cecil, of Olympic, Oregon. The information is conveyed that a peak of the Olympics has been named Muncaster Mountain, in honor of the heroic forester, who was a private in the 20th Engineers, (Forest). The peak is on the line between townships 24 and 25 north, range 7 west, north of Quinault River and south of Rustler River in the district of the Olympic National Forest formerly administered by Ranger Muncaster. His courage and nerve in the face of danger is attested by his last words: "Cheer up, Harp, we'll get the Kaiser yet," spoken to E. E. Harpham, a brother forester who was in the lifeboat with him, just before their frail craft was smashed on the rocks. Similar honors have been paid to two other departed foresters in the north Pacific district, Plummer Peak in the Tatoosh range, Washington, having been named for Fred G. Plummer and Ireland Mountain in eastern Oregon for Henry Ireland.

## HOO-HOO ANNUAL MEETING POSTPONED A YEAR

**A**FTER consulting the members of the Supreme Nine and House of Ancients regarding the 1918 annual, Snark of the universe, W. A. Priddie has instructed Secretary-Treasurer, E. D. Tennant to announce that it is the unanimous opinion of the executive boards of the Order that, for patriotic reasons, the 1918 Annual Meeting be postponed, to take place in Chicago September 9-10, 1919.

The reasons that induced the Supreme Nine and House of Ancients to come to this decision were principally that, owing to a large proportion of our members being engaged in the manufacture of lumber, which is an essential win-the-war industry, they should not be asked to take time from their work to attend an annual meeting. Also, that the fourth Liberty Loan is due September 28th.

The cost of attending an annual this year would be almost double any previous year and, as the members of the Order of Hoo-Hoo are determined to do their utmost toward helping the Government win the war, they felt it was the patriotic duty of the members to forego the pleasure of meeting their fellow Hoo-Hoo at an annual and save the money for Liberty Bonds.

It also costs considerable for the Order to hold an annual meeting and it was decided that this money should be conserved for work that will help the Order do its share in the all-important duty of beating the Hun.

**MCCULLOUGH WALNUT TREES FOR GOVERNMENT**

WHAT has been known as "The Walnut Grove Farm," near Troy, Ohio, belonging to D. M. McCullough, must now seek a new name and the owner thinks that it might be called, appropriately "The Liberty Farm."

The reason for the change in name is the result of a call which Lieut. J. F. Keene, of the ordnance department at Washington, made upon Mr. McCullough, when the military officer suggested that the Government would like to have all walnut trees of any value on the place. As the results of the visit Mr. McCullough arranged to sell the trees to J. W. Frye, representing the Hoosier Veneer Company, of Indianapolis, which has a government contract.

All of the walnut trees, except three, located in the back woods of the farm, will be cut down and shipped to Indianapolis, while a large part of what is known as the "walnut grove" will be cleared.

At the same time W. J. Meredith, residing on the ridge north of Troy, arranged to sell all of the walnut trees on his land. Mr. Meredith has some ten trees, all of which are splendid specimens.

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"I think the pictures of the spring wild flowers in AMERICAN FORESTRY are the most superb that I have ever seen. I am so delighted with the magazine that I have subscribed for it."

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"AMERICAN FORESTRY is a magazine with a mission, and is doing much to preserve and increase our beautiful forests, shrubs, birds, national parks, etc. By increasing its scope, it is made more useful, interesting, beautiful and gains a wider circulation. The nature lover is the one who will do most to preserve the beautiful in nature. The admirable series of articles on trees, by Detwiler, are as interesting to me as a novel, and should be published in book form. I was surprised that these articles could be made so intensely interesting. The same is true of the series on birds, by Allen, and these should by all means be published in book form and spread broadcast over the country, so as to still further educate people to the importance of bird life. I hope you keep up the bird department, as this is a very important one from the standpoint of forestry. Articles on shrubs, wild flowers, landscape gardening, parks, rivers, mountains, etc., will add to the usefulness of the magazine. I intend to bind all my back numbers, as the information will be good for generations. I will recommend

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**P**ROCLAMATIONS have been issued by Governor Withycombe, of Oregon, and Governor Lister, of Washington, calling attention to the great fire danger, and warning campers and other forest users to be especially careful in the use of fire. Posters bearing the proclamations have been printed and sent to the Supervisors for posting. Two slogans have been placed on the posters, printed in red: "All campers should carry shovels" and "Patriotic people prevent forest fires."

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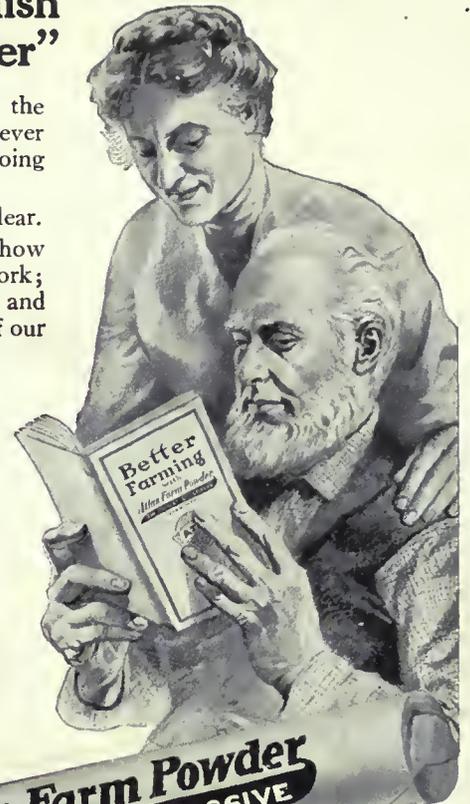
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**National Association of Box Manufacturers**

B. W. PORTER, Greenfield, Mass.  
S. B. ANDERSON, Memphis, Tenn.  
ROBT. A. JOHNSON, Minneapolis, Minn.

**Carriage Builders' National Association**

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D. T. WILSON, New York.  
C. A. LANCASTER, South Bend, Ind.

**Boston Paper Trade Association**

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JOHN E. A. HUSSEY, Boston, Mass.  
ARTHUR L. HOBSON, Boston, Mass.

**Philadelphia Wholesale Lumber Dealers' Ass'n**

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FRED'K S. UNDERHILL, Philadelphia, Pa.

**New Hampshire Timberland Owners' Association**

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F. H. BILLARD, Berlin, N. H.

**Massachusetts Forestry Association**

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FREDERIC J. CAULKINS, Boston, Mass.  
HARRIS A. REYNOLDS, Cambridge, Mass.

**Lumbermen's Exchange**

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**Camp Fire Club of America**

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O. H. VAN NORDEN, New York  
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**Empire State Forest Products Association**

FERRIS J. MEIGS, New York City  
RUFUS L. SISSON, Potsdam, N. Y.  
W. L. SYKES, Utica, N. Y.

**California Forest Protective Association**

MILES STANDISH, San Francisco, Cal.  
GEO. X. WENDLING, San Francisco, Cal.  
GEO. H. RHODES, San Francisco, Cal.

**Minnesota Forestry Association**

W. T. COX, St. Paul, Minn.  
PROF. D. LANGE, St. Paul, Minn.  
MRS. CARRIE BACKUS, St. Paul, Minn.

**American Wood Preservers' Association**

M. K. TRUMBULL, Kansas City, Mo.  
A. R. JOYCE, Chicago, Ill.  
F. J. ANGIER, Baltimore, Md.

**Southern Pine Association**

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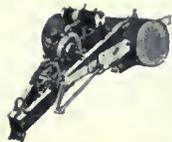
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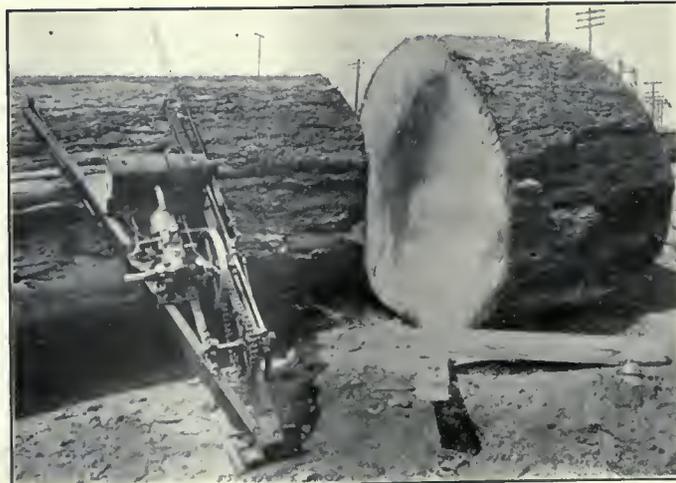
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# American Forestry



FACULTY OF FORESTRY  
OCT 26 1918  
UNIVERSITY OF TORONTO

Y.M.C.A.



Central picture: British Official Photograph, showing destruction of timber at "Great Battle of Messines Ridge." To left: "Logging in the great California forests" (copyrighted by Underwood & Underwood). To right: "Speeding up the great lumber industry in the Northwest to meet war demands" (copyrighted by U. & U.)

# "Conservation Imperative"

*The Waste "Over There" must be replaced by the Plenty "Over Here"*

Never before has the word Conservation held the meaning that it does at present, nor has the importance thereof been impressed upon us as fully as by the gigantic scale of the destruction wrought in Europe.

Our timber resources are still immense. Waste in the utilization of forest products has been, perhaps, the inevitable result of plenty, but today wastefulness in any form is reprehensible.

In the period of reconstruction more structural wood than ever will be required, great as the war demands are, and therefore every stick should be conserved.

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# AMERICAN FORESTRY

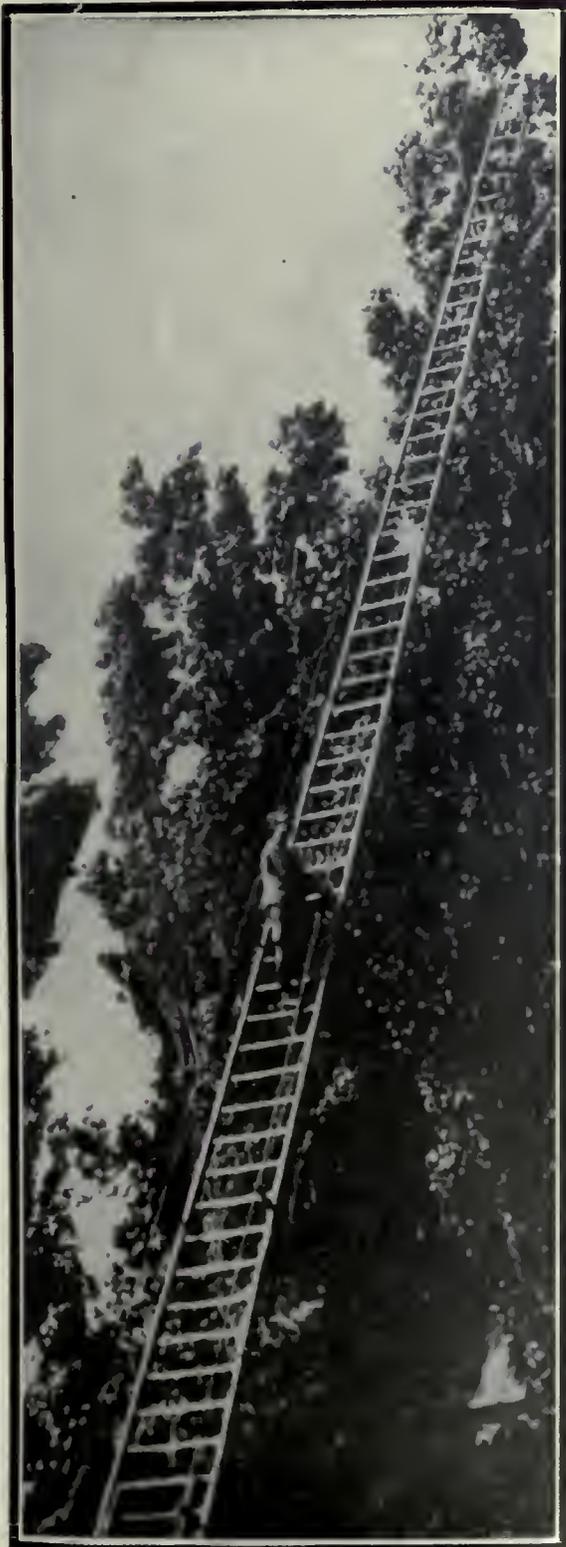
THE MAGAZINE OF THE AMERICAN FORESTRY ASSOCIATION

PERCIVAL SHELDON RIDSDALE, Editor

OCTOBER 1918 VOL. 24

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### ITALIAN OBSERVATORY CLEVERLY SITUATED UP A TREE

This observatory has been cleverly selected by the Italians as a most suitable place for watching the Austrians. Acting under the camouflage screen afforded by the giant trees, the Italians have placed a ladder that reaches to the very tree tops and from here they are able to keep a close watch on enemy movements.



#### WOOD WHICH WILL FLY OVER THE HUNS

This "cord wood" is the finest of black walnut, the best wood known, from which to make airplane propellers and gun stocks. The forests of the United States are being scoured for this material. It is impossible to secure too much, as thousands of airplanes and millions of gun stocks are needed. Americans who own walnut are asked to fight with their trees.

# AMERICAN FORESTRY

VOL. XXIV

OCTOBER, 1918

NO. 298

## WALNUT IN THE WAR

THE government needs now and will continue to need as long as the war lasts all the walnut it can secure; and yet the government will not buy any of this lumber. This sounds paradoxical. It does not mean that Uncle Sam has turned beggar and that he is asking the people of the country to give him their walnut trees. No, it merely means that those patriotic owners of such trees who desire to see them converted into airplane propellers and gun stocks must deal in making their sales with one or more of the saw mills which have government contracts for this material. The government cannot buy either the logs or the trees, as part of the lumber produced by the log is not suitable either for airplane or gun stock making.

"Fight with your walnut!" This is the message which is being conveyed through various channels to everybody in the United States possessing any of this valuable wood which can be utilized for the purposes desired. Boy Scouts, at the request of President Wilson, and the American Red Cross have been among the agencies which are assisting in locating and in persuading the owners to part with their walnut trees.

American walnut is the finest wood that has been discovered both for airplane propellers and for gun stocks. That is the reason why the United States government is anxious to secure as much of it as can be obtained. The supply is not as plentiful as that of many other woods. While there is still a considerable amount of walnut standing in this country, it is not as abundant as might be wished at this particular period in the world's history. Even if

there were more than the United States could use in its war preparations, the Allies are calling for more and would quickly use up any surplus supply of this valuable timber.

Turn your trees loose and put them into the air or the front line trenches to help the American fliers and the American soldiers in their advance for democracy!

In making this appeal the Bureau of Aircraft Production points out that a half dozen walnut trees will provide lumber to build a propeller blade and put a gun stock into the hands of each man in a platoon; and then adds:

"Picture your own son or the son of your neighbor holding on and fighting against desperate odds until the company or regiment your trees have armed can come to his relief. Make this relief possible! Turn your trees loose! Wake up and get into the fight! In this way you will be fighting for and with him as truly as if you stood beside him in battle."

It is interesting to note that the old plea, "Woodman, Spare that tree!" has been of value in this connection. It has preserved many a fine specimen of walnut which now will be able to serve the nation in its time of vital need. "In youth it sheltered me," the appeal to the woodman added: and that same tree now transformed into the swift-revolving propeller of

a speeding air-fighter or into the smooth-polished stock of a gun, will continue to shelter and protect the homes and the lives of democracy the world over.

Sentiment was often the motive which saved some of these finest trees from the blows of the axeman. But



GETTING READY TO FLY

Thousands of feet above the fair plains of France and probably over the Rhine in the propeller of an American airplane this walnut log and its fellows will see service in helping to vanquish the German hordes. A lot of gun stocks also will come out of this pile.

no sentiment today should keep any patriotic American from giving up material which is so urgently and vitally needed in the fight. Whoever has any walnut trees should get in touch at once with any one of a number of lumber companies or manufacturers who have contracts with the government to supply airplane propellers or gun stock material. A list of these is given at the end of this article.

Walnut possesses qualities which make it better fitted than any other known wood both for the propellers of airplanes and for gun stocks. Its strength and lightness combined; and the fact that it does not warp or splinter have placed it in the front rank of forest products for the uses named. These are all important characteristics when it comes to the manufacture of equipment that must stand the hardest tests and the most gruelling stress of war.

With the severe strain to which an airplane propeller is subjected every second of the time it is in active operation, it is essential to the life of the machine and of the flier, as well as to the success of his hazardous tasks that nothing should "give." The slightest warp at a critical moment might work untold and irreparable damage. It might result in the needless loss of hundreds or thousands of lives, or in the turn of a battle.

What is true of an airplane propeller is true also of the trusty gunstock which the soldier polishes carefully and gently and upon which he depends when he goes "over the top" after the enemy. If it fails him it may cost not only his life but that of some of his fellow fighters. In order to do accurate and deadly work the barrel of the gun must be perfectly true. The least warp of the gun stock is very likely to turn the barrel slightly so that it will not fire straight. Surely no one could wish a finer mission for some of the noble old walnuts which have stood for seventy-five or a hundred years, than to see

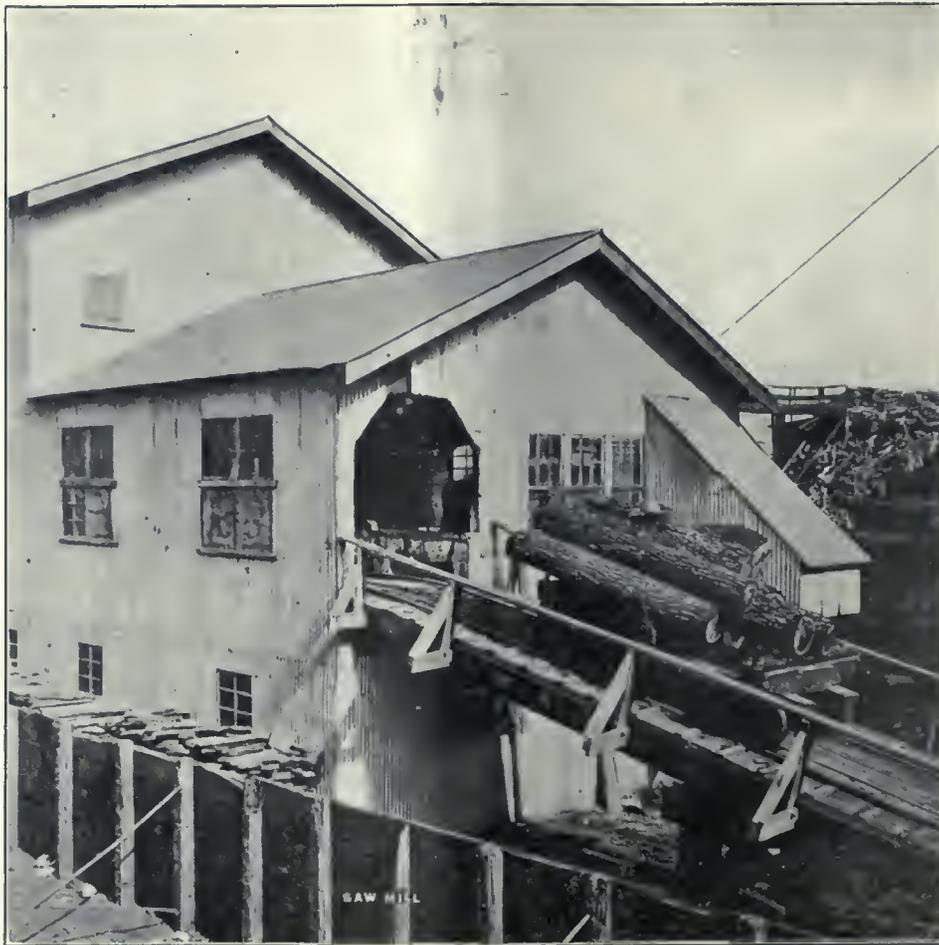
them start for France to help in the drive into Germany.

And like the men that this country is sending abroad, no weaklings are wanted. Walnut trees to be available for either of the uses desired, must be at least twelve inches in diameter at the smaller end; and from logs which are under fourteen inches nothing but gun stock is made. They are too small for airplane making. The trees which will be acceptable for government needs will be from sixty-five to one hundred and fifty years of age, while a few may even exceed the latter age.

The walnut belt of the United States extends roughly from the western end of New England on out into Nebraska, and on the north from a short distance up into the Lake States down into Tennessee. Some scattered walnut is found in other places, but probably not in sufficient quantities to make up car-load lots which would warrant the cutting and shipping of the timber to the manufacturer.

While the government does not buy any of the lumber direct, it has prepared a scale of prices in order that those who have the wood to sell may know what is a reasonable price for them to secure. Buyers for the various sawmills and lumber companies will pay to owners prices in accordance with the government

scale. It should be understood that these are not prices fixed by the government but that they allow only a fair and reasonable profit to both the mills and the log buyer. These prices are as follows:



UP THE ROAD TOWARD VICTORY

These walnut logs going into a saw mill "somewhere in America" are on their way to the battle front "somewhere in France." Part of them will serve the cavalry of the air in the form of airplane propellers. Some will go into gun stocks. Millions of feet are needed for these two purposes. United States foresters and Boy Scouts are helping the Government to locate walnut.

scale. It should be understood that these are not prices fixed by the government but that they allow only a fair and reasonable profit to both the mills and the log buyer. These prices are as follows:

Diameter	Prices of Black Walnut Logs 8 feet and over long on board cars on railroad		Equivalent Value for Standing Timber	
	Minimum	Maximum	Minimum	Maximum
12"-14"	\$45. per M.	\$55. per M.	\$20. per M.	\$35. per M.
15"-16"	55. "	65. "	30. "	45. "
17"-18"	65. "	75. "	40. "	50. "
19"-20"	75. "	85. "	50. "	60. "
21"-22"	85. "	95. "	60. "	70. "
23"-24"	95. "	105. "	70. "	80. "
25"-26"	105. "	115. "	80. "	90. "
27"-28"	115. "	125. "	90. "	100. "
29"-30"	125. "	135. "	100. "	110. "
31" and up	135. "	150. "	110. "	120. "

No logs of less than the dimensions mentioned should be cut as they are too small to pay either the owner or the saw mill and they do not produce governmental material. Where possible logs should be cut ten feet and up in length, as the longer logs produce more material suitable for the government's needs.

There must be no "slackers" among the trees any more than among civilians. Every one that can be drafted into the service must be numbered and called to arms. It is the duty of every patriotic citizen to see that there is no evasion. The



LOGS LIKE THIS ARE SCARCE

The figure 1452, chalked on the side of this six foot walnut log, does not indicate the year in which the tree began to grow, although it was about 150 years old. It has been saved for America to help fight in the present war. In spite of its monstrous weight it will rise like a bird and, transformed into an airplane propeller, soar thousands of feet above the earth.

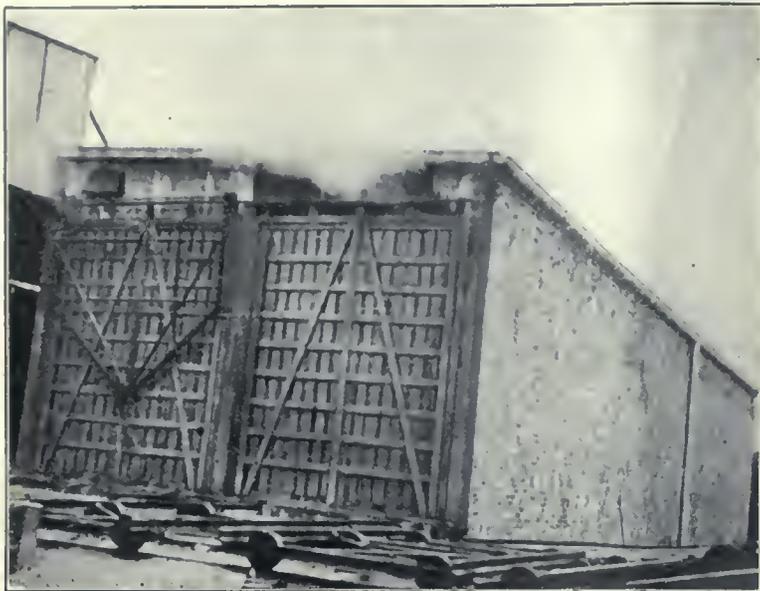
dling this end of the work testify to the assistance which is being rendered them in this way. The Boy Scouts are taking great pride in this patriotic service and have entered into it with the same spirit they displayed in selling

work that the Boy Scouts have been doing in spotting walnut trees all over the United States is proving very helpful and has won for them hearty commendation. As the boys discover the trees they notify their scout master who in turn prepares a report which is forwarded to the proper officials. The army officers who are handling



HOW NEBRASKA IS HELPING

Most people do not think of the state by the Platte as having any woodland, and yet it is turning out some of the walnut for which the Government is now eagerly searching all over the country. A belt from Massachusetts to Nebraska and from the Great Lakes to Tennessee virtually covers all the walnut territory of the United States.



GETTING THE STEAM UP

In this kiln 17,000 gun stock blanks are being made ready for service. Five days is about the time required to prepare them. The walnut timber which goes into airplane propellers is steamed in a similar way before the turning of it into its finished shape is begun. At some points whole batteries of kilns are at work, hissing out the smoke of battle thousands of miles from the firing line.

Liberty Bonds and War Savings Stamps and in planting war gardens. As a result of the President's personal appeal to them they feel that they are the trusted messengers of the commander-in-chief of the American army and navy. In some places the boys attach tags to the tree located, giving the name of the scout and his troop number, and adding that this marking was done "at the request of the President of the United States." With reports still coming in, there have been located in this manner about 4,000 carloads of lumber.

Valuable aid is being given by the American Red Cross which has sent requests to its chapters and branches in various parts of the country to direct the attention of the members to the need for walnut. This help is referred to as "an opportunity to demonstrate their patriotism in a most practical and effective way."

"Owners of walnut trees can probably find out in your community," says the Red Cross statement, "which saw-mills have government contracts, but if this information is not available, please write, giving the number of trees and their location, to the Ordnance Department, Procurement Division, Small Arms Section, Washington, D. C."

One Red Cross member who desired to donate some trees to the government was informed that this could not be done but that the same result could be accomplished if the trees were given to the Red Cross chapter or the national organization which could sell them and use the money thus obtained to aid in the great philanthropic and life-saving work of that society.

Offers of all sorts have been received. People have written in to inform the war department that they had an organ, a walnut bedstead, some furniture, a few boards in the attic or other small pieces of this wood. Of course, the patriotic spirit back of these desires to help is greatly appreciated, even when the material is not available for

use. Unless as much as a carload lot at least could be assembled in the same neighborhood, it would not be practicable to utilize the lumber.

Representatives of the United States Forest Service and county agents of the Department of Agriculture, in addition to their own field men, are working with the Bureau of Aircraft Production and the Ordnance Department in locating walnut and in getting the owners in touch with the buyers. There is complete co-operation between these two branches, and after that part of the lumber has been taken which is most suitable for one purpose, the balance is applied to the other. Ordinarily when a large tree contains material for both airplane and gun stock use, about fifteen per cent goes into the former and seventy-five per cent into the latter, the remaining ten per cent being sold for small furniture manufacture or some similar purpose. Trees which are large enough for government use as a rule would be fifty inches and up in circumference at a point breast high.

Three giant black walnuts which had stood in the graveyard of a Presbyterian Church in a little Maryland town for almost two hundred years, have



"DRAFTED FOR SERVICE"

This fine old walnut tree has been selected to serve the country whose soil nourished it. There will be no cry of "Woodman, spare that tree," when the ax is laid to the root, for it has been called into the service of the Government. It will soon be on its way to the airplane and gun stock factory.

recently bowed their leafy heads to the needs of their country. For twenty years the women of the congregation had opposed all attempts to have the trees removed. Twenty years ago the trustees of the church decided to sell the trees. The women protested. While efforts were being made to come to a decision, some stranger offered the trustees a sum equal to the value of the forest giants provided they were allowed to stand until the timber was actually needed. No one today knows the name of the man who proved to be such a benefactor to America and saved the walnut mammoths until this hour of need. Get your walnut trees into the fight!



OFF TO THE GUN FACTORY

This load of gun stock "fitch" is going to help the boys in France bring home the "bacon." These walnut boards are ready to be cut up into the rough forms which then quickly will be shaped and polished into fine handles and settings for gun barrels.

Your country needs them! That is the message which whirrs from the propeller of every American or Allied airplane as it starts after a flock of Boche fliers who may be on their way to bomb a hospital. That is the message whizzed from every bullet that speeds from an American gun to help crush militarism and bring justice and righteousness to the war-ridden world. No one surely can fail to heed the call.

Herewith is a list furnished by the Bureau of Aircraft Production and the Ordnance Department, giving buyers of walnut for airplane and gun stock material:



WIN WITH WALNUT!

The American flier and the American fighter are counting on those back home to turn out many great piles of walnut like this to furnish the whirling propellers which will send them forward over the enemy's lines and the gun stocks in whose strength they trust.

## WALNUT MANUFACTURERS WITH GOVERNMENT CONTRACTS

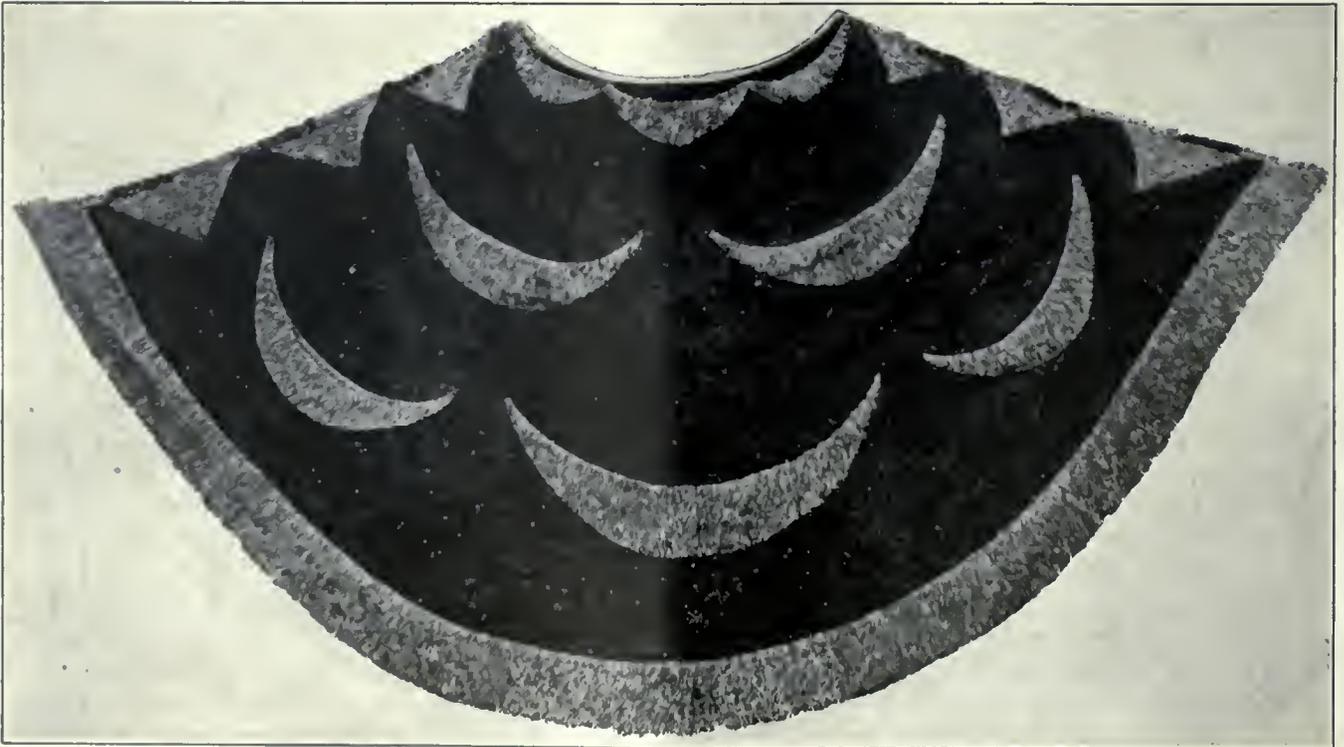
NAME	ADDRESS
Amos Lumber Company,	Edinburg, Indiana.
Central Timber & Express Company,	115 Broadway, New York.
The Cherry Lumber Company,	Cincinnati, Ohio.
Cincinnati Walnut Company,	Cincinnati, Ohio.
Des Moines Sawmill Company,	Des Moines, Iowa.
Farris Hardwood Lumber Company,	Nashville, Tennessee.
T. A. Foley,	Paris, Illinois.
Geo. W. Hartzell,	Piqua, Ohio.
Hoffman Brothers Company,	Fort Wayne, Indiana.
Hoosier Veneer Company,	Indianapolis, Indiana.
Kosse, Shoe & Schleyer,	Cincinnati, Ohio.
Long-Knight Lumber Company,	Indianapolis, Indiana.
Penrod Walnut & Veneer Company,	Kansas City Missouri.
Pickerel Walnut Company,	St. Louis, Missouri.
J. B. Ransom Company,	Nashville, Tennessee.
Sander & Egbert,	Goshen, Indiana.
J. V. Stimson & Company,	Owensboro, Kentucky.
Wood Mosaic Company,	New Albany, Indiana.
I. T. Williams & Sons,	11th Avenue Corner 225th Street, New York.
Williamson Veneer Company,	Baltimore, Maryland.
The Martin Barris Company,	Cleveland, Ohio.
Bear Brothers,	Madison, Indiana.
Burns & Knapp Lumber Company,	Conneautville, Pennsylvania.
Ideal Veneer Lumber Company,	Franklin, Indiana.
T. F. Jennings,	Marianna, Florida.
Keystone Manufacturing Company,	Elkins, West Virginia.
Louisville Point Lumber Company,	Louisville, Kentucky.

NAME	ADDRESS
L. J. Meeks,	Muncie, Indiana.
The Ohio Veneer Company,	Cincinnati, Ohio.
Eisman & Richer Lumber Company,	Peru, Indiana.
N. C. Stansberry,	529 Liberty Street, Jackson, Tennessee.
Coffman Manufacturing Company,	Washington C. H., Ohio.
Fourman Brothers,	Arcanum, Ohio.
Geo. H. Amick,	Clendenin, West Virginia.
C. H. Barnaby,	Green Castle, Indiana.
Langton Lumber Company,	Pekin, Illinois.
W. H. Robinson Real Estate Trust Building,	Philadelphia, Pennsylvania.
W. S. Ranson,	Shelbyville, Tennessee.
Pennsylvania Furniture Company,	York, Pennsylvania.
The Steel Alderfer Company,	Cuyahoga Falls, Ohio.
W. J. McIntosh,	Monticello, Illinois.
C. L. Willey Company,	Chicago, Illinois.
Brown & Harris Lumber Company,	Holmesville, Ohio.
Freiberg Lumber Company,	Cincinnati, Ohio.
Imperial Lumber Company,	Columbus, Ohio.
Nickery Brothers Company,	Memphis, Tennessee.
C. C. Shafer Lumber Company,	South Bend, Indiana.
Talge Mahogany Company,	Indianapolis, Indiana.
Batesville Walnut & Veneer Company,	Laurenceburg, Indiana.
Breece Veneer Company,	Kenova, West Virginia.
Maley & Wertz,	Evansville, Indiana.
Astoria Veneer Mills & Dock Company,	Astoria, Long Island.
J. W. Willis,	Washington, C. H., Ohio.

## WALNUT GUNSTOCK MANUFACTURERS WITH AIRPLANE LUMBER CONTRACTS ALSO

NAME	ADDRESS
Pickerel Walnut Company,	St. Louis, Missouri.
Penrod Walnut & Veneer Company,	Kansas City, Missouri.
Frank Purcell,	Kansas City, Missouri.
Wood-Mosaic Company,	New Albany, Indiana.
Langton Lumber Company,	Pekin, Illinois.
Illinois Walnut Company,	East St. Louis, Illinois.
Hoosier Veneer Company,	Indianapolis, Indiana.
Des Moines Sawmill Company,	Des Moines, Iowa.
John B. Ransom,	Nashville, Tennessee.
Geo. W. Hartzell,	Piqua, Ohio.

NAME	ADDRESS
Kosse, Shoe & Schleyer,	Cincinnati, Ohio.
Long-Knight Lumber Company,	Indianapolis, Indiana.
Chillicothe Gunstock Manufacturing Company,	Chillicothe, Missouri.
Steele Alderfer Company,	Cuyahoga Falls, Ohio.
L. J. Meeks,	Muncie, Indiana.
Breece Veneer Company,	Kenova, West Virginia.
Central Timber Export Company,	New York, New York.
Cherry Lumber Company,	Cincinnati, Ohio.
Pennsylvania Furniture Company,	York, Pennsylvania.



Courtesy of American Museum of Natural History

## A MOST EXPENSIVE CLOAK

THIS FEATHER CAPE, NOW ON EXHIBITION IN THE MUSEUM OF NATURAL HISTORY, NEW YORK CITY, LOOKS VERY COMMON IN A PICTURE. TO DO IT JUSTICE AT ALL IT SHOULD BE REPRODUCED IN ITS NATURAL COLORS, IF THAT WERE POSSIBLE. IT WAS FORMERLY THE PROPERTY OF A HAWAIIAN PRINCESS. IT IS MADE FROM THE SMALL TIPS OF THE FEATHERS OF THOUSANDS OF TROPICAL BIRDS, AND REQUIRED MANY YEARS WORK BEFORE IT WAS COMPLETED. THERE ARE OTHER CAPES OF THIS KIND, BUT THIS ONE, WHILE NOT SO LARGE, IS MORE BEAUTIFUL AND VALUABLE THAN THE OTHERS. THE VARIOUS COLORED FEATHER TIPS HAVE BEEN MARVELOUSLY BLENDED IN THE CONSTRUCTION OF THIS UNIQUE CAPE, WHICH IS VALUED AT TEN THOUSAND DOLLARS.

# A GOOD WINTER SPORT

BY JAMES C. GRAHAM

THERE comes a time in the lives of the most of us when the perfect symmetry of the sphere, whether in the guise of the base ball, the tennis ball, or the golf ball, no longer has its all-compelling powers of seduction. And yet we still need exercise. We need it, not only for the physiological benefits which we derive from it, but also for the joy which it brings to us, irrespective of any other benefit received. But how are we to get it?

The war gardens have, for the present at least, furnished an answer to which many of us have given ear. But even in the Garden of Eden, the tilling of the soil was but a temporary occupation; and in the most of our many states the time of gardening is limited to the few months when the desire for exercise is the least imperative, and the chances for the gratification of that desire are the most frequent. The question which confronts the man of the sedentary life is,—“What can I do in the winter?”

Some of the teachers at Phillips Academy, Andover, Massachusetts, have found an answer to the question which is more than an answer. It not only furnishes the needed exercise, but it provides as well an object and a result of the exercise. Briefly, the answer is “Chop Wood.” But it is more than that. It is to chop wood in such a way that you not only get your exercise and the wood, but provide for more and better wood in the years to come.

The game is this: On the estate of the Academy, two or three hundred acres, there is quite a number of acres of woodland. As in the case of all woods which have received no special care, many of the trees are dead and dying, and many more growing in such a way that good trees are being injured by too close crowding and by less valuable ones in their immediate vicinity. The first thing done was to go carefully over the growth and “spot” those trees which were to be removed later. This was done in the fall, when it was easier to tell the dying from the healthier ones. Then as the winter months passed by, those of the teachers who wished to would go out from time to time and chop them down and cord them up. Later they would saw and split them into lengths suitable for burning in the fire-places. Now Andover is fortunate in that practically all the houses are provided with open fire-places, so that there was a constant demand for all, and more than all, the wood which could be so provided. The result was that the wood sold for a good market price and the proceeds during a season would amount to from fifty to one hundred dollars. And now comes the part of the scheme which gave it interest. All moneys received from the sale of the wood were used in buying young trees and setting them out in deserted pastures and uncultivated land belonging to the school, so that during the past

three or four years more than fifteen thousand (15,000) trees have been set out in this way. They were mostly three-year-old white pine; but in places where the effect of the trees upon the landscape was important, some spruce, hemlock and fir were also planted, so as to give a little variety to the winter green. In one plot a planting of red pine was made and it was found that red pine and white spruce gave the most satisfactory results.

Now this is a winter game which a good many of us can play. It is not necessary that you own the land upon which you work and which you plant. Almost anywhere you can find the woods and the fields necessary for the game. If you or your friends do own the land, so much the better. But if you do not, you can arrange it so that your exercise costs you nothing and when you are through you have made many more than two trees grow where one tree *died* before. If you live in the city, the case may be more difficult. But even for those who are so unfortunate, there is usually some chance to get away for week-ends and occasional afternoons. If you work alone, all that you need is a good ax, a one-man cross-cut saw, a buck saw and a saw buck. If others work with you, a larger cross-cut and a sledge with wedges are often helpful. But one word of advice: Do not buy your axes and saws at the nearest hardware store; but get them from some concern which is in the habit of selling to the men who use these things in the “big woods.”

In regard to the planting of the young trees: In many states young trees will be furnished gratis to those who are doing the work of reforestation; but the people of Andover found it more satisfactory to purchase the stock of some reliable forestry company. Two, three, and four-year-old transplants were all tried, with the result it did not seem to make very much difference which were used, though a system was finally adopted by which the older trees were used for small plantings and the younger ones where several acres of land were to be filled in. The planting was done in some cases by the teachers and in others by the people from whom the trees were purchased. It depended upon the time of planting. As a general rule April seemed to be about the best month; but at that time many of the teachers were busy in their war gardens. As the forestry companies will furnish and plant the trees for from one to two cents apiece, depending upon the age of the trees and the number ordered, it was fully as convenient to let them do the planting when there was other out-door work to furnish productive employment for the teachers. But for those who had no gardens, the planting itself was plenty of exercise.

Note. There will be more work accomplished and less friction developed if you have a “boss.”

# EXPERIENCE OF A FORESTRY ENGINEER OFFICER IN FRANCE

BY MAJOR FRANK R. BARNES

COMMANDING NINTH BATTALION, TWENTIETH ENGINEERS (FOREST)

OUR arrival at the mountain village which was to be headquarters had been anticipated by an advance officer from the adjoining district so that despite rain, snow and separation enroute from our tentage, ranges and rations, we were able, through his practiced direction to secure billets, food and a large English truck, which though clumsy and worn, was a veritable life-saver during the first few days.

Our troops, through the kindness of a local manufacturer, were soon quartered comfortably in a factory

units scratch for themselves, like a wise old hen with its chickens—except on actual essentials—and the supply officers were the busy little persons while learning from where and from whom the various supplies and equipment should come.

When finally the special forestry equipment and the pioneer Engineer equipment, packed and boxed by us with so much care over there (in America) arrived, we were all most heartily glad. The distinctive green stripe around the boxes and crates—originated by our Hibernian Supply Officer, had a homelike and intensely satisfying look, and the axes, saws, cant hooks and other woodstools were greeted with cheers; likewise the rubber boots, gloves, tarpaulins and other



building, which luckily contained several stoves, running water and beds.

Some used tents arrived in a couple of days, and the troops moved to their site in the mountains; but the entire tentage caved in about ten o'clock one night under the weight of an especially heavy snow fall. The men then took possession of a large barn close by and slept in the hay until the arrival of new tents a little later.

For six weeks we had daily rain or snow storms with hail and sleet thrown in for good measure. Mud—ankle, and in places knee, deep.

However, the sun finally appeared from out of the mists, dried our tents and the ground and put better heart into our rain-soaked woodsmen, who had worked continuously under the conditions mentioned. Our Headquarters had adopted the plan of letting the new Forestry

THE STEEP, INCLINED ROAD

This shows a section of the track built up one of the mountain sides in France. The logging is done at top of the mountain and the load is sent down a 72-degree drop, to the bottom for milling.

woods necessities provided through the experienced foresight of our organization purchasing officer in the U. S. A.

The trees came down, our horses, harness and log wagons arrived, and gradually organization and operation began to take shape. As weeks passed the piles of cordwood, ties and other hewn material grew; logs were banked around the mill site and logging trails.

Soon the mill machinery began to arrive, was placed, the mill frame went up and our saw sang its way through the first log and cut some good one and two



Underwood and Underwood—British Official Photograph

THIS IS A TYPICAL SCENE IN NORTHERN FRANCE TODAY

Beaumont Hamel, where the brutal mark of war is indelibly placed. Before the attack these hills were covered with beautiful trees and sheltered many peaceful homes.

inch lumber which will do its bit toward taking the "I" out of Kaiser.

We have a fine, rugged lot of young Americans, toughened by three months of out of door work in the keen mountain air, and directed by officers trained through years of experience in the various branches of lumbering.

Our first Independence Day abroad was celebrated in true American style and our French neighbors closed their offices and stores and came en masse to look on with

keen interest as the intricacies of base ball and *la boxe* were explained to them in American French.

The importance of our work is realized by all officers and men. They feel that every stick of firewood, every tie, every piece of lumber furnished, may accomplish as much for the common cause as the bullets and shells, and therefore shall use every endeavor to shoot the stuff out of their operations relatively as fast as our boys at the front are handing Boches their pills from American machine guns.



A LOAD OF LOGS ON THE INCLINED ROAD

They are just about to start on the shoot to the bottom. The cable control is perfect. Engine compression is used as brake and it takes just seven minutes to make the descent from the top of the mountain. Note the dense and beautiful forests—in strong contrast to the utter desolation pictured above.



Underwood and Underwood—British Official Photograph



Committee on Public Information

PHOTOGRAPHS PICTURING THE USE OF WOOD

The first picture shows British Tommies in the front area heaving down shell scattered trees for firewood. This gives a good idea of the utter desolation left in the path of battle. And the lower picture shows the transportation of food on a narrow gauge road in a mule-hauled car to the trenches, under cover of dense woods in France.



*Committee on Public Information*



*Committee on Public Information*

#### AND THE WOODS IN THE WAR

The upper picture was taken at a spot very near the front lines in France, and gives a splendid idea of the construction of a first-class shell shelter, doubly protected by the woods in front. In the lower picture are shown typical dug-outs, this one being that of a post commander. He is receiving a message for artillery barrage. Note the walk made of wooden trench-mats, or "duck boards."

## MEXICAN FORESTS AFFORD MANY VALUABLE WOODS

**R** EPORTING on commercial woods of the Mazatlan district of Mexico, Frank C. Jordan, clerk in the American consulate there, writes in part as follows:

"Following is a list of twelve woods which are available in sufficiently large quantities for commercial purposes, though the question of getting them to the market is a serious one:

"Palo Prieto.—Found over all the southwestern part of Mexico, is quite common in Sinaloa, but does not here reach the enormous size of the trees in the extreme southern part of the republic. Both sap and heart wood are highly resistant to rot, and it is considered one of the best woods of Mexico.

"Ebano (ebony).—Found all along the coast of Mexico, grows to a large size in Sinaloa, but the logs are not very straight. Logs of more than twelve inches in diameter with perfectly sound hearts are very rare. The excellent qualities of this wood when cut from live, sound trees are known all over the world.

"Amapa Negra, or Amapa Verde.—Found all over Mexico. In the state of Sinaloa the trees are rather small in size, although plentiful. It is a very much better wood than the Amapa Blanca, and is employed rather extensively in shipbuilding.

"Tepemezquite, or Meuto.—Found all over the southwestern part of Mexico and is especially plentiful in the states of Sinaloa and Nayarit (Tepic). Used extensively in shipbuilding, especially where heavy compressive stresses are encountered. Its worst characteristic is a tendency to check badly when exposed to the sun, the ends frequently opening up for a distance of two or three feet and curling back on the log.

"Truchas or Trucha.—Found all over the Pacific coast of Mexico. Grows well in Sinaloa, especially in the southern part. This wood is used in shipbuilding wherever heavy tensile stresses are encountered.

"Palo Amargo or Cedro Blanco (Mexican white cedar).—Found all over the northwestern part of Mexico. Grows to a fair size only and is not very straight. The Mexicans consider this wood to be superior to the best Douglas fir or yellow pine. It is used very successfully in naval construction where a light wood of the approximate strength and resisting qualities of Douglas fir is required.

"Palo Margarita or Baritillo.—Very often confused with the Palo Fierro (ironwood). Found all over the southwestern part of Mexico and quite common in Sinaloa. Considered one of the very hardest of the hardwoods and used very extensively in shipbuilding, especially where heavy compressive stresses occur.

"Haba.—Very plentiful in the coast country of Sinaloa and Nayarit. Grows to a large size, fairly straight, and is seldom hollow. Considered by Mexican shipbuilders to be the best native wood for naval construction. It is rather difficult to handle when green, as the sap burns the skin upon contact and is very plentiful just under the bark of the tree.

"Guayacan (lignum-vitae).—Very plentiful on the west coast of Mexico from the state of Sonora to Oaxaca. Grows to greater size and degree of hardness in southern Sinaloa and Nayarit. Regarded as one of the most reliable woods growing in Mexico and undoubtedly the best for certain parts of ships. When placed in very dry places, however, it is liable to become brittle and break under heavy shearing stresses.

"Amapa Blanca.—Found all over the republic of Mexico; in the state of Sinaloa grows to a fairly large size and is quite straight. While the Amapa Blanca is not so durable and is more liable to decay than others of the Mexican hardwoods, it is considered well adapted to take its place among the most reliable materials in shipbuilding.

"Mora Amarillo (logwood).—Found all over the west coast of Mexico in great quantities, the most durable kinds being from the state of Sinaloa and Nayarit. Considered and proved to be one of the native woods most highly resistant to the effects of salt water, damp atmosphere, and rot induced by vegetable fungi. Its qualities as a dyewood are too well known to require comment.

"Arellano or Palo Colorado (rosewood).—One of the softest of Mexican hardwoods. Undoubtedly has the greatest resistance to decomposition induced by vegetable fungi of any of the native woods. It is found in Sinaloa, Nayarit, Colima, Jalisco, and Guerrero, and it is considered by the natives to be well adapted to constructions of all kinds where strength, durability and reliability are essential."

**I** N STRONG and characteristic fashion, the Southern Pine Association pledged itself to the service of the Government by adopting the following resolution at its recent impressive meeting at New Orleans:

"To accomplish our war aims, it is essential that the nation administer in a very large way our industrial efforts. To this end the War Industries Board was created. Fully appreciating our responsibility, we offer to the War Industries Board every resource of our industry and pledge our unreserved co-operation."

**S** EVERAL years ago basket-willow cuttings were furnished to a number of persons in District 6 of the United States Forest Service to find out if there are regions in the district specially adapted to the growing of the species. Mr. Luther J. Campbell, of Walla Walla, Washington, writes that he has been able to grow some good basket-willow from the cuttings. He sent 150 pounds to a furniture company, at Portland, who found it suitable for their use and requested him to take up basket-willow growing on a larger scale.

## THE WHY OF THE "Y"

SOMEWHERE in the woods of France a big husky young American was swinging his ax with a vim which sent the music of his strokes echoing through the forest. He was many miles back from any firing line but he was working as if a regiment of Germans were about to fall upon him and his life depended on how many trees he could fell before they made the attack.

He was a member of a Forestry Regiment which had begun its wonderful work in France. It was getting dusk.

"Sam, I guess we'll call it a day now," said his superior officer.

"All right, lieutenant," replied Sam. "But if it's all the same to you, lieutenant, I'd like to work a little longer. I think I can clean up quite a bit yet before it gets too dark to see. I understand that some of this lumber we're cutting is going into one of the new Y. M. C. A. buildings over at —, and that they want to get it up as quick as they can.

"You know, lieutenant," he continued, "I'm from way out almost in the back woods and I had never even heard of the Y. M. C. A., or the "Y," as the boys call it, until I got in the army. But I remember there was a Y. M. C. A. man with his Red Triangle on his sleeve passing out cakes of chocolate and cigarettes at the station when we

were starting off to embark; and I remember that there were some of those same fellows on the dock when we landed in France, and one of them said to me: 'What state are you from?' and when I said 'California,' he said, 'Why, that's my state, too.' I tell you it helped to have a friendly word like that and made me feel sort of home-

like. I had been feeling kind of blue. And then I remember seeing those 'Y' men along the way as we came out here; and they were always doing something to help somebody, it seemed to me.

"That is why I want to help them, lieutenant. They need the lumber for their huts and other buildings, and if I can do a little to help them get their buildings up quicker, I want to do it, if it is all right with you, Sir."

"Well, Sam," replied the young lieutenant, as he thought with distant eyes of the far-flung line in the United States and France over which the Y. M. C. A. had its messengers of good

cheer stretched, "if you want to work a while longer, go to it; and more power to your arm."

"Thank you, Sir," smiled Sam, as he touched his forehead in salute.

And that is why the merry blows of the American forester's ax were heard in that particular stretch of



WORKING UNDER FIRE

Y. M. C. A. workers distribute food and supplies to soldiers in advanced positions, carrying supplies five miles through trenches under fire. The front cover of this issue of American Forestry was inspired by this photograph, which is an actual picture of the exterior of a Y. M. C. A. canteen dug-out, situated only 150 yards from the Boche lines.

French woods long after the sun had gone down.

The men of the Y. M. C. A. are worthy of such unselfish assistance, for they are working night and day to perform the deeds of service and of helpfulness which are making the lives of the American soldiers and sailors so much happier. Without any more thought for their own safety than the soldier displays they disregard danger from shot and shell in order that they may be near "the boys." In their little shelters right up close to the firing line they pass out hot coffee and cakes of chocolate and give the final word of cheer to the fighters just before they go "over the top." They are there to help them and welcome them when they return wounded from the trenches or the charge. They give them food and drink, help to furnish first aid, often giving up their own beds in order that some soldier who needs rest may lie down and get a little nap.

The danger to which they are constantly exposed and the nature of the work they are doing is best shown by the fact that a large percentage of the "Y" men close to the front are hit by flying shells and wounded or killed. These soldiers of good cheer are brave men, worthy of the nation's highest praise, encouragement and support. But wherever these workers are,—at home, in the camps, in the ports where the American troops land, in the distributing centers in France or in shelters close to the jumping off place into "No Man's Land," they are doing a service which in the opinion of army officers and laymen alike is of the most vital character in helping to maintain the efficiency, both physical and mental, of the men who are fighting the battles of democracy.

There are approximately 2,500 American Y. M. C. A. workers, about 300 of them women, now serving American and French soldiers in almost 1,200 different centers throughout France. The familiar Red Triangle holds out its inviting sign to all alike; and no group of soldiers when looking for a place of rest or amusement, has to seek far afield. These havens dot the landscape,

shining out amid the hell-like night blaze of battle "like good deeds in a naughty world."

There is scarcely a comfort, except that of actual home, which the "Y" does not supply to Uncle Sam's fighting men. Moving pictures and lectures, school facilities and books, writing rooms and athletic outfits, pianos and phonographs, games and tobacco cutters—these and innumerable other things are among the outward signs of home surroundings which the organization provides for the soldiers.

One of the biggest phases of its work is the handling of the six hundred post exchanges of the American Expeditionary Forces. The total sales at these exchanges are expected to amount to \$75,000,000 a year. Every month from three to four thousand tons of post exchange supplies go from America to France, while additional supplies are purchased in England and France. Eight factories have been taken over in France by the Y. M. C. A. to fill the needs. Five of these factories are for the making of chocolate, of which the American troops eat 920,000 pounds a month, while the other three make biscuits and cookies.

In a single order recently the Y. M. C. A. bought 1,337 tons of tobacco of all kinds, chewing tobacco being purchased by the half-dozen carloads. At one time there was a single shipment of 900,000 cigars on the seas for the post exchanges.

In times of emergency large quantities of these supplies are given to the men. The post exchange enterprise is not a money-making one but the effort is to have it self-supporting. All goods sold at any time by the Red Triangle are handled through the post exchanges. All of the other vast facilities furnished by the Association are free. Approximately one million sheets of writing paper are given to the men every day. A fleet of about two hundred trucks and automobiles are maintained to transport pianos, books, stereopticons and other articles needed in the "Huts" so that none of them may be lacking even for a day in many of the requisites to the comfort and welfare of the American soldier.

### "FOLLOW WASHINGTON TO THE END"

**I**N CONCLUDING a patriotic and most impressive address before the recent convention of the Southern Pine Association at New Orleans, Mr. John H. Kirby said: "It is our duty as Americans, as true-blue Americans and men, to get behind Washington in our program, whether we think it right or wrong.

"Our boys this very minute, over yonder, millions of American boys are 'going over the top' and offering themselves as willing sacrifices upon the altar of Liberty, to the end that the blessings of peace and the spirit of Democracy and Liberty may descend to our posterity. Let us not falter, let us go forward—whatever may be the sacrifice—and hold up their hands. Let us go forward as one man and co-operate with whatever plans Washington may formulate, not only for our industry but for all other industries. Let there be no "slackers" among us, whether we approve or disapprove of the

plans that are formulated in Washington. Let us bear in mind that fathers in this country have given their sons to this great cause; that mothers have kissed their boys in khaki farewell, not knowing but that it was for eternity; that brave young wives have placed the sword in the hands of their husbands, and bid them 'Charge.' For God's sake, can *we* falter? Civilization is in the balance, Humanity is in the balance, Liberty is in the balance. Whatever Washington's plans may be to get men and send them over, provide for them, transport them; whatever bans they may put on industry, or whatever orders they may give out, let us obey. Let us say to Washington, as true-blue Americans,—whether we think they are right or wrong, we know that the more men they send, the fewer we will lose,—let us say to Washington: 'Win this fight, win it quick, and we will follow you to the end,—just point the way.'

# THE USES OF WOOD

## THE EMPLOYMENT OF WOOD AS HOUSE FINISH

BY HU MAXWELL

**Editor's Note.**—This is the sixth story in a series of important and very valuable articles, by Mr. Maxwell, on wood and its uses. The series will thoroughly cover the various phases of the subject, from the beginnings in the forest through the processes of logging, lumbering, transportation and milling, considering in detail the whole field of the utilization and manufacture of wood.

**T**IMBER and lumber used in their rough form for the frames and roofs of buildings were considered in preceding articles of this series; but these are not the only forms in which wood is employed in the construction of houses. Finishing material, or trim, is wanted for both the outside and the inside. This consists of stuff that has been through the planing mill or some other wood-working factory where it has been surfaced, cut, carved, or otherwise prepared by machinery for final use. It is included in the general term of mill-

a similar kind. They are not part of the building itself and frequently may be removed without much injury to the building or to the fixtures themselves. Furniture differs from both finish and fixtures in that it may be moved in and out at will without injury to itself or to the house. The three products, finish, fixtures, and furniture, are nearly always intimately associated in use and in statistics, but in the present article finish alone is considered. The wood from which finish is made is nearly always machine-worked so far as molding, beading, and



WHITE PINE EXTERIOR FINISH

Fine northern residences with massive columns and broad cornices have been constructed of white pine since colonial days, and many of the oldest of them remain in an excellent state of preservation till the present day. But all the details are not massive. Small balustrades, delicate moldings, and small latticework have their places also.

work; but that term is broad, and much millwork is not intended for house building.

There is a relationship between house finish, and store and office fixtures, and a relationship, also, between such fixtures and furniture, and it is not always easy to determine the dividing line separating them. However, some of the distinctions can be borne in mind and they will assist in segregating these related classes of woodwork. Finish is built in as a part of the house. It is not intended to be removed, and usually cannot be separated from the building without being destroyed or much damaged, and at the same time defacing the building from which it is taken. Fixtures include counters, show-cases, cabinets, shelving, low partitions which do not extend to the ceiling, and numerous other appliances of

polishing go, then carpenters cut, fit, and join the different parts. Formerly, before machinery was in much use, carpenters, cabinet makers, and joiners worked with planes, saws, augers, chisels, and other tools, to convert rough lumber into finish for houses. The processes were then very slow and the results were generally much below what passes for good finish only. Solomon is said to have had a considerable army of workmen getting out and fitting the finish of his Temple during several years, and it has been claimed that one modern planing mill and a dozen or so of good carpenters could duplicate the woodwork in the Temple in a few weeks. It is estimated that he did not use sixty thousand feet altogether. It is not necessary to go so far back to find how slow finish work used to be, and how mediocre the workmanship

generally was. It appears upon examination of the finish in very old houses which are still standing. There were some good joiners in those days of hand tools, and a few of them achieved excellent results: but the generality of the work done then in the line of interior finish was crude in comparison with what the planing mill and wood-working factory turn out at the present time.

Numerous and excellent machines have been invented for working in wood, and to them the credit is largely due for the fine trim which is now found, not only in expensive buildings, but likewise in those of only moderate cost. Joiners and carpenters are needed in as large numbers as ever, but by taking advantage of machine-dressed stock, they produce better work and more rapidly than their ancestors were able to do.

Finish is classified as interior and exterior, that belonging inside the house, and that intended for the outside. The principal inside items are ceiling, beams, wainscoting, molding, pilasters, frames, stairs, brackets, and ornaments. Floors are usually considered to be separate from finish, but the two belong in the same general class, and some manufacturers specialize in flooring. Items almost beyond counting belong with interior trim.

The outside of the house receives finish of wood, also, and the separate items are no less numerous than those belonging inside, but the larger of such are cornice, porch columns, railing, balusters, and window and door frames. One part of the frame may be regarded as outside finish, the other as inside, for the frame may extend through the wall. The siding or weatherboarding is some-

times regarded as finish and sometimes otherwise. In that

respect it is like flooring. Buildings of nearly all kinds require wood trim either outside or in, or both. The house of brick, stone, or cement is no exception. Wood is the most popular and most widely used finish, though in some instances metal, marble, tile, or some other material takes its place. The cheapness or the costliness of a house does not determine whether the trim shall be of wood or of something else. Houses of great cost use the output of the planing mill for ceilings, panels, columns, and stairs and the modest cottage does the same. Wood serves the poor and appeals to the rich, and it ministers to the wants and the tastes of both without prejudice or distinction. But there are differences in the way it is used and in the motives leading to its employment, depending upon the builder's skill, purse, purpose, and education. A wooden stair may be as rude and coarse as the ladder leading to the haymow of a barn, or it may be fine and faultless enough for a palace; ceilings may be common or they may be exquisite; posts and columns may be simple and small or carved and massive. Wood serves for all, meets multitudes of demands, in all places and under various circumstances.

Exterior woodwork is usually painted to protect it against the weather; but paint is not needed to protect inside finish, though paint may be used for the sake of appearances. Wood which does duty outside would soon become weathered and dull, unless covered with paint; yet, sometimes a weathered and dull appearance is precisely what is wanted, especially for siding and shingles, and these are frequently and purposely left unpainted, and when they take on the color of a hornet's nest, they are regarded as very artistic. The exteriors of most houses are kept well acquainted with the paint brush. The life of weatherboarding is easily



RICH BUT NOT GAUDY

The accompanying picture of a doorway of white pine attracts by its plainness and perfect harmony. From the days of the Puritan Fathers down to the present time the northern white pine has held its place against all rivals as material for exterior and interior finish, and particularly as doorways of simple plainness.



WHITE PINE CORNICE DETAIL

Though white pine is one of our softest woods, its ability to stand long exposure to the weather is remarkable. The secret of this lies principally in the fine painting qualities of this pine. Oil and white lead adhere to its smooth surface and exclude dampness, thereby hindering decay and weathering. Fine detail lines remain sharp and distinct.

doubled by being protected with a coating of linseed oil and white lead, while porch columns and balusters are apt to take on an appearance of seediness and neglect if left exposed to the elements. Outside house painting is for protection and appearance..

Some interior finish is painted, some is treated with oils, varnishes, and stains which are not intended to conceal the color, grain, and figure of the wood. Paint, being opaque, hides the wood. As to whether oils or paints are preferred, depends largely on the tastes of the owner, but also somewhat on the kind of wood used. Those without attractive color or figure may look better if covered with paint; but if the wood itself is beautiful, it is foolishness to hide it behind the finest paint procurable. Figured and colored woods are oftenest used inside where transparent oils will leave the beauty exposed to view; but no purpose is served by employing such woods outside where weathering will spoil or where paint will conceal them. When rough lumber is used

in the frames and roofs of houses, no attention is paid to the wood's color or figure, or the lack of them; but the case is different with interiors. In coarse, undressed frames, the strength, stiffness, and durability are the chief considerations, but these are not much thought of in

planning finish; for here value is placed upon beauty above everything else, particularly for inside finish.

Both hardwoods and softwoods are employed in interior finish, and both are used outside; but there is wide room for intelligent selection. Generally, hardwoods are liked best for interiors and softwoods outside; but the exceptions to this arrangement are many. For outside

work, the pines have always been in favor, especially the soft pines which exude little resin to mar the paint that is put on them. In the northern region, white pine was always a favorite for weatherboarding, for window and door frames, posts and columns for porches, balusters and railing, and for cornice. That is no less true now than it was a century or two centuries ago when the respectable old New England and New York houses were being erected. The pine was easy to work, and neither sun nor storm ever warped it, and through all vicissitudes of fortune it remained in line as true as a gun barrel. Some of those



A CLASSIC WOODEN PORTICO

Simple beauty has reached very nearly perfection in this style of architecture. This is a view of the portico of the Lincoln House at Manchester-by-the-sea, Massachusetts. It is from the Mary H. Northend collection and is here shown by the courtesy of the Northern White Pine Bureau, St. Paul, Minnesota.

old porches and doorways have come down to the present day, and are an inspiration to the modern architect, a compliment to the skill of the old carpenters, and a recommendation of the qualities of the pine that once clothed so much of the Northeast and which still abounds in

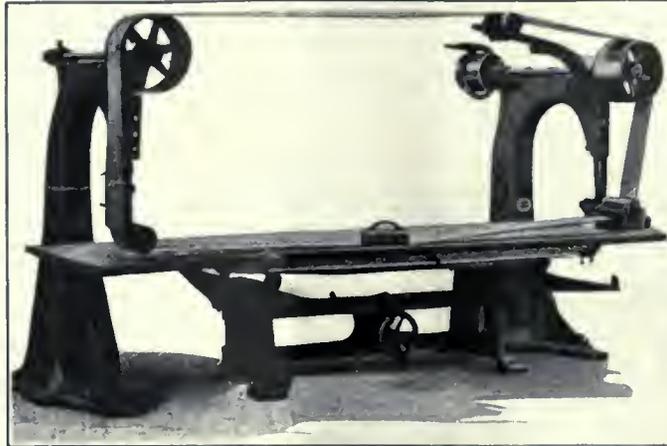
many localities. White pine siding more than a century old stands as well yet as that which has gone in place recently. It may finally wear out without checking or warping.

The South has and has always had excellent woods for exterior finish, and claims equal honors with the North in that respect. Cypress and the yellow pines uphold the reputation of the southern states, where old buildings, as well as new, display these woods in outside trim, such as weatherboarding, porches, cornices, and prove the excellence and beauty of wood in ambitious buildings, as well as in small.

The central hardwood regions of the East have contributed in yellow poplar perhaps the best hardwood for exterior finish. This poplar grows to be the largest

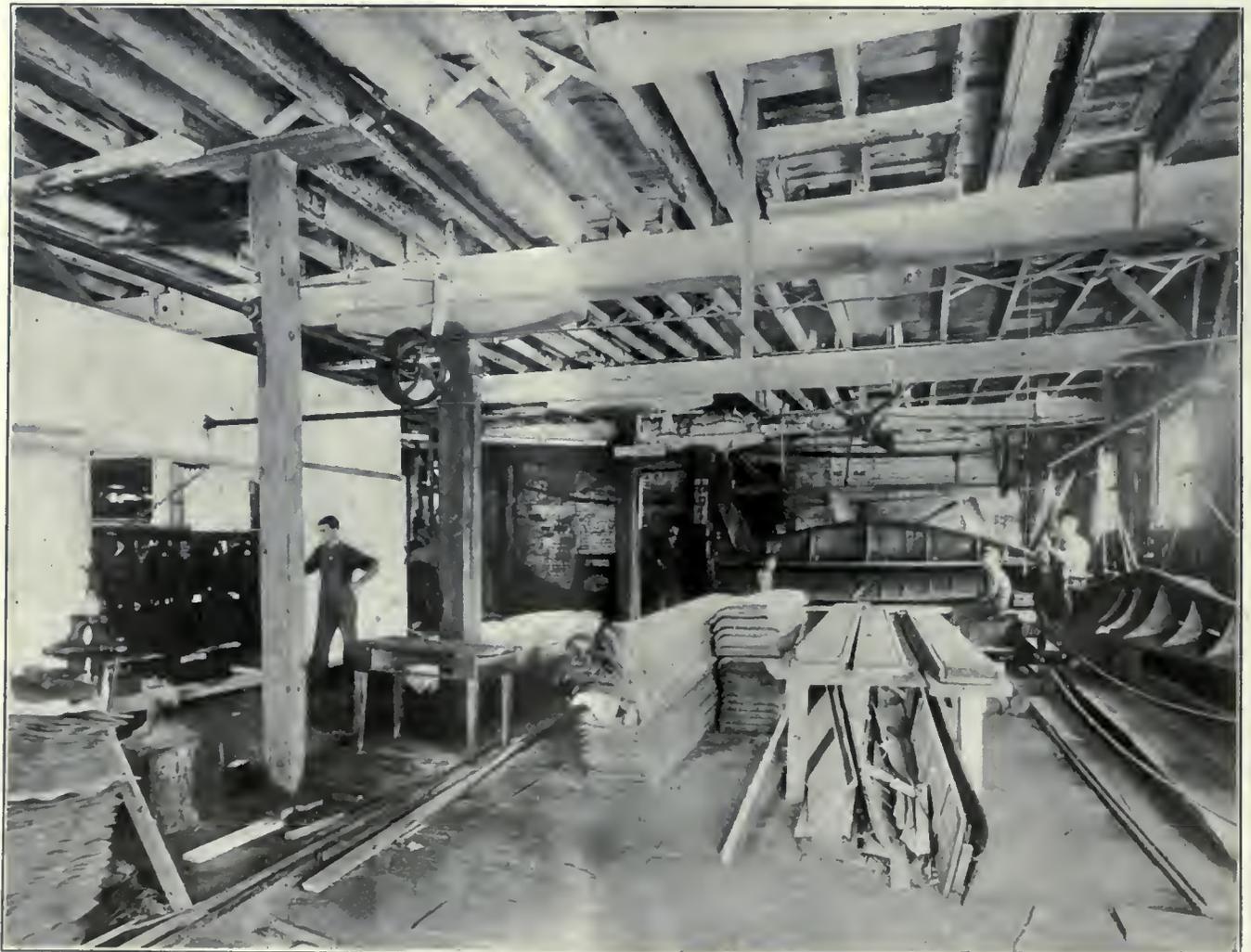
hardwood tree of the United States and no other exceeds it in the romance of botany and history. No wood of this country paints to better advantage, and that fact has been largely responsible for this wood's popularity as weatherboarding, cornice, and porch-work.

The far West, too, has its excellent woods for outside trim, but they do not have the long records of use which belong to some of the eastern species. The western country has not been settled long enough for that. They are softwoods, and chief among them are redwood, sugar pine, and Douglas fir. Redwood's smoothness of grain and its painting qualities measure with the best everywhere, and its durability in outside finish is all that the builder could ask. No portion of the



OPEN END BELT SANDER

Wood for interior finish and furniture is polished with a sand belt passing over pulleys. It does the work of several men operating by hand. Many types of sanding machines are made. The one here shown is manufactured by the Mattison Machine Works, Beloit, Wisconsin.



WHERE FINISHING VENEERS COME FROM

Here is shown the interior of a veneer mill with its enormous slicing machines which convert logs into the thin sheets used by manufacturers of high grade interior finish. Most of the material passing through such a mill is finely-figured hardwood from our own forests or from distant lands.

exterior work of a house attracts more attention or is worthy of more, than porches. It does not matter how pretentious a house may be, a well planned porch will add much; and at the same time it is equally true that no dwelling is so small but that a porch will improve its appearance. The salient features of a porch are its posts or columns, its balustrades, and its cornice, and in these are found the highest uses of exterior finish made of wood. Take away the porch columns from the venerable edifices which have come down from former generations, and a void is felt which nothing else can fill; and the absence of such columns from the imposing houses of the present impresses the beholder as being akin to inexcusable stinginess. Strip the pine columns from the front of the Washington home at Mount Vernon, and something of the reverence which one feels for that classic place would vanish. The Greeks knew what porch columns were worth, or they would not have lavished so much time, science, and labor on them.

The extra fine touches bestowed on the outside of a house are primarily for the purpose of making a favorable impression upon passers-by and others who may never enter the doors; but the inside finish is meant for a restricted and select class of observers—the occupants. A few choice woods serve as outside trim, but there is no practical limit to the number of those which hold places of honor within. The artistic taste of the builder, and the fatness of his purse, decide what

woods and what quantities shall appear in ceilings, panels, wainscot, and stair. The cottage and the cabin may not have many or costly woods, and the workmanship may be mediocre; but even there it may be taken for granted that if the builder has not used the best he could afford and used it to the best advantage within his means, it is because his tastes are uncultivated or his sense of beauty defective.

The improvement in architectural instincts or education, and the development of ideas, are seen in few things to better advantage than in the changes that have taken place in stair building in the homes of the common people during the last century or so. A study of the interior arrangement of old houses which have survived the grandchildren of the original owners, usually reveals the stair as a plain and rather meanly-planned contrivance for reaching upper floors and descending from them. Too often it is apparent that no glimmer of a sense of beauty was in the mind of the builder. His stair was for use and for absolutely nothing else. It was frequently planked in and



A SPLENDID CORNER IN OAK

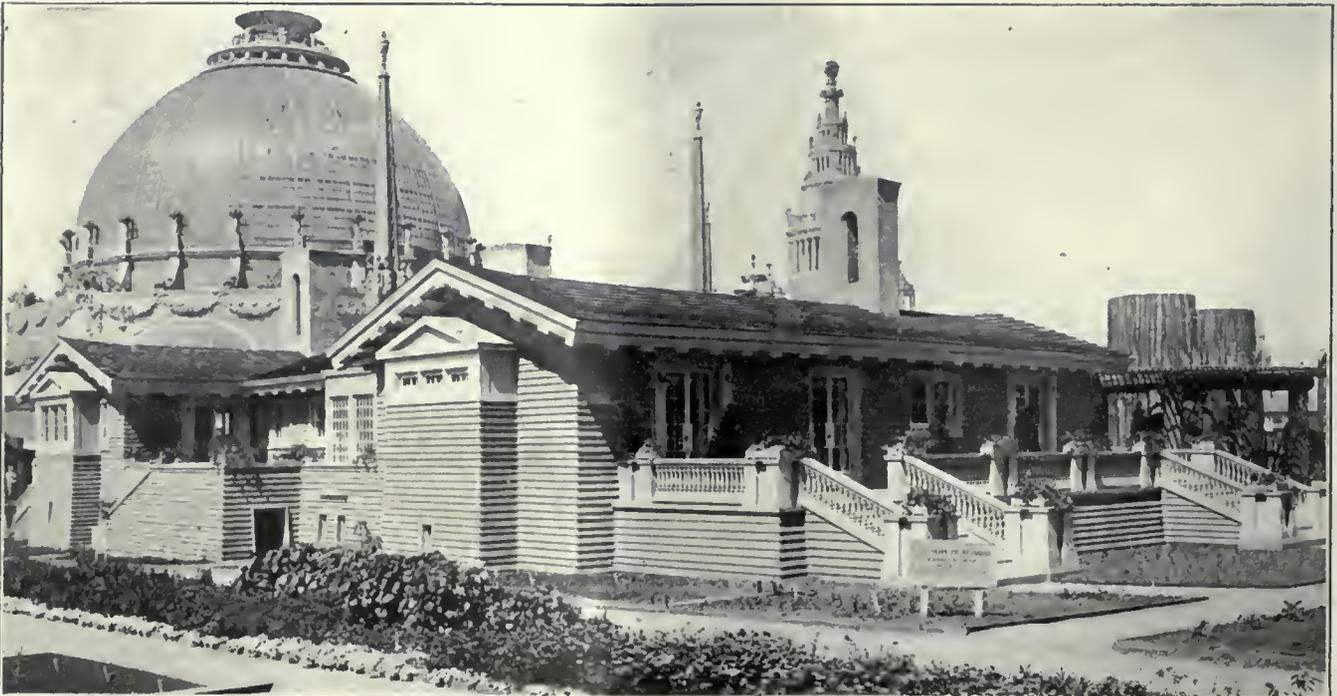
The quarter sawing is brought out nicely and the figures harmonize with the moderate sizes of the panels. Therein lies one of the advantages of using oak for interior trim. It can be made to match nearly any kind of tasty surroundings and the architect finds it an easy wood to work into combinations.

concealed from sight, and the only visible sign of its presence was a door leading to it, and the door was kept religiously shut when the stair was not in actual use. That explains why so little is generally said on the subject of stairways by persons who preserve or describe old buildings. The less attention called to such stair, in many instances, the better, because in the old buildings they too often suggest



KITCHEN FINISH IN DOUGLAS FIR

Parlors and front halls hold no monopoly of fine finish woods, as is apparent in the accompanying picture of kitchen with fir cupboards, cabinets and shelving. This wood's natural whiteness and clean appearance are assets in its favor in work of this kind, which does not call for a display of figure. Photograph by the courtesy of the West Coast Lumbermen's Association, Seattle, Washington.



EXTERIOR FINISH OF REDWOOD

This remarkable bungalow was one of the features of the San Francisco World's Fair, and the possibilities of redwood in work of this character are well brought out. No color contrasts are apparent, but beauty and dignity are combined. The photograph for this illustration was furnished by the California Redwood Association, San Francisco.

passageways leading from one story to another as described by Dante in the first book of his great poem.

The modern builder, whether he plans a cottage or a mansion, tries to do something artistic in his treatment of the stairway. He is awake to the opportunity to do something handsome with that part of the interior. He selects fine woods and gives them harmonious grouping. He is a stingy or a stupid builder these days who is unwilling to spend some money on his staircase, for he knows that he will be judged largely by that feature of his work.

It would be an error



A LOUNGE HALL IN REDWOOD

Californians are proud of their redwood, and they may well be, for they have the entire world's supply and it comes from the largest trees in the world. The wood is popular both as exterior and interior finish both plain and figured. The illustration shows panels of natural redwood. The photograph was supplied by the courtesy of the California Redwood Association, San Francisco.

to suppose that the high class stairway is an invention of the present generation, or that the immediately preceding generation invented it. There have long been builders of attractive stairs. Some who died long ago were the peers of any now living. But those of former periods were few and they lived ahead of their time. We should not forget the debt we owe them or fail to feel thankful that they lived at all. The first man who conceived, planned, and built a pretty stair deserves a place of honor beside the first man who wrote an inspiring poem, and the first who drew a picture with a good perspective. They all three taught how to see things in a better



THE STAIRWAY'S PLACE IN ARCHITECTURE

The ambitious architect and the competent builder do their best work on stairways, for a stairway may be made a building's most attractive feature. That shown in the accompanying illustration is of red gum. The wood is not highly figured but is strong in its simplicity and



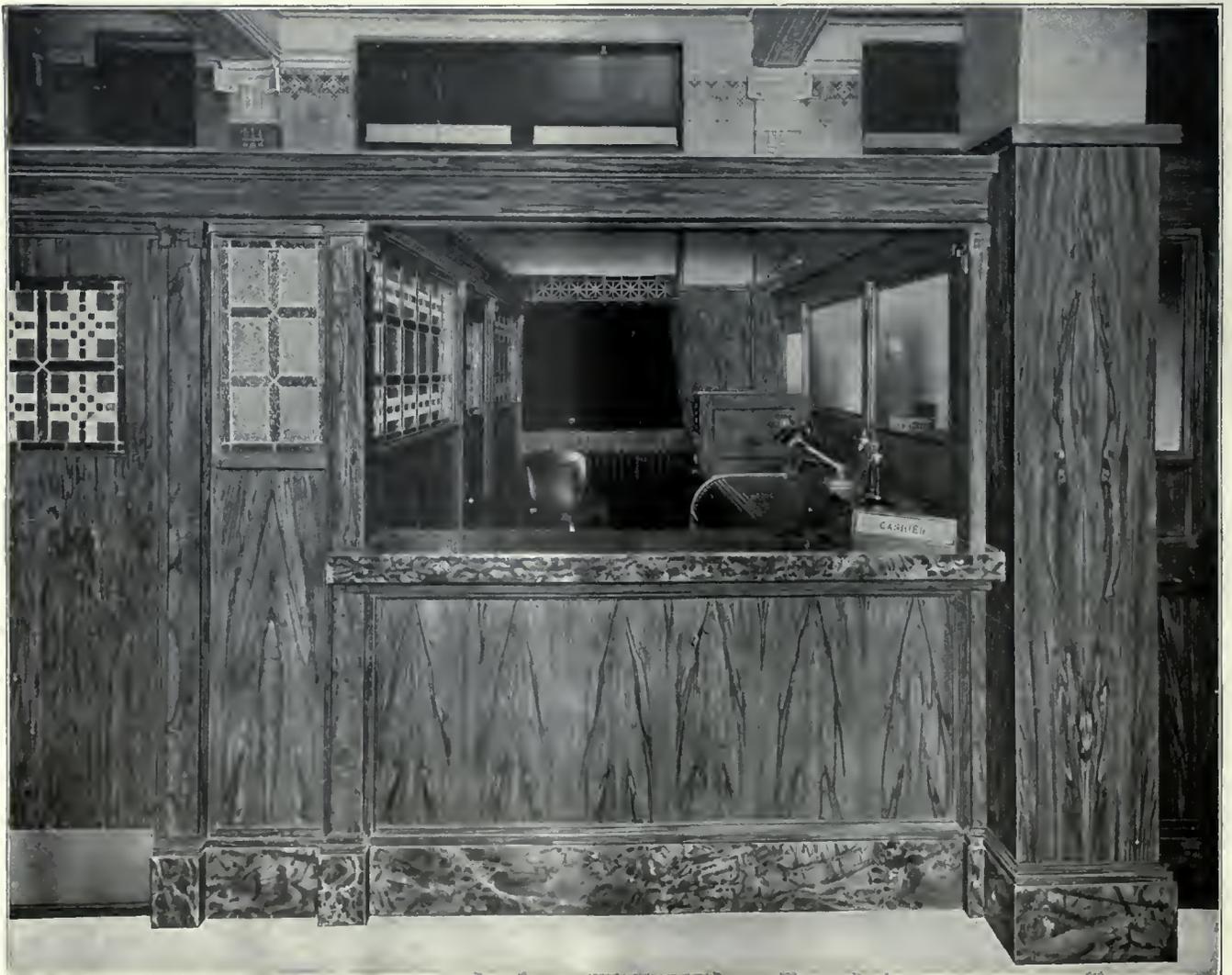
MANTEL AND BOOK SHELVES

The fine appearance presented by red gum panels well displayed, is apparent here in this fire place and its surrounding wood work. The color of the wood harmonizes almost perfectly with the tones of the tiles of the fireplace.

light. The maker of interior finish draws upon every available wood that has beauty of grain, figure, or color. He is not much concerned with strength, for all woods are strong enough for such trim, except in a few situations where the stresses are above the average. Certain characteristics, however, are carefully looked after. The woods are liked best which shrink and swell little during seasonal and weather changes. It may not be generally known that interior finish responds more noticeably to the changes of the seasons than the outside finish which is directly exposed to the weather. The wood within the house swells in summer and shrinks in winter, due to summer dampness when the windows are open, and to artificial heat and dryness when the winter fires are burning in furnaces and stoves. Interior panels and joinings which are not made of well seasoned wood and put together in a substantial manner, are liable to check on account of dryness, or to swell in dampness, and the swelling will manifest itself in doors which refuse to shut, or in drawers which scrape against the sides, or in window sash which stick and hang with perversity to try

the patience of Job. In order to lessen the propensity to shrink, swell, and check, inside woodwork is oiled or varnished, or stained or painted. This helps the cause, but it does not wholly prevent the undesirable results.

Both hardwoods and softwoods have places as inside trim. Almost every commercial wood is found in this industry. In point of number of species, the hardwoods exceed the softwoods, but in quantity of material it is probable that the softwoods lead. Pine meets the largest demand for softwoods in this industry, followed in the order named by Douglas fir, spruce, cedar, hemlock, cypress, and redwood. The principal hardwoods in the supply list, named in the order of their importance, are: oak, maple, yellow poplar, birch, gum, chestnut, basswood, beech, cottonwood, ash, and tupelo. Foreign woods fill a rather important place in the industry, and mahogany leads, followed by Circassian walnut in normal times, but the use of this walnut has almost ceased since the war cut off the supply. Other foreign woods contributing to the supply of inside finish are padouk, teak, ebony, rosewood, prima vera, and satinwood.



FIGURED RED GUM FIXTURES

The most perfect imitation of Circassian walnut is supplied by red gum if the figure is carefully selected, but the two woods may be distinguished, one from the other by their pores, those of walnut being the larger and more prominent. The walnut usually shows stronger contrasts of colors in the figure, the dark tones being deeper than those of gum.



BIRCH INTERIOR TRIM AT ITS BEST

The birch finish of the dining room here exhibited came from the Wisconsin forests. This wood may be given practically any tone or color desired, and the smooth surface always betrays the high-class of the material. It never looks cheap and it never has a tendency to cheapen its surroundings.

Some woods for interior work are chosen for their figures, others on account of their color, and still others because of the smooth surface which may be given them, and the excellent manner in which they receive and hold paint. Yellow pine and Douglas fir are not surpassed in richness of figures by any other softwoods of this country. Their figure is formed by contrast of color in the annual growth rings. Cypress responds readily to treatment to accentuate the figure due to the growth rings. The novel and artistic "sugi" effect is produced by scraping out the soft portions of the rings, and is not an inherent figure in the wood. Redwood is treated in the same way. Redwood and cedar rank high among softwoods for richness of color, but they have little figure. The figure of hemlock is often strong and shows well under high polish. White pine and the spruces have little color or figure. They are among the plainest of woods, but they possess excellent qualities. White pine is one of the best of woods to display enamel and paint, because of the smooth surface that may be given it.

It is not practicable to list the hardwoods in the finish

industry and specify what prominent characters best fit each for trim, but the woods may be partly included in groups. At least 100 species of American hardwoods contribute to the country's interior finish. The oaks have two kinds of figure, one formed by the contrast of colors in the rings, the other produced by quarter sawing to expose to view the bright surfaces of the medullary rays. Oak responds splendidly to the application of stains and fillers which enter the wood's pores and heighten the contrast or color. Walnut possesses two kinds of figures, one due to rings, the other dependent upon pigments dispersed irregularly through the wood, forming lighter or darker areas. Red gum's figure is due to irregularly deposited pigments, the same as in the walnuts. This wood is a good substitute for Circassian walnut, and so closely do the two woods resemble each other that the difference is apparent only to persons well acquainted with both woods. Maple is highly figured in two general patterns, bird's eye and wavy, the former being most common. Both figures are believed to be caused by regular changes in direction of the fibres. Birch has the

wavy or curly figure, due, as is supposed, to the reflection of light from fibres which run in waves or spirals.

No wood displays figure to the best advantage until its surface has been polished; and for that reason finely figured woods are seldom used as flooring because the chafing due to wear soon dulls the polish of the surface and the figures fade. The figures of wood are displayed to best advantage in broad surfaces like panels, doors, pilasters, and wainscoting, where the light is good



HIGHLY ARTISTIC PLAINNESS

Nothing could be in better taste than this Douglas fir finish for a living room in a Pacific Coast residence. Though this wood may be had in highly figured stock, many persons prefer that which is absolutely plain when they plan finish for the rooms in which they spend most of their time. They never tire of it.

but the glare and brightness are absent.

Sash, doors, and blinds are sometimes considered as finish and sometimes they are placed in an industry to themselves. Many factories which produce them do not make other kinds of finish.

Statistics have not been compiled in a way to show the annual demand for finish as separate from other stuff, but the whole group, including planing mill products, sash, doors, blinds, and general mill-work requires 13,000,000,000 feet a year in the United States.



OUTSIDE FINISH MODESTLY APPLIED

The doors, balconies, cornices and windows of this pleasing residence display wood in subdued elegance. There are no sharp contrasts to disturb the harmony. It is the residence of J. C. Foute, Oshkosh, Wisconsin, Auler and Jensen, architects. The interior is of enameled birch.

# LION'S FOOT, THE JEWEL WEEDS, AND OTHER AUTUMN PLANTS

(WITH A BRIEF ACCOUNT OF CENTIPEDES AND WHIP-TAILED SCORPIONS)

BY MAJOR R. W. SHUFELDT, C. M. Z. S., ETC.

MEDICAL CORPS, U. S. ARMY, WASHINGTON, D. C.

NATURE is quite oblivious to the terrible and stupendous tragedies now being enacted in many parts of the world; nature always has preserved this attitude—the machinations of man to the contrary. Men may saturate the soil with the life-blood of the combatants' millions, with the tears of armies of women and children, and devastate civilization's structures of the centuries—yet, only where man does his slaughtering, his burning, his incessant shell and mine exploding, and such other wholesale destruction as follows in the wake of his warring millions, does nature stand, for the time, aghast at his savagery, succumbs to the grinding of his merciless

heel, or shrivels under the searing engendered by the ceaseless fire of his countless weapons of destruction, of every conceivable description.

In ages to come, the shell-riven fields of France, rendered hideous by the forces and power of man's modern means of destruction, will again grow a soft, green turf; will once more admit of the unhindered blossoming of flowers, and permit the birds to return to the trees and hedgerows, to build their nests and rear their young, as they did in the happy days of peace.

Well may that country be congratulated which has escaped such devastation; whose forests and fields have



PIERCE'S MILL (ROCK CREEK PARK), WASHINGTON'S SUBURBS. A SUNSET SCENE LATE IN SUMMER

Fig. 1—Far up this stream, in Maryland, many of the flowers that have illustrated these articles in *American Forestry* have been gathered. This shows Oaks and Beech in September leaf.

not known the effects of battling armies, whose streams and rivers have not been dyed with human blood and choked with the bodies of war's victims.

Often it is that nature gains in times of conflicting nations; for the bird-destroying gun of the thoughtless frequenter of the woods is exchanged for the weapon of war, and the meadows and suburban timbered districts enjoy a partial rest from the ravages of the usual hosts of ramblers that hie thither in times of tranquil-

limits. Along the borders of rich woods in October, for instance, or in the near neighborhood of some dense thicket, we may meet with a specimen of the not too abundant Lion's foot (Fig. 2)—so named from the curious form of some of its larger leaves. In such localities, this interesting plant flourishes over the greater parts of the eastern United States. It may grow to be a yard high, and it will be recognized by its stout, purplish stem and drooping heads of curious flowers, which are usually whitish in color and not infrequently tinged with purple. Note that they are always nodding on their stems like so many little bells, each with its bunch of cinnamon-colored styles protruding beyond the flower, awaiting the insect visitors. Among the other species in this genus *Prenanthes* we have the one known in some places by the common name of Gall-of-the-Earth (*Prenanthes serpentina*), which appears to be confined to the Atlantic tier of States, as far around as Alabama. In the upper part of the

same region, and bearing the same vernacular name, we have *Prenanthes trifoliolata*, so called on account of its thin-nish, usually petioled, 3-divided leaves.

Again, in the sandy pine barrens of New Jersey, it is not difficult to find specimens of the slender Rattle-snake root (*Prenanthes virgata*), and there are fully half a dozen other well-marked species, some of which range westward as far as the Rocky Mountains, while



WE HAVE SOME CURIOUS PLANTS WITH STRANGE FLOWERS IN THE *Compositae* OR COMPOSITE FAMILY; THIS IS ONE OF THEM, AND FROM THE DROOPING BLOSSOMS OF THE VARIOUS SPECIES, THEY HAVE BEEN GROUPED IN THE GENUS *Prenanthes*.

Fig. 2—*Prenanthes alba*, by some writers called *Nabalus albus*, bears the common name of Lion's Foot from its leaf; for other reasons it has been named White Lettuce, Rattle-snake Root and Canker Weed. Its tuberous roots are extremely bitter.

lity. War workers have scant time for country outings, while even joy-riders have other uses for their cars than to carry great bunches of ruthlessly gathered wild flowers and branches of flowering trees.

For reasons not far to seek, in some countries the birds and small mammals are again becoming more or less abundant; at the same time, the demand for great quantities of timber jars the vegetable world in many regions, in a manner heretofore unknown to its usual quiescence. Millions of trees are tumbling to man's merciless axe and saw, and the lowly plants suffer severely from his down-tramping where this timber is sought.

Let not all this discourage us. Nature will arise and re-establish her rule in many, many places; while with us here, in this country, she is actually enjoying, in not a few regions, a rest from man's interference. There are wild flowers in plenty for us to study, and no especially keen power of observation is required to gather a bunch just beyond one's city



WHEN A FLOWER IS KNOWN BY A GREAT NUMBER OF VERNACULAR NAMES, WE MAY BE SURE THAT IT IS A FAMILIAR PLANT TO NEARLY EVERYONE WHEREVER IT GROWS, OR ELSE IT POSSESSES NUMEROUS CURIOUS CHARACTERS; THIS IS THE CASE WITH OUR TWO BALSAMS OF THE *Balsaminaceae*.

Fig. 3—Balsams or Jewelweeds belong in the genus *Impatiens*; this is the *Impatiens biflora*, so named for the reason that the flowers are, in most instances, in pairs, while in other cases four of their slender peduncles may be springing from a single leaf-axil—each bearing its blossom.

*P. boottii* is an alpine form, occurring in the mountains of New England and New York. Among the near relatives of Lion's foot we find the dandelions, lettuce, and



IN SOME RESPECTS, THIS IS AN EVEN HANDSOMER SPECIES OF BALSAM THAN THE MORE ABUNDANT ONE WITH THE ORANGE FLOWERS (Fig. 2). BOTH FLOWERS AND LEAVES ARE LARGER, THE FORMER BEING A PALE YELLOW—HENCE ITS NAME, *Impatiens pallida*.  
Fig. 4—Some know this pale Touch-me-not as *I. aurea*, on account of its golden flowers. The lower blossom in the cut shows the incurved spur very well. It has a beautiful leaf.

the hawkweeds, but all of these bloom much earlier in the season.

In our northeastern sections we have another very beautiful genus of flowers in the Touch-me-not family, well known as the American Balsams. (Figs. 3 and 4.) They may still be found in bloom in the early days of October, the plant growing in masses in swampy, wet places along the shady banks of small streams and rills. Their seed-pods burst upon the slightest touch—hence one of their common names, while the plant will begin to wilt and droop the moment after it is plucked. This renders it extremely difficult to photograph, and the specimens here figured were only obtained after many trials. The best way is to get a plant, as perfect a one as possible, early in the morning of a gray day, and transport it, roots and all, to the place where the photograph is to be taken. Even with these precautions failure is sometimes the only reward. However, it is well worth the effort, and through it we have the two species shown here in all their glory.

In some regions where our Ruby-throated Hummingbirds may still be found in abundance, we will see many of them at a time paying their respects to these beautiful flowers, where the plants grow in masses, and where few people visit to frighten them away. You may be sure that these winged jewels of the air are chiefly responsible for the perpetuation of these species of balsams, although insects of several kinds also do their part.

These little ruddy "horns-of-plenty" have been likened to a certain style of ladies' ear-rings; hence the name Jewel-weed; on the other hand, owing to the leaves not shedding the rain, but collecting it in glistening drops upon their serrated margins, this may likewise be responsible for the appellation. To note this, we have but to dip a freshly plucked leaf in water, and the point in question will be demonstrated; for upon being lifted out, it will appear almost as though silvered or thinly coated with quick-silver. There is a sort of hair-trigger arrangement at

the extremity of the seed-pod of the Jewel-weed which we have but to lightly touch in the ripened structure to have it pop suddenly open, and the seeds are tossed about, not a few of them landing several feet away. It is thus that the plant is spread over the area where it thrives. But this method does not ensure great rapidity of extension, perhaps only a few feet each season. As a matter of fact, when one comes to think of it, we usually meet with Jewel-weed growing in restricted masses, only rarely covering extended areas, as in the case of borders of little-frequented ponds in secluded



OAK GALLS, OR "OAK APPLES," PRESENT MANY UNUSUAL SHAPES. HERE ARE THREE ON THE LEAVES AND TWIGS OF A LIVE OAK; THEY ARE WONDERFULLY SYMMETRICAL IN FORM AND OF RATHER LARGE SIZE.

Fig. 5—These abnormal growths are due to the entrance of the larvae of certain insects into the substance of the leaf or twig, the gall forming at the point of the wound; they often yield over 75 per cent of tannin.

woods, or in marshes seldom penetrated by man. In such localities the plants may, in years, come to fringe the water's edge all about; but the progress is very slow. As may be readily appreciated, birds have but little or nothing to do with disseminating the seeds of the Touch-me-nots, probably only a small swamp warbler would ever see them, and they are not seed eaters. In the last issue of AMERICAN FORESTRY an account is given of the plant called Dodder; it is an interesting fact that the jewel-weeds are especial sufferers from its parasitic propensities. We still have a great deal to learn about these interesting balsams, but such researches will now remain at a standstill, more or less, until the war comes to an end.

Alice Lounsberry, in her "Guide to the Wild Flowers," devotes fully half a page to *Impatiens biflora*, the species of Jewel-weed just considered; but we should read that account with a certain amount of caution. She states that the flowers are arranged in clusters instead of in pairs, as the name indicates. She

further says that the plant grows by "bright running streams;" that at all times its leaves are hung with dew-drops; that the flowers are dependent upon insects for fertilization. Finally, she says that when the seed-pods burst, the seed are thrown "to a considerable distance." Surely not a very safe guide to the study of our wild flowers—too many slips in one paragraph.

The pale yellow Jewel-weed, with its big yellow flowers,

is not nearly as abundant a plant as the Spotted Touch-me-not; though sometimes it may be met with in masses, as along the Georgetown Canal, about a mile out of the city of Washington.

Often, in going through the oak forests in October, we will note peculiar globular growths on the leaves of some of the trees, examples of which are here shown in Figure 5. They are green during the spring, summer, and early autumn months, but turn a pale tan when the leaves turn. They have different forms, and one versed in such matters can determine which species of insect, or rather its larva, it was that produced that particular abnormal growth through its attack on the leaf or leaves. In ancient literature, these excrescences were known as "Dead Sea Fruit" or "Apples of Sodom;" and in California today the

and upon the uses of tannin and the dyes made from them; but it need not detain us here, as space admits only of giving their general appearance and how they are produced. (Fig. 5.)

Many trees and shrubs in October, in the northern sections of the country, have their leaves turn to gorgeous colors before "the fall;" chief among the tints are the bright tans, the reds and scarlet, the yellows and the oranges. In many instances, these brilliant colors will be off-set by the remaining

greens of the summer leaves. Our maples, dogwoods, and some of the oaks are well known examples; and in some seasons, when the conditions are favorable, the Black Haw constitutes another addition to the list. When such is the case, its yellow and scarlet leaves, interspersed with those of glistening green, are sure of our admiration, especially when such foliage offsets the beautifully



WE HAVE HERE A SUPERB GROUP OF POKEBERRY PLANTS. PHOTOGRAPHED *in situ* IN AN OLD FIELD OF GREAT EXTENT, IN WHICH THOUSANDS OF QUEEN ANNE'S LACE WERE IN FULL FLOWER.

Fig. 6—The generic name of this Pokeberry—*Phytolacca*—is an unfortunate compounding of Greek and French words, the first two syllables meaning a plant, and the last two from the French *lac* (lake), inviting attention to the crimson color of the berries.

buds of the live-oak, or any other species for that matter, it will not be long before curious little wasp-like insects will be observed puncturing the tender leaves, and depositing their eggs in the wounds. A fortnight thereafter, those leaves, which have come to be an inch or more in length, will have upon them, here and there, little globular, bright green bodies, which represent the commencement of so many oak-galls. There is a rich literature extant on the subject of these galls,



IN THE "BLACK HAW" (*Viburnum prunifolium*) WE HAVE A SHRUB OR SMALL TREE-REPRESENTATIVE OF THE HONEYSUCKLE FAMILY (*Caprifoliaceae*), IN WHICH GROUP OCCUR THE ARROW WOODS, THE CRANBERRY TREE, THE WAYFARING TREE, AND OTHERS.

Fig. 7—Late in September the Black Haw berry is in fruit, and a beautiful example of it is here shown. The ellipsoidal drupes are of a rich blue-black color, and the leaves are finely serrated.

galls produced by *Cynips* are known as "flea seeds."

If in the spring one will take the trouble to carefully study the opening

formed and dark-colored fruit. (Fig. 5.) Strange to relate, the botanical classification now in use places this "tree or shrub" in the Honeysuckle family (*Caprifoliaceae*), in which occur all the various species of Honeysuckle; the Twin-flower (*Linnaea*); the Snowberry; Horse Gentian; Elder-bush, and other apparently distantly related plants, though the arrangement or classification can, with success, be readily defended.

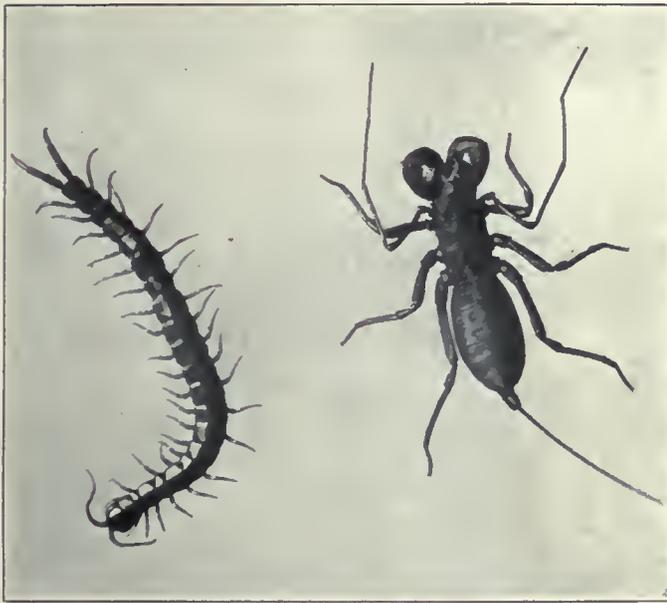
Every one will be likely to recognize the plant here shown in Figures 6 and 10, as it is very abundant in many sections



TWO WELL-KNOWN SPECIES OF CLEMATIS OR VIRGIN'S BOWER HAVE BEEN DESCRIBED AS GROWING NEAR WASHINGTON, DISTRICT OF COLUMBIA; THE ONE HERE FIGURED IS THE VIRGINIA CLEMATIS (*C. virginiana*), AND THE OTHER IS *Clematis verticillaris*. THE LATTER OCCURS AS FAR SOUTH AS WEST VIRGINIA.

Fig. 8—Clematis is a somewhat numerous assemblage of climbing plants, together constituting the genus *Clematis* of the Crowfoot family (*Ranunculaceae*). Most of them belong in the flora of the eastern United States.

of our country, and very conspicuous when allowed to reach the full measure of its growth. Its small flowers are white, tinted with bright pink on the outside. As suggested in Figure 10, they are arranged in fine racemes, sometimes fully ten inches in length. This Poke-weed, also called Pigeon-berry, Soko, and Garget, and by still others the Ink-berry, flowers from early summer to October, and thrives from southern Canada and Maine to the Gulf. Its favorite localities are along highways in the country; in the corners of old fields; open pastures, and similar places. Often it is found far within city limits, growing in lots not yet built upon, and in certain



THE COMMON FLORIDA CENTIPEDE IS HERE SHOWN IN THE LEFT HAND FIGURE OF THIS CUT, THE WHIP-TAILED SCORPION BEING THE OTHER FORM ILLUSTRATED. (See Fig. 12.)

Fig. 9—Centipedes formerly constituted the Class *Myriapoda*, and many still recognize that group. There are many species of them occurring throughout the world in temperate and tropical regions. Some of the species are at least a foot in length, and the bite of one of these is extremely painful.

waste places. The roots are said to be poisonous; yet some country folk boil the young shoots with asparagus, and partake of the combination without disastrous effects.

Neltje Blanchan invites our attention to the plant by pointing out the fact that "the large leaves, and even the footstalks, take on splendid tints of crimson lake, and the dark berries hang heavy with juice in the thickets; then the birds, with increased, hungry families, gather in flocks as a preliminary step to traveling southward. Has the brilliant, strong-scented plant no ulterior motive in thus attracting their attention at this particular time? Surely! Robins, flickers, and downy woodpeckers, chewinks, and rose-breasted grosbeaks, among other feathered agents, may be detected in the act of gormandizing on the fruit, whose undigested seeds they will disperse far and wide. Their droppings form the best of fertilizers for young seedlings; therefore the plants which depend on birds to distribute seeds, as most berry-bearers do, send their children abroad to found new colonies, well equipped for a vigorous start in life."

When our wild pigeon was with us in countless millions, the bird was extravagantly fond of these poke-weed berries—hence the name of "pigeon-berry." The vernacular synonym is a grim reminder of man's extermination, by fowling-piece and net, of this superb representative of our avifauna.

References were made in previous issues of *AMERICAN FORESTRY* to Solomon's Seal and the beautiful climbing Clematis. Different stages in the growths of these interesting plants can now be given, and thus more fully illustrate what was said about them in the aforesaid earlier numbers of this magazine (Figs. 8 and 12). This month of October is the time of the year to find them as they are shown here, and both are well worthy of our consideration and study.

#### CENTIPEDES AND WHIP-TAILED SCORPIONS

In our homes as well as in nature there is quite an extensive group of forms that most people know as "thousand-legs." They are very interesting, extremely



FROM JULY TO SEPTEMBER THERE IS NO BETTER KNOWN PLANT IN THE UNITED STATES THAN THE COMMON POKE WEED OR POKEBERRY (*Phytolacca decandra*); IN THE CUT WE HAVE A FINE BUNCH OF ITS BERRIES.

Fig. 10—This is our only species of the Pokeweed family (*Phytolaccaceae*) in eastern United States; but it is a very striking one, and its crimson juice is used to some extent in the arts.

varied in kind, and the different genera and species are found all over the world. In structure and habits they approach some groups of insects; though should we trace them in another direction, they approach the crustaceans. We are all familiar with the common and

entirely harmless "thousand leg" that finds its way into houses (*Scutigera*), a gentle, a fragile creature that is seen to run of an evening close to the wall, sometimes up the latter to the ceiling. A mere touch is sufficient to sever its legs or delicate antennæ from its body, and the weight of a finger enough to crush it entirely. Yet there are people who are as much alarmed by the presence of one of these utterly harmless little creatures as by the coming in of a full-grown rattle-snake.

Some of our "thousand legs" are positively handsome animals, and during the summer it is not difficult to find several species of them under logs and stones in the woods. Two kinds have a cylindrical form, with a great many pairs of soft little legs that they move, in walking, in an alternate fashion in a manner of waves. One of these species is much larger than the other, while both have a flinty shell to the body and curl up when handled (*Iulus*). Thousand-legs of all kinds have been grouped into a class called the *Myriapoda*; a single specimen is referred to as a myriapod. One of the groups of these myriapods has been named the *Chilopoda*, and it has been created to contain the more conspicuous collection of forms very generally known as *Centipedes*. These also have segmented bodies, with a pair of legs attached to each segment. In our part of the country these centipedes are small and quite harmless, while in the tropics the species are very much larger and, in some instances, dangerously venomous. Most of them belong to the genus *Scolopendra*, one species of which, in South America, is fully a foot long and greatly dreaded by the people, as it well deserves to be. In Europe, too, they have an electric scolopendra which is said to be luminous in the dark; while here in the United States we have but one small species (*Scolopendra viridis*), which is found in Florida and for some distance

northward. One specimen of this, captured by Mr. Wood at Auburndale, Florida, was received alive by the writer, who succeeded in making a photograph of it; this is reproduced in Figure 9, where the centipede is viewed from above. It is a very unusual cut, and probably for the first time gives the relative sizes of the centipede and the whip-tail scorpion. An authority at hand says that "Centipedes, or 'Hundred-Legs,' have

their segments flattened, and covered with a leathery skin, and have one pair of legs on each segment, the posterior pair being directed backwards and elongated so as to resemble a couple of jointed tails. Their antennæ have not less than fourteen and rarely more than forty joints, while the body segments do not usually exceed twenty. The organs of the mouth are masticatory, and are admirably adapted to the carnivorous habits of the centipede. It feeds principally on insects, seizing them with its powerful prehensile organs, and injecting at the same time its venom into the wound. The bite of the larger forms, as *Scolopendra morsitans*, occurring in tropical countries, is exceedingly painful, and is described by those who have suffered from it as 'similar to what might be produced by contact with a red hot iron,' giving rise to swelling, throbbing pains and febrile symptoms. These, however, yield readily to an application of ammonia. Centipedes seldom exceed a foot in length. They are exceedingly active in pursuit of their prey, insinuating their many-jointed and flattened bodies under stones, beneath the bark of trees, and wherever insects usually lurk."



WHIP-TAILED SCORPIONS MAY BE RECKONED AMONG THE MOST INTERESTING OF THE ARACHNID FORMS IN OUR FAUNA. THE SPECIMENS SHOWN IN THE ACCOMPANYING CUTS WERE COLLECTED BY MR. NELSON R. WOOD, OF THE UNITED STATES NATIONAL MUSEUM, AND PRESENTED ALIVE TO THE WRITER.

Fig. 11—These cuts are reproductions of photographs from life, and show two angry whip-tailed scorpions, with their "tails" erect, and their claws thrown widely apart. This thelyphonid is known as *Thelyphonus giganteus*.

In the same locality where the centipede shown in Figure 9 was found, Mr. Wood came across several specimens of the famous Whip-scorpions, one of the common names of which, among a dozen others, is vinegerone. Three illustrations of this curious creature

are shown in Figures 9 and 11, the larger one, in either cut, being the same specimen. Seven of the specimens received by me were alive upon their arrival and in fine condition. They were consigned to a large fish-globe, wherein was placed a quantity of black earth, some small pieces of pine-bark, fine grass, moss, and dead leaves, with a shallow pool of clear water. Three of the largest of these "scorpions" lived in this globe for over two months, during which time I had ample opportunity to study their habits under fairly natural conditions. As there were various small insects in the material placed so abundantly in the jar, it is quite likely that they furnished food for my captives, as far as they would go.

As a rule, entomologists classify these remarkable forms in an order, the *Pedipalpida*, the family being the *Thelyphonidae*—a group created to contain all the tailed whip-scorpions known to science. Further than this it will not be necessary to enter upon their relationship. In this country, species of whip-scorpions range from the Atlantic States to those of the Pacific, but only in the tropical areas of this region.

It is not difficult to appreciate why the name whip-scorpion was bestowed upon them, as they support, at the middle point of the abdomen behind, a long, jointed, and very slender appendage which certainly has a very tail-like appearance. This "tail" they have the power of lashing about, and also of holding erect in a rigid position. For this reason it does not show well in the accompanying cuts, which are from life by the writer, and taken when the specimens were very excited and angry; and when this is the case, the tail is almost invariably held at right angles to the body.

As in the case of all spiders and scorpions, this relative of theirs possesses four pairs of legs, and a pair of

formidable-looking *pedipalps*, each *palpus* being a six-jointed appendage, the distal joint of which is a true claw. With these claws a whip-scorpion captures and crushes its prey, which, as stated above, consists of various kinds of insects. When angry, these palpi are thrown widely apart, which gives this harmless creature a very ferocious appearance, and doubtless is often responsible for saving its life. It also possesses the power of curling these "claws" inwards, in such a manner as to have them entirely out of the way when it desires to run or otherwise move about. (See cuts.) As to the other legs, the front pair is modified to become slender, jointed ones, having the function of sensitive feelers, while the three remaining pairs are in their nature entirely locomotory. Note, too, that the thorax and abdomen of these whip-scorpions are quite distinct, the lungs, of which there are two pair, open on the hinder

edge of the second and third segments of the latter.

When irritated or disturbed, one of these "scorpions" discharges a minute quantity of invisible fluid which possesses a pungent odor, and which at once reminds one of the scent of vinegar—hence it has received the name of vinegerone. Locally, in the South, it is also known by the name of "Grampus," and it is greatly feared by those who are

ignorant of its habits and structure—the negroes standing in particular dread of it. However, naturalists have long known that it is not venomous, and does not even possess a poison-gland of any description. Our single species may attain a length of four or five inches, and is now known as *Mastigoproctus giganteus*. Its nearest relatives are the Micro-Whip-Scorpions (*Microthelyphonida*), species of which have a caudal whip, quite similar to the one possessed by their "gigantic" relatives.



IN THE LAST ISSUE OF *American Forestry* (SEPTEMBER, 1918) AN ACCOUNT WAS GIVEN OF SOLOMON'S SEAL. IN IT THE BERRIES WERE REFERRED TO BUT NOT FIGURED. HERE THEY ARE, AS WELL AS A PART OF THE ROOTSTOCK.

Fig. 12—In rare instances, the first of the series of berries or fruit on the stem of this plant may be in threes instead of in pairs; the former arrangement is here shown in the first two groups, and when ripe they are blue or black. *Polygonatum biflorum* belongs to the Lily family.

# QUEBEC BUSY PLANTING SPRUCE AND PINE—A TRIP TO THE NURSERIES

**F**OLLOWING the close of the formal proceedings of the quarterly meeting of the Newsprint Service Bureau held in Montreal August 20, a party of visiting members and others were taken on a motor-car trip to Berthier and Grand Mere, Quebec, to inspect the forest nurseries maintained in the former place by the Provincial Government of Quebec and in the latter by the Laurentide Company, Limited.

Included in the party were Mr. George M. Knowlton, of Knowlton Brothers, Watertown, New York, dean of American paper makers, whose active connection with the industry covers a period of sixty consecutive years; Mr. E. B. Sterling, West End Paper Company, Carthage, New York; Prof. C. T. Hamill, New York State College of Forestry, Syracuse, New York; Mr. R. O. Sweezy, consulting engineer and forestry expert, Montreal; Dr. J. S. Bates, Canadian Forest Products Laboratory, Montreal; Mr. Ellwood Wilson, forestry expert of the Laurentide Company, Limited; Mr. R. S. Kellogg, secretary Newsprint Service Bureau, New York; Mr. A. L. Dawe, secretary Canadian Pulp and Paper Association, Montreal, and others.

Arriving at Berthier, two hours were spent in going over the nurseries and plantation under the guidance of Mr. G. C. Piche, chief forester of Quebec. The grounds cover more than twelve acres in extent and are soon to be considerably enlarged. They contain trees in various stages of development, from seedlings of less than a year's growth to some standing timber of a very fair size and comprise a great number of varieties. Pine and spruce specimens, however, predominate, experimental work in the production of pulp, woods being the strong feature of the nurseries. Mr. Piche is producing upwards of 2,000,000 seedlings a year and has orders for the coming year for 500,000 replants for the Laurentide Company and 1,500,000 for the Riordon Pulp and Paper Company. He expects soon to be producing upwards of 5,000,000 seedlings a year, when he figures that the nurseries will be on a self-sustaining basis. Not the least interesting

exhibit was that comprising two acres of natural re-growth of spruce and pine containing a large number of young trees of less than nine years' growth averaging about eleven feet in height, some of them reaching a growth of twenty feet. In the plantation are many trees of various ages which are all duly ticketed and numbered and are subjected to constant observation and an accurate system of record-keeping which, in time, will result in the accumulation of a great deal of valuable data respecting growth, production, climatic influence, etc. Mr. Piche conducts a school for forestry students at the nurseries two months in each year, where young men come for practical instruction in forestry. He reports that there is an increasing interest in the science among the youth of Quebec.

The visitors were most favorably impressed by all that they saw and left with expressions of admiration for the work being carried on under the direction of the Quebec Provincial Government, which they thought might well be emulated by other governments.

At Grand'Mere the visitors were introduced to the reforestation work of the Laurentide Company by Mr. Ellwood Wilson, the company's chief forester. They were again greatly surprised and not a little pleased over the extent and the seriousness with which this work is being carried on. In their nurseries the company has some 750,000 spruce and pine replants of from one to three years' growth and about 250,000 seedlings just beginning to make their appearance. Everything is carried out in the most scientific manner, special attention being given to the preparation of the soil, to its drainage and the watering and care of the plants.

The company is also engaged in some quite extensive reclamation work in some nearby swamp lands by which they hope to obtain an additional large tract for reforestation. The nurseries and swamp lands are located within six miles of the company's mills and are easily accessible thereto.

## LUMBERMAN, SAVE YOUR CHIPS

**T**HEY are going to hew close to the line in the timber forests of California, henceforth, but they are not going to let the chips fall where they may. The importance of the conservation of timber for construction purposes in the United States war for freedom has brought about a movement in the western lumber industry, which has for its object the saving of the chips.

Timber experts sent out by the federal government are teaching real conservation to western saw mill operators. One of them, at least, is declared to have had palpitation of the heart when he saw several hundred thousand feet of high grade lumber converted into chips in one of the forests of southern California.

This expert proceeded to unburden his mind to the timber owner declaring that in the eastern and southern states a tract of lumber that would average 10,000 feet to the acre, was considered a good stand. In this particular case, he found single red wood stumps in Humboldt County containing 10,000 feet of lumber, the quantity of stumps containing from 2,000 to 5,000 feet.

Another thing to which these experts are calling the attention of saw mill owners, is the great undercut, or the waste that comes from cutting down the tree. Instead of the old fashioned ax which produced the chips that fell where they might, federal experts are recommending the use of saws of the cross cut variety.



SNAPSHOTS OF THE LAURENTIDE OPERATIONS AT BERTHIER

1—At the Forestry Headquarters, Berthier, Quebec. 2—Rapid growing White Pine of which Forester Piche is justly proud. 3—Going through the Nursery at Berthier. 4—View in a permanent sample plot at Berthier. 5—A section of Forester Wilson's nursery and a few of the buildings. 6—Seedbeds. 7—Thriving young White Spruce. 8—Draining a swamp preparatory to forest planting. 9—Part of a pile of 120,000 ends of pulpwood at Grand'Mere.

# THE LIBERTY-OIL PLANT

BY ROBERT SPARKS WALKER

THE castor-oil plant has during the last two years had bestowed on it a new name—a name of which anything with real life might well be proud. Americans have been growing it for decades as an ornamental plant and it well deserves a place on every lawn where the climate suits it. But down in the State of Florida and in other Southern localities of the United States it does best. In some sections of the United States where freezes occur the castor bean plant is an annual, but down in Florida it is a perennial and makes a good sized tree. Its seeds are beautiful things with wonderful markings and they are filled chuck full of the kind of oil that makes airplanes work to perfection. So our Government has contracted with growers in Florida for the oil from thousands of acres of castor beans or the new "Liberty-Oil" plant. (Hats off to the name!) The "Liberty-Oil" plant is playing an important part in the winning of the war for Freedom, Democracy and Christianity, for the entire world. For many years Floridians have been growing castor beans as a shade plant for the poultry yard, to temper the heat from a blazing sun, but now it is being grown that the Allies may make it so hot for the destroyers of human souls, that the world will never again be threatened with this demon of militarism. The new "Liberty-Oil" plant will play such an important part in the winning of the present war that the Huns will doubtless wish it was numbered among the extinct plants of the world.

The following interesting facts are taken from a report on "Castor Beans," by W. W. Stockberger, Physiologist in Charge of Drug and Poisonous Plant Investigations of the United States Department of Agriculture:

The castor-oil plant or Palma Christi (*Ricinus communis* L.) is a member of the family Euphorbiaceae, and is not a legume or true bean as some suppose. The seeds of this plant, called "castor beans" or "mole beans" yield the castor oil of commerce. About one hundred years ago small local crops of castor beans were produced in Virginia, North Carolina, South Carolina, Georgia and other Southern States, and later in Kentucky, Texas and California. Between 1860 and 1900 the castor bean was an important crop in certain sections of Oklahoma, Kansas, Missouri and Illinois, but during recent years its culture has been practically abandoned. The decline of the industry in the United States is attributed to the growing importance of other crops and the reduction in prices brought about by heavy importations of castor beans from India.

For the commercial production of castor beans, the warm climate and longer growing season of the more southern states is necessary. If planted much further north than St. Louis, Missouri, or Washington, D. C., the crop is very likely to be caught by frost. In general, any fertile soil which produces good crops of cotton or corn is suitable for castor beans, but a very fertile soil favors the growth of the plant



A SPIKE OF THE CASTOR-OIL PLANT

This shows a typical spike of the "Liberty-oil" plant, with ripe pods, each containing three beans.

at the expense of seed production and early maturity. The land is prepared in much the same manner as for cotton or corn: that is, plowed, disked and harrowed level before planting, which may be done by hand or with a corn planter with especially prepared plates. The seed should be planted early in the spring as soon as the soil is warm but still moderately moist. The time of planting varies according to locality, but in general corresponds to that of cotton. A good time for planting in central Oklahoma would be about the first of May, and correspondingly earlier in localities to the south. In central peninsular Florida, conditions will probably be suitable any time after the middle of March.

The depth of planting varies according to the time, soil and moisture. In the extreme South the beans are preferably planted about 1 inch deep, further north from 1 to 2 inches. The spacing of the rows and the plants in the rows should vary according to the variety of castor bean planted and the nature of the soil. The varieties having small seeds are usually planted more closely than those having large seeds. Towards the north, the rows are usually made four feet apart, and the plants spaced three feet apart in the row. Further south the rows should usually be made about 6 to 8 feet apart. On very light land the hills may be 4 feet apart in the row; on heavier land 6 or 8 feet apart. As a general rule 3 seeds are planted to the hill, and not less than 2 should be planted. When the plants are from 4 to 6 inches tall, the weaker ones should be removed, leaving one plant in a hill. In the extreme South where frost does not often kill the castor bean plant, the beans are sometimes planted in hills 5x5 feet, and as the plants develop, they are thinned to stand 10x10 feet apart. With the closer planting, it is well to leave a space of about 8 feet between every sixth and seventh row, to permit the passage of a wagon when

the beans are harvested. In planting for commercial purposes a distinction should be made between the ornamental and the oil-producing varieties. The seeds of the latter are small to medium in size, usually about 2-5 to 3-5 inches long and 1-4 to 2-5 inches broad, oval in shape, smooth and shining, and of a grey ground color, irregularly marked with brown. The most desirable beans run from 1,500 to 2,500 to the pound, or about 69,000 to 115,000 per bushel of 46 pounds. The number of acres a bushel of beans will plant depends upon the size of the bean and the method of planting.

The crop is cultivated similar to corn, until the plants are large enough to shade the ground. In case the field becomes foul with weeds and grass some hoeing may be necessary, but practically all the cultivation required can be done with a horse-drawn weeder. Cultivation should not continue after the first bloom spikes appear. If the plants do not thrive, some fertilizer consisting chiefly of ammoniates may be supplied.

The yield will depend much upon cultural conditions, upon the season, and the care exercised in harvesting and thrashing the seeds. Yields of 30 to 40 bushels per acre have been reported from Florida, South Carolina, Georgia, Texas and California. In the Middle West yields of 15 to 25 bushels per acre have been reported under favorable conditions. Much smaller yields will, of course, result if conditions are unfavorable.

Until recently the farm price for castor beans has been not far from \$1.00 per bushel. The increased demand for castor oil due to war conditions has caused

the price of the beans to advance rapidly, and it is probable that high price for castor beans will prevail until the end of the war. The normal market requirement in the United States for castor beans is about 1,000,000 bushels annually, but until present conditions change materially, a larger quantity will be needed.

In the United States castor beans are used in quantity



THE "LIBERTY-OIL" PLANT

This shows a young plant, with small fruiting spike near the top.

only by manufacturers of castor oil. The principal castor-oil mills are located at Jersey City, New Jersey, Buffalo, New York, Toledo, Ohio, and Grand Rapids, Michigan. In general the equipment and operation of a castor-oil mill resembles that of a cottonseed oil mill or linseed-oil mill, but special and expensive equipment is necessary for the proper extraction of the oil from castor beans. The best grade of oil is obtained from the beans by hydraulic pressure. An additional quantity of oil of lower grade is obtained by treating the press cake with naphtha or other volatile solvent. The pomace resulting from the second extraction is used as a fertilizer for tobacco, corn and other crops, but because of a poisonous principle cannot be used for cattle feeding unless specially treated.

### "SAVE PAPER!"

**T**HE American Forestry Association earnestly urges its members to comply with the request of the War Industries Board and economize in the use of all paper, as it is only by individual effort and co-operation that the supply of paper for essential purposes may be maintained.

The following appeal has been sent out by the Board:

**DON'T WASTE PAPER** PAPER IS ESSENTIAL: It has been placed on the priority list only on the express condition that all wastes be eliminated and every economy be practiced. In doing this the Government will use its best efforts to provide sufficient paper for strictly needful purposes, but nothing more. Every distributor converter or user of paper is hereby notified that the continuance of his supply is dependent strictly upon his observance of the rulings of the War Industries Board, one of which is that paper must not be wasted. Failure to comply with this requirement will lead to the withdrawal of any or all priority privileges, without which the supply cannot be maintained.

### SEVEN REASONS WHY PAPER MUST NOT BE WASTED.

1. The Government's requirements for all kinds of paper are increasing rapidly and must be supplied.
2. Paper requires a large amount of fuel which is essential for war purposes. A pound of paper wasted represents from one to three pounds of coal wasted.
3. Paper contains valuable chemicals necessary for war purposes. Economy in the use of paper will release a large quantity of these materials for making ammunition or poisonous gases.
4. Paper making requires both labor and capital, both of which are needed in war service.
5. Paper making requires transportation space. Economy in the use of paper will release thousands of freight cars for war purposes.
6. Greater care in the purchase and use of paper will save money.
7. Your savings will help finance the war. Strictest economy in the use of paper will prevent shortage.

War Industries Board,  
B. M. Baruch, Chairman,  
By E. O. Merchant.

Owing to the heavy outlay required for the necessary machinery and the high cost of manufacture on a small scale, it has not been found profitable for the growers of castor beans to undertake the extraction of the oil.

The castor-oil plant is not known to be poisonous, and although the leaves are not relished by farm animals they are said to be used as fodder for cattle in India. Castor beans, however, contain a poisonous principle, and though harmless when handled, may cause serious, if not fatal effects, when eaten, especially in the case of small children. Care should be taken to prevent these beans from being accidentally mixed with the grain fed to animals, since many cases have been reported in which the death of horses has been due to eating feed in which they have become mixed.

### OLIVES AND WALNUTS—THE FOOD TREES OF FRANCE

**T**HE walnut and olive trees of France stand as an example of what a crop of trees may mean to a nation hard at war. H. R. Isherwood, head of the Trade Extension Bureau of the National Lumber Manufacturers' Association, cited recent reports on the olive oil and walnut crops in that country, as an encouraging factor in the food situation of the nation which is bearing the heaviest part in the struggle for world democracy.

Olive oil is one of the staple fats of French diet, taking the place of animal fats, which though not as scarce in France as in Germany, are still too scanty for comfort. Walnuts, of course, are the richest of foods.

Mr. Isherwood dwelt at length upon the benefit to a country hard pressed for food which results from large crops of the fruitage of these trees. The olive oil crop for last year was one of the largest for a generation. In spite of the shortage of labor, it was saved. The French Government closed the schools, and sent boys and girls to the groves. The walnut crop also was the largest in years.

Walnuts are planted at wide intervals all through the fields of central France, and the ground farmed under them as though the trees were not there at all. Olive orchards are sometimes cultivated, more often they serve as pastures, and a great many of them are on ground that would be useful for little else if the trees were cut down. Doubtless there are thousands of olive trees in France that saw Napoleon set out on his first Italian campaign.

**HELP THE GOVERNMENT SAVE PAPER BY USING ONLY WHAT YOU REALLY NEED. EACH POUND OF PAPER REPRESENTS SEVEN POUNDS OF FUEL AND FUEL IS NEEDED TO BURN OUT PRUSSIANISM.**

# NIGHT-HAWKS AND WHIP-POOR-WILLS

Family Caprimulgidae

BY A. A. ALLEN, PH.D.

ASSISTANT PROFESSOR OF ORNITHOLOGY, CORNELL UNIVERSITY

TO try to understand every impression that is made upon the senses is a sign of intelligence. The dog that howls at the moon because he does not understand it, is more intelligent than the dog that takes the moon for granted. We humans know that every effect should have a cause and, having sensed the effect, are quick to search the cause. So insistent are we if we do not discover it, that we invent one to our own satisfac-

milk as is desired, the explanation took hold. It was too dark to see the insects that the goats were disturbing, but it was light enough to see that the birds were following the goats. So, even today, the nightjars and their relatives the night-hawks and whip-poor-wills, must bear the family appellation of goat-suckers and bear the ill-will of the non-observant world.

Nor is it from this superstition alone that these strange



Courtesy of "Bird Lore"

## A MODERN HOME FOR A NIGHT-HAWK

Night-hawks have adopted the flat topped, gravel-covered roofs of our large cities as quite suited to their needs. This bird is fluttering from its eggs on the roof of the Bell Telephone Building in Philadelphia. Note the white bar on the wing that distinguishes it from the whip-poor-will.

tion. Later on when our mistake has been rectified, it may cling to the world for generations as a rumor or a superstition.

A good many generations have passed since a group of nightjars were disporting themselves one evening on a European pasture and some one inquired what they were doing. It must have been a disgruntled herdsman that offered the explanation that they were sucking the milk from the goats but, since goats never give as much

but useful birds have come into disrepute. The idea of a bird waiting until dark before it goes about its work is enough to prejudice most minds against it, and when it is also responsible for some of the most weird sounds in all nature, even the most intelligent will lend a willing ear to almost any fiction about it. When one is alone in the forest and a whip-poor-will breaks the silence with its strange liquid notes, one can easily understand how the Indians came to believe that misfor-

tune was imminent when one called near his tepee. And when a tenderfoot has strayed from camp after dark in the southwestern desert and a chorus of poor-wills make the rocks resound, he can easily imagine that there are evil spirits all about him.

There are over 100 species in the goat-sucker family, found all over the world except in Arctic and Antarctic regions and a few of the eastern Pacific Islands. About fifty are found in the New World, the majority of which



WHERE RACE SUICIDE IS POSSIBLE

The tropical whip-poor-wills lay but a single egg. This is the home of the white necked parauque in a thicket of bamboo, the leaves of which cover the ground.

live in the tropics, so that only six reach North America. Four of these are rather well known birds, the night-hawk, the whip-poor-will, the chuck-wills-widow and the poor-will. They are all small birds, but their long wings and tails make them appear much larger than they really are. The night-hawk, for example, whose body is smaller than that of a robin, appears, on the wing, about the size of a sparrow hawk. A few of the tropical woodland nightjars are considerably larger, being about the size of short-eared owls, which, indeed, they somewhat resemble. Nor is it any wonder when we stop to consider the relationship of the goat-suckers to the owls.

It is not only in color and nocturnal habits that the goat-suckers resemble the owls, but structurally as well. So much so in fact, that modern systematists remove the owls from the raptorial birds where they have rested for so long, and put them close to the goat-suckers. The chief difference between the two groups has arisen because of their differences in food habits. The owls are largely carnivorous and their bills and feet have been modified for catching mice. The goat-suckers, on the other hand, feed chiefly on flying insects and have little use for their bills and feet which, therefore, have de-

generated while their mouths have developed to an extreme size. In all but the night-hawks, the corners of the mouth are provided with long bristles, making them most efficient scoop nets. The seven species of woodland nightjars (*Nyctibius*), however, have much heavier bills which are strongly hooked, and they likewise have better developed toes. They differ also in assuming an erect owl-like position when at rest and in having the eyes more nearly directed forward. Indeed, in many respects, they seem intermediate between the rest of the goat-suckers and the owls. The night-hawks and whip-poor-wills, when at rest, always perch lengthwise of the branch or log because of the weakness of their feet. This, together with their eyes being on the sides of the head, destroys their similarity to the owls in spite of the fact that their plumage is quite as soft, their colors similarly mottled, and their eyes much larger than in ordinary birds.

In nesting habits, the goat-suckers are at the bottom of the scale. They build no nest whatever, but lay their eggs on the bare ground without even a depression to keep them from rolling. The North American species normally lay two eggs, but the tropical species, only one. The eggs are whitish or cream-colored marked with darker gray and purplish, those of the night-hawk being quite inconspicuous on the gravel where they are



IIAS A RELATIVE IN TEXAS

A subspecies of this parauque (*Nyctidronus albicollis*) is found as far North as Texas. This bird was photographed on its egg at the base of a bamboo sprout in a thicket—Its long tail is not always held so high. It was difficult to see even at a distance of six feet because of its protective coloration.

usually laid, but those of other species being quite the reverse. The young are hatched blind and helpless, but are soon covered with long grayish or brownish down not very different from the down of young owls.

The most abundant and widespread of the goat-suckers is the night-hawk which is found in summer in one or

another of its sub-species from Florida to Alaska. In winter the night-hawk retires to South America, traveling in scattered flocks. Sometimes they just skim the ground or large bodies of water and at a distance look remarkably like black terns. Again they fly high over head. In climbing the Andes of Colombia in October at an altitude of 12,000 feet, I saw flocks of night-hawks flying several thousand feet higher, crossing snow-capped ridges and making for the plains beyond. The birds that nest in Alaska have a long way to travel, for even should they stop in the Bahamas, it would mean 6,000 miles each way, while, if they continued to central Argentina, as do many, it would mean an annual pilgrimage covering at least 18,000 miles.

Night-hawks are usually birds of the pasture or prairie country and are seldom found in heavily wooded districts unless it be in clearings. They spend the day perched lengthwise on a rock or post or branch of a tree and will frequently permit of a close approach. At dusk they begin hawking about after insects and consume great quantities of gnats, mosquitoes and other flying insects. Five hundred mosquitoes were found in the stomach of one night-hawk, and 1,800 winged ants in another. Occasionally they pursue insects on bare ground and are sometimes seen at dusk along country roads, flitting from spot to spot capturing beetles and

known as the "bull-bat." Its erratic flight made it a difficult mark for the gunners and it was considered legitimate sport to go out at dusk and shoot them as they darted back and forth over the pastures after insects. Sometimes they were used as food. For a time they became extremely scarce and in some localities were threatened with extinction but, now that their value has come to be realized, and they are rigidly protected by both State and Federal laws, the custom of shooting



BE IT EVER SO HUMBLE

None of the night-hawks or whip-poor-wills build nests. They lay their eggs on the ground without even a depression to keep them from rolling. One of this whip-poor-will's eggs has hatched and the young is seen to be covered with long brownish down.

them has gone out of vogue and they are increasing in number.

Of recent years, the night-hawks have been attracted to large cities where the flat-topped buildings with their gravel roofs are not very different from the stony fields where the birds ordinarily nest. They have little competition for the hosts of flying things that are attracted by the lights and are steadily increasing. They are often seen perched on chimneys or gables during the day and darting over head at dusk uttering their sharp call of "peerd—peerd."

During the breeding season they can often be seen to dive toward the earth from a considerable height, catching themselves with an upward turn just before they strike the house tops, the rush of the air through their wings causing a roaring sound like that produced by blowing over the bunghole of a barrel.

The night-hawk and the whip-poor-will are quite similar in appearance, both being beautifully mottled with gray and brown, somewhat lighter below with conspicuous white patches on the throats and white in the tails. The night-hawk is easily distinguished by a white bar across the wing which is very conspicuous during flight. The two birds, however, are not ordinarily



Photograph by A. D. DuBois

#### RELATED TO THE OWLS

A whip-poor-will brooding its young among the oak leaves on the forest floor. Modern systematists remove the owls from the raptorial birds and put them near the goat suckers. Here there is a suggestive resemblance.

grasshoppers. Sixty grasshoppers were found in the stomach of one bird. They ordinarily feed only at dusk or at night, but during the nesting season or on their migrations, they are sometimes seen darting about high over head even on bright days.

In former years, the night-hawk was shot for sport in large numbers throughout the South where it was

found in the same places for their habits are very different.

The whip-poor-will is a bird of the woodlands, spending the day on the ground under the trees and coming out into clearings or along the forest borders at night to feed. At such times it sometimes ventures close to door-yards and startles the unsuspecting householders with its loud liquid notes—"whip-poor-will—whip-poor-will—whip-poor-will." These are given with an accent that does not tend to make one sorry for poor Will, but rather to feel that he quite deserves his misfortune.

The whip-poor-wills feed upon larger insects than do the night-hawks, being particularly fond of the large night-flying moths, the larvae of which are very destructive to the foliage of trees.

Whip-poor-wills are found in summer from Florida to Nova Scotia as far west as the Plains. They leave with the night-hawks for the south the last of September or the first of October, but they do not go far, stopping in Central America and West Indies.

In the Gulf States and occasionally as far north as Maryland and Ohio, occurs the chuck-wills-widow, which is a larger edition of the whip-poor-will. In habits they are not very different except that they have been seen occasionally to pursue and swallow such small birds as warblers and sparrows, and humming-birds have been taken from their stomachs. Their call is similar to that of the whip-poor-will, but is louder and more slowly uttered, and each phrase has an additional syllable as suggested by the name.

In Western North America from Nebraska to the Cascades and as far north as British Columbia, occurs the poor-will, a small sized whip-poor-will, abbreviated

in actual length as well as in name and call. To those who have an ear attuned to nature, its call is said to be soft and soothing, but to others it is said to be diabolical and suggestive of evil spirit. Such is the nature of man.

In southern Texas is found a whip-poor-will known as Merrills parauque, the name being derived from its call which is quite different from those already described, being a rather hoarse "pa-rau'-que." It represents a group that is quite common through tropical America and which differs somewhat in feeding habits from the other members in that it catches most of its insects on the ground along roads or bare spaces among the mesquites.

Like the rest of the goat-suckers it is very protectively colored and difficult to see when at rest on the ground.

The Texan night-hawk, which is found from Texas to Southern California, differs from the common night-hawk in having the white bars near the tip of its wings and in call which Vernon Bailey describes as "a low rapid—chuck, chuck, chuck, followed by a soft pur'r'r'r'r'r'r'.



Photograph by A. D. DuBois

#### A HAWK THAT ISN'T A HAWK

A western night-hawk incubating its eggs on a lichen covered rock. The night-hawk is one of the maligned group of goatsuckers and is one of the most beneficial insect destroying birds that we have. Note its protective coloration.

The whole family of goat-suckers is without exception one of the most beneficial that we have. An occasional small bird swallowed by the chuck-wills-widow is the only exception to a diet that is almost exclusively insectivorous. They capture the night flying insects which have few other bird enemies and some of which are the most destructive that we have. Their wierd calls and nocturnal habits will undoubtedly continue to prejudice unthinking people against them and we should, therefore, do everything in our power to disseminate the truth and cultivate a love and respect for some of the strangest, most interesting and most beneficial birds that we have.

Save fruit pits and nut shells. Two hundred peach stones or seven pounds of nut shells will furnish enough carbon for a gas mask and save the life of an American soldier.

# "BALDY DAN" IN FRANCE

BY LIEUT. SHELBY M. SAUNDERS

COMPANY E, SIXTH BATTALION, TWENTIETH ENGINEERS (FOREST)

WHEN pine was "King" in Michigan a familiar figure in the camps north of the Saginaw Bay country was "Baldy Dan" McDonald. He had the unique reputation of being the best lumberjack in that section of the state. There was nothing that he could not do in the woods. When it came to sawing "Baldy" could outwear a dozen ordinary men, not because he "rode" the saw, but simply because he was a wizard at his work. He could chop, swamp, top load, deck load and handle a peavy, and if there was anything in the woods he could not do it was simply because no one had ever heard tell of it before.

of the glory that is due them. When men learn what has been achieved by the Forestry Regiments they will ponder and remember, and they will give to these warriors of the forest all of the credit that is due them in helping to free the world of Prussianism.

Organized for the purpose of supplying the American Army in France with its various needs of forest products, the task in spite of being almost superhuman in the face of so many difficulties, is being accomplished with a smoothness that is astonishing. While it is true that members of the Forestry regiments do not have to share the dangers that do members of fighting units, yet they



SOME OF OUR LUMBER BOYS IN FRANCE

Organized for the purpose of supplying our army in France with the necessary forest products, our two Forestry Regiments are acquitting themselves with great credit and these are some of the boys who are helping to make them famous.

"Baldy Dan" like the mighty pine of Michigan has gone, but men of his calibre have come to take his place. It is a mighty odd statement to make, but one that is true and one that will be vouched for by every man who is in a position to know and that is, that the best loggers, the best woodsmen, the best sawmill men that America can produce are now in France. They are members of the Tenth and Twentieth Engineers, Forestry Regiments, which are making a big name for themselves in France and America and they will go down in history as having played a large part in the World War.

The Forestry Regiments are just coming in for some

are ready at any time to take their places in the front line trenches, if the need be.

Before anything could be done by America in the war, it was necessary to have lumber. There was need for it everywhere. Docks had to be built, railroads had to be constructed, hospitals, barracks and warehouses, and the many other things that an army needs had to be erected.

As soon as the Forestry Units arrived in France, they went to work. Shortly after production started and the flow of lumber from the mills began. As rapidly as possible additional battalions of Forestry troops were dis-



THE MILL

This is the American mill at the foot of the mountain, down which the logs come at a 72-degree grade for milling. Its capacity is 10,000 feet, but it does much better than this.

patched to France and in a comparatively short time, they started to send lumber where it was most needed. A steady stream of lumbermen and sawmill men of America came "over" and soon lost themselves in the forests of France. They are working in every section of the country; from east to west, and from north to south.

Trench timbers, stakes for barbed wire entanglements and fire wood for the supply of the army "over here" are some of the things they are getting out. In spite of increased production, come increased orders and it is a race, at breakneck speed, with men working in shifts by day and night to meet the demands of the growing army of Democracy.

The men of the Forestry regiments are a mighty big factor in the war. They are doing their bit, and it is a big bit. They

work hard, ten hours a day and they are among the huskiest men in the A. E. F. They are as hard as nails and are always ready for any emergency.

On account of the hard work these men are doing, they have been granted an increase in rations of twenty-five per cent over that allowed the men in the other units "over here." They need it, these men of the forests, for they are fighting a battle every day; a battle of production and the way the reports are coming in from every camp and operation, indicates that the For-

estry Regiments are out to bury the Kaiser beneath a mountain of sawdust, "Somewhere in France."



ENOUGH TO MAKE THE KAISER FEEL "LOGGY"

These are all ready for business, and the flow of lumber from the American mills in France is not going to stop until the "I" is taken out of "Kaiser."

## DONATIONS TO THE WELFARE FUND FOR LUMBERMEN AND FORESTERS IN WAR SERVICE

AMERICAN FORESTRY will publish each month the list of those making donations to this fund. Many of the donations from members of the American Forestry Association so far received were made without solicitation and were inspired by reading in the magazine that a relief and comfort fund for men of the forest regiments was being collected. Many substantial contributions are being received from the Forest Service and from lumber companies and lumbermen following requests sent to them by the Secretary of the Welfare Fund for Lumbermen and Foresters in War Service, by the lumber organizations of which they are members, and by the committees of lumbermen which had charge in various sections of the United States of securing enlistments for the forest regiments.

Contributions to the Welfare Fund to October 1, 1918, are as follows:

Previously acknowledged .....	\$20,428.06	Rosemary Pine Lumber Mills, South Mansfield,	
Dock, Miss Mira L, Fayetteville, Pennsylvania	5.00	Louisiana .....	50.00
Kenneth, O. Ward, Candor, New York .....	10.00	Wesbon, Gertrude S.....	5.00
Merkel, Hermann W., New York City, New York .....	5.00		
Reeve, C. Mc., Minnetonka Beach, Minnesota..	10.00	Total .....	\$20,513.06

## SHEEP ORNAMENTAL AND USEFUL

“MATCH THE PRESIDENT” was a slogan sounded during the Third Liberty Loan drive which resulted in the addition of millions of buyers to the Government bonds.

Another helpful way in which patriotic Americans can follow the lead of their Chief Executive and thereby contribute to the winning of the war, is by putting a flock of sheep to graze on their lawns, woodlands or private forests. Altogether there are hundreds of thousands of acres of excellent forage land which, like the big sloping lawn back of the White House, would furnish excellent pasturage for sheep. In addition to large private lawns there are golf courses, public parks in nearly all of our cities, college campuses and similar open spaces which should not be left lying idle in these days.

The fine flock of wool growers which for the past several months have been contentedly nibbling their way about the White House grounds, obviously happy in their peaceful historic surroundings, add not only to the quiet beauty of the landscape, but they are serving

a valuable utilitarian purpose—they are raising part of the wool which later will help to keep some soldier in France warm. The meat also which will be added to the nation's food supply by raising sheep wherever it is possible, will constitute a worth-while item in the country's war supplies.

Since the appearance of the President's flock on the White House lawn, announcement has come from a number of places throughout the country of the intention of officials or individuals to follow the President's example and put some of the woolly-backed animals to fattening in public parks or private grounds. But there are still many thousands of places where small flocks of sheep might be maintained with profit to the owner and, what is more important, with benefit to the nation.

What is apparently a minor value of sheep in these days, although it is worth considering in connection with the subject, is that they serve as animated lawn mowers. This means that they save a certain amount of man-power; and any release of workers for more essential war duties is eminently worth while. Of course,



“ANIMATED LAWN MOWERS”

These woolly-backs clean up as they go and they save man power. But it is because of their addition to the food and clothing supply of the nation that they are most prized. Thousands of lawns, public and private parks, woodlands, golf courses and similar spaces throughout the United States would do well to maintain small flocks of sheep.

lawns can go uncut, as has been the case this past summer with more than one college campus which in normal times was kept trim and neat. It would have been a patriotic as well as a picturesque sight for a flock of sheep to have gone moving back and forth between the dormitories and the classroom halls.

Not only during the days of the war but in the long



WHERE OUR WOOL COMES FROM

Sheep add to the attractiveness of any landscape. Poets have sung of them; artists have painted them. But it is because of their practical value today that people are urged to "Match the President" and go in for sheep raising on their estates as he is doing on the White House grounds.

hard reconstruction days which will follow and when there will be still a shortage of food and of material, sheep can play an important part in supplying some of the needs of the country. The individual or the official organization that buys a few sheep now and puts them to grazing on idle pasturage, whether it be front lawn, public or private park, golf links or other similar space, will find after the war that it is a profitable investment, in the matter of dollars and cents and in other ways as well.

It is impossible not to consider the sentimental value of a flock of sheep serenely grazing on a velvety carpet of grass or winding their unconcerned way through the trees of a fine grove, cleaning up the track over which they have moved. Sheep have been the subject of song and poetry. "I heard the sheep-bells ringing on the Downs," the poet sings. They have been a favorite subject for painters and have been immortalized by many of the world's greatest artists of the brush. Ever since the days of David who sang of the flocks which he tended, sheep have been held in a sort of kindly regard by man. Their submissive innocence, which is best summed up in the fine Biblical phrase, "led as a sheep to the slaughter," combined with their pastoral beauty, has always made man look upon sheep with a pleased eye.

Nevertheless, as Richard Le Gallienne so well says, "who can doubt that the farmers are right and that sheep were made to be fleeced and eaten, and for no other more transcendental purpose at all?" Certainly for

the time being, at least, the "transcendental purpose" of sheep—if there be any such *raison d'être* in their branch of the animal kingdom—must be put aside for the utilitarian service which they can perform for mankind. This is by furnishing food and clothing—and by being lawn mowers.

Before embarking in the enterprise of raising sheep individuals are advised by the animal husbandry division of the United States Department of Agriculture to seek information on the technical side of the question so that there may be no wasted effort. The division has a number of publications on the subject and has announced that it will be glad to answer any questions. The belief has been expressed, however, by officials of the Department that this raising of sheep on lawns and small parks can be of real practical value.

A recent statement by the Department says that persons who desire to raise sheep are advised to enter the industry with a view of staying for several years at least. The gross annual returns from the ewes of breeding age

may be expected to range from \$8 to \$15 a head, depending upon the percentage of lambs raised, the weight of the fleece and the value of these products. The fleece from one sheep averages five to eight pounds and is now selling for from fifty to sixty-five cents a pound. The ewes with good management will each raise a lamb.



A HISTORIC BACKGROUND

The President's flock of sheep graze benignly away over the beautiful sloping lawn of the White House, indifferent to their surroundings. Since the Nation's Chief Executive entered the "sheep business," others with spacious lawns about their homes are following his example.

The lambs at five months will weigh approximately sixty pounds and will be worth fifteen cents a pound or more. The useful life of a sheep is about six years.

The day will not come again when each family will have its own spinning wheel and weave its own clothing; but as a result of the White House precedent it is certain—and it is a good step—that hundreds of homes throughout the country will in the future have small flocks of sheep grazing on the lawns or in the woodlands about them. The benefits both to the nation and to the individual will be manifold.

### CAPT. BARTELME PROMOTED

**F.** E. BARTELME, president of the Keith Lumber Company, of Chicago, has received the good news that his son, F. M. Bartelme, has been promoted to major in the 20th Engineers of the national army, one



MAJ. F. M. BARTELME

of the forestry regiments in France. Mr. Bartelme with rank of captain has been in France several months as advisory lumbering expert under Col. W. A. Mitchell. When he was chosen, last September, as advisor in lumbering to Colonel Mitchell the intention of the War Department was to rank him major then, but as he was then only 36 years old the honor could not be bestowed upon him. Since then his services in France have been so notable that the War Department evidently has found some way to waive age requirements, as 40 years is the age for conferring the rank of major.

Major Bartelme is well experienced in every branch of lumbering. Before going to France he was engaged in business in Minneapolis, Minnesota, with a branch at

Cairo, Illinois. The business is still conducted at Minneapolis with L. T. Lloyd, its secretary, in charge and the branch at Cairo in charge of C. E. Johnson, the company specializing in hardwoods. Though a young man, Major Bartelme passed through every stage of lumbering in the North from woods operations to salesmanship, which made him a well equipped man for Uncle Sam in getting out lumber supplies in France, a work that he has evidently done to the entire satisfaction of his superiors, judging from his promotion.

### PARROT AN AUTOMOBILE SPEED FIEND

**A**LTHOUGH this picture shows the car standing still in order to allow a good picture to be taken, nevertheless the parrot on the windshield is undaunted by speed. In fact the faster the machine goes the more he enjoys it, and the louder he screeches. As the auto whirls about the streets of Stockton, California, he is in his element, and the curious pedestrians are amazed to see him perched perilously on the swaying car, al-



"CRANK 'ER UP!"

This is the parrot that loves to speed and he is impatient now to be off. ways at his post at the top-edge of the windshield. He has the "motor-bug," and thus imitates man as he does in his speech. Other animals have been reported at various times as having the "motor-bug," but a parrot so affected is rather a novelty. Dogs take to the automobile as a duck takes to water, and seem to enjoy the outing and speed as much as their masters and mistresses. A new type of automobile dog may yet follow in line of succession to the coach dog, now becoming a rarity.

**T**HE Mississippi Legislature has passed a bill exempting from taxation for a period of five years all wood distillation plants that may be built in the State. The purpose of the bill is to encourage the wood distillation industry in Mississippi. The measure will affect pine more than hardwoods, but there is much hardwood in the State that might be used in destructive distillation.

SHOW YOUR PATRIOTISM BY SELLING YOUR BLACK WALNUT TIMBER—BADLY NEEDED  
BY THE GOVERNMENT FOR PROPELLERS AND GUNSTOCKS

## WOOD FOR WATER AND AIR SHIPS MUST BE HAD

SINCE the War Industries Board has placed airplane material first in the priorities classification of industry necessary to win the war, employers of the big army of men at work in the fir and spruce operations of Western Washington and Western Oregon will be obliged to ask local draft boards to provide deferred classification for such men as are essential to the continued maximum operation of their plants.

Representatives of the government as well as the lumber operators themselves have been impressing upon the men the fact that those of their number who are given deferred classification on occupational grounds will be rendering a valuable service to the country by remaining at home and helping to get out the material that the government so badly needs and that is so necessary in winning the war.

It is apparent, however, that the lumber industry does not propose to ask for wholesale exemptions for its employes. Each application for exemption or for deferred classification will be presented on its individual merits. The test in each case coming before a local draft board will be whether the man is indispensable in the plant in which he is employed. Final determination of exemptions will lie, as at present, with the draft board officials.

The new law will affect thousands of men engaged in the lumbering industry, as most of the skilled employes are between the ages of 31 and 46. Were all the men of those ages taken into the army the industry would be unable to meet the government's demands for the production of airplane lumber and ship timbers.

The forests of Western Oregon and Western Washington alone have been able to produce the quantity and quality of fir and spruce necessary for airplane construction. The volume of this production has been increasing every month but further increases are necessary in the future. The needs of the government are urgent and every man necessary in getting out this material is required on the job.

At the same time fir is absolutely essential in future wood ship construction as it is the only wood that produces timbers of the lengths and strengths necessary to build the big ships required by the Emergency Fleet Corporation. The main bulk of all the wooden ship material used in the country is in the fir woods and can be produced only by the fir mills. The mills of Western Oregon and Western Washington also are furnishing the decking required for the steel ships both on the East and West Coasts.

Orders also have been placed in the Northwest for immense quantities of large and long timbers and special length planks for Eastern ship construction.

To fill all these government orders the mills of this territory have been forced to speed up their operations and any considerable loss of men, it is pointed out, will result in curtailed production of government lumber.

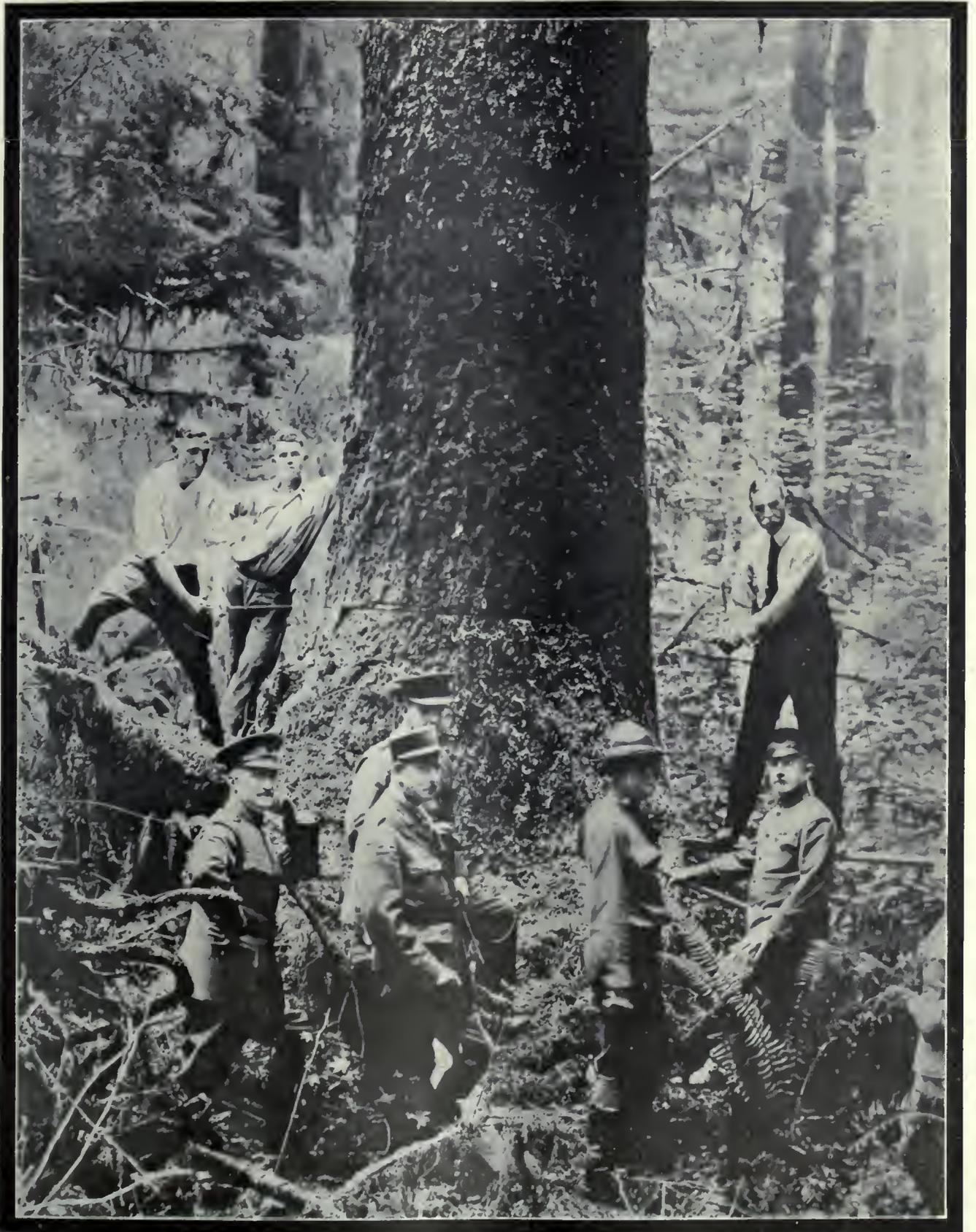
The lumbermen will co-operate with heads of the government and with the local draft boards in their desire to furnish the required number of men for the army without crippling the industry.

The production of sufficient quantities of spruce of the proper quality is one of the critical phases of airplane manufacture. The Forest Service is co-operating with the Signal Corps of the War Department in the West and the Navy Department in the East in speeding up spruce production. The co-operation consists in the compilation of existing estimates of stand, the location of suitable bodies from the standpoint of quality and accessibility, where advisable the collection of logging engineering data, such as costs and the best methods of exploitation, and in general recommendations of any character whatever as to means of increasing production.

The work in the West is being conducted by the District Forester at Portland, who has detailed a force of approximately 20 men, and in the East by the Office of Forest investigations by the detail of two men. These activities, which are under the general direction of the Branch of Research, supplement other activities of the Branch under way at the Forest Products Laboratory at Madison. The satisfactory kiln-drying of spruce in from one to three weeks rather than in an entire year required for air-seasoning, the selection of other species as satisfactory substitutes for spruce, and the determination of methods for kiln-drying them, tests to develop laminated construction and joints which will permit the use of a much larger proportion of the spruce cut, specifications for individual airplane parts for the same purpose, and finally, veneer tests with the idea of partial substitution for spruce, all bear directly or indirectly on the problem of speeding up spruce production and have the same general effect.

Some idea of the enormous quantities of wood going into war material for the United States Government, may be gained from a statement of John D. Ryan, Director of air craft production, before a crowd of several thousand soldiers, working in spruce lumber camps, at Vancouver, Washington. Mr. Ryan declared that the Government aircraft program is coming to fruition so rapidly that 50,000 Liberty Motors have been ordered for airplanes in the course of construction or already finished. This means that spruce for that many planes has already been used up, and it also means that much more of the same sort of wood will be necessary before the Government air craft program has been completed.

**SAVE PAPER BY ECONOMICAL  
USE AND HELP WIN THE WAR. BY  
REQUEST OF THE WAR INDUSTRIES  
BOARD.**



*Committee on Public Information*

**A MONARCH OF THE FOREST MAKING READY FOR CONVERSION INTO A POWER OF THE AIR**

Mr. John D. Ryan, Director of Bureau of Aircraft Production, cutting a giant spruce in the Northwest, preparatory to felling it. Mr. Ryan and Colonel Disque on the saw. Photograph obtained from District Commander, Gray's Harbor and Willapa Bay District, Aberdeen, Washington.

# PROGRESSIVE FORESTRY LEGISLATION IN LOUISIANA

BY R. D. FORBES

SUPERINTENDENT OF FORESTRY OF THE CONSERVATION DEPARTMENT OF LOUISIANA

THE recent session of the Louisiana Legislature passed two laws of far-reaching effect along forestry lines, providing an appropriation for the next two years. The appropriation consists of one-fifth of the Severance Tax on forest products, and this fund will amount to between \$15,000 and \$20,000 per year. The collection of the tax on all natural products severed from the soil has once more been made the business of the Conservation Department after a lapse of two years and there is every reason to expect that the larger figure will be realized.

The first of the forestry laws was one empowering the Commissioner of Conservation, as chairman of the Forestry Advisory Board, to promulgate and enforce

regulations requiring the use of spark arresters and proper ash-pans on all locomotives and stationary engines operated within two hundred feet of any wooded or cut-over land. The second law empowers the sale of timber on the Caldwell State Game Preserve on some 6,000 acres and to apply the proceeds of the sale to the purchase of new State Forests. This law serves a double purpose: First, it makes of the area a demonstration tract in forest practice; second, it gives much needed funds for the acquisition of State Forests. We are coming more and more to the opinion that in spite of the rapid growth of our southern species, the business of raising timber is a public rather than a private undertaking.

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## SHOOTING OF REED BIRDS FORBIDDEN BY LAW

THERE will be no reed or rice bird shooting in New Jersey, Pennsylvania, Delaware, Maryland, District of Columbia, Virginia, North Carolina, South Carolina and Georgia this year. In the past shooting has been permitted from September 1st to November 30th, but the new Federal regulations have placed the reed or rice bird, which in reality is the bobolink, on the song bird list.

Rice planters, particularly in South Carolina, have stated that the reed bird or rice bird does millions of dollars of damage to the rice crop, and as far back as 1770 South Carolina placed a bounty upon this bird. It is only during its migratory period that the rice bird is so destructive to South Carolina's rice crops.

It is when the bobolink is through with reproducing its own kind and takes on a sober coat of mottled yellowish gray and ceases to sing, merely uttering the one note "chink-chick," that it becomes a different bird. Then

it starts on its wonderful journey, and this little bird, not much bigger than a sparrow, goes from 50 north to 20 south, covering 4,600 miles, and it does it twice every 12 months. When it arrives in Jamaica it is known as the "butter bird."

The rice bird gets its name from the fact that it is a lover of the wild rice that grows in the estuaries and swamps of the middle Atlantic States, and when it arrives in South Carolina the planted rice is "in the milk," and there the planters regard the bird as a pest.

Wherever there are rice plantations it is necessary to employ "minders," who with powder and shot kill the birds by the thousands or drive them away. The flight of these birds from Jamaica across the Caribbean Sea to South America is somewhat remarkable. For 400 miles there is not a reef or islet where the birds can stop. The birds fly that distance without a stop.—From *Daily Tribune*, Johnstown, August 27, 1918.

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## PROTECTION OF THE ROADSIDE TREES URGED

THE value of roads to the public depends not only upon their usefulness, but upon their beauty. This is the new view of good roads which was endorsed at the annual meeting of the North Carolina Good Roads Association at Wrightsville Beach.

On the first evening of the Convention State Forester Holmes gave an illustrated lecture on "Securing and Protecting Roadside Trees" in which he urged legislation by the next General Assembly empowering Boards of County Commissioners or other bodies in charge of the roads in the State "to plant, reserve, protect and care for roadside trees" in accordance with plans which it shall be the duty of the State Geological Board to pro-

vide when so requested. The State Forester argued that whereas, in many parts of North Carolina the chief money crop is the stream of tourists and summer visitors, nothing could increase the income from this source like beautiful as well as good roads. A law along the lines suggested, would, he contended, gradually result in a settled policy of maintaining the natural beauty of our roads and of adding to that beauty where this was possible.

The rough draft of a law which would provide for the making of plans and the growing of roadside trees by the State, and the protection of such trees from mutilation by linemen and advertisers, was read.

# FIRE DANGER IN FEATHER GRASS

BY ROBERT T. MORRIS

FOR the purpose of beautifying some of the slopes on my country place at Stamford, Connecticut, I encouraged the growth of feather grass (*Andropogon*), cutting out underbrush and everything excepting trees which I wished to have grown upon these slopes. Late in April of the present year when the pines were just beginning to send out new herbaceous growth a fire was started by some one and it swept over more than one hundred acres of my property before it could be brought to a halt although we had Fire Engine Companies from Stamford, Mianus and Greenwich, Forest Fire Wardens and their crews of Stamford and Greenwich and a number of Boy Scouts.

Feather grass makes a particularly inflammable cover crop as the dried masses of leaves persist for years, constituting a thick carpet of material which burns almost like a prairie fire when it is very dry and with a little breeze as we had on this occasion.

The effects of the fire upon various trees may be worthy of note. On one slope I planted red pines far enough apart to give a park-like effect and these were now approximately twenty-five feet in height—magnificent specimens with lower branches sweeping close to the ground. The fire burst through these trees with a loud roar leaping high in the air above their tops and practically all of them were destroyed although a few are sending out herbaceous growth from the upper branches. On two other slopes a couple of thousand young red pines averaging less than ten feet in height were completely destroyed. Mugho pines were wholly burned up excepting a few which stood upon a gravelly bank not covered with feathergrass. The feature of note in connection with these Mugho pines which were spared by the fire is the fact that their tops were promptly invaded with the white pine weevil, although I have kept the weevil pretty well in check upon my property.

White pines of twenty feet in height suffered less than did the red pines although their lower branches were destroyed and they are now ragged and unsightly. The tops of the white pines which were spared are now being attacked ferociously by an aphid of a species which I have not determined, but which is very destructive sometimes to young white pines, unless they are thoroughly sprayed. For some reason these aphids have made a very vicious onslaught upon what remains of the fire damaged white pines.

Pitch pines burned nearly as fiercely as the red pines, although they were set widely apart for park effect. These pitch pines at the present date of writing, July twenty-third, have now sent out very many new shoots from adventitious buds. The pitch pine is the only one among my conifers excepting *Araucaria imbricata* which is able to start anew from adventitious buds in the trunk.

I had one compact stand of white spruces averaging rather less than twenty feet in height which had been set out for the purpose of making winter cover for deer, partridge and quail, also a smaller patch of Norway spruces closely set for game cover. All of these spruces went up with a roar, not only the foliage, but the limbs being consumed.

Austrian pines more than twenty-five feet in height set apart separately for decorative purposes lost their lower limbs, but the fire did not consume them clear to the tops as in the case of the red pines. Several hundred red junipers of various heights were entirely destroyed but here and there one escaped with a few ragged branches still living among the tops.

The feathergrass fire was nearly as destructive to deciduous trees as it was to the conifers. In this part of my property there were a number of grafted hickory trees most of them less than twenty feet in height, ranging from that down to more recently grafted stock. All of these were destroyed excepting one that happened to have had the mulch about its base recently removed.

A large number of young hybrid chestnut trees representing crosses I had made between various Asiatic and American *Castanaeae* were destroyed, but they are now sending out vigorous new shoots from the roots and will not be lost. The same is true of a hillside of chinquapins averaging perhaps twelve feet in height and which had been bearing very heavily for many years. A field filled with hybrids which I had made between various European, Asiatic and American hazels showed no living hazel until nearly a month after the fire when vigorous new shoots from stolons promised to replace those that were lost.

Various clumps of grey birches had all of the beautiful white bark blackened and burned beyond hope and the lower branches killed, although the tops of practically all of the grey birches remained alive. The same is practically true of the sweet birches although here and there a large sweet birch more than thirty feet in height was killed entirely. Alderleafed chestnuts with a trailing habit and with thickly massed branches were killed to the ground but they are now sending up vigorous new shoots.

I do not know of any cover crop which one might employ for beautifying his grounds which would be more destructive in case of fire than feathergrass. During the fire it was impossible to make effective fire lanes through the feathergrass because flying cinders started advance blazes many yards ahead of the main conflagration. Fortunately the long hose of the Mianus Fire Company with water pumped directly from the stream on my property sufficed to check the feathergrass fire and in the woods the forest fire fighters eventually made fire lanes to check the blaze.

## NATIONAL FOREST TIMBER FOR SALE.

**SEALED BIDS** will be received by the District Forester, San Francisco, California, up to and including November 15, 1918, for all the merchantable dead timber standing or down and all the live timber marked or designated for cutting in all or any of the following compartments, Shasta National Forest, California.

**COMPARTMENT 1.**—This area consists of about 9,022 acres made up of whole or parts of the following Sections: T. 42 N., R. 3 W., M. D. N. Sections 2, 4, 6, 8, 10, 16, 18, 20 and 22; T. 42 N., R. 4 W., Section 12; T. 43 N., R. 1 W., Section 18; T. 43 N., R. 2 W., Section 21; T. 43 N., R. 3 W., Sections 26 and 34; T. 44 N., R. 3 W., Sections 30 and 32; T. 45 N., R. 1 W., Sections 24 and 26; T. 45 N., R. 1 E., Sections 19, 21, 27, 28, 31, 32, 33 and 34; T. 45 N., R. 3 W., Sections 28 and 32; containing an estimated amount of 76,548 M. ft. B. M. of yellow pine, 5,341 M. ft. B. M. of white fir and 423 M. ft. B. M. of incense cedar timber, more or less.

**COMPARTMENT 2.**—This area consists of about 1,120 acres made up of whole or parts of the following Sections: T. 42 N., R. 2 W., M. D. M., Section 4; T. 43 N., R. 2 W., Sections 26 and 34; containing an estimated amount of 11,552 M. ft. B. M. yellow pine, 6,650 M. ft. B. M. white fir, 1000 M. ft. B. M. red fir, 275 M. ft. B. M. Douglas fir, more or less. A cut of 75 per cent pine from this compartment will be guaranteed in the timber sale contract if desired by the purchaser.

**COMPARTMENT 3.**—This area consists of about 360 acres in Sections 6 and 8, T. 44 N., R. 1 W., M. D. M., containing an estimated amount of 1,611 M. ft. B. M. of yellow pine, more or less.

**COMPARTMENT 4.**—This area consists of about 240 acres in Section 1, T. 44 N., R. 1 W., M. D. M., containing an estimated amount of 200 M. ft. B. M. yellow pine, more or less.

No bid of less than \$2.75 per M. for yellow pine, 75c. per M. for Douglas fir and 50c. per M. for white fir, red fir and incense cedar will be considered. Rates to be readjusted at three year intervals if the contract period is longer than five years. Deposit with bid \$5,000 for Compartment 1; \$1,000 for Compartment 2; \$200 for Compartment 3, and \$100 for Compartment 4. The right to reject any and all bids is reserved. Before bids are submitted full information concerning the timber, the conditions of sale and submission of bids should be obtained from the

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## AN AMERICAN FORESTER ABROAD

**U**NDER date of June 7, from "Somewhere in France," Tom Luther, son of Thomas C. Luther, proprietor of the White Sulphur Spring Hotel, Saratoga Lake, writes interestingly of the work of the American Foresters in France, as follows:

"It has been my firm intention to write you ever since I have been over here, which represents some time now, as we already have our first service stripe, representing six months in the Zone of the Advance or the Zone of Supplies.

"We would all like to be up front to a man, especially now during the Boche offensive, which is doomed to failure. It's never a question of who will win—never! It's always 'How long will it take to lick them in real American style?' Many of the companies of my regiment are working within sound of the big guns and even under fire—tin hats and gas masks being in order. We are not so fortunate, since we are working in the maritime pine forests.

"Having had the preference over many thousands of combatant troops of coming over many months ahead of them we feel that our work is important, but it doesn't appeal to the red-blooded American, as do the trenches with possible military honors. Nevertheless, our mark, my own company's mark, now stretches from the piling and timbers used in the piers, where our ever-aiming transports land, clear up and out into 'No Man's Land,' where our entanglement stakes are being used for the barbwire.

"Company C's 'trademark' can be found in the great warehouses at the ports of debarkation, at the rest camps, on the ties supporting our own railroads, on the duckboards in the trenches and on the props used in the dug-outs. To say nothing of the fuelwood we ship everywhere.

"There is hardly a nook or corner of France where the American soldier cannot be found today. Instead of 'Somewhere in France,' it should be 'Everywhere in France.'

"Our mills are running night and day and personally I have to be on the job seven days a week, as I'm looking after the shipping.

"I know you are interested in efficiency; therefore, I cannot help but take this opportunity to tell you a bit of French efficiency. It is their railroads. An American must laugh at them. The cars and engines are so small—and I cannot help but recall my ride from a base port here in a wee small box car with some thirty-five other men. I would not have believed that one small car could hold so many of the men if there had not been a written guarantee in good French on the outside to the effect that the car would hold thirty-six to forty men or eight horses. To return to the point, America could well take a

lesson from their 'petite' railroads in the wonderful way in which they have for four long years done everything and much more than could be expected. They have been 100 per cent efficient, or the British and French armies would have been lost long before this. Of America we all read last winter of the freight 'tie-ups' and all—they couldn't be over here. But my real point is I take off my hat to the French and British.

"We do salute you all back home for the unbelievable way in which you are all giving to the Red Cross, to the Y. M. C. A., and the Salvation Army. There seems to be no end to your capacity to give—it's that wonderful feeling that everyone everywhere back home is right behind you that will bring this war to a speedier end. If you all could but see one incident of what your giving means you would be glad through and through. Only the other day I saw several refugees from the last invaded districts who were eating food from the American canteens bought with your money—poor old men and feeble women with their teeth in many cases eaten out by German gas (there's something even poisonous about the name German now), and the little girls, their hair gone—gas! And one small boy totally blind for life—more gas!"

Mr. Luther has been in the Zone of Advance or the Zone of Supplies for six months and wears a first service stripe. —*New York Lumber Trade Journal.*

## SAVE YOUR NUT SHELLS AND FRUIT PITS

**E**VERY American has the chance for direct war service that will save the lives of soldiers. Carbon is needed to make millions of gas masks for the American Army. Cocoanuts have furnished much of this material, but cocoanuts mean ships, and during the present shortage material for carbon must be found nearer home. The pits of apricots, peaches, prunes, olives, dates, cherries and plums and the shells of Brazil nuts, hickory nuts, walnuts and butternuts make carbon for gas masks that will outlast the most diabolical of the German gases.

Here is work for all, every home, church and school. Urge the boys and girls to scour the woods for nuts and incite your patriotic organizations to rivalry in making collections. See that the work is started in your neighborhood. Place collection boxes in schools, churches, banks and stores, and above all in your own home so your boys and girls can see the pile grow. It takes two hundred peach stones or seven pounds of nut shells to furnish carbon for a gas mask and save the life of an American soldier. How many masks can your neighborhood furnish?

Dry the pits and shells before turning them into the nearest Red Cross chapter. This organization is in charge of collecting all material.

## CANADIAN DEPARTMENT

BY ELLWOOD WILSON

PRESIDENT CANADIAN SOCIETY OF FOREST ENGINEERS

ON the twentieth of September there was held at the Windsor Hotel in Montreal, the first regular meeting of the Woodlands Section of the Canadian Pulp and Paper Association, which was organized last February. There is much significance in the formation of this section, as it brings together the practical woodsmen and responsible heads of woodlands operations who furnish the raw material for the immensely important pulp and paper industries. In the past these men have been concerned only with the delivery to the mills, at as low a cost as possible, of the logs necessary for the mills. They have never given the future a thought, or if they have they have said "What do we care what happens in 25 or 30 years, let our successors attend to that." They have not been to blame in this attitude as their work has been judged solely on a basis of cheap production. Get us cheap logs, has been the order. Now that the price of labor and supplies has advanced so much and the timber is rapidly growing more inaccessible and of poorer quality, they are beginning to look ahead a few years and are taking an interest in the future. This naturally brings them into touch with the man who understands these matters, the forester, and they are asking him what can be done to insure a supply of logs for the future. This is certainly a good thing and it is fine to see how these men are tackling the problem. Great strides may be expected in Canada in the near future due to the co-operation of all those interested in the exploitation and conservation of the forests. There is no sentiment about it, but only the desire to perpetuate and use properly, what is one of Canada's most important natural resources.

Dr. Swaine, the Dominion Entomologist, reports that an insect which has hitherto only attacked the cultivated species of white birch, has now attacked the birches in the forest and will in all probability exterminate them if some means is not found of combating its ravages. He also reports finding the worm which causes the balsams to turn red and die. The proper scientific study of our forests is one of the most important pieces of work which has been undertaken and will yield highly important economic results.

The preliminary report of Dr. Howe on the conditions of growth and reproduction of conifers in the Province of New Brun-

wick, shows that they are very similar to those ascertained last year in Quebec.

The new Forestry Service of New Brunswick is progressing well and reflects credit on Col. Logie, who for years has been working to establish a rational system of forest management for the Provincial lands. New Brunswick is now in some respects ahead of all the other Provinces in the Dominion.

The St. Maurice Forest Protective Association reports for the season to date show 90 fires, which burnt 340 acres of merchantable timber, 425 acres young growth, 1,340 acres of cut-over land and 2,230 acres of old burn. The total cost of extinguishing these fires will amount to about \$900, a further reduction over last season, which was the lowest on record. Only one arrest was made for setting fires and the man was fined. Much use has been made of motor cycles with side cars which can go where automobiles cannot and use less gasoline. Their cost of upkeep is also lower.

On August 20th, after a meeting of the members of the Newsprint Service Bureau in Montreal, some of the members, Messrs. G. M. Knowlton, E. B. Sterling, Prof. C. T. Hamill, R. O. Sweezy, J. S. Bates, R. S. Kellogg, A. L. Dawe, Beck and Ellwood Wilson, made an automobile trip to the Quebec Government Nursery at Berthierville. Here they were met by the Chief Forester, G. C. Piche, who welcomed them on behalf of the Minister of Lands and Forests and showed them the very excellent nursery. Here trees are raised for sale to those reforesting on a large scale and also for farmer's woodlots and ornamental planting.

The writer has just returned from a most interesting and successful meeting of the Society for the Protection of the New Hampshire Forests at Dover, New Hampshire. The Secretary, Mr. Philip W. Ayres, deserves great credit for the interesting meetings which he organizes. Col. Graves gave some very interesting accounts of the work in France and called attention to the necessity for better forest utilization and management on this continent and expressed the opinion that when our men return from France where they have had an opportunity to see the value of forests in war and the wonderful way in which France has built up her forest resources and conserves them even under the stress of war conditions, there will be



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## MAKING PAPER FROM DEAD LEAVES

**B**OTH in Europe and in America there has been a sharp rise in the cost of paper, and this has been peculiarly critical in France, says the *Scientific American*. Even before the war France imported half a million tons of paper pulp yearly from Austria and Germany, or about half of the whole amount used. The cutting off of the supplies from the Central Powers, and the severe deforestation due to the war have made paper pulp so scarce and so expensive that many periodicals have been forced to suspend publication. It is now proposed to make use of fallen leaves to supply this lack of raw material. On March 27, M. Edmond Perrier of the French Academy of Sciences presented before that body an account of the successful experiments along this line of Madam Karen Bramson.

The process is very simple, rapid and inexpensive; the leaves are first crushed, which reduces the blades to powder, which is carefully separated from the ribs and veins. It is the latter which form the raw material for paper pulp. They are subjected to a somewhat rapid lixiviation and are then washed and bleached, whereafter the pulp is ready for use. The leaf powder which remains is useful in two ways. It has a high food value, since it contains the digestible and nutritious parts of the leaf after the removal of the cellulose. As a food for cattle its nutritious value is almost

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equal to that of hay, especially when mixed with molasses and compressed into cakes. The leaf powder may also be used as a combustible. For this purpose it may be compressed into briquettes, either with or without being previously mixed with charcoal powder.

Madam Bramson recommends however, the practice of dry distillation, by means of which she obtained a comparatively pure porous charcoal rich in calories (6,500 to 7,000 cal.), and easy to agglomerate. The process also yielded an excellent tar, having all the qualities of the so-called Norwegian tar, having tar, as well as acetone, and pyro-ligneous acid. One thousand kilograms of the leaves yielded 250 kilograms of pure carbon (or 500 kilograms of edible powder) 30 kilograms of tar, one kilogram of pyro-ligneous acid and 600 grams of acetone. According to a recent estimate by the Director of the School of Grignon, France produces annually between thirty and forty million tons of dead leaves. It is calculated that only four million tons would be required to furnish the paper pulp required in an average year. The economic importance of the question is evident from the fact that in 1913 France paid \$20,000,000 for the paper pulp imported from the Central Powers.

It is believed that the collection of the leaves can be done by women, children and war cripples. The leaves can be transported to the paper mills in compressed blocks, but it would be better to build factories on the borders of great forests so as to eliminate the cost of transportation.

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## ANCIENT PINE DOORS

ONE of the most remarkable instances of the permanency of wood construction has been found by Mr. John H. Kirby, President of the National Lumber Manufacturers Association, in the romantic and picturesque old mission church of San Xavier Del Bac, nine miles from Tucson. The huge wooden doors which have swung open to countless thousands are today performing the service they performed when the famous old mission was built, more than two hundred years ago.

Founded in 1692, the mission, which many claim to be even more beautiful than the missions of California, was conducted continuously by resident Jesuits until 1751. Then for a few years it was administered as a visita from Tubac, and in 1767, fol-

lowing the Spanish expulsion of the Jesuits, was turned over to the Franciscans. This order continued the work of the mission until 1827, when Mexico expelled all the religious orders.

For a number of years the mission was practically abandoned. After the Gadsden purchase in 1854, it came into the diocese of Santa Fe, but not until 1866 were the missionaries from the New Mexico city able to reach the Santa Cruz Valley and take up the work there.

In 1900 the Right Rev. Henry Granjon was appointed bishop of Tucson. He secured title from the Government for the land on which the mission stands, and restored the building, which had fallen into ruin to a certain extent. Since that time the work of the mission, including a school for the

Indians on the reservation which entirely surrounds it, has continued regularly.

The pine doors which have done service for so long a period, were, according to tradition, a part of the original building completed in 1699. When this original structure was demolished in 1793, the doors were saved from ruins and made a part of the present building which is built of brick and stone and is of a Moorish-Byzantine type of architecture.

The pine doors are today in virtually as good condition as when they were first hewn from the trunks of the tree, a striking example of the durability and serviceability of wood as construction material, the merit of which was recognized even in early times as it is today when the lumber industry has grown to such enormous proportion in the United States.

## THE PROUD RECORD OF ONE DISTRICT IN SHIPBUILDING

FORTY-FIVE completed wooden steamers worth \$150,000,000 will have been delivered to the Emergency Fleet Corporation by the end of 1918 from Portland and the Columbia river district, according to a recent announcement at Portland. In addition, shipbuilders of the district will have launched 105 additional hulls worth \$50,000,000.

This means a total contribution by this section of the Pacific Coast of 540,000 tons to the United States Merchant Marine Fleet. The wooden shipyards of the district have on hand contracts calling for construction of thirteen steamers of 3,500 to 4,600 tons each. New contracts are being awarded at frequent intervals.

It costs \$200,000 to equip a wooden hull with machinery and prepare it for ocean service.

## WOOD TO ROOF INDEPENDENCE HALL

WOOD in the form of shingles has been decided upon as the best possible protection for the roof of old Independence hall by the Philadelphia Chapter, American Institute of Architects. These are to be laid on shingle lath so they will be visible from the loft, and nailed with copper nails.

The Philadelphia architect body made the decision after a long and exhaustive study of the subject during which all sorts of roofing material was proposed. The work, which is to be finished in four weeks, has already been let for \$5,936. The specifications call for split, all heart shingles, seven by twenty-four inches, with butts not less than a half inch.

When the work has been completed the historic building will be about as fully restored to its original condition as possible. Part of the work to be done on the contract is to move the skylights from the north side and place them on the south side as they were originally.

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**WOOD FOR FUEL IN IOWA**

CROSS-CUT saws, buck saws and axes are making sounds like victory for the United States in its war against Germany throughout Iowa this week. They are being wielded by determined men who are putting wood into shape to be used as fuel this winter. Their employment is a part of a gigantic plan inaugurated by Charles Webster, Federal Fuel Administrator for the state, to conserve coal during the coming winter months.

The equivalent of one million tons of coal, or rather to be more explicit three million cords of fuel wood, is the mark set by the state administration to be reached by November 1, 1918. Iowans generally are co-operating and it is expected there will be no difficulty on that score. Nearly 60,000 pledges have been obtained in which the signers pledge themselves to have cut for own use certain quantities of fuel wood by that date. In many of the larger cities of the state municipal wood yards have been established and are doing good work.

**CHINESE CHESTNUTS THRIVE**

The Chinese downy chestnut trees (*Castanea mollissima* which were distributed in 1907 have not succumbed to the bark disease and some of them have borne a few fruits. It is clear that they have a high degree of resistance to disease, and although they can not be expected to take the place of the much larger species of chestnut native to America, in so far as timber production is concerned, they can be at least relied upon to furnish good nuts for the trade.

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tree in Panama, by H. Pittier, p. 159-60.

Indian forester, May, 1918.—Recent investigations on soil-aeration, by A. Howard and R. S. Hole, p. 187-212; Forestry in Lower Burma, by H. W. A. Watson, p. 212-17; Note on jungle-wood shingles, by J. D. Hamilton, p. 217-25; Experimental sowing and planting of *Cupressus glabra* in Garhwal, by M. P. Bhola, p. 228-9; Natural regeneration of conifers in the Pacific coast forests of the U. S., p. 234-5; Wood distillation, p. 235-8; Notes on dry rot, p. 238-40.

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Revue des eaux et forets, Aug. 1, 1918.—Production en matiere des forets francaises, by A. Arnould, p. 169-80.

Skogen, July, 1918.—Meddelanden fran Svenska skogsvardsforeningen (Report of the annual meeting of the Swedish forestry association), p. 201-13.

### BLACK WALNUT NEEDED

**T**HE bureau of aircraft production of the war department has announced that there is an urgent necessity for the immediate delivery of all the black walnut wood it is possible to obtain. This wood is desired for use in the making of airplane propellor blades and gun stocks.

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A part only of the lumber from each tree can be used, and the Government, therefore, cannot buy the trees direct from the owner. When the trees are sold to a saw mill which has a Government contract for lumber for propellor blades or gun stocks, this wood will be sorted out and put to the uses to which it is adapted.

No trees which produce logs less than 12 inches in diameter can be cut, as they do not yield material suitable for Government use.

It is desired by the bureau that anyone having information on the subject of black walnut trees get into touch with saw mill concerns in their communities, which may have Government contracts, or communicate with the Ordnance Department, Production Division, Small Arms Section, Washington, D. C.

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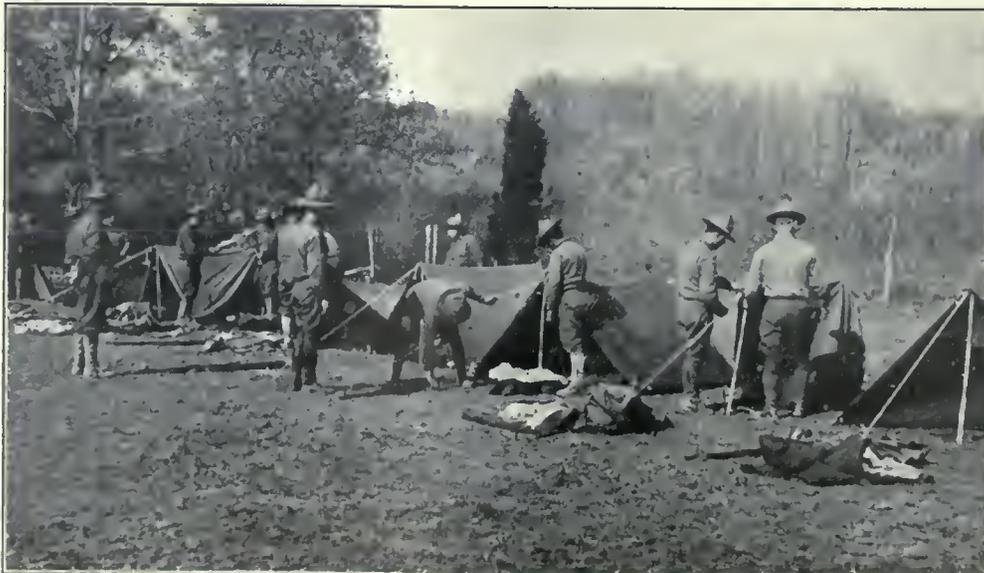
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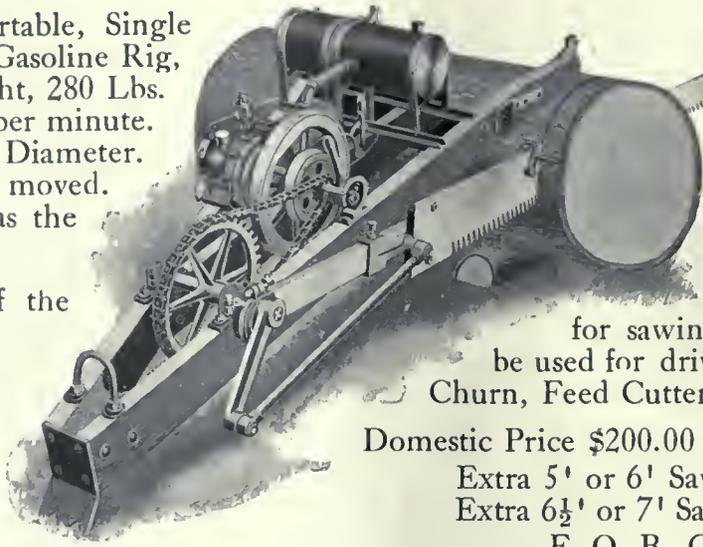
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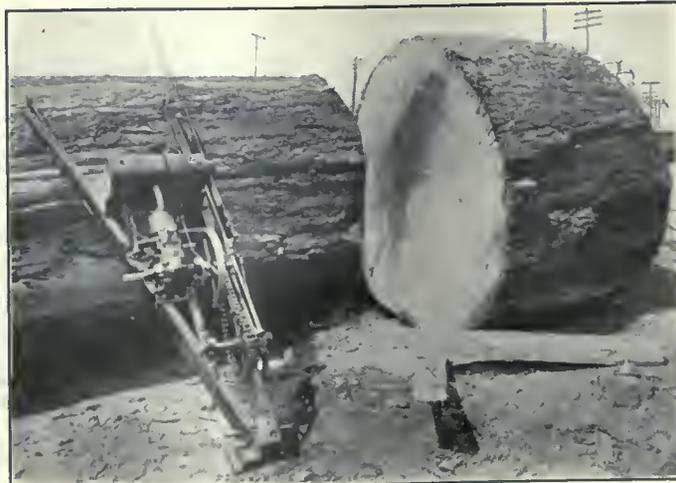
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# AMERICAN FORESTRY

THE MAGAZINE OF THE AMERICAN FORESTRY ASSOCIATION

PERCIVAL SHELDON RIDSDALE, Editor

NOVEMBER 1918 VOL. 24

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### DOUGLAS FIR—MONARCH OF THE WOODS

This vast resource of the West is practically untouched. It is the wood *par excellence* for airplane stock and is valiantly doing its bit in winning the war. A raft of logs recently cut in Oregon, consisting of 210 sticks, totaled one million feet board measure.



*Photograph by McKenzie, Duluth*

#### AFTER THE FIRE DEMON PASSED

"It did not smoulder, crawl and creep as ordinary fires do, but with one great bound it clutched its prey in instant flames." The picture shows the wreck of a home—all that was not metal burned; and, above, a swamp, almost a peat bog, that will burn and smoulder probably for weeks.

# AMERICAN FORESTRY

VOL. XXIV

NOVEMBER, 1918

NO. 299

## THE HOLOCAUST IN MINNESOTA

### A GREATER HINCKLEY

BY E. G. CHEYNEY

THE afternoon of October 12, 1918, differed but little from many another afternoon that Cloquet had seen in years gone by and her busy life pulsed on with normal beat. Her five great sawmills hummed

solid ground beneath their feet. It was dry? Yes, twenty inches short of rain in twenty months, but the fire ranger was an able man and surely he could handle the little tract of 107 townships that were his to watch



Photograph by Underwood and Underwood

NOT WHAT IT SEEMS TO BE AT ALL

This is not a reconstruction committee visiting a scene of devastation left by the vandal Hun, but it shows all that is left of the Country Club of the Golf Association of Duluth after the terrific fire had swept on.

and coughed as was their wont, the toothpick factory turned out its accustomed thousands of surgeon's paddles, the planers whined plaintively, the endless stream of pulpwood went its jerky way down the long conveyor into the paper mill, and 150 million feet of lumber in high, neat piles lay drying in the two miles of valley at the foot of the prosperous town.

To be sure the wind was rising steadily, but what of that? Let sailors cast their eyes aloft and trim their sails with cautious care, it mattered not to men with

alone. Wind and smoke had come and gone before and no one been the worse for it.

So, "On with the dance." Why worry over things that are none of one's business?

Better had the land lubbers heeded the wind and not rested so contemptuously secure in their fancied safety. Far away to the west and north that very wind was preparing some weird rites ordained to recover its lost prestige. Persistently it whispered to many a little bunch of coals left smoldering in some lakeside swamps

by the hunters, to little blazes wavering up from careless matches, and to clearing fires insanely set at such a time. They might have been harmless enough without the drouth and of little power without the wind, but the stage was set for greater things by a master hand.

The devil dance was on.

Quickly those little fires responded to that seductive wind. Through dust dry swamp and swirling autumn leaves they crept with eager pace, till urged on to madness by the ever more furious wind they joined hands in the St. Louis Valley near Floodwood in one wild burst of flame. The devil dance was on indeed.

The Cloquet mills coughed and shrieked. Duluth lay

pass away that the destruction of a large town by a forest fire seemed to them incredible.

The smoke had become so dense that neighbor bumped into neighbor on the street and yet the mill ran on. But at last the wise ones were convinced. For the first time in fifteen years the great steam siren shrieked its frightful call of impending disaster and the authorities began herding the unbelieving people onto the cars. No pullmans, these cars. A few coaches, baggage cars, box cars, coal cars of almost every type, but they could carry people; and they did. Reluctantly and often protesting the people clambered on. There was no panic and no confusion. Fear there probably was before the



*Photograph by Underwood and Underwood*

#### RUIN NEAR THE SUBURBS OF DULUTH

"All unheralded, the fire descended on the far-flung suburbs of Duluth. A night raid from the forest on a mighty city. Two hundred deaths tell the horrible story." This is all that remains of a farm home, twelve miles west of the city.

secure in her civic might and Moose Lake cared little for a fire in the distant woods.

But the ore trains were blocked on the Great Northern tracks, a matter of international importance at the present time, and the first word of warning was sounded in Cloquet. It was not a very loud warning and no one heeded it much. Then a train of refugees went through from Brevator on their way to Superior. The warning was a little louder now and the wise ones began to prick up their ears. The mills coughed on. Brevator was a long way off. But the wise ones arranged for an open track to Superior and held relief trains in readiness. The people smiled indulgently and coupled up the garden hose. So quickly do the memories of former disasters

three trains pulled out, but if so it was well contained and no one disgraced himself.

In the meanwhile it happened. With one mighty bound, a massive, solid wall of flame shot over the hill at the west end of the lumberyards and all hope of saving the town was gone. It did not smoulder, crawl and leap by turns as ordinary fires do. With one great bound it clutched its prey in instant flames. A dozen blazing centres had sprung up at once. Furiously the fires raged. But even so it could not stampede that last waiting train of hope. When the flames began lapping over the rear cars, the train moved slowly ahead till free of the flames, and waited. The flames forced it to move again and again it waited. There were to

be no abandoned souls in that town driven to madness by the sight of a departing train. Eight thousand people taken out of town in one short hour, and only seven lost. Seven who were lost in the smoke or refused to leave and never reached the tracks at all. It was a wonderful record.

Nor was the reception in Superior less wonderful. Superior might well be proud. Twelve thousand refugees welcomed, housed and fed in twelve hours.

The few brave spirits who went back the next day to learn the fate of the town must have stood in silent awe of what they saw. Nothing! Hardly a trace of the thriving city that had hummed with normal life the day

sniffed at each new comer, and disappointed trotted on to try again. Hardly a sound in this ghost of a noisy city, even the footsteps seemed to lose their sound in that awful emptiness. Where row after row of lumber piles had stood the ground was smooth and clean, swept bare by that sixty-mile an hour wind.

As though to display its power of wilful destruction, the flames by strange caprice had skipped some spots as though by a miracle. The public library with its heavy walls of brick had faced the lumberyard. The last vestige of the lumber piles was gone. The back portion of the building was gone. Only some ten feet of the front wall remained. And yet on the two ornamental



*Photograph by McKenzie, Duluth*

#### DESTRUCTION SWIFT AND COMPLETE

This is the site of an inn, where many a merry party has foregathered. Now only blackened ruins and charred stumps remain to tell the story of flame and terror.

before. Block after block there was not a thing in sight above the foundation lines. Chimneys, framework, everything gone. Mere blackened stubs where large crowned trees had been. Brick buildings level with the ground. And round, about, and through it all paved streets and curbing. Indeed had it not been for these paved streets with many a familiar crook and turn the searcher could not have found his way about, so completely had the buildings disappeared.

Here and there the wreck of an abandoned automobile leaned drunkenly against the curb. A few stray dogs

lamp posts on the front steps were to round glass globes uncracked, while up and down the curb was spattered lead which had melted from the insulated telephone cables overhead.

Far up on the hill where the fire had wiped away whole blocks of houses as if by magic stood a lonely house. Its neighbors on the four adjoining lots had disappeared, only the charred foundations left. Not a pane of glass was cracked, not a thing was burned. Three houses on the eastern edge of town and four on the west shared with it the glory of survival in that

great inferno. Two of the sawmills were there in tact, the paper mill, the box factory and some of the lumber piles. The town was gone. The leaves on the willows in the park were green and unshriveled. Every house around it was in dust and the dust had blown away.

A bunch of nickels in a cash drawer had fused into a solid lump. Two bicycles lying where a shed had been were welded into a single tangled mass. Whole sections of copper wire had been burned away. The grass in some of the yards was unscorched.

Never was there such complete destruction of a good sized modern town accompanied by so little loss of life. Three days after the fire reconstruction had commenced. So thankful were the people for their own escape that scarcely a voice was heard to bemoan the loss of property, as complete and thorough as it well could be. Such the astounding story of Cloquet, and pity it is that others could not have been as fortunate. The death song of Moose Lake must be written in another minor key.

The devil dance was not confined to the St. Louis Valley. A branch of it shot across the swamps to the southeast and closed in on the illstarred town of Moose Lake. They laughed at such warnings as they had. No relief trains came to take them out. The blow was swift and terrible.

It bathed a wide stretch of country in flame and literally tore out the center of the town leaving a fringe of houses along one edge. Destruction was swift and complete. People were burned in the houses in the town, drowned

in the lakes where they had taken refuge, smothered in root cellars, overtaken on the roads and trapped in the woods. One couple put their seven children in the root cellar for safety while they went to get their stock. The

fire cut them off from the root cellar. Through some miracle they themselves escaped, but only to find their seven little ones smothered to death by the smoke and gasses. The loss of life on every side was frightful.

It is reported that 300 bodies have been found so far and the search of the back districts has but just begun. Hundreds more will be found and many a silent spot in the forest will keep its gruesome secret to the end of time.

Still another branch of the devil dance left the St. Louis valley to the Eastward and descended all unheralded on the far flung eastern suburbs of Duluth. A night raid from the forest on a mighty city. Two hundred

deaths tell the horrible story.

Between these towns, including an area of thirty miles across, lies desolation. Many another smaller town felt the heavy hand of the forest fire, and paid a heart-breaking toll of human lives. Many a tragedy was played that night in isolated forest homes far from any helping hand. Many an unselfish hero died unknown in vain attempts to save the ones he

loved. Many a little group of charred and blackened bodies tells the sickening story of fleeing families overtaken in helpless flight on those lonely forest trails.

It will be days before the list of dead, already soaring



Photograph by McKenzie, Duluth

#### INSPECTING THE RUINS

This was once a beautiful home near Duluth, in Lakeview district.



Photograph by McKenzie, Duluth

#### WRECKAGE WHICH TELLS A GRUESOME STORY

The unfortunate woman who lived in this house took refuge in the dugout root-house and was smothered to death by smoke and gasses.

toward the thousand mark, can be considered even approximately correct; it can never be complete. It will be weeks before the property loss, mounting high into the millions, can be even guessed with any degree of accuracy.

The loss of merchantable timber was comparatively small in the light of the area covered, but even that when the young growth is included will be a staggering total. The loss of property, owing to the destruction of so many towns and country homes, will be enormous. The loss of life is simply appalling even in these times of war when ever-swelling casualty lists make life seem lightly held. It is far the most disastrous fire in Minnesota's history, and when the whole truth is known few will be found to surpass it anywhere.

It cannot be traced to any single cause. The rainfall was eight inches below the normal last year and has

fallen twelve inches below the average so far this year. The leaves had fallen and the weather was unseasonably warm. Certainly these were prime conditions for a sweeping conflagration. Add to this a sixty or eighty-mile wind that raged for several hours, and the stage was

set. The rangers could not be given the needed help. Four years ago a pennywise legislature cut the force in half and invited this disaster.

Four years of inadequate patrol service has allowed the conditions grow steadily worse. Luck has been with us. Today the luck has changed and the inevitable has happened.

Probably no bronze tablets will be erected, no dedication ceremonies performed, but none the less will these blackened acres, these desolate, ruined homes, and the silent graves stand as a memorial to the men who arbitrarily abandoned the northern peoples to this fate.



Photograph by McKenzie, Duluth

LINES OF WIRES BROUGHT DOWN

Rows and rows of telegraph poles leveled by that sixty-mile a minute wind, but unburned.



Photograph by McKenzie, Duluth

THE ONCE FAMOUS DULUTH COUNTRY CLUB

A remarkable thing, and of the freak tricks of the fire, was that the small and apparently easily inflammable bungalow in the rear was untouched while the club house was completely demolished.

# THE GREAT MINNESOTA FIRE

BY J. F. HAYDEN

**A** PRAIRIE fire keeps pace with the wind, but it can be outwitted. Backfiring will open a path to safety. But a forest fire, unchecked by wide fire lanes and fanned by a high wind whose velocity is increased by the atmospheric disturbance caused by the fire itself, cannot be avoided nor evaded. Speed counts for little, for flaming brands, carried on the wings of the wind, fly ahead of the fugitive and cut off escape. And when fires break out in many localities at once, as was the case with the fires that raged in several counties

Here were many settlers making homes on the lands that had been cut over in lumbering operations, and the lives of more than one hundred of them were snuffed out.

The life and property losses of these previous fires are dwarfed by the latest fire disaster. Lives to the number of fully one thousand have been the sacrifice, and the property loss will probable reach well up toward \$100,000,000. Many of those who were overtaken by the raging flames will be listed as "missing," for no



*Photograph by Underwood and Underwood*

THE PROPERTY LOSS WAS PROBABLY ONE HUNDRED MILLION DOLLARS

Again we might believe this scene in devastated Belgium or tortured France, but it is really the wreck of the big trestle between Duluth, Minnesota, and Superior, Wisconsin. After the railroads ceased to operate, automobiles brought hundreds away from burning farms and towns, but many were trapped and burned to death.

of northeastern Minnesota, and are still unsubdued, fleeing settlers can find no haven of safety.

Take the map of Minnesota and mark the boundaries of an area with Bemidji on the west, Duluth on the east, Hibbing on the north and Brainerd on the south, and you will have roughly the area over which the most recent and the most disastrous holocaust has swept.

Minnesota has had bad forest fires in the past. The Hinckley fire of the fall of 1894 burned through much good timber, destroyed the towns of Hinckley and Mission Creek and took a toll of more than four hundred lives. Fourteen years later the city of Chisholm was burned and its six thousand residents made homeless. Much timber and other property was destroyed. In 1910 the northern counties of the State were fire swept.

vestige of their bodies remains. Dozens of others were burned beyond recognition.

There have been hints of incendiarism, by a widespread plot, but whether by this cause or by carelessness and lack of protective measures, conditions were such as to make the disaster inevitable once fires started and the wind blew.

Most of the territory over which the fires swept had, in years past, been denuded of its original forest growth of pine. Small towns had sprung up and settlers had gone into the outlying districts to reclaim homes from the stump lands. Second growth pine, tamarack and hardwood timber remained in many localities, and small mills had been brought in to manufacture it. Swamps had been drained to make farm lands—drained to a dry-

ness that made them dangerous fire beds in many cases. The vegetation of the summer was dead and dry; hay had been cut and stacked. No rain had fallen for weeks. Everything was tinder. Fires, started no one knows how, had been smouldering for days. Forest rangers and patrols had done what they could to extinguish them; but the force available was inadequate.

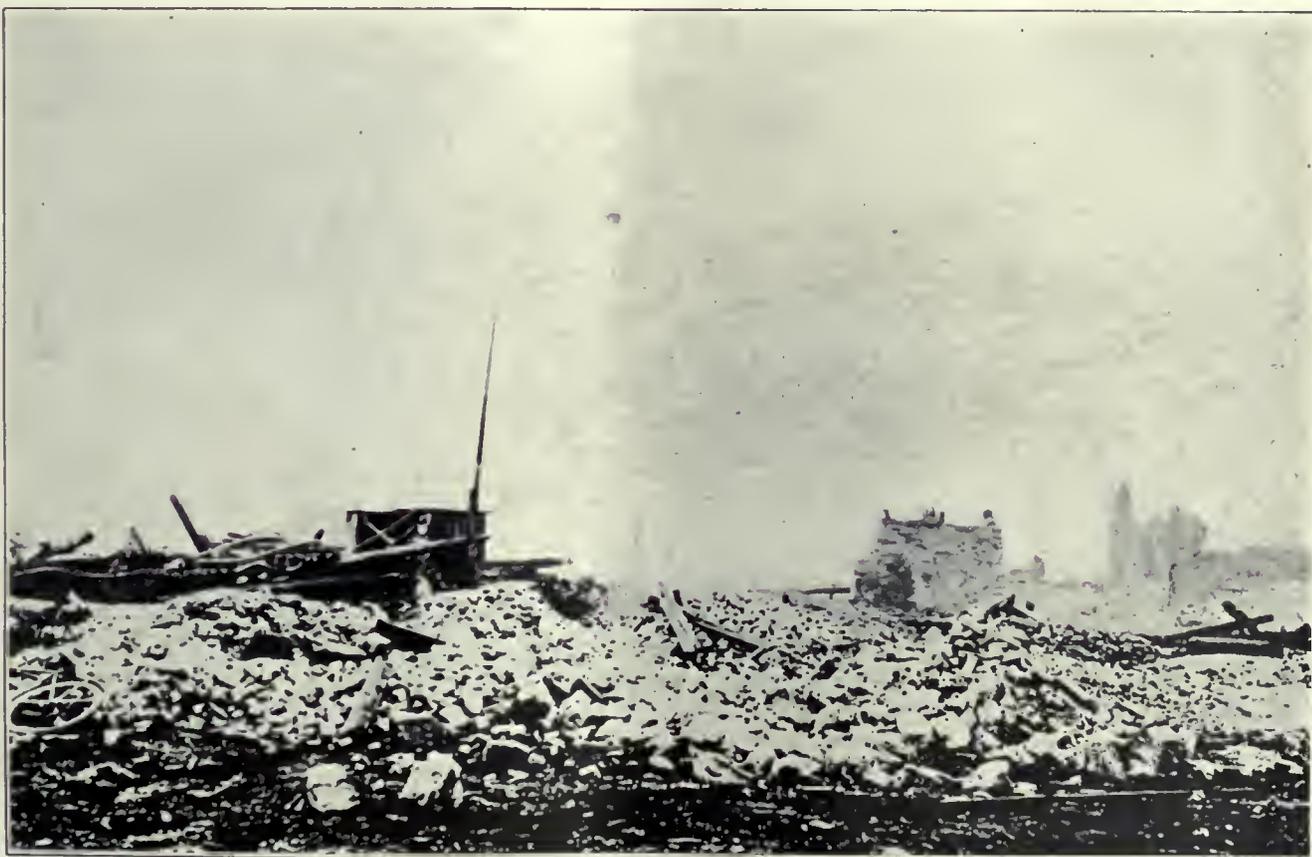
Following the Hinckley fire, the state legislature took measures to prevent recurrence of such disaster, and for several years funds were provided to support properly fire prevention work. But in the years that followed a sense of security born of small fire losses, resulted in relaxation. The Chisholm and Spooner fires followed.

Again the legislature had a spasm of righteousness; and again it relaxed. At the last session, two years ago,

detail is even now only difficultly available, and it will be weeks before the full extent of the disaster is known.

A connected and general description of the fire is impossible. Personal experiences of those who escaped are mere incidents from scattered localities in the wide fire zone. Refugees crowd the bordering towns; morgues are full of bodies; dozens of dead are being buried in trenches where their bodies were found; charred remains of farm buildings and town residences and store buildings are everywhere visible; gaunt and blackened tree trunks stand sentinel over scenes of desolation.

State guard troops, state motor corps, state and county officials, the Red Cross and civilian volunteers under the direction of State Forester W. T. Cox, are fighting fires which break out anew, fanned by the shifting winds,



*Photograph by Underwood and Underwood*

RUINS OF THE ALGER-SMITH LUMBER COMPANY'S YARDS

Furiously the fire raged at Rice's Point, near Duluth, levelling everything in its path. The last vestige of the lumber piles disappeared, all metal and wire work welding into a solid mass. The total loss of manufactured lumber was conservatively estimated at over 100,000,000 feet.

the state forester asked for \$75,000, and was granted about half that sum—too little to provide adequate protection and an efficient corps of rangers and patrols.

Perhaps the large sum would not have sufficed. Much of the area over which this latest fire swept was out of the forest boundaries—farm lands and sites for growing communities—but the state forest service would have had some jurisdiction.

The fire, or fires, for there were many of them, started and swept onward with such rapidity that the worst was over before information came out of the devastated districts. Because of destroyed telegraph and telephone lines, highway and railroad bridges, information in

and giving relief to those who are in need and can be reached.

Actual loss to the lumber industry is represented chiefly by the destruction wrought at Cloquet. The two large mills of the Northern Lumber Company at that point were burned, with the entire stock of lumber. The planing mill of the Cloquet Lumber Company burned, with much of the company's stock—forty million feet, which, with that of the Northern Lumber Company totals one hundred million feet. Five small mills, at Kettle River, Lawler and Automba, manufacturing mixed hard and softwoods for the Parker-Kellogg Lumber Company, of Minneapolis, were destroyed. The loss of

good timber will not be known until the fires and smoke subside and accurate cruises can be made, but it is great.

In a general way, it may be said that the fire started east of Bemidji and, fanned by high northwest winds,



*Photograph by McKenzie, Duluth*

#### RAZED TO ITS FOUNDATIONS

Chimney, framework, everything gone. This was a schoolhouse in the Woodland district, northeast of Duluth, which stood in the path of the fire. Smoke still hangs behind the trees.

swept across Cass, Aitkin and Carlton counties to the suburbs of Duluth. Parts of Itasca, Crow Wing and St. Louis counties were touched, and there were scattered fires in other localities.

Wherever, and as long as railways could operate, schedules were abandoned and trains were given over

to the removal of refugees to places of safety. Automobiles brought many away from burning farms and towns, but dozens of these were trapped and their occupants burned to death. Hundreds of people, escape by other avenues having cut off, rushed into lakes and stood nearly submerged for hours in the chilly waters.

Towns and villages in the path of the flames, and wholly or partly destroyed, were Cloquet, Moose Lake, Kettle River, Carlton, Lawler, Adolph, Munger, Five Corners, Harney, Barnum, Grand Lake, Maple Grove, Twig, Matthew, Atkinson, Brookston, Brevator, White Lake, Pine Hill, Automba, Ronald, Salo, Kalbata, Split Rock, McGregor and Warba.

A summary of the situation, insofar as can at present be determined, is that more than twenty-five towns have been destroyed; twelve thousand square miles of territory have been devastated and all of the settlers' homes burned; More than thirteen thousand persons have been made homeless; at least a thousand persons were killed; property to the value of from \$75,000,000 to \$100,000,000 was burned; practically all of the horses and fifty per cent of the other live stock in the district was destroyed; thousands of acres of valuable hardwood timber and much pine timber is rendered worthless; telephone and telegraph lines suffered approximately a half a million dollars damage, and highway and railroad bridges were destroyed.

Reconstruction plans are being worked out. So far as they have been completed, they include immediate supplying of food and clothing to survivors and feed for the animals; financing and government supervision



*Photograph by T. J. Horton, By Courtesy of the Minnesota Forest Service*

#### THE FIRE SWEEPED WOODLAND

This tract of fire destroyed timber is just south of Automba and indicates the character of the destruction by the flames which spared nothing in their path. What timber still stands was killed by the fire and the timber loss in the fire area is complete.



*International Film Service*

PITIFUL PICTURES FROM MINNESOTA

Automobiles brought many away from burning farms and towns, but dozens of these were trapped and their occupants burned to death. The upper picture shows the abandoned automobiles in which the terrorized inhabitants sought to escape. Hundreds of people, other avenues being cut off, rushed into lakes and stood nearly submerged for hours in the chilly waters.

for rebuilding settlers' homes (this involves the waiving of the provisions of rule No. 21 of the Non-War Construction section of the War Industries Board which

of the burned district; making a complete survey of the live stock situation and preparing to restock the district; helping banks in the burned district to weather the



Photograph by T. J. Horton, Courtesy of the Minnesota Forest Service  
THE RUINS OF AUTOMBA

This progressive little town on the edge of the forest was almost totally destroyed by the fire, only a few of the buildings being left. Tents are being used as temporary shelters by the survivors and relief was sent to them as soon as possible. So rapidly did the fire advance that the residents who got away saved practically nothing except the clothing they wore.

prohibits new construction to cost more than \$1,000); supplying labor for the rebuilding and reconstruction

situation and reopen for business; rebuilding of factories burned in Cloquet and homes needed in Duluth.

## EDITORIAL

### MINNESOTA'S FOREST FIRE DISASTER

ONCE more disaster in the form of a forest fire has overtaken Minnesota. Eight hundred lives and approximately one hundred million dollars in property were wiped out of existence. Surely a heavy responsibility rests somewhere. Had there been no warnings in the past the plea of unpreparedness might have some weight, but in the light of the destruction of Hinckley, Chisholm, Spooner, and Baudette the argument falls flat. These fires proved conclusively that death and destruction ever await forest and town alike if necessary precautions are not taken. In the light of this *past* history, the greatest conflagration in history has been allowed to develop and carry misery and poverty to thousands of people.

Whose is the responsibility?

The prevention of all forest fire in such a country as northern Minnesota is probably an impossibility; the prevention of a great conflagration is not only altogether possible, but the occurrence of such a fire is criminal. According to all reports the ground was exceedingly dry and the wind reached the proportions of a hurricane, but these alone cannot make a great conflagration. There are only two ways in which a conflagration can arise; from many small fires united, or from one small fire long neglected. Either one implies neglect, *criminal* neglect, when the terrible warnings of the past twenty-five years are considered. The responsibility for that neglect seems very definitely placed in this instance.

When the Minnesota Forest Service was created in 1911 a careful estimate placed the needs of the Service at \$150,000 per year. The legislature appropriated \$75,000. The experience of the first two years of operation showed clearly that \$150,000 was the minimum for efficient service. The legislature of 1913 appropriated \$75,000. In 1915 the minimum of \$150,000 was again asked, and the appropriations committee of the Senate cut the appropriation to \$40,000 in spite of the pleadings of all the foresters in the State and of all others interested. The dangers were pointed out, and the present disaster clearly predicted. The same committee in 1917, when the management of a new state forest of 300,000 acres had been added to the duties of the Service, held down the appropriation \$50,000. In the face of all warnings and pleadings the fire patrol service in the north woods was cut to one man for every million acres.

Long before the fatal disaster of October 12 it was very well known that the north woods were full of small fires. The rangers knew it and they did all that was humanly possible to put them out. They extinguished many of them; but for one man to put out all the fires on one million acres in a dry season is an impossibility. Given an adequate force of patrol men the small fires would have been taken care of promptly and such a holocaust as we have just witnessed would have been an impossibility.



Photographs by T. J. Horton, Courtesy of the Minnesota Forest Service

#### PART OF THE PRICE THAT WAS PAID THE FIDDLER

It seems incredible that after the terrific disasters from fire in the past, Minnesota must record a repetition of such history today. Surely the voters of the State, who are property owners and tax payers and as such entitled to protection by the commonwealth, will this time register their protest in no uncertain terms and guarantee the future as far as is humanly possible. The first picture shows the ruins at Moose Lake; the second is a bird-eye view of Cloquet after the fire had passed; (note the temporary tent shelters) and the third is a farmstead west of Moose Lake where reconstruction work is already under way. The free sock on this farm alone escaped.

Without question the graves of those 800 innocent men, women, and children; and the scattered ashes of those thousands of homes are a gruesome memorial to the misplaced parsimony of the state legislature. It is doubtful if the action of the legislature regarding protection from forest fires met with the approval of the people in the past. It is certain that it will not be approved in the near future. We are fighting the greatest war of the world as a protest against the unwise use of arbitrary power in Germany; how long must we put up with it at home?

## PRESS COMMENTS ON THE FOREST FIRES

It is interesting and informing to note the reports and comments on the forest fire disaster in the leading papers.

Condemning the parsimony of the Legislative body in Minnesota, the *Minneapolis Journal* says editorially:

The Legislature of 1915 reduced the annual appropriation for the Minnesota Forest Service from seventy-five thousand dollars to forty thousand dollars. This was done by the Senate Appropriations Committee in the face of the estimate of the Service that the appropriation should be doubled, in order to provide adequate protection from forest fires.

Certain State Senators, however, desired to punish the Forest Service for its share in securing the adoption by the people of the Forestry Amendment, Number Nine, to the State Constitution. It was speciously argued that the expense of fire protection should be paid by the lumber companies and the railroads, and not by the State. Accordingly the appropriation was cut almost in two.

The Forest Service had planned to put a patrolman on each ten townships in the dangerous districts, instead of one to twenty-five townships as it had been doing. But the Legislature gave it only money enough to give each patrolman the vast area of forty or forty-five townships to guard.

The service had already demonstrated the value of its work in fire prevention. Before its organization fire losses in Minnesota had averaged a million dollars a year, with occasional disasters like the Hinckley and the Baudette fires, which not only destroyed much property, but caused great loss of life. Organized in 1909, the Forest Service had in six years prevented any great conflagration, and in 1914 had held the property loss down to sixty-one thousand dollars, although 265 fires broke out.

In the face of this showing and of the pleadings of Northern Minnesota for better protection, the Legislature of 1915 persisted in reducing the appropriation to a meager forty thousand dollars a year. Commenting on this state of affairs, the *Journal* on April 22, 1915, said:

"It is to be hoped that, until another Legislature can act with wisdom in protecting the forests, no great forest fire gets beyond the control of the crippled Forest Service and destroys lives and property."

This hope was borne out, so far as fires were concerned. There was no great disaster before the next Legislature met. But that body showed no greater wisdom than its predecessor, and in a spirit of false economy held the appropriation to fifty thousand dollars a year.

The terrible harvest of this legislative parsimony has now been reaped in the fire stricken sections. A thousand useful lives have been wiped out under appalling conditions. The State of Minnesota saved a few thousand dollars, and now loses perhaps as many millions. And the property losses fall, not on the railroads and the lumber companies, but on the cities and villages and heaviest of all on the poor settlers through this region. The merchantable timber has mostly been cut from these devastated lands, which were covered with dry brush, slashings and other inflammable material. The Forest Service, crippled fatally by legislative hostility, has been unable to detect and stamp out fires as quickly as they broke out.

The State of Minnesota and its citizens will now spend many thousands of dollars for relief of the fire sufferers. The State will lose, too, the taxes on the property that has been burned up, and the products of the industries and the farms that have been wiped out.

Is it necessary for our Legislatures to learn wisdom at the expense of such torture to human beings and such tremendous property loss? Will the coming Legislature provide adequate protection for the life and property in other regions of the North Country now untouched, but quite as liable to disaster?

The settlers who were burned out in this great fire were tax payers. For what were those taxes paid if not for fire protection? It is almost all that some of them can get. The argument has been raised that protection should be furnished for the state lands alone. It would be a fine city fire department that would protect nothing but the city hall.

It is to be hoped that the people and the legislature of Minnesota will now see the light. The old saying that "An ounce of prevention is worth a pound of cure" is nowhere more applicable than to a forest fire.

And in its issue of October 17th, approving the plans of the State for relief and protective measures, the *Journal* continues:

The decision of the State Public Safety Commission to devote all the funds remaining at its disposition, some \$284,000, to the pressing work of relief in the fire-swept districts, will of course be generally approved. It was eminently the right thing to do, despite the fact that the Legislature foresaw no such use of the money. But neither the last Legislature nor its predecessor ever displayed any foresight with regard to the possibilities of such disaster in Northern Minnesota.

There is ample justification for the assertion in resolutions adopted by the people of Hibbing and Stuntz, that the State of Minnesota is "morally responsible" for the loss of life and property, because it has never afforded adequate protection against the constant menace of forest fires. The mass meeting demanded that an extra session of the Legislature be called at once to furnish immediate relief, to "set on their feet again hundreds of settlers who have lost everything they had," and to pass such laws and make such financial arrangements as will prevent a recurrence of similar catastrophies, "a recurrence which is absolutely certain, unless protection is afforded by this State."

With the provision of an immediately available fund by the Public Safety Committee, supplemented by voluntary contributions from all over the State, and with the new Legislature scheduled to meet early in January, it is probably not necessary to call an extra session at this time. But there is crying need for comprehensive legislation that will provide not only for adequate protection in future, but for the huge task of reconstruction.

If the State is morally responsible for what has happened, it is only fair that the State should bear the entire financial burden of what must be done. In this way the expense, duly spread on the tax rolls, would be equitably distributed among the taxpayers. It ought not to be necessary to ask the public, which has already responded to numerous "drives" for war philanthropies, and which is soon to be called on to fill the "war chest" for the coming year, to make these extra contributions at this time. But the need is exigent, the public is deeply touched by the tragic condition of the fire victims, and subscriptions are already flowing in with increasing volume. There is immediate use for every dollar.

At the earliest opportunity the Legislature is bound to provide a fire department that will guard other large areas in the North Country from similar visitations. Every city of any account has a fire department to protect the lives and property of its citizens. What possible excuse is there for the State to do less for its citizens in the regions where forest fires are an ever-present menace?

The *Philadelphia Inquirer* lays the blame for the conflagration to unprotected slashings, and says:

So long as Wisconsin, Michigan and Minnesota continue to leave their forests and pine-slashings unprotected, just so long may great conflagrations like that of the last few days be expected. They have been periodical since the white man began his murderous onslaught on the pine trees, and will continue until scientific care, such as the Federal Government exercises over its own great reserves in the Far West, is enforced.

Those who have traveled through the forests of the States mentioned have been amazed that no greater damage has been done. The seeker after pine or hemlock logs leaves behind him all the materials for a first-class conflagration at any moment. After a dry autumn, such as has been experienced this year, there seems nothing for a fire to do but run its course. The

States which have been so prominent in forwarding "civic righteousness" are not always those which have shown the most common sense in protecting the lives and property of their citizens.

The forests of Michigan and Wisconsin were ruthlessly debauched in one of the greatest economic blunders in our history. Not only was the good timber taken, but no efforts were made at afforestation. Timber which was not needed was destroyed and material for conflagration accumulated. A wise policy would have left today in those States stands of timber which would be reservoirs for all future time. We have sowed with the sack and not with the hand, and have paid the penalty of our folly.

Under the heading "Northwest Forest Fire A National Calamity," the *Pittsburgh Press* sounds a warning against carelessness with fire in the woods:

While forest fires are a constant source of costly waste and danger in this country it is not often that they reach such sensational proportions as the one that has just swept large parts of the States of Wisconsin and Minnesota with a loss of from 1,000 to 1,250 lives and a property loss of somewhere in the neighborhood of \$75,000,000, of which \$25,000,000 is covered by insurance. The wiping out of so many lives, the irreparable destruction of so much valuable timber, and the infliction of so heavy a blow on the insurance companies, make the affair a genuine national calamity.

There is a theory that the fire was of incendiary origin. In a state of war, on the heels of so many exposures of German spy activities, it was to be expected that the theory of incendiarism would be held in many quarters. But it is needless to resort to such an assumption. Sheer carelessness has caused hundreds of other extensive forest fires, and it is an entirely sufficient, and moreover an entirely probable, explanation of this one.

The hunting season is on, and hunters who neglect to extinguish thoroughly their camp fires are by no means a rarity. The fact is that their frequent if not habitual carelessness in this regard necessitates the organization of regular forces of forest rangers, whose whole time is employed in patrolling the great timber sections to keep fires under control.

A single camp fire carelessly left smoldering may have caused this great fire in the northwest with its awful toll of life and property.

Indeed, a single cigar stump tossed thoughtlessly into a clump of undergrowth may have kindled it.

There was a time when the people of the west used to deal with carelessness of this sort as they dealt with horse thieves. Could you blame them?

Emphasizing the seriousness of this loss of timber, so vitally necessary in the winning of the war, the *Springfield, Ohio, Sun* says:

We learn with apprehension of the serious conflagrations in the forests of northern Minnesota and Wisconsin, for at this crucial time in the history of the entire world, when the war hinges upon America's ability to bridge the Atlantic with ships, such forest fires are particularly disastrous and the loss of timber therefrom will mean a serious handicap to the nation, more particularly its ship building program.

The fires have wrought havoc in Minnesota and Wisconsin, killing many, making thousands homeless and completely annihilating scores of hamlets and villages.

The United States cannot afford to have such devastating forest fires. It has been estimated that about one-fourth of the area of the United States, or 550,000,000 acres, is in forests and it is also authoritatively stated that the present rate of cutting timber exceeds the annual growth of the forests, thus reducing the amount of standing timber. And as the rate of cutting timber has been tremendously increased lately due to the demands for lumber for ships, cantonments and for overseas uses, it can easily be seen just how serious the present fires may be, for in a few days' time the flames can destroy more timber than is cut for use in an entire year. Already the loss has run into the millions of dollars.

No explanation is given of the forest fire that blotted out twelve towns in Minnesota, destroyed hundreds of prosperous farms, and cost the lives of 1,000 persons, says the *Chicago, Illinois, Journal*.

Probably to those familiar with the region, the conditions which permit such a disaster are commonplace; but certainly they are not commonplace to the outside world. How a country

can be so thickly forested as to permit the unbroken sweep of the flames, and yet so thickly settled as to be dotted by a dozen towns and thousands of homesteads is a puzzling problem when viewed from a distance.

Relief has been rushed to the stricken district from St. Paul and Minneapolis, and probably the call for help will be sent widely through the land. If so, it should meet a generous answer. We have learned to give, these days, and there is more than one field in which we can apply the lesson.

Referring to the cause and responsibility for the fire, the *Pioneer Press* of St. Paul, Minnesota, says:

The obvious and businesslike way of laying bare the entire situation in connection with the forest fires has been taken by Governor Burnquist. A commission of nine business men in whom the public has confidence will conduct the probe and the results will be laid before the coming session of the legislature as a basis of procedure to prevent a recurrence of the tragedy. This course will meet general approval. There is little doubt that the commission will determine that an inadequate patrol, as the result of legislative shortsightedness, is primarily responsible for the spread and extent of the fires. This will tell the legislature nothing that has not been told its predecessors with force and eloquence, but with the catastrophe fresh in mind and under pressure of an aroused public opinion there is reason to hope the folly of the past will not be repeated. If it is, we may be assured the catastrophe also will be repeated, sooner or later.

Reviewing the situation in a broad and comprehensive manner, the *Christian Science Monitor*, in a forceful editorial headed "The Woodland Catastrophe" says:

It is a striking and far from pleasant commentary on the times that, while the United States is reaching out in all directions for man-power, raw material, and financial means necessary to the maintenance of war activities at the highest pitch, only passing notice is given by the press and the public to a disaster in Northern Wisconsin and in Minnesota which has resulted in the devastation of five counties, with the destruction of more than 800 lives and a property loss of approximately \$100,000,000.

The war and the tremendous questions growing out of the war accounts in a large measure, of course, for the seeming indifference of the nation to this catastrophe. Moreover, Wisconsin and Minnesota, having made provision for possible occurrences of this kind, by creating large emergency funds, are not crowding either the wires or the mails with appeals for outside help. Liberal aid has been extended to the survivors; the work of providing food, clothing, and shelter for thousands of families made homeless was begun even before the smoke of the forest fires had disappeared; Wisconsin and Minnesota are not unloading their troubles on the rest of the republic, and so the rest of the public apparently regards the calamity as merely a passing circumstance, and proceeds to forget it.

There is some excuse for this in the fact that forest fires, and terrible forest fires, are not rare in the United States. But there is lurking danger in this excuse. Carelessness is not new to the United States. Fires, sinkings, and even explosions, were not rare in the United States before the war, and this very fact enabled conspirators and incendiaries to carry on their work with comparative safety from prosecution after the war began. Even now, when a vessel sinks at its dock, or conflagrations occur in forests from which timber is being drawn for the Government, and situated close to shipbuilding yards, there is always the ready presumption of common carelessness. So it is in the present case; while the origin of the forest fire is admittedly "mysterious," and the rapidity of its spread "unaccountable," yet it is quite easy for some people to find an explanation for the one in the negligence of campers, and for the other in the high winds.

Similar excuses were offered in connection with outrages committed by the I. W. W. in the Pacific Northwest. Not an atrocity perpetrated by German agents or German sympathizers in the United States since the war began has lacked an "explanation" on grounds calculated to quiet suspicion or forestall investigation.

Certain phases of the Wisconsin and Minnesota forest fires demand the attention of the state and federal governments. This tragedy in the woods of the old Northwest should not be accepted as a matter of course. The "accident" theory with reference to disasters which affect the nation's war industries is worn threadbare, and the cause of such "accidents" should be sought and found at any cost of time, labor and money.

The period through which the country is passing is one in which vigilance should be intensified rather than relaxed.

# USE BUT DO NOT ABUSE FARM WOODLANDS

By C. R. Tillotson

**F**ARM woodlands are today being drawn upon for large quantities of timber for war purposes. There is a big demand for logs of black walnut, white oak, hickory, spruce, black locust, yellow birch, yellow poplar, rock elm, ash, white cedar (in the Southern States); and also for the bark of chestnut, oak, and hemlock if near tannin-extract factories. Large, sound trees of these species should be cut and marketed for war purposes, and under no consideration used for cordwood except as their tops and branches may be utilized for this purpose.

Farm woodlands are also furnishing perhaps double the ordinary amount of wood for fuel. This increased demand may result in considerable and lasting damage to the woodlands unless certain precautions are taken. On the other hand, the cutting of cordwood affords each owner of woodland an opportunity to clear his land and put his timber in better condition. To accomplish this the idea to keep in mind is to remove for cordwood the poorer, less valuable trees, leaving the better ones to stand. In removing the fuel wood the greatest precaution should be taken not to injure the more valuable trees or the young growth. Briefly, the material which should be removed is as follows:

1. Sound sticks lying on the ground. This will include tops which have been left in logging operations, and trees which have been blown over by the wind, crushed down by snow, or otherwise toppled over. If left on the ground these tops and trees are a serious fire menace, will eventually rot, and are then of no value for any purpose.
2. Dead trees which are sound and still standing. They are usually dry, make good firewood, and are of no account in the woods.
3. Trees which are diseased, or are so seriously injured by insects that they will probably die; and also trees which are specially subject to serious disease or insect attack. By cutting them out the spread of the disease or insects may be checked. Thus chestnut, which is almost certain to be killed when attacked by the chestnut bark disease, should be cut out in preference to other kinds of trees whenever this disease is present.
4. Crooked trees which are crowding out straight ones. The former will not become valuable timber trees while the latter may.
5. Large old trees unsuitable for lumber, and having big tops which shade out numerous smaller trees growing beneath them.
6. Small trees which are overtopped and stunted by larger and better ones. The former are not likely to develop into trees of any value.
7. Trees of the less valuable kind which are crowding good trees of the more valuable kinds. Thus a black oak or a beech which is crowding out a white oak or a hard maple of equal size and health should be removed.
8. Trees which by some chance are growing on ground unsuited to them. They will not grow into valuable lumber trees. Thus a yellow poplar on a dry ridge should be cut out in preference to a hickory, an oak, or a pine in its locality.
9. Slowly growing trees which are crowding out equally valuable kinds that grow faster. Thus a white oak, hickory, or sugar maple should be removed in preference to a yellow poplar, black walnut, or ash.
10. Trees badly fire-scarred at the butt. These are of less value for lumber than sound trees. They usually become rotten, and are among the first to be blown over by heavy winds.
11. The ideal trees for cordwood are those which range from 4 to about 10 inches in diameter. The yield of cordwood from trees smaller than 4 inches in diameter is very slight, and trees larger than 10 inches in diameter are usually more valuable for some other purpose, unless they are defective.

# A MARITIME PINE OPERATION IN FRANCE

## WITH OUR FORESTRY ENGINEERS

BY CAPTAIN JOHN D. GUTHRIE, A. E. F.

**L**UMBER is a necessity to Modern War, lumber in unbelievable quantities. The Forestry Regiments came to France to help furnish lumber in the World War and they are doing it with a vengeance. They are doing it cheerfully, gladly, without any of the "glamour and glory of war" to sustain their morale.

Company — of the — Engineers, Forestry, is doing its part and this article deals solely with the operations and life of the one Company, only one of the many now cutting and sawing lumber in France to help put the

Monday morning the woods crews were at work in the nearby forest felling special timbers needed at once for war uses. By Thursday of the same week the first timbers were loaded by the Company for shipment. This is believed to be the record for timbers for war purposes for the entire regiment. The horses had not come, so the wagons which had arrived with the troops were useless. However the wheels and axles of several heavy dump carts were on hand, so not to be held up by such a small thing as lack of horses for skidding, American

Hun where he belongs. The details, the lights and shadows of the organization of the Company, its stay at Camp American University, the trip



across, its stop in England, its stay in Central France, might be of interest but have no immediate direct bearing on the story of Company —'s logging



resourcefulness came to the rescue, and swinging one end of the logs under the axles and some 15 to 20 men taking the places of horses, the 45 and 50 feet timbers were man-



### ON THE OPERATION

First, skidding the logs to the landing, loading, and the mill itself in February, 1918. The flume completed, ready for water and logs (the Company's crack pitcher, Sgt. Bill Smith, facing the camera). And finally the night shift at work under electric lights. Note the "No Smoking" sign. Always, safety first.



and milling operations. For obvious reasons it is best not to tell where the Company is located—suffice to say that they are operating in the maritime pine region of France, in a flat, sandy country, a part of France once a waste of sand dunes but wisely reclaimed by the French foresters, by forest planting, so that what was once almost a desert is now one of the most productive parts of entire France. This production consists not alone in lumber from the immense forested tracts, but also in naval stores, turpentine and rosins.

Company — landed in this part of France on a Friday morning in late October, and on the following rainy

hauled to the main wagon road where they were loaded onto the heavy motor trucks and went to the railroad shipping point—and the rain fell steadily all the time! Were the men downhearted? Not a bit. Here was work they could do, work in the woods, here was the job they came over to tackle, a job they knew, and although for days wet to the skin, laughing and singing they went to it. A few days later the horses came and then matching up teams, trying out teams, and soon work settled down into that of a logging camp.

This camp was wet—though the highest site that could be found—the ground was wet, everything was wet.

There were no floors to the tents, there were no bunks nor cots, no stoves—soon the mud was about like that Flanders mud we've read so much about. It was rather sloppy lining up in the dark mornings for roll call while someone held a lantern back of the top sergeant while he read the orders of the day. On one of their especially dark and wet mornings, a private, routed out of his tent by the sounds of "Reveille," inquired as he came out of his tent, "What it is—a night attack?" But in spite of the rain, damp clothes, wet feet, wet woods and the mud, the work went on.

Here at this Camp the Company had its first Thanksgiving in France, and although the turkey and fixings were late in reaching Camp, they did arrive, and the cooks did themselves proud by spending the entire night before Thanksgiving cooking turkey for 250 men—no small undertaking in the army field ranges, under a tent fly with wet wood! But the turkeys were cooked and every man had his fill of a real Thanksgiving dinner.

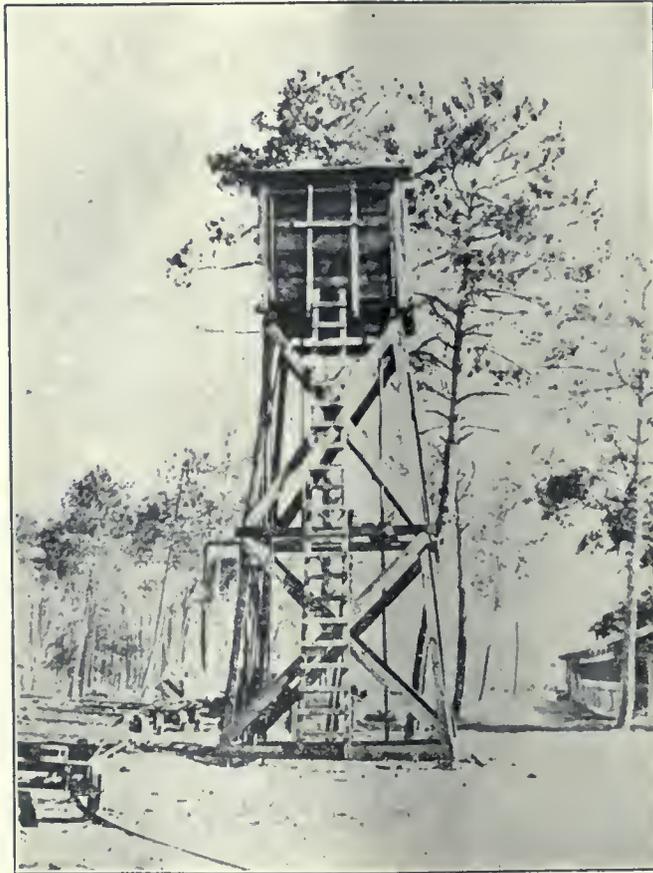
The Company remained at this Camp for about two months, getting out special timbers, felling sawlogs and cutting cordwood, then moved to its present Camp, a well drained and better site. Before moving to the new Camp a barn, a mess hall, kitchen and store house had been put up, floors had been made for all the tents and the stoves had arrived, so that when the men came to the new Camp, just before Christmas, they began to live, and life took on a rosier hue, especially after another fine turkey dinner and the arrival of many Christmas packages and letters from home. On New Year's eve a snow came to make it seem more like winter, the first snow, the local people said, in twenty years.

While waiting for the mill machinery to arrive a small French sawmill was leased by the Company and sawing began, night shifts only, in the first few days in January, and the first sawn product from the Battalion was loaded out by Company —, as they had previously been the first to cut and ship the first war timbers. It was an interesting experience for the sergeant and his squad of eight men sawing logs with an old French sawmill, with sawmill machinery certainly unlike anything they had ever encountered before, but they turned out the lumber and

beat the crew of Frenchmen who used the mill during the day time—in the meantime the felling of sawlogs and the getting out of hewn ties was going ahead in the woods. The parts for the Company's mill (20,000 ft. B. M. capacity) were dribbling in, and finally, on February 27, 1918, the first log was sawn in Company —'s mill, the first 20,000 foot mill of the — Engineers to be completed. And here a word of appreciation is due the Battalion Engineer Officer, the Master Engineer and the crew of Company millwrights who worked untiringly and enthusiastically to get the mill completed and running, but who were held up by delays in the receipt of parts, delays as unavoidable as they were exasperating, for building a sawmill in France, in wartime, over 3000 miles from a source of supplies, is not an easy matter. How

pleased every man in the Company felt when the saw hit the first log and they heard its music as it went singing its way through the first big maritime pine! The Sergeant Sawyer —, who handled the lever, was duly impressed by the occasion and handled matters like the experienced sawyer that he is.

Company —'s timber consists of three different tracts and, while joining, are very irregular in shape, and the three tracts contain 80,000 trees covering some 11,000 acres. Here it may be said that timber is sold in France by the tree and not by the board foot. All trees are cut on these tracts; clear cutting or as the French call it, "*couper a blanc*," is followed; the area will be planted again to pine later. About 85 per cent of the trees are of saw timber size. The mill being located on the main wagon road a narrow gauge



THE WATER TOWER

Cleanliness being next to godliness, this thirty-foot tower is held in high respect by our forestry soldiers, for it makes possible the shower baths they so thoroughly enjoy.

railroad was necessary to haul the lumber from the mill the-2½ miles to the shipping point. The mill is built on leased land about a half mile from the edge of the Company's timber, so a narrow gauge railroad was necessary to transport the logs from the woods to the mill, some 10 miles of logging railroad being required on account of the irregular shape of the tracts and the distance from the mill. The farthest timber is some five miles distant. Two "Dinkey" engines are in use, a 10-ton one to haul the logs from the woods to mill and a 20-ton one to take the lumber from the mill to the shipping point.

The woods work is carried on under the supervision of



"SNAPS" OF OUR FORESTRY BOYS IN CAMP "SOMEWHERE IN FRANCE"

"All work and no play makes Jack a dull boy" so there is plenty of diversion. Taking the pictures from top to bottom, we see a ball game, when the day is done. Then "Sergeant's Row" with Top Sergeant Billingslea's tent on the right, proving that he is living in luxury! Then that ever-popular person, the camp cook, entertaining a visitor between meals. The mess hall is seen in the background. Then the barn, which accommodates sixty-five animals. At the top and to the right of the page are shown docks and dead rolls and boards coming from the edgers. Then a "railroad" company starting work on a road to one of the shipping points. Diversion once more—a sergeant and a wagoner making good with the ladies, and finally the camp in the early part of 1918, showing the remains of the big snow of January 2nd.

a lieutenant who has two sergeants under him, one in charge of the felling and brush cutting and the other looking after the loading and railroad building. Under the sergeants are corporals in direct charge of felling, brush cutting, loading, railroad construction and scaling. The fellers work in two-man crews and fell on an average 6000 ft. B. M. per day. To keep the mill going night and day shifts some 300 trees per day must be felled and put on the railways at the mill. Loading in the woods is done with a "Gin-pole" (see photograph) which works very efficiently. The tops of the trees (and there isn't much top left) and the limbs are converted into cord wood or charcoal, in the woods, the charcoal burning being done by a crew of Spanish laborers for a French munitions plant in the region. The forests contain a very heavy growth of underbrush, from 4 to 10 feet in height (*sous-*

of pine. In the woods the logs are hauled to the railroad landings with horses and "big wheels," the Company using some 60 head of horses in its operation. The big wheel bunching and loading is in charge of two former lumberjacks who worked for a purchaser of Government timber on a National Forest in New Mexico; both know their business and are good, steady men.

The mid-day meal for the woods crews is sent out to them on the logging train. The men are working 10 hours, the mill running 20 hours out of every 24, except on Sunday when as a rule no work is done. On Saturday afternoons the men shave and clean up and line up for inspection, when their personal appearance as well as their tents are looked over critically. At these inspections the kitchens, mess hall, stable, meat houses and entire camp are also inspected to make sure that the camp is kept in a neat, orderly and sanitary condition.

The mill is rated at 20,000 ft. B. M. per day capacity, but has been averaging 30,000 ft. per 10 hour shift. The record cut for 10 hours to April 10, was 38,660 ft. B. M.

The mill is equipped with circular saws, edgers, cut-off



THE OFFICE AND OFFICERS MESS

The side-walls are covered with slabs and the porch columns are made of cork-bark oak.

*bois*, the French call it), very prickly and nasty to handle and very easy to burn. This all has to be cut and piled for burning later. Needless to say that stumps are cut low, eight inches or under, as a rule as low if not lower than the French cut them in this region. In short the principles of forestry in the main are being followed. The reputation of American foresters is at stake in the operations of the Forestry Regiments; in our lumbering operations over here we are going to be judged largely as foresters, not as lumbermen, and here let me say that the American lumbermen and the American lumberjacks in the Forestry Regiments are receiving a liberal education in forestry over here and the prediction is made that they are going to return to the United States with a whole lot clearer idea of the value of forests and forestry than they ever had before. The region where Company — is operating is a striking example of the wisdom of forestry. A waste, almost a desert, has been converted into a highly productive region through the planting



THE Y. M. C. A. HUT

This shows the sergeant in charge of all construction work standing at the corner of the hut.

saws, and a very satisfactory electric lighting plant for the night shift. This plant (20 H. P. Engine) supplies lights for the entire camp, stable, kitchens, mess, office, and there is a light in each tent. At one end of the mill are two rollways with tracks on the outer side of each and a flume in between. This flume was considerable of an experiment at first but has proven very satisfactory. The logs are brought in from the woods on light cars, are rolled off onto the rollway, then dumped into the flume, poled to the haul-up and raised directly to the log-deck by the side of the carriage. The boiler furnaces are equipped with "dutch ovens" enabling the larger part of the sawdust to be burned. The mill is under the super-

vision of a lieutenant who has two sergeants directly in charge, one in charge of the day shift and the other in charge of the night shift. The sawyers are experienced men in that line and have the grade of sergeants.

The mill is built some seven feet above the ground and at one end the level of the mill floor is extended onto a long dock onto which the lumber is conveyed by a series of live and dead rolls. On the dock the lumber is sorted and slid down sets of skids directly onto cars which, after loading, are shifted out onto the main yard and picked up by the dinkey and taken to the shipping point. Two turntables and a series of switches made by the Company's efficient blacksmiths render the loading and shifting of cars at the docks and in the yards a simple matter. The lumber goes direct from the saw onto cars and thence to the shipping point where a large lumber yard is maintained.

The camp site while small is well adapted to the purpose. A very attractive and conveniently arranged office building was put up. The building is bungalow style, with side walls covered with rough slabs, a wide porch with columns of cork bark oak. In this building is the main office, with a large sliding window for use on pay days and an alphabetical set of letter boxes for mail. In the same building is the small office of the Company Commander where judgments are meted out to offenders and delinquents, for we're in the army! Back of this small office is an attractive room used as an officer's lounge and mess. Back of the office building is a Y. M. C. A., barracks, provided by the "Y" and having a small stage with footlights, a piano and phonograph,

table and benches for reading and writing. Here is also the canteen or company store and a barber shop. In this building entertainments are given either gotten up by the Company (and some splendid vaudeville has been given by the Company) or provided by the Y. M. C. A. Here band practice and concerts are held, for Company — started a band of thirty pieces shortly after arriving in France. This band has now been made the battalion band. Company — also started at Camp American University, the first and only fife and drum corps in the — Engineers. The large

mess hall, with tables and benches provided for some 225 men is well screened, and being at a permanent camp the men eat from real tableware, and not from the time-honored and useful mess kit. Near the mess hall is a well-screened meat house and a vegetable cellar.

Back of the mess hall is a building used for sleeping quarters by night crews. Nearby is a small building containing a store room for quartermaster supplies (clothes, shoes, leggins, etc.) and a room used as the sergeants' mess, a great convenience and comfort to the non-commissioned officers, Company — being the only Company in the battalion to have a sergeants' mess.

Across from the mill is the store house for mill and blacksmiths' supplies, a carpenter's and blacksmith's shop being in the same building. Beyond and out at the extreme edge of the camp site are the barn and hay sheds and nearby the small garage for motor equipment.

On the side of the camp are the long rows of pyramidal tents for the men, each with floor and boarded-up sides, bunks, a Sibley Stove and electric lights. A water tower and tank provide 8 shower baths and a tank for washing clothes. The first line of tents in the company street is "Sergeants' Row" and occupied by the fifteen sergeants of the company.

Beyond is "Officers' Row," small 7x7 tents with floors, boarded sides, cots, stoves and electric lights.

With the heavy underbrush and the general dryness of the region for several months during the year the danger from forest fires is great. Every

precaution has been taken well in advance of the season to see that no fires get started or if started accidentally that they are put out at once. A fire plan was drawn up before the danger season, just as is done each year for each of the National Forests in the United States. Little did I think when drawing up fire plans as an American forest supervisor for the past eight years that in 1918 I would be making one for a forest in France!

The mill and other buildings are supplied with water barrels, buckets, pyrenes and a fire hose, and daily inspections are made of this equipment to see that it is



"TIMBER!"

And this time its far from home in the maritime pine forests of France, that the old familiar cry rings out.

in readiness at all times. No smoking is allowed in the mill or barn. Large "No Smoking" signs being placed at all entrances. There is a small fire tool house near the mill and a sergeant in charge as Camp Fire Chief and another as Woods Fire Chief. Along the logging railroad are fire tool boxes and an improvised speeder was constructed by one of the Motor Squads which patrols the right of way after each trip of the Dinkey Engine over the logging road. The men were carefully instructed regarding the danger from fire and are allowed 10 minute smoking periods twice daily during which time they come out of the timber and the mill to smoke. Although there have been a number of accidental fires started, mostly by the Dinkey Engine, Company—has had none but Class A fires (one-half acre or less burned over) which is rather good evidence that the fire plan and the precaution taken have been fully justified.

If a soldier has near relatives who are dependent on him for a livelihood, Uncle Sam requires him to make an allotment of at least one-half of his monthly pay to this relative. He can allot more than this proportion if he so cares, or he can allot a part of this pay to a bank, relative or friends, in case he has no dependent relatives. The average monthly allotments

for Company — ran around \$2,386, which for a year, would be \$28,632.

Another wise provision is the deposit system. Under this section a soldier can if he so desires deposit any amount with Uncle Sam, which amount is kept for him until he receives his discharge from the Army when the amount is returned to him plus four per cent interest. This deposit may be in any amount, and its just as if a soldier went to a bank and deposited the money. He can deposit any amount, each month, or any month. Monthly deposits for Company—have averaged some \$900 per month, or for a year would amount to some \$10,800. Some thrifty

souls have not missed a month since last September, one soldier having something over \$600 on deposit to date, which, at four per cent, will be a nice little nest egg for him when he receives his discharge papers from your Uncle Samuel.

It was stated to me by officers having charge of the of the War Risk Insurance and allotments and Deposits that Company — had as good a record if not the best record for total amounts of any Company coming under their observation.

Men must play, as well as work, and all forms of recreation are encouraged in this war game. Last fall, the battalion had a



NEAR OUR LUMBER OPERATIONS IN FRANCE

These are Spanish laborers from a munitions plant nearby, making charcoal out of slabs.



LOADING UP

And they stopped and posed to have their pictures taken. Even the horses look self-conscious and shy!



THE COMPANY MILL

This shows the sawmill and log skidways, after four months in operation.

football team, organized and coached by a lieutenant, formerly Yale crew and football man. With the coming of spring a volley ball court was laid out and has proven extremely popular. Basket ball and "horse shoes" are popular in the company. The baseball season opened on Washington's Birthday when a team from the Battalion won a badly contested game with a Battalion from our sister regiment. Company — has the champion baseball team of the Battalion having yet to lose its first game, having won from all the other companies in the Battalion and several games from the Canadians.

A field meet on Decoration Day and a meet with aquatic sports on July 4th were features of the recreational program. The Y. M. C. A. during the year has

247 men and of these 240 men had taken out War Risk Insurance to the value of \$1,891,000, or an average of something like \$7,879.16 per man. The following table may be of interest showing the amounts:

Number of Men.	Amount of Policy.	Total.
10	\$2,000	\$20,000
8	3,000	24,000
4	4,000	16,000
67	5,000	335,000
1	6,000	6,000
7	7,000	49,000
4	8,000	32,000
1	9,000	9,000
138	10,000	1,380,000
240		\$1,891,000

An occasional airplane sails over the camp but aside from this, the news in the daily papers and the



Underwood and Underwood—British Official Photograph

"PERSHING'S PUSHERS" HOLDING UP THE HUN

These men are busy wiring fallen trees across a canal to hang up the enemy—a difficult and unpleasant job.

provided an excellent series of concerts and entertainments, the entertainers oftentimes being theatrical stars—for example, Elsie Janis, who made her usual hit.

As is well known, the—Engineers is made up of volunteers, men who came into the war game to help beat the Boche, in a line of work for which they were best fitted. Many of the men of Company—are married or have dependent relatives that must be cared for. A splendid record has the company along this line. At the time of my leaving the company its strength was

rush lumber orders that come in, it is difficult for the men to realize that they are a part of the A. E. F. and serving their country just as truly as though they were in the front line trenches. In spite of this the morale of the men of Company — has been excellent, and it is not easy to do good and faithful work day after day when you are miles and miles away from the big guns and the fighting, when you want to get into the big game, and make a try at going over the top. The men of the Forestry Regiments deserve a world of

credit for faithfulness and enthusiasm in their daily work behind the lines, a work just as necessary in the war as mopping up a trench or going over the top.

Speaking personally and a bit frankly, because I am no longer connected with Company — and because I

know the personnel of the company, so well, I can say with considerable pride that the men of Company — have gone "Over the Top" so far, many times, and that they can be counted on to do so again and again, jusqu'au but!

## DONATIONS TO THE WELFARE FUND FOR LUMBERMEN AND FORESTERS IN WAR SERVICE

AMERICAN FORESTRY will publish each month the list of those making donations to this fund. Many of the donations from members of the American Forestry Association so far received were made without solicitation and were inspired by reading in the magazine that a relief and comfort fund for men of the forest regiments was being collected. Many substantial contributions are being received from the Forest Service and from lumber companies and lumbermen following requests sent to them by the Secretary of the Welfare Fund for Lumbermen and Foresters in War Service, by the lumber organizations of which they are members, and by the committees of lumbermen which had charge in various sections of the United States of securing enlistments for the forest regiments. Contributions should be sent to P. S. Risdale, Treasurer, 1410 H. Street, N. W., Washington, District of Columbia.

Contributions to the Welfare Fund to November 1, 1918, are as follows:

Previously acknowledged .....	\$20,513.06	Nelson, Jr., John M., Endeavor, Pennsylvania (N. P. Wheeler, Jr., District No. 3).....	5.00
The Biltmorean .....	5.00	Peters, J. G., Washington, District of Columbia	5.00
Blackman, W. R., Los Angeles, California....	3.00	Schreiter, Henry, New York City, New York..	5.00
Dunham, Miss M. V., Chicago, Illinois.....	100.00	Stadtmiller, L. R., Hankow, China.....	15.00
Hayes, Mrs. R. P., Asheville, North Carolina	10.00	Wiggin, Mrs. H. C., Cloquet, Minnesota....	3.00
Johnson, Miss Elizabeth, Pasadena, California	5.00		
Maddox, R. S., Nashville, Tennessee.....	5.00		
Morris, John B., Saugatuck, Connecticut.....	10.00	Total.....	\$20,684.06

## IMPROVE YOUR WOOD-LOT WHEN CUTTING FUEL--TREES TO LEAVE AND TREES TO TAKE

IN cutting firewood for this winter's emergency fuel supply the operation should be undertaken with the double purpose of furnishing heat and improving the farm-wood lot at the same time. The United States Department of Agriculture has issued a brief statement which tells what trees to leave and what to cut.

It recommends that the trees be marked for cutting now while the leaves are on them, even if other farm work prevents the actual felling until later, because it is easier to tell the different kinds by the foliage than by the bark. But the cutting should be done as soon as possible if the firewood is to be used this winter, so there will be some time for the wood to season.

In the New England and Middle Atlantic States the following kinds should be left standing to furnish lumber, except in the case of individual trees that are crooked, knotty, diseased, or defective; white pine, red spruce, balsam, chestnut, white oak, red oak, hard maple, yellow birch, tulip poplar, white ash, hickory, and basswood.

The trees of less value for lumber, or slow growing, and which should be cut are: Hemlock, arbor vitæ, black oak, scarlet oak, red maple, beech, gum, elm, gray birch, and ironwood.

In Ohio, Indiana, Illinois and Southeast Missouri save: Yellow poplar, black walnut, red gum, white oak, red oak, cottonwood, hickory, white ash, hard maple, and basswood.

In these States the trees to be cut from the farm wood-lot for firewood are black oak, red elm, beech, and red maple.

In the northern parts of Michigan, Wisconsin, and Minnesota the trees to be saved for lumber are: White pine, red pine, aspen, yellow birch, basswood, red oak, white ash, and hard maple.

Farmers in the northern section of these States may well cull out for firewood and thus improve the value of their lumber stands the following trees: Jack pine, hemlock, scarlet oak, black oak, elm, and beech.

In the southern portions of these Lake States—Michigan, Wisconsin, and Minnesota—farms would do well to save: White oak, red oak, white ash, basswood, hickory and hard maple.

The trees that may be removed for fuel in the southern farming section of these states are: Black oak, red elm, and beech.

# THE FUTURE OF WAR GARDENING

BY CHARLES LATHROP PACK

PRESIDENT, NATIONAL WAR GARDEN COMMISSION

**A**FTER-THE-WAR food needs must be regarded as no less vital than those with which conflict has made the world cruelly familiar. Authorities are in full accord that the cessation of warfare must needs give even greater emphasis to the food requirements of Europe and America. They are also agreed that there must be no let up in food production and food saving.

Europe's food problems of peace cannot fail to be of extreme gravity. In reclaiming vast areas of country

vital truth that no increased production can be expected in France and Belgium during the first year of peace. Restoration will be long and laborious. Food Administrator Hoover has stated that there will be seven years of food shortage in Europe following the declaration of peace. His statement is in no wise exaggerated, and this condition must be fully recognized in working out the world's food problems.

An added factor is that the population of Germany



PRIZE WINNING GARDEN OF THE EASTMAN COMPANY

The Camera works of the Eastman Kodak Company, at Rochester, carried on a systematic war garden campaign and followed it with a campaign to can and dry the surplus produce. This is the prize winning garden of one of the employees. Hundreds of such plots were planted and is an example of what business concerns throughout the country have done to induce the workers to produce more food f. o. b. the kitchen door.

which have for years been in the hands of the enemy, France and Belgium have also reclaimed the vast population and assumed the burden of feeding hundreds of thousands of starved peoples thus restored to the rights of citizenship.

This, of itself, would be enough to intensify the food problem of these countries. To this must be added the

must be reckoned with. After war-time starvation the German people will make demands that will have direct and serious bearing on the food question. We may not have to feed Germany as we feed France and Belgium, but in one way or another we will have to face the demand from this source. One phase of the German demand will be the buying of foodstuffs in the European

markets by wealthy Germans. The war has made many people in Germany extremely rich. After years of privation these people will enter the open markets of the world to buy heavily of foodstuffs regardless of price. This cannot fail to create a heavy drain on the food supply.

Russia, too, must be taken into account. Evidence is at hand indicating a serious food famine in that disrupted country during the next few months. This will prove a mighty factor in complicating the food problems of the world. In all these problems, the United States must regard itself as carrying the full burden of responsibility. It is a burden that no American is willing to shirk. Europe looks to us for food and must not look in vain. The war has given us a full realization of our duty to other nations. With peace this duty must be even greater than before.

Along with other business that of feeding the world has undergone significant and vital changes with the

Working Reserve in this country and other bodies abroad, have furnished a certain amount of assistance in solving the food problem. Some of these war-time plans of operation will be continued. They have been found to be practical and valuable. Furthermore, some of the improvements in farm life will make agriculture a more desirable occupation in the future than it has been in the past, in many instances, so that many returning soldiers may find it desirable to take up this method of making a living.

There is no other single business born of the war which has affected a greater number of people than that of war gardening. More individuals have engaged in it than in any other line of work through which they have been called on to help in the crisis. Starting from a mere nothing before the United States entered the war, this form of activity grew in less than two years into a new occupation which counted its numbers by the millions and, in the statistics of labor employed, exceeded



SOME STORES TOOK A DOUBLE SHOT

Many were the ideas used in war garden windows, but this one by Goldenberg, of Washington, District of Columbia, took a "double shot" in food conservation and devoted half the window to food production and the other half to food saving.

passing of the years since Germany forced Belgium to the point of starvation and spread desolation and death from hunger and famine through Poland, Armenia and other helpless dependent nations. Women have taken their places on the farms, doing all kinds of work there, just as they have in other branches of industry. New methods for increasing the yield of the land, including especially the application of more power through machinery, have been applied. Means for getting the produce from the farm to the urban consumer have been improved, the extension of the rural delivery system and the utilization of motor trucks having been the chief factors in this step forward. Various organizations for helping the farmer in harvesting his crops, such as the Woman's Land Army and the United States Boys'

any other branch of gainful employment with the exception of actual farming itself.

The fact that such a vast number of American citizens took up this work shows that they appreciated the merits of it, and is one of the reasons for the confident prediction that war gardening has come to stay. As the great poet said of his writings, it is something "the world will not willingly let die." Home food production will continue because it has been found worth while; and all the things which this war has proved to be of value and benefit to mankind will last. The practical lessons learned, as well as the greater Freedom, the more perfect Justice and the truer Democracy born of blood and battle, will remain to bless the world.

War Gardening will establish itself as a peace meas-

ure almost equally valuable with its war-time aid. This will be true at all times, but more strikingly so during the first five or ten years of the great reconstruction period. The food problem then will be of pressing importance. It will be on a par with many of the other enormous reconstruction problems that will face the world. It will require the continued application of broad thought and effort. There will be no let up in the demand for food; in fact, it will be greater than during the actual days of the conflict.

One of the great helps which the war gardener will have again next year to assist him in his labors will be the Daylight Saving law. This measure met with uni-

In summing up the benefits gained from the law this year, Senator Calder, of New York, author of the measure, emphasized particularly the help it had been to war gardeners. In a statement which he has made he said:

"The Daylight Savings Law which became effective on the last Sunday in March has more than fulfilled the prophecies of its advocates. It has really turned one hour of night into day. People live by custom. They rise in the morning by the clock; they eat their meals by the clock, and go to bed by the clock, so that during the time this law has been in operation a vast majority of the people of this country have been awake one hour more of daylight and asleep one hour more of dark than they were formerly.

"This additional hour of daylight has been most helpful to the men, women and children of the nations who have taken advantage of it to plant war gardens, thereby not only relieving the strain upon the farm but to a very considerable degree tending toward economy in family expenditures. It has also saved in gas and electric light bills not less than ten per cent of the money formerly spent for this purpose. In addition, it will



SHOW WINDOWS AIDED IN CAMPAIGN

Every store in the country had a war garden window and this valuable space was given over to demonstration gardens. At many of these stores the garden books of the National War Garden Commission were given to customers. Bigger display plans for next year are now under way. This window is by Brager of Baltimore.

versal approval in the United States during the first season of its operation in this country; and the gains therefrom were of inestimable benefit in the nation's war preparations. The first seven months of trial proved its value. The law as enacted by Congress last spring provides that it be in effect "each year;" so that the clocks will be turned ahead again an hour on the last Sunday of next March and remain so until the last Sunday of the following October.

The National War Garden Commission which took an active part in urging the passage of this progressive legislation feels that it has cause for gratification in the results accomplished. The extra hour of daylight gave the home food producers a vast total of extra time for their work and added many millions of dollars worth to the value of their product.



MODEL GARDEN AND MODEL COSTUME

Two model gardens were marked out for the "city farmer," by Woodward & Lothrop of Washington, District of Columbia. The famous "Sow the Seeds of Victory" poster, made for the National War Garden Commission by James Montgomery Flagg, were used as part of the decorations. The "gardener" in the picture is shown with the approved garden costume of the "soldiers of the soil."

during its seven months of operation this year save at least one million tons of coal. It has afforded in the construction of cantonments for our Army, in the manufacture of munitions and war supplies of every character and in the building of ships one hour more of daylight for the men engaged in these industries.

"It is a universal practice for working men and women to begin their day's labor at eight o'clock and in some industries, at seven o'clock in the morning. They can-

not be induced to work before seven o'clock, but with the long evening, produced by this law, those whose labor have been induced to work additional hours at night where the exigencies of the occasion demanded it. Without question this bill has been more helpful in the great war work in which this nation is engaged than any other one thing."

The coming of peace means the release from a bondage of shortage and suffering of hundreds of millions of peoples who have been compelled while war shut their harbors and checked their commerce, to shift as best they could on short rations. The starvation of millions of human beings was the result. The lifting of the ban with the cessation of battle and blockade brings into the market for food supplies countless millions who have been denied sufficient daily bread for years. With a steady demand from such sources years will be required

scanty mouthfuls of this necessity because of the impossibility of reaching them on account of German blockade or because of the knowledge that the food if shipped to them would in all likelihood fall into the hands of the Central Powers.

Just as they have been doing during the war, therefore, war gardens must continue their merciful work of helping to supply the food needs of the world. They will be called on to add as much as possible to their productive capacity because of the new mouths to be fed. It is estimated that there are more than 100,000,000 people who will be included in the number of those to be helped in this way. War Gardening assumes a new phase and a new motive, therefore, in this service it must render. It is offered a new opportunity to show its power to help. There is no question but that the war gardeners, realizing this high need for their work,



Photograph by Western Newspaper Union

#### THE COMMANDING GENERAL HELPS PICK BEANS

Like all good generals Hugh L. Scott does not ask his men to do anything he would not do, so the commander at Camp Dix does a little plain and fancy string bean picking for the "soldiers of the soil." In the meantime Charles Lathrop Pack, president of the National War Garden Commission (just back of General Scott), tells Dr. J. H. McNeil, of the New Jersey State Department of Agriculture, that they are mighty fine beans.

before the food stocks of the various nations can be restored to anything like a normal condition and before some surplus can be established in their warehouses which will prevent the possibility of famine. The United States and the Allied nations will have before them an immense task during the busy reconstruction days. They are to be called on not only to feed their own people, but those of many other nations. Their own workers who will be occupied with the rebuilding of thousands of ruined cities, towns, docks, railroads, bridges and with a hundred other big tasks, must be fed. In addition as much food as can be spared must be sent to those oppressed peoples who have been denied more than

will continue to labor as they have in the past to supplement the world's food supply.

But it is not only the new peoples of the world who will make the increase in food production necessary. Great quantities of supplies will be just as essential in the other countries, in France, England, Italy and the United States, where immense after-the-war tasks are waiting to be done. The release of millions of soldiers from the battlefield will not, like the waving of some magic wand, bring about an immediate re-establishment of pre-war conditions as far as food is concerned. Some of these men will return at once to the farm; others will be help in other ways; but the vast majority of them

will remain in the cities and towns and they will require food then as much as if they were still in the trenches. It is not to be expected that there will be any great flocking back to the farms, and the farmers will be short of help as they were before. It will not be possible, therefore, to look for any large increase in the quantity of food produced on the farms. Broad plans are being

swamp, arid and other waste land to work. It is figured out that there are considerably more than 230,000,000 acres of unappropriated land which could be made to yield valuable crops.

But this other back-to-the-land movement—that of war gardening—is an accomplished fact. It was established simply and without any disturbance of existing



Photograph by Paul Thompson

#### YES, THEY HAVE APPLES, TOO, AT CAMP DIX

Gen. Hugh L. Scott samples the apple crop of the demonstration garden at Camp Dix for which the National War Garden Commission gave the seed and implements. Next to General Scott is Charles Lathrop Pack, president of the Commission, discussing with S. W. Hartley, of the Motor Transport Corps, the value of food f. o. b. the kitchen door.

made in the United States by Secretary of the Interior Lane to provide land which can be reclaimed for settlement and use by the soldiers. This back-to-the-land movement is probably the biggest that has ever been attempted and if it is carried out successfully will add to the wealth of the country by putting much of its idle

social, political or economic conditions. For a decade or two before the war there was deep study and much discussion of the problem as to how to check the exodus from the farm to the city. There was a steady drain cityward. Argument and discussion, however, availed nothing; and the exodus continued. In the "city farmer"

has been found the true answer to the stay-on-the-farm idea. The ambitious young man or woman will not remain in the country where comforts are denied them and where advantages of education and social life are few; but they will be glad to "farm" in the city. The war garden has opened the way. By this means almost everyone becomes a food producer.

Increasing prices will make it desirable to the individual, and the growing demand of the nations will make it desirable from the country's point of view, that everyone help to feed himself. The readjustment which must come out of the war will call for Herculean powers as great as those which it has been necessary to put forth during the terrible struggle against the materialism and



Photograph by Beitler

#### MARION CLAIMS THE CHAMPIONSHIP

The Kiwanis Club and the Boy Scouts, at Marion, Indiana, got together to see what could be done, and as a result Marion claims the war garden championship of the universe. Lewis de Wolf reports to the National War Garden Commission one garden to every two people. The picture shows the luncheon tables at which the season end was celebrated. The affair was strictly a war garden luncheon.

militarism of Germany. This reconstruction work,

will keep the workers of the world busy. In these and a hundred other ways there will be steady call for the men released from strictly war work. These facts point to the increasing value of the war garden. It will be just as important a factor in the life of the nation and the community after the war as it has been during the war. This need will last for many years; and by that time the value of the project will be so firmly established as a peace measure that it will continue indefinitely. It

formed. But elsewhere there will be required much new work.

In the United States, for instance, thousands of miles of road which have been given the hardest kind of usage with nothing more than the most superficial repair, will have to be completely rebuilt. The day of the heavy motor truck as a means of transportation between city and city has come to stay, and with it there must be a strengthening of roads. This is one of the great tasks awaiting the returning army of men from the battlefield. The construction of new buildings in our cities which has been checked on account of war-time need of material and men, must be resumed and lost time

made up. Cities will need many improvements which



"EVERY INCH PUT TO WORK"

This is the garden of an employe of the Eastman Kodak Company, at Rochester, and gives a fine example of what can be done with little space. Here every inch of the side yard has been put to work.

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Photograph by Paul Thompson

THEY HAD GARDENS IN NEW YORK CITY TOO

Here are school children in Thomas Jefferson Park, New York City, harvesting the war garden crop. This garden is along the East River at 114th Street.

will have become a habit fixed and firmly implanted in the hearts and lives of the people of the country.

It is a habit which makes for better living all around. It brings health and wealth to the individual; it creates a more friendly and more democratic community feeling; and it adds to the moral strength and the material resources of the nation. Everything possible must be done to encourage and spread the growth of a habit such as this. On that account the pioneer work which has been done by the National War Garden Commission in the two seasons since the United States has been in the war, must be continued and expanded and intensified. There must be no let up in the progress which has been made.

Gardening has been found to be a health measure. It has been used in the rehabilitation of convalescent soldiers. Around the hospitals in Europe almost since the beginning of the war vegetable plots have furnished the means for providing easy and pleasant outdoor work for

the men which acted as a tonic to their shattered nerves and a bracer to their recuperating bodies. Similarly at the hospitals and army camps in the United States this form of activity was employed to help in the rebuilding of disabled and convalescing soldiers. In the great reconstruction work carried on at Walter Reed Hospital which lies in the outskirts of the Nation's Capital a fifteen acre war garden proved of much therapeutic value in the treatment of men suffering from various diseases, including war neuroses. In addition to helping them to regain their health and strength, it is training these men for the future and equipping them to make their own living and become valuable citizens of any community after they are out of active service. Part of the large



FIRST WINNER OF NATIONAL CAPITOL PRIZE CERTIFICATE AWARDED TO BLUE RIBBONS BY NATIONAL WAR GARDEN COMMISSION IN CO-OPERATION WITH COUNTY FAIRS

"We got all our vegetables from our garden, 100 x 150, this summer, canned 125 jars and stored 25 bushels of potatoes. This is the message sent to the National War Garden Commission, of Washington, by Mrs. Frank P. Brown, of Cincinnati, Ohio, who was awarded a National Capitol Prize Certificate for her canned vegetable work. This National recognition, Certificate No. 1, is the first award made by the Commission to blue ribbon winners "eited" as worthy of National recognition by local fair committees all over the country. The Commission is offering certificates and ten thousand dollars in THRIFT STAMPS to such local prize winners.

war garden at Camp Dix, New Jersey, adjoins the base hospital and potatoes and other vegetables were growing during the season of 1918 right up to the sun porches on which some of the invalids had to sit in their wheel chairs.

Sailors cannot grow vegetables at sea. They would hardly find it possible to cultivate a war garden on a wave-washed battleship or a swift-speeding destroyer. But to overcome this handicap a movement was started throughout the United Kingdom to give these men a

of 300,000 pounds of fresh vegetables and fruits were being furnished to the British Navy, which meant a distribution of about one and a half pounds per week per man. In speaking of this work and its value, Rear Admiral Lionel Halsey, third sea lord of the Admiralty, said:

"Those associated with the Vegetable Products Committee can happily feel that this work is of priceless value, for without a vegetable food the men of the fleet could not have so thoroughly performed their work in



THEY CAN THE KAISER AT THE CAMERA WORKS

Miss Tillie Baldwin won the blue ribbon for this work and was awarded the National Capitol Prize Certificate by the National War Garden Commission. Not only did employees of the Eastman Kodak Company make some new records in war gardening, but they held a county fair and had competitions for the best canned vegetables.

supply of fresh vegetables whenever they get to port. Navy vegetable rations consist of potatoes only and a few other dried or canned products which can be kept a long time and stored in small space. On this account an organization which soon had 800 branches and collecting depots throughout the United Kingdom was formed to provide fresh vegetables for the men of the grand fleet. Headquarters were established in London, with Admiral Lord Beresford as president and the patrons included many prominent people, but its members rank from the owners of large estates who contribute regular supplies weekly to the small schoolboy whose labors on his 10-foot plot aggregate whole. It was not long after the work got under way before a weekly average

the past; nor will they be able to do so in the future without a continuance of this splendid work as efficiently and as generously as in the past. Its value may be realized when it is stated that these supplies are an invaluable factor in keeping the men in good health and fitness."

What is true in the case of the stalwart men of the British Navy is true of all other members of society, of high and low degree. There is need for vegetable food. The body is kept in better condition if it does not depend too largely on a meat diet. War gardening will add greatly to the proportion of greens which will enter into the diet of the American people. It is well that this is so, for with the steady rise in the price of meat it is one

of the important factors which will help the average American family to economize on the market bills. The value of this saving will make itself felt in a hundred directions. The individual will be able to provide for himself and his family some of the comforts and advantages which he would be compelled to forego were it not for the saving he has affected through his back yard vegetable plot. This saving enables him to procure for his children added educational advantages, and for the entire family some of the home enjoyments which are so vital to the continued happiness and the ultimate welfare of a nation. The future of war gardening, therefore, is



WHILE THE FLYERS DODGED IN AND OUT

The Pennsylvania Railroad conducted a division to division garden campaign and placed war garden primers of the National War Garden Commission in the hands of every superintendent and thousands of its employees. This garden is on the Tyrone, Pennsylvania, division and the smoke of a passing train may be seen at the right.

assured. It is such an important economic gain and its benefits in other ways are so numerous that the army of home food producers themselves will be its own strongest and most ardent champions. Both by practice and by precept they will continue to spread the gospel of "food f. o. b. the kitchen door." Just as the army which has fought for justice, democracy and equal rights of mankind will see to it that these principles are

maintained in every part of the world, so the soldiers of the soil in city, town and village, millions of whom have tested the worth of war gardening, will be its future champions and defenders.

### "WALNUT TREE PLANTING DAY"

**F**RIDAY, October 18, was officially designated in a proclamation by Governor Brumbaugh of Pennsylvania as "Walnut Tree Planting Day." The Governor urged school children, boys and girls scouts, sportsmen farmers and "other well disposed citizens" to plant on that date.

The proclamation called attention to the great importance of black walnut wood and to the scarcity now existing, while it also referred to the value of the nuts for food for game and to the shade properties of the tree.

Planting of both black and white walnut trees is urged "to the end that we may always have in this commonwealth a generous growth of this most useful tree, thus insuring to the nation and to industry necessary lumber, to the wild life in our forests a generous supply of food and to the people the blessing that attends the planting of trees—generous shade, pure air, regulated water supply and spiritual administration."

### PLANT TREES AND SAVE TAXES

**C**AN you imagine living in a taxless city? But there really are such places. For instance: There is Orson, in Sweden. The municipality has its ordinary city expenses, but it imposes no taxes. Moreover, the local railway is free to every citizen, and there is no charge of telephone service, schools, libraries, and the like.

All this is due to the wisdom of a former generation, who planted trees on the available ground, with the result that during the last thirty years the town authorities have sold over £100,000 worth of young trees and timber, while judicious replantings have provided for a similar income in the future.

Then there is Montmarlon, in the Midi, France. Here not only are there no taxes, but the timbers on the communal lands are sufficient to grant each person a small annuity.

The man who would like to burn coal because it is easier and handier, but who thinks enough of his country and the boys over there to shoulder his ax, brave the winter wind, and go out to cut wood in order to save coal, is helping to win the war.

Methods of cutting cordwood are discussed in a circular, "Emergency Fuel from the Farm Woodland," issued by the United States Department of Agriculture to aid farmers in helping to meet the fuel shortage.



WHITEWATER FALLS IN THE SAPPHIRE COUNTRY "LAND OF THE SKY"

This beautiful waterfall, three hundred feet high and with a spread of over seventy-five feet, lies in the heart of the new lumbering project in North Carolina.

# NORTH CAROLINA'S CONTRIBUTION TO THE WINNING OF THE WAR

BY CRETE HUTCHINSON

AT THE present time the Railroad Administration is facing a serious shortage in tie production. West of the Mississippi 50,000,000 cross ties are required annually for replacement; East of the Mississippi 80,000,000, with approximately 20,000,000 additional ties for street railways and other industrial needs. A grand total of 150,000,000 cross ties or four billion five hundred million board feet of timber. Six months ago, only forty-five per cent of the amount needed was produced, due to additional requirements for transportation of war materials, withdrawal of labor into war industries, the drafting of labor into the Army and Navy and the rearrangement of methods of purchase by the Government control of railroads. The present purchase methods include new cross tie specifications, grading rules, a publishing of prices with power to purchase direct for cash from producers. Against the shortage of 65 per cent six

months ago, the present shortage is only 40 per cent and probably will be reduced to 30 per cent by the end of the year due to a better understanding of specifications, general requirements and prices paid, together with the ability to pay cash.

Thirty-four per cent of the timber used by the Railroad Purchasing Committee is white oak. Large areas of the forested section of North Carolina in Transylvania, Jackson, Graham and Clay counties contain this desirable timber and has been obtained through Jonathan Starr of New York for the needs of the Government for the period of the war. In the North Carolina tracts are approximately 152,000,000 feet of poplar; 240,000,000 oak; 120,000,000 hemlock; 32,000,000 yellow pine; 41,000,000 hickory; 50,000 black walnut; 249,000,000 chestnut; 50,000,000 bass; 75,000,000 white pine; 32,500,000 beech and gum, and 10,000,000 feet of locust. The white



MOUNT TOXAWAY IN THE "LITTLE SWITZERLAND OF AMERICA"

One hundred and fifty-two million feet of poplar and forty-nine million feet of chestnut are scattered through the North Carolina acreage acquired for the Railroad Administration for cutting into cross-ties.

oak, locust and black walnut do not require chemical treatment so are used in a greater percentage when obtainable. The stumpage value of the enormous holdings which Mr. Starr controls is estimated at a minimum of fifteen millions of dollars, all of which will contribute to the winning of the war in speeding up cross-tie production to facilitate the tremendous movement of freight necessary at this crucial time in the affairs of our nation.

The timber resources of the Southern Appalachian range include almost every variety known to commerce, the development of which is absolutely necessary to the carrying out of the stupendous program planned by the Railroad Administration for the betterment of transportation conditions in the South. With the shipment of men to France, we are sending miles of railroad to move them on the other side. It is the hope of the nation that a United States Government and Allied Powers controlled railroad will be laid direct to Berlin. The cross-ties for the foreign program must come from home and are being shipped to France in our new ships at this time. To move the cuttings from the forests of North Carolina, new rails will be laid to convenient points of vantage near the mills, facilitating the conveyance of ties to the nearest points of consumption. The ties for foreign shipment will be routed to the nearest ports and there passed upon by Government inspectors.

Forty-six miles of railroad to be used for the exclusive use of the Government for the period of the war and as long after as is necessary to complete the present program, will be laid into the heart of Clay and Graham counties within the next few weeks. Cross-ties will be ready for shipment as soon as the rails are in and the movement of this vital necessity to safe travel will begin.

North Carolina will try to contribute every ounce of patriotic manhood, every mill, every stick of timber, to assist in the alleviation of this acute shortage of cross-ties for she has within herself the power to reduce the crying need to an immaterial percentage through her bountiful

forests in the Appalachian Mountains. It may be necessary to ask for labor from other parts of the United States for time is valuable and the need is great. At least three thousand men will be needed to fell the great trees and operate the two hundred mills that will be installed within a short time. It is planned to give the men engaged in the work an opportunity to obtain homes in the region cut so that a great enthusiasm will enter into the real work. Trucks will be utilized as much as possible in the movement of the ties from the mill to the railroad; a series of portable mills will be operated in

the least accessible areas and roads opened in new sections for the betterment of the hamlets which will undoubtedly grow rapidly with the advent of this big Government business.

Much of the mountainous section of North Carolina is in an undeveloped state and presents an interesting solution to a few of the great problems which must be solved with some degree of haste by the Railroad Administration. In addition to the cross-tie famine there is real need of car timbers, switch-ties, bridge-ties, and other forest products. Every forested part of the United States has been thoroughly cruised for products required in the various branches of the Government and contracts have been placed with producers for the particular commodity which they can contribute to the promulgation of the war. Some excellent virgin timber has also been obtained by Mr. Starr in Georgia, but the largest acreage that will produce the greatest amount of cross-ties is in the sublime and untouched confines of North Carolina.

In the Sapphire country, Lake Toxaway, fifty thousand acres have been obtained, an irresistible lure to the operating lumbermen. Giant oaks, lordly poplars, great cherry, walnut, ash and hickory are scattered in profusion in an untouched state with the "Whitewater Falls" as the scenic attraction. This timber is located at the junction of three states, North Carolina, South Carolina and Georgia and contains sticks up to two hundred feet high, from six to nine feet at the stump. The elevation in



IN THE WOODS

This will give a fair idea of the size and kind of timber which will be made available for cross-tie manufacture by the opening of the tracts in the South.

this so-called "Land of the Sky" is from two thousand to three thousand feet. Mount Pisgah is adjacent to the property and the accessibility to the Southern Railway, six miles from the Transylvania branch, adds value when haste in production is so essential. The ties will be loaded

tion will become a natural shipping center for the distribution of cross-ties.

In the Hiawassa Valley section, from Andrews to Haysville in Clay County, twenty-five miles of road have been graded by Andrews Township and Clay Coun-



THE BEAUTIFUL HEART OF THE SAPPHIRE COUNTRY

It is here that beauty and utility meet in the service of the Government. By the end of the year it is hoped the present shortage of cross-ties will be greatly reduced by the development of North Carolina's as yet untouched forests.

at Lake Toxaway Station, until a few years ago one of the wonderful resorts of the South, the "Little Switzerland of America." It has been in a dying state since the flood and is in dire need of the development which is now a part of the Railroad Administration plans. The sta-

ty and are ready for the rails recently granted by the Railroad Administration. These rails would have been laid sometime ago but for an injunction served by the citizens of Andrews on the town restraining the sale of bonds. This matter was finally adjusted but too late as

we were then at war. Now the grade paid for by the county is to be used exclusively for the movement of cross-ties. In Western North Carolina peaks and ridges of the Appalachians form a magnificent skyline and, in part, constitute the dividing line between the streams flowing into the Atlantic Ocean and those which make their ways to the Gulf of Mexico. The timber of this section has attained international fame and will be distributed in the form of cross-ties, car timbers, bridge-ties, etc., in the war torn countries of Europe as well as in the United States. The valleys in the West are not so broad as farther east but contain an abundance of fine timber of great size and unusual height. Particularly is this true of the timber resources along the streams and in the coves, where the quality is exceptionally good, yielding a high percentage of upper grade stock.

The forested tracts are sparsely settled and of the usual cross-roads type, consisting of postoffice, general store, blacksmith shop and a few dwellings of poor construc-

tion. The plans now being prepared for the better housing of the men employed in the mills should prove sufficiently attractive to induce settlers to remain on the land as soon as it is cleared. The Southern Railway has kept close watch over the needs of the industries along its lines and has added materially to the information necessary to the gigantic development of the natural resources of the South. It serves a large section of the

lower Appalachian range, and has two lines across the mountains; one leaving the main north and south road to Salisbury, North Carolina, continuing west through Asheville, North Carolina, to a junction with the western, north and south line to Harriman Junction, Tennessee. This western branch runs south to Knoxville, Tennessee.

With the new rails laid into the heart of

the big trees and the many huge mills installed the cross-tie famine will be so reduced that little anxiety on the part of the Railroad Administration will be felt by the end of the year.



TYPICAL OF THE TIMBER TO BE CUT FOR CROSS-TIES

In Graham County, North Carolina, these cross-tie lengths are ready for stripping and will be shipped as soon as the new rails are laid into the properties.

### CUT WOOD, SELL IT, BURN IT--HELP SAVE COAL

**T**HE coal shortage for next winter, estimated by the Fuel Administration at about 14,000,000 tons, makes it necessary that wood should be used to save both coal and transportation. Country districts and small villages are in position greatly to help coal conservation by burning wood.

Farmers now use on their farms 883,000,000 cords of fuel wood annually. All farms should use it during the war or emergency periods, officials urge.

Any kind of coal stove or furnace can be used for burning wood in a pinch. With a careful attention to drafts and grates, the change can be made with little trouble.

On the average, according to the Forest Service, United States Department of Agriculture, a cord of wood

is about equal to seven-tenths of a ton of coal. Two cords of soft wood are required to equal a ton of coal, but a cord of wood from a number of well-known kinds of trees will equal a ton of coal in heating value, and for three varieties—osage orange, canyon live oak, and black locust—a cord has a higher value than a ton of coal. Most of the oaks and hickories, as well as western yew, honey locust, blue gum, sweet birch, and a number of others are the equivalent of nine-tenths of one ton of coal.

The following have a low heating value, but are approximately equal to one-half a ton of coal: Yellow buckeye, black cottonwood, basswood, western red cedar, Alpine fir, Englemann spruce, black willow, balsam fir, Sitka spruce, aspen, and white spruce.

# THE USES OF WOOD

## WOODS USED IN THE MANUFACTURE OF HANDLES

BY HU MAXWELL

**Editor's Note:**—This is the seventh story in a series of important and very valuable articles by Mr. Maxwell on wood and its uses. The series will thoroughly cover the various phases of the subject, from the beginnings in the forest through the processes of logging, lumbering, transportation and milling, considering in detail the whole field of the utilization and manufacture of wood.

**A**S an all-round handle material, wood has no equal. If handles of moderate weight are wanted woods may be had like cedar, white pine and basswood. If strength is of prime consideration, strong woods are available, such as persimmon, dogwood, maple, birch, beech and hickory. Sometimes weight is essential, though that is the case with small rather than with large tools, and lignum-vitae, live oak, and certain tropical species meet that requirement. Elasticity is a prime requisite at times, combined with toughness, and our forests furnish what is wanted, notably, hickory and hornbeam. Sometimes in using a handle the hand must

dry, are poor conductors of heat, and that quality is taken advantage of by handlemakers who fit curling irons, frying pans, corn-poppers, stove lid lifters, pokers, coffee pots, smoothing irons, and other similar articles and utensils, with wooden handles to protect the hand from the heat of the fire.

Woods are tested in laboratories and experiment stations to determine their various qualities, and the handlemaker puts to his own use data so worked out, and he measures his material's strength, elasticity, hardness, weight, and other properties, and determines what woods suit best for various kinds of handles.



WOEFUL WASTE OF HANDLE STOCK

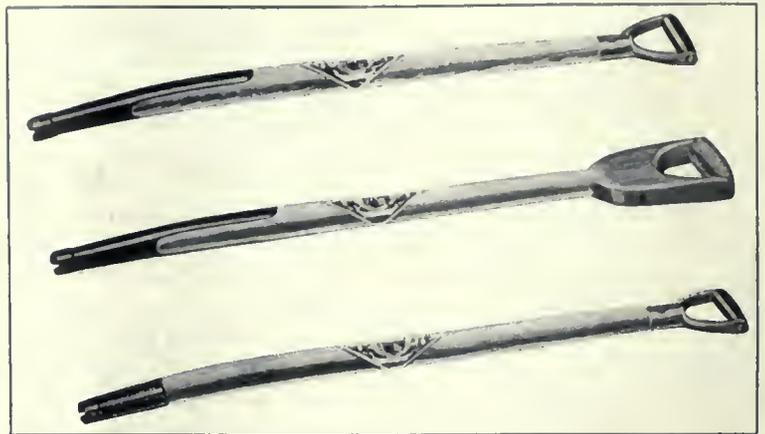
The best hickory handles are made from split billets. Riving the wood offers a guarantee against cross grain, and for that reason is preferred to sawed wood. In splitting operations the waste of wood is regrettable. The picture gives a view of a typical handle camp in a Kentucky forest.

slip to and fro, as with an ax in chopping, and a wood is required that will polish smooth so that the hand will not be chafed. Many woods polish smooth, but few equal hickory in that particular. Beauty is sometimes, though not usually, considered in the selection of a handle wood. The handles of pocket knives, miscellaneous cutlery, screw drivers, curling irons, and other toilet articles, afford a considerable use for handsome woods. Our forests possess many of fine color and dense grain, among such being cherry, kalmia, manzanita, wild lilac, koerberlinia, walnut, satinwood and devil's claw. All woods, if

The annual demand for wood by handle makers in the United States approximates 280,000,000 feet, consisting of thirty-three kinds, of which four are softwoods, twenty-three native hardwoods, and eight hardwoods of foreign origin. The number would appear much larger, except that manufacturers follow the custom of grouping several species as a single one. All maples are listed as one, all birches, pines, oaks, hickories, ashes, and cottonwoods in the same way, though each of these includes several trees of the same genus. Nearly all handles are made of hardwoods, their contri-

bution totaling more than ninety-nine per cent of the whole. It is apparent that softwoods fill a decidedly minor place in the industry, only four of them appearing in the list, and not one of them contributing more than half a million feet yearly. The four softwoods and their annual contributions of material for handles are here shown:

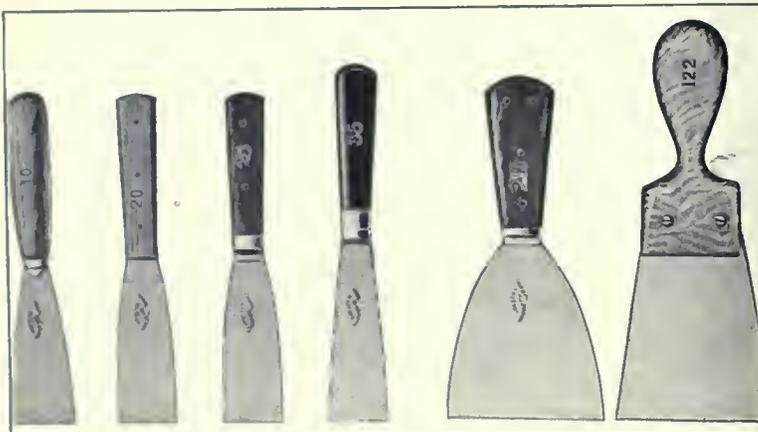
	Feet
Hemlock .....	500,000
Douglas fir .....	247,200
Cypress .....	122,000
Pine .....	92,000
<b>Total .....</b>	<b>961,200</b>



HANDLES FOR SPADING FORKS

These handles are known as the "D" pattern, so named from the form of the end grip for the hand. In some styles of handles this grip is of wood wholly, and in others it is partly metal. Short handles only, whether for spades, forks, shovels, scoops, or other tools, have the "D" attachment.

The number of foreign woods entering into our handle trade is rather large, but the total supply is not as great as that contributed by the soft-



HANDLES FOR PUTTY KNIVES

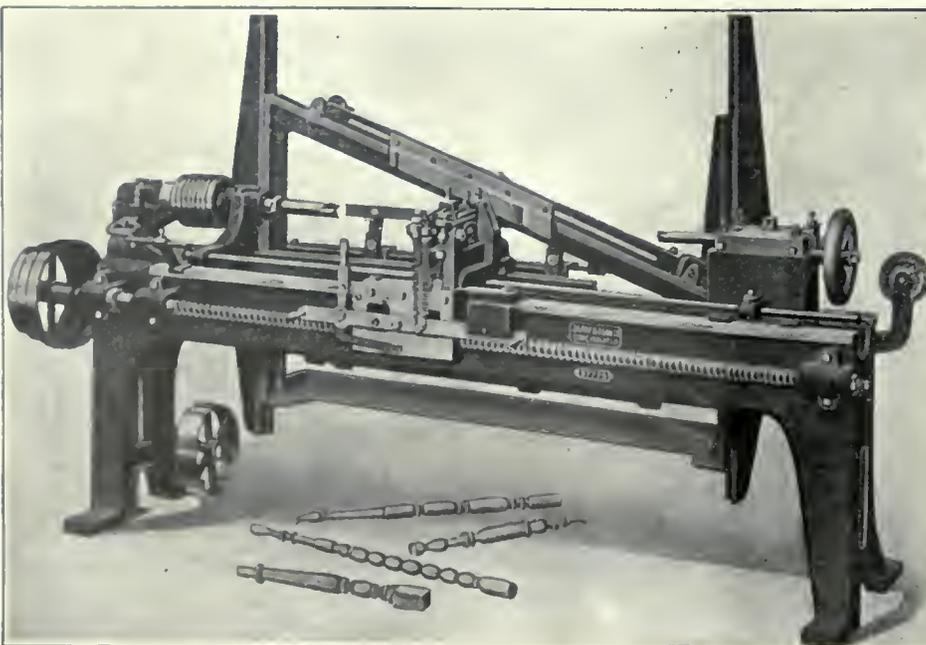
Some of the knives in this class are equipped with handles of the plainest wood, while others are provided with colored or figured woods, or the handles may be finished with enamel. There is no practical limit to the variety, so far as the kinds of wood, shapes, and finishes are concerned.

woods. The eight foreign species, and the amount of each per annum, are here given:

	Feet
Cocobola .....	210,000
West Indies boxwood.....	37,556
Mahogany .....	29,000
Rosewood .....	15,456
Ebony .....	4,464
Lignum-vitae .....	1,500
Green ebony.....	985
Turkish boxwood.....	225

**Total..... 299,186**

Native woods in the following list furnish the bulk of the handle material in this country. The figures give the yearly production in feet:



GAUGE LATHE FOR QUICK WORK

No matter how curved and irregular a handle may be, a lathe can be made with appropriate adjustments to form the handle. It is thus turned true to pattern and with great rapidity. The lathe represented in the above cut is from the catalogue of the Fay & Egan Company, Cincinnati.

Hickory .....	120,294,466
Ash .....	64,156,872
Maple .....	41,238,446
Beech .....	16,671,207
Oak .....	12,457,472
Birch .....	9,908,370
Red gum.....	6,654,370
Elm .....	3,060,307
Basswood .....	2,285,885
Cherry .....	617,500
Horbeam .....	415,000
Red alder.....	361,770
Yellow poplar.....	211,900
Dogwood .....	190,230
Applewood .....	153,400
Sycamore .....	156,000
Black walnut.....	29,050
Cottonwood .....	27,000
Willow .....	19,000
Chestnut .....	10,000
Persimmon .....	7,000
Locust .....	4,000
Butternut .....	2,000

**Total..... 278,954,985**

Handles may be divided into classes based on shapes, materials, uses and patterns. However, there is overlapping to such an extent that lines separating class from class cannot always be clearly drawn or defined. The difference between a handle for a hatchet and one for a mallet is not great, still the two are not precisely the same in form or in the use intended. Allowing for exceptions and variations in classification, it is practicable to group nearly all wooden handles for tools in six groups, based chiefly on uses. They follow:

1. Agricultural tools for planting, cultivating and harvesting.
2. Edged and pointed tools for working materials sufficiently soft to be cut.
3. Saws, files, rasps and similar tools for scraping, shaping and smoothing.
4. Tools for pounding. These are not very clearly



STYLES OF LONG SHOVEL HANDLES

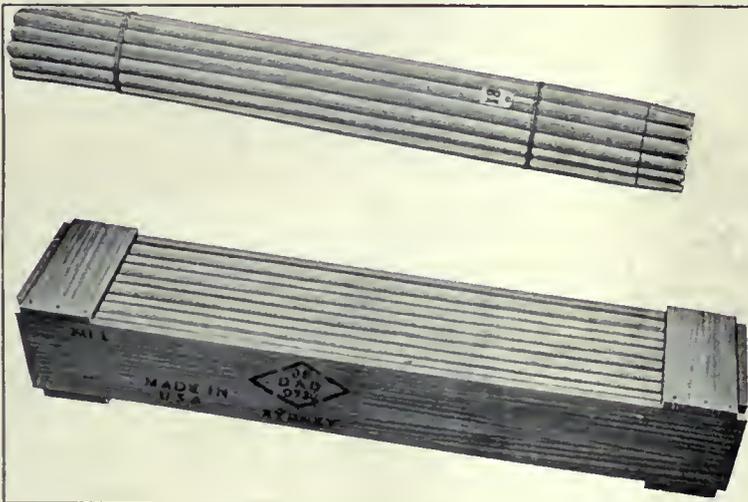
There are as many styles of long as of short shovel handles. Each tool for a particular use has a handle style of its own. Differences in styles consist in length, diameter, and especially in the bend or crook. Ash is the prevailing wood, but hickory and occasionally other species are used.

the handles made do not require tough or strong woods. They are not expected to endure severe strains or twists.

Among handles of that class are those for paint brushes, pails, packages, saws and numerous other tools and commodities.

There is a difference between farm tools and agricultural implements. The tools are for hand use; implements are operated by horses or other power a little stronger than man's muscle. The distinction may not be recognized always and everywhere; but most people acquainted with the matter bear it in mind. Taking that view of it, a scythe is a tool, a mowing machine an implement; a flail is a tool, a thrasher an implement; a pitchfork is a tool, a tedder an implement. Most farm tools have wooden handles, but implements usually have none.

Up to a time less than a century ago, agricultural implements were rare. Few had been invented, except the plow which was a poor affair until recent years. The farms were then cultivated with tools, yet the factories for making tools were small and few. The metal parts were hammered into shape in blacksmith shops, and the



PACKED READY FOR EXPORT

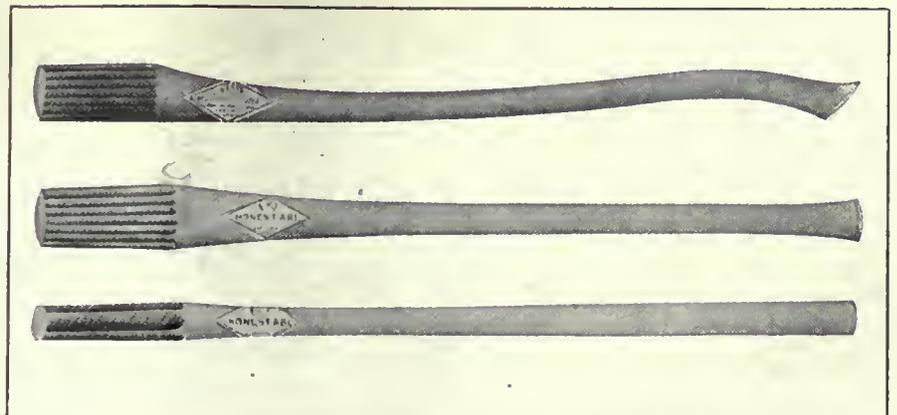
American handles, and particularly hickory handles, are exported in large numbers to foreign countries. They stand without a rival in those markets. The exporter crates them or ties them in bundles of two dozen. The illustration is shown by courtesy of the United States Handle Export Company of Piqua, Ohio.

defined, but hammers, mallets and mauls belong here. ing tools were small and few. The metal parts were

5. Tools for painting, sweeping and dusting, such as brooms, brushes and mops.
6. Handles for vessels which need them, like pans, pails, ladles, dippers, skimmers and coffeepots.

It would not be difficult to designate several kinds of handles which do not seem to belong in any of these classes; but nothing more precise than a general grouping has been attempted.

Strength is one of the chief considerations in selecting handles for farm tools, and also for those intended for cutting, punching and pounding, and frequently both strength and toughness are of prime importance, though more than half of



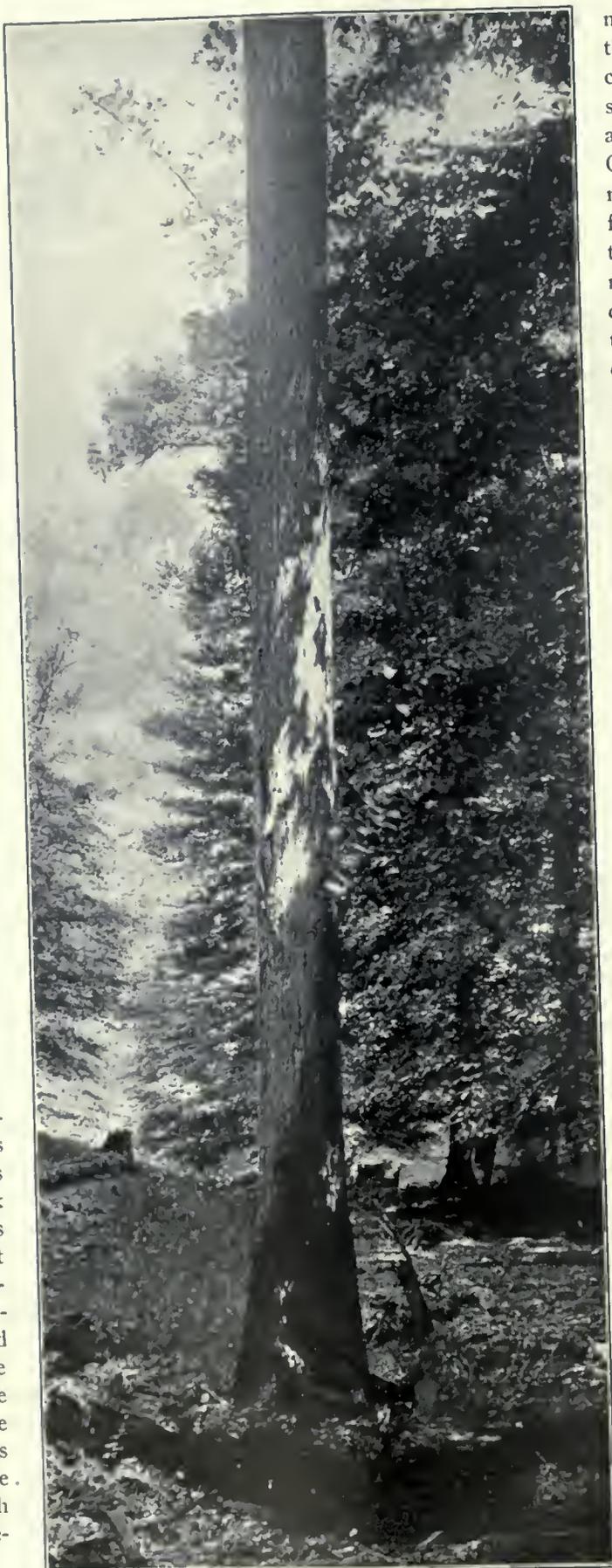
AX AND HAMMER HANDLES

Three common styles are here shown, but each style has a number of variations to meet individual tastes. The upper is an ax handle, the middle one is for a pick, and the lower for a sledge hammer. Such are usually of hickory, the hammer and ax handles being of sapwood, and the pick of red heart.

handles were hewed and shaved by hand. The scythe cut the hay, the sickle the grain. The grain cradle is quite recent, but the scythe and the sickle were ancient, and the flail which thrashed such of the grain as the horses and oxen did not tread out, was the main dependence in separating grain from straw. Rakes were of wood, both handles and teeth, and most pitchforks were of wood, both handles and tines. Thousands of years were necessary to bring them to the degree of perfection in which the beginning of the nineteenth century found them. Compared with the corresponding tools of today, they were crude and clumsy. But their use served one good purpose at least: the man who made and used the tools learned by experience what woods were best, and these woods still furnish the handles and part of the other materials of which tools are made.

Ash is the leading wood for the farm tool handles, and more than one-fifth of all the ash cut in the United States goes into such handles. It is strong and does not snap easily and has plenty of spring. Fork handles are of various lengths to suit different kinds of forks. Two general styles of shovel handles are in use, the long and the "D." The latter name is due to the shape of the grip for the hand at the end of the handle. Hoes and rakes also have handle styles ranging through many lengths and diameters.

The invention of agricultural implements did not drive tools out of existence. Perhaps as many are made



SMOOTHBARK HICKORY FOR HANDLES

This picture shows a large, straight trunk from which the finest handles are made. As a usual thing the largest hickory trees are not the best for handles, because the sapwood becomes thinner with age and size, and the sapwood is the best part, or is so held in popular opinion.

now as ever before. Even the sickle is still sold in country stores for use in some rural communities, and cutting lawns in towns. Grain cradles and flails may be bought, and most farms possess a scythe or two to be employed in mowing weeds from fence corners, trimming round trees and stumps, and occasionally for mowing grass. The scythe handle is called a snath, which is a name handed down from the Anglo-Saxon hay farmers. The snath is the most crooked handle in existence, if it is well formed. Formerly the farmer who wanted a handle for his scythe went into the forest and searched until he found a sapling with natural crooks conforming to his idea of what they should be, and no artificial bending was attempted. Now the snath maker steams his ash, hickory, cherry or mulberry, and bends it according to a regulation pattern. In some of the parishes of Louisiana descendants of the French settlers still use homemade snaths and wooden pitchforks. The same styles are sometimes seen in the mountainous regions of eastern states.

The proper seasoning of wood is highly important in the manufacture of farm tool handles. The long and slender spindles of wood, if not thoroughly dry, will bend out of shape when strain is put on them, and they never regain their form. When farmers made their own forks and rakes, it was customary to air season the handle woods for years, or at least for a year, before whittling the handles into final shape. Manufacturers

now hasten the process by using the dry kiln.

Edged and pointed tools are of so many kinds that it is impractical and would be unnecessary to list them.

Axes and sledge hammers, and others like them, must have highly elastic handles in order that the workmen's hands be spared from the jolts, jars, and stings resulting from striking blows. Some other tools do not call for resilient handles, chisels, awls, augers, and hatchets being in that class. For elastic handles, hickory is without a peer. It possesses more good qualities, and fewer that are poor, than any other handle wood in this country, or in any other, so far as known. The expert axman can almost instantly pass judgment on a handle when he gets his hands on it. When hickory cannot be had, handles for axes are made of other woods. Some of the woods answer fairly well, but others are poor. Every wooded region has one or more ax handle woods, though some of them do not rate high. Hornbeam and blue beech are used in certain of the northern states. On the Carolina coast good ax handles are made of tough young oak, and to improve the quality of the wood it is boiled in oil, after which it may be bent far out of line and it will spring back. Many ax handles are of ash, some of birch, others of maples, and in California eucalyptus is satisfactory, provided the handles can be prevented from warping out of all reason. Locust and bois d'arc make strong handles, but these woods are so rigid and harsh that the chopper's hands may be severely bruised in the process of striking blows. In the absence of better woods, ax handles have been made of wild cherry.

When a farmer or a country wood chopper makes himself a hickory handle for his ax, he splits the billet from the white sapwood and shaves it into shape without any cross grain. The final polishing is usually done with a piece of glass. The whiteness of such a handle when new is like ivory, and if the handle does not give the countryman two or three years of service, it does not come up to expectations, though it would scarcely last a lumberman that long where it has constant use. Hickory rots quickly when exposed in damp places, and decay need not advance far or last long before it renders the wood brash. It then breaks easily.

Fashion governs in the selection of wood for handsaw handles, but not for those fitted for other saws. The operator of a crosscut saw is satisfied if the handle is strong and is of wood which polishes or wears smooth. A rough, harsh handle is apt to blister the sawyer's hands. Among the satisfactory woods for crosscut saw handles are maple, birch, beech, hickory, dogwood, persimmon, hornbeam, sourwood and gum. On the northern Pacific coast where good hardwoods are few, a satisfactory crosscut saw handle is made of cascara buckthorn which wears very smooth.

According to some unwritten law, a handsaw handle is supposed to be made of applewood, though some are of wild cherry, beech, mahogany and birch. The yearly demand for applewood to equip handsaws with handles exceeds 150,000 feet. It comes from old orchards

where trees are cut to make way for improvements. It does not pay to grow apple trees for the wood alone. Early colonists in Pennsylvania, who were acquainted



MATERIAL FOR FARM TOOL HANDLES

This white ash trunk is prime stock for the handle factory. Nothing better can be had for pitch fork, shovel, spade, hoe and rake handles. This tree grew on the bank of the Muskingum River in Ohio, and was more than three feet in diameter, with an assurance of clear, straight wood.

with the value of apple and pear wood in Europe, for engraving and carving, planted and pruned their orchards with the ultimate object of selling the wood after the trees were done bearing. For the purpose of producing smooth trunks, they pruned their apple trees about fifteen feet high, leaving no limbs near the ground. Wood grew wood at the expense of fruit. They found no sale for applewood in their time, but more than a century afterwards some of the old high-pruned orchards were bought by saw manufacturers who made handles of the richly-colored wood.

Many kinds of wood, excellent, medium and somewhat poor, are manufactured into handles for brooms, mops and brushes of numerous sorts. Requirements are so various that most woods are suitable for some of the handles in this class. Extraordinary strength is not essential, nor is high elasticity required. Broom handle makers sometimes insist upon having heavy woods like sugar maple and birch, but they prefer that kind because weight helps the sale of the brooms, and not because a heavy handle makes a better broom than the one with a light handle. Brooms, handles and all, may be sold by the ton, and the heavier the wood, the more favorable the selling price. Broom handles are now produced by machinery and in large quantities, but the old hand-made broom which was put together by farmers for their own use many years ago, often had octagonal handles, shaved slowly, one at a time, with a drawing knife. An expert could shave fifty a day.

Paint brush handles are generally in the cheapest class. In size they vary from those as long as a broom handle down to lengths of four inches or less; and many kinds of wood are satisfactory for their manufacture. Enormous quantities of such handles are made by special machines run at high speed.

The cheapest grade of handles are those for pails, buckets, bundles and boxes, but many of them are made of handsome and expensive woods and it is not unusual

for them to be painted, stained, enameled, or japanned. That finish is put on to hide the cheapness of the wood and to improve the handle's appearance. The pattern is cylindrical, bored lengthwise for the insertion of a wire bail or fastening to complete the handle. The wooden piece is merely the grip for holding in the hand. It is three or four inches long and an inch or less in diameter. The softwoods represented in the handle business are mostly in products of this class, and hemlock leads the softwoods in quantity.

Another group of small handles differs in some particulars from the foregoing. They are for use on buttonhooks, manicure rasps, ladles, dippers, and many similar tools and utensils. Wood is one of the best nonconductors of heat, and when a wooden handle is affixed to a coffee pot, frying pan, curling iron, or any other tool that is to be used near the fire, it is meant to keep the hand from the hot metal. The wooden handle on a poker or a fire shovel is there for a similar purpose. The wooden handle is frequently employed to protect the hand against cold instead of heat. In very cold weather metal tools quickly freeze the hand that comes in contact with them, and the protection which a wooden handle affords is highly essential. The holds with which levers in mills and brakes on cars and wagons are equipped are examples of the use of wood as a shield to the hand, against both cold weather and the hardness of the metal.

The wooden knife handle occupies a large place or several places. This handle may be of very cheap and common wood, or it may be made of the finest and most costly product of forests either domestic or foreign.

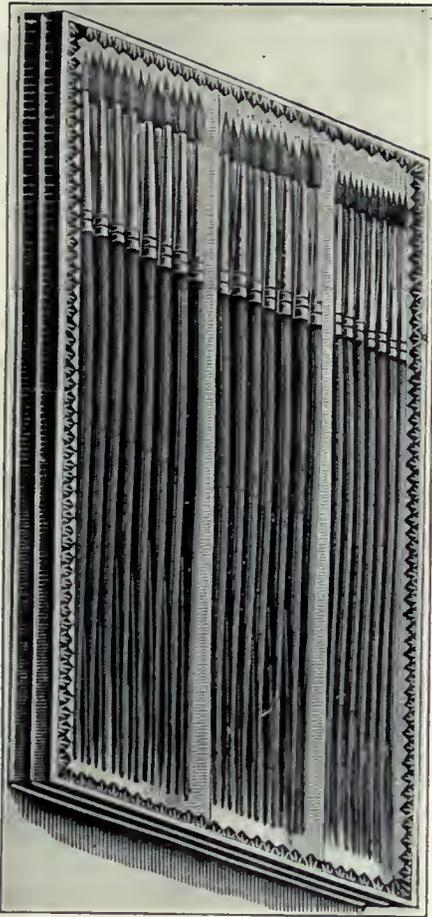
Foreign woods listed in the knife handle industry may cost thirty or forty cents a square foot. Highly expensive woods are used in very small pieces on each knife. The wooden part of the pocket knife handle is usually thin and is restricted to a thin splint on each side. Such splints are known as scales. A foot, board measure, of



Photograph by Romcyn Hunt

#### THE SHAGBARK HICKORY

Note the characteristic tall, oblong crown, even in field growth. It generally furnishes the highest quality of hickory wood for commercial purposes and by some this is called the national tree of America.



HANDLES OF SMALLER SIZE

The wooden handle as equipped with the diminutive brush of camel hair for water color painting is among the smallest regularly manufactured. The penholder is very near akin to these handles in size and form. The illustration shows a package put up ready for shipment or for sale

cocobola, boxwood, or green ebony, will supply enough handle scales for a hundred pocket knives; and though the wood may be very costly, the pieces are so small that the wood for a single knife handle may cost less than a cent. The foreign woods listed in the knife handle trade are hard and handsome. It is commonly supposed that American forests do not grow woods suitable for such handles, but that opinion is probably erroneous and persists because of ignorance of the real wealth of woods in our forests. Many of the minor species are little known and some of them produce woods of fine grain, handsome color, excellent hardness, and good working qualities. Nearly six hundred kinds of woods grow wild in the United States, and not more than half of them are in common use. It is true that most of the minor and little used species are quite scarce, but enough wood might be secured from them to supply handles for all the pocket knives made in this country. Many knife handles are of plain uncolored woods, and there are gradations from the finest to the commonest. Even the cheapest woods may be peculiarly suitable for certain kinds of handles. Oystermen use an aspen wood handle for the shucking knife.



SHORT HANDLES OF HARDWOOD

This is a type of handle made by the million for small tools like screw drivers, awls, files and other similar kinds. Different woods are in use, but the harder it is, the better. The handle shown in the cut is of paper birch, part white sap and part red heart.

It possesses a peculiar characteristic which prevents the handle from becoming slippery when in contact with oysters, and workman can retain firm hold on and good control of the handle. That is not the case with most woods in that situation.

A larger assortment of special woods are listed in



PAINT BRUSH HANDLES

Hundreds of patterns, shapes, and sizes of paint brush handles are on the market and no complete list is possible or desirable. The accompanying cut shows a few of the most usual. The man who makes the handles is seldom the man who completes the brushes by attaching the bristles or fiber. Most handles of this kind are made to order.

the handle industry than in most others. Among such are hickory for ax handles ash for pitchforks, apple

sight or in prospect to supply the needs of the handle manufacturers. So many species may be used that

for handsaws, aspen for oyster knives, cocobola for pocket knives, hemlock and paper birch for buckets and pails, and sugar maple for broom handles.

No general shortage of handle woods need be feared. Though 280,000,000 feet a year must be cut to meet the demand, enough is in



HEMLOCK FOR PAIL HANDLES

More handles are made of hemlock than of any other softwood of this country; but they are handles of certain kinds only, such as are seen on bucket bails to provide a hold for the hand, and on packages, bundles, and schoolbook carriers, and on lunch boxes. They are cheap and are seldom enameled.

the drain does not fall heavily upon any. Exception to this view might be taken with regard to three woods, hickory, ash, and apple, each of which is demanded for a special class of handles, apple for saws, ash for farm tools, and hickory for axes and some kinds of hammers, and also for golf clubs. An examination of the sources of supplies brings to view no alarming condition. Hickory to the amount of 120,000,000 feet is cut yearly for handles, and nearly 20,000,000,000 feet of standing hickory remain in the United States. It is clear that exhaustion of this wood is not imminent, though it is used by many industries besides that producing handles. Hickory grows rapidly and it flourishes best as an open ground tree, and seedlings may be expected to spring up in old fields and in cut-over lands. These situations are precisely the places where the hickory tree produces its best and most abundant wood. The more rapid the growth of hickory, the better the wood is. It is one of the few trees whose sapwood is more valuable than the heart; and since sapwood predominates in young trees, hickory is valuable as soon as it reaches a size sufficient to make billets. Therefore, hickory is good for handles when quite young, and it being a species which reproduces rapidly and abundantly, handle makers in the future can rest assured that hickory trees can be found.

The situation is not quite so reassuring with regard to ash for tool handles; yet no cause for pessimism exists. Handlemakers require about 64,000,000 feet of this yearly, and the existing supply of standing ash timber in the United States has been estimated at 16,500,000,000, which, if cut for handles alone, would last 250 years without depending on new growth. But other industries demand ash, and young trees are coming on. The drain is pretty severe, but no cause for uneasiness or alarm is apparent. Ash handles for hoes, forks and shovels will be forthcoming during many future years.

Good handsaws could be made without applewood handles; but enough of this wood for handles is assured for a long period.

A large class of small, medium, and miscellaneous handles can be made from American woods without danger of exhausting the supply. No large quantity of foreign woods is imported by handle makers, but such as are imported are very hard and very fine-grained woods, or woods of attractive color. These, too, might be largely, if not wholly, supplied from our own forests, not to identical species which are brought from foreign countries, but others which might take their places without causing any lessening in quality or appearance of the handles produced. Our forests are rich in minor species of hardness, fine color, strength and of beautiful grain. Most of them are not abundant, but they exist in sufficient quantities to meet a much larger demand than is now met by imported handle woods. The trouble is, manufacturers are unacquainted with or have no knowledge of many woods of our country

which do not appear in the markets, and they have made no effort to become acquainted. Beautiful, hard, strong woods are to be found in many regions, though thus far they have not been much used for any purpose, out-

Name of Wood.	Color.	Region of Growth.
Blackwood	Black	Florida
Catsclaw	Rich brown	Texas
Fiddlewood	Red	Florida
Redbud	Brown	Arkansas
Strongback	Brownish yellow	Florida
Devilwood	Dark brown	Florida
Frijolito	Reddish orange	Texas
Madrona	Reddish	Oregon
Joewood	Rich brown	Florida
Mountain laurel	Reddish brown	Kentucky
Jamaica dogwood	Clear yellow brown	Florida
Manzanita	Reddish brown	California
White buttonwood	Dark yellow	Florida
Lignum-vitae	Dark green	Florida
Holly	White	Alabama
Poisonwood	Orange brown	Florida
Koerberlinia	Brownish yellow	Texas
Satinwood	Light orange	Florida
Huckleberry	Dark yellow	Arkansas



AN APPLE TREE TOO OLD FOR FRUIT

Old trees like this furnish stock for handsaw handles. The tree in this picture is of historical interest, it being the original and first "Grimes Golden." All apples of this well known variety have descended from this tree which was discovered wild on the bank of the Ohio River a century ago. Photograph by courtesy of the Baltimore & Ohio Railroad.

side of the immediate localities where each grows. The list which follows names some of them, but by no means all which ought to make fine, small handles. The list likewise gives the wood's color, and the region where the species is best developed:

Name of Wood.	Color.	Region of Growth.
Yew	Red	Washington
Black olive	Yellowish brown	Florida
Mesquite	Reddish brown	Texas
Lancewood	Dark brown	Florida
Santa Cruz ironwood	Clear red	California
Mountain mahogany	Reddish	Utah
Mangrove	Reddish brown	Florida
Texan ebony	Dark brown	Texas
Valley mahogany	Reddish	California
Crabapple	Brown or reddish	Ohio Valley
Service	Reddish	Pennsylvania
Nakedwood	Yellowish	Florida
Huajillo	Dark	Texas
Cockspur thorn	Brown	West Virginia
Huisache	Rich reddish brown	Texas
Wild plum	Dark brown	Ohio
Black calabash	Brown	Florida
Red ironwood	Rich reddish brown	Florida
Waahoo	Orange-white	North Carolina

Note: In Mr. Maxwell's article in the September issue on "Wood in the Manufacture of Boxes and Crates" the legends of two of the illustrations on page 536, "Box Board Matching Machine" and "Screw Driving Machine" should be transposed.

The woods in the foregoing list are more widely dispersed than is indicated by the name of the single state where each is best developed. Some of the species are found in a dozen or more states. However, Texas and Florida are credited with more than any other states. Climatic conditions in those regions are doubtless re-



THE FUTURE'S WALNUT HANDLE SUPPLY

Fine handles for knives and small tools are frequently of black walnut. The war demand has depleted the supply of large trees, and dependence for walnut handles in the future must be placed on small growth. The above cut shows a thicket of young walnut saplings which will do for handles in about twenty years.

sponsible for the profusion of hard, heavy, colored woods found and which invite investigation from certain classes of handle makers. Some of the woods are very scarce, and others are rather plentiful.

## ANOTHER FOREST REGIMENT FOR FRANCE

**D**O you see that sawmill? Now rub your eyes. The magic carpet has lifted it and is carrying it twenty-five miles away. This is not a fairy tale. It is a story of the American foresters in France. A 10,000 capacity mill was buzzing away merrily one day in the woods of France. Forty-seven hours later it was operating at a point twenty-five miles away.

More men who can do things like this are needed on the other side. They are needed to bring victory quicker. That is the reason why there is being organized what practically amounts to another American Forest Regiment for service in France. With the growing demands of the army for lumber of all sorts it was found necessary to add to the force of workers who are getting out the railroad ties, the trench timber, the wood for new buildings and for a hundred other purposes.

Whether the new regiment will be formed into a separate organization or incorporated with the 10th and 20th Engineers (Forest) is not yet certain.

It is expected to have all the new men on the other side in a short time, within the next month or two at the outside. The officials on this side who are selecting the members of the new regi-

ment are working with some of the same speed which the rustlers on the other side are showing. The officers are being selected from experienced logging superintendents, mill operators and superintendents and others in civil life who have been accustomed to handling entire operations in lumbering; the enlisted men will be chosen from among drafted men whose trade in civil life has been that of lumber jack, saw mill man or forester. In a camp in this country they will be given a month or so of intensive instruction in military drill and in the duties and responsibilities of soldiers.

The principal qualifications for the officers who are to be in charge of the new regiment is that they be able to take charge of logging and lumber manufacturing operations immediately on their arrival in France.

Organizers and administrators with experience in all branches of lumbering and manufacturers who know all the processes from the stump to the car, are the class from which will be selected largely the commissioned officers. Men are needed who can rustle equipment and supplies and do it under abnormal conditions, where time is worth more than money and men easier to obtain than machinery and where breakdowns must be patched up with whatever is at hand. For convenience in handling all such applicants, as well as those selected from civil life for commissions in other branches of the army service, there have been established by the personnel branch of the General Staff agencies in a number of cities through which applications must be handled. These agencies are at the district headquarters of the recruiting sub-section and the offices of the Military

Training Camps Association in the following places; New York City, Boston, Philadelphia, Atlanta, Chicago, Cleveland, St. Paul, Dallas, Kansas City, Portland, Oregon, San Francisco and Los Angeles. This new procedure has the great advantage that it saves those desiring commissions the inconvenience of coming or writing to



AMERICAN SAWMILL IN FRANCE

It is in plants like this that millions of feet of lumber are being turned out for all sorts of army uses. The mills are being driven day and night with ten-hour shifts at work.

Washington. With more than 2,000,000 American soldiers in France and with several hundred thousand being added to their numbers each month, it is necessary for the foresters to keep pace with the rest of the army. In fact, they must keep ahead and anticipate the demands of the fighters. They must prepare months in advance the timber of all kinds which will be called for. While they work in the rear they really lead the army. When the long lines of khaki-clad boys arrive they must find barracks ready to receive them, hospitals erected, Y. M. C. A. huts, and in addition many millions of feet of lumber to be employed in construction work essential to their advance. Many of the loyal foresters who are felling trees would prefer to be felling Germans, many of those who are guiding the logs

through saw mills and shaping them would rather be up in the front line somewhere; but they are faithfully shouldering that portion of the service which falls to their lot, working with a will and oftentimes putting in long hours. It is seldom that any of them work less than ten hours a day.

There is no doubt but that the new regiment which will soon be on its way overseas, will live up to the reputation already established by the American Forest Regiments in France. They have shown some marvelous accomplishments in production which opened the eyes of our allied brothers in arms, and they have also introduced some methods in logging and in manufacture, as well as in lumber conservation, which were new to the French but which won their praise and their admiration. At the same time much of value in forestry work has been learned from the experts of Europe who had been studying and improving forestry methods for many years.

The adaptability of the American Forest Regiments to new conditions was one of the surprising things to the French. This gives ample assurance that the new men to be sent over will "find themselves" immediately upon their landing on the other side. That they will find a way or make a way for getting out all the timber that is necessary, is a foregone conclusion.

The French were surprised for one thing at the large output from the American sawmills. Plants which were rated at a certain capacity doubled or trebled the amount it was supposed they could handle. Instead of 10,000 feet in a day they turned out 25,000 or 30,000 feet. They accomplished this in various ways. One was by the operation of two ten-hour shifts. The way in which these mills were driven night and day was one of the large production methods. The use of thick circular saws has permitted this driving quick results. The French are accustomed to thin saws. This was slower although it is not so wasteful of timber. As a matter of conservation, therefore, the thin saws had been used.

They did not produce much sawdust. But the Americans showed that there need be little loss on this account, that the sawdust could be utilized for fuel under the boilers which ran the larger mills. The greater results obtained by the use of thick saws, it was found, did not conflict with proper conservation.

Another important conservation measure which the Americans put into operation was in connection with the getting of the logs from the forests to the mills. The French had not been accustomed to driving logs loose in the streams. It was claimed that their specific gravity was too great and that they were too heavy to handle in this manner; and so other means of transportation were adopted. These required more man and team power. The American forest workers, however, began to fell trees three months in advance of the time they were to be moved. The branches and leaves were left on the trees and as long as they remained continued to draw moisture from the trunk. By the time, therefore, that the logs were ready for the mill they had lost much of their specific gravity and were floated down stream without any difficulty. This along with many other short cuts and labor-saving devices which had been seen in operation or learned in theory in the United States proved of inestimable value in speeding up the output of lumber and in keeping Pershing's men supplied with all they needed.



MAJ. DAVID T. MASON

Maj. Mason spent one year in France in connection with the American army's forestry work there, and is now in this country assisting in the organization of the new force of foresters which is to go abroad.

The way in which these forest engineers of the American forces built railroads to move their products with greater facility and in much larger quantities than by simpler methods and the gain in efficiency obtained thereby, was another feature of American methods which appealed strongly to the French and won their high commendation. It was found that in spite of the preliminary work required in building logging railroads, the ultimate saving in time and labor and the greater results obtained more than compensated for the original outlay. The American mills in France have been running full speed. They have not

slowed up for a minute. They have been turning out the material as fast as it was humanly possible. The men behind them have been working night and day to

the scene. The army which the United States plans to have in France by next spring, which will then number 3,000,000 or more, will not want for the timber it needs to push forward through the German lines.

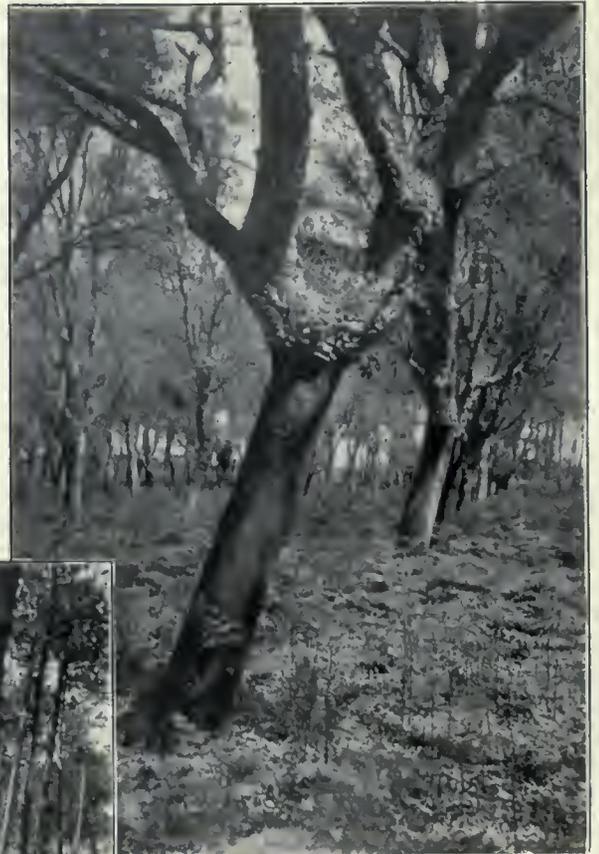
The new regiment will do its part in helping to meet this demand. Winter snows and cold weather will not stop the men from the good work for which they are crossing the Atlantic. They will get out the trees and cut them into all shapes and sizes, into piles for trench fortification and railroad bridges and foundations, into ties for railways, into boards for buildings and boxes, and so



OFF TO THE SAW MILL

The American Forest Regiments in France have speeded up the transportation of logs by building railroads wherever possible for this purpose, instead of using the slower team method of the French.

keep up with the tremendous demands upon them. They have worked early and late. Their one thought has been—more lumber. They have put brain as well as brawn into their task. They have allowed nothing to stand in their way and have overcome obstacles which appeared almost insurmountable. In spite of this the growth of the army has been such, new troops have



CLEAN FORESTRY

This is the condition of the timber lands in parts of France where the American forces have been busy in getting out lumber. The lower picture shows a maritime pine forest cupped for turpentine, with piles of fern cut for compost to be used on sandy agricultural land. The other picture is of a cork orchard.



been pouring across the ocean at such a rapid rate that it has become necessary to increase the size of the forest force. This is being done by adding the equivalent of a new regiment to the two regiments already on

be over-emphasized. The men of the Forest Regiments are truly soldiers of the first rank. Axes and saws are the bayonets with which they are fighting the Boche.

#### HOW WOOD COMPARES WITH COAL IN HEATING VALUE

In heating value one standard cord of well-seasoned hickory, oak, beech, birch, hard maple, ash, elm, locust, or cherry wood is approximately equal to 1 ton (2,000 pounds) of anthracite coal, according to estimates by the Forest Service, United States Department of Agriculture. However, a cord and a half of soft maple and 2 cords of cedar, poplar, or basswood are required to give the same amount of heat.

One cord of mixed wood, well-seasoned in heating value at least 1 ton of average grade bituminous coal.

# OUR LUMBER OPERATIONS IN FRANCE

BY CAPT. GEORGE E. LAMMERS,

20TH ENGINEERS (FOREST), A. E. F.

UNLIKE those we left behind, the lumbermen in France are not worrying about market conditions, as we enjoy the unique distinction of operating on a mammoth scale without the aid of price lists and discount sheets. We are not losing sleep over excess profit taxes, nor are we fretting about collections or financing in general. The wage problem causes us no concern whatever, and we do not have to contend with the scarcity of labor. This introduction is not written with the idea of recruiting your services for overseas duty; not that we would not welcome each and every one of you, but it would be unfair to dwell only on the things which do not worry us, for all is not "easy sledding."

Being concerned chiefly with transportation, it is pardonable, I trust, if I make first mention of this problem. The accompanying views will in a measure acquaint you with some of the methods used in transportation. It must be borne in mind that even in the heaviest stands of timber only such trees as are selected and marked by the French authorities are available for our use.

Scenes No. 1, No. 2 and No. 3 will undoubtedly prove the most interesting. Scene No. 1 shows a section of track where a donkey engine is used in logging the rough country. At one point, there is a 72 per cent grade. Scene No. 2 shows

is loaded, couplage sets are furnished. A couplage set consists of two or more flat cars equipped with swivel bunks and idlers between the cars varying in length according to the length of the stock to be loaded.

France, it is true, is literally covered with a network of railroads both narrow and standard gauge, but this does not simplify transportation problems. A number of our operations are located on narrow gauge lines which necessitates transfer and storage yards at standard gauge junction points. We have five different railway systems to deal with in addition to our own lines of communication operated with American equipment. In spite of the fact that the Americans have rebuilt a considerable number of French locomotives and cars in addition



to erecting our own, daily transportation problems will enable us to talk intelligently on the "car shortage" subject when we return.

## RIGHT ON THE SPOT

Our boys "on the job." They are fast producing and manufacturing lumber to win the war and this shows a section of that famous logging road with a 72-degree grade.

You will undoubtedly be as pleased to learn as we are to announce that our production has increased

the transportation of piling from the woods to the railroad. At some operations, we are getting out 90', 95' and 100' piles for dock construction and, in as much as the founders of the French villages overlooked the necessity of accommodating such traffic in laying out their streets, we have encountered numerous difficulties. Scene No. 3 shows a few dock timbers on one of our loading platforms, but it is especially interesting from the standpoint of transportation. Note the French couplage cars with the swivel bunks. The average French car will not accommodate stock over 16' long and only has a capacity of 10 tons. When long stock

monthly by leaps and bounds and that our daily average for July was 1,300,000 feet. The demand, however, still exceeds the production by far, due to the amount of permanent dock, railway and warehouse construction, but additional troops and equipment are constantly arriving to assist us in meeting the demand. Judgment, however, should not be passed on the efficiency of our organization, based on the daily cut for July, for in addition to this, we are keeping pace with the demand for piling, poles, entanglement stakes, pit props, camouflage pickets and fuelwood, all of which are as essential as the output of our mills.

Very interesting articles could be, and we hope some day, will be written on the timber we have acquired in France; the logging chances which confronted us and methods used; the possibilities of French, Scotch and American sawmills; the problems of supplying mills rated from 1½M to 20M capacity with suitable orders,

and many other subjects on which you would all like to be enlightened. However, the most interesting reading of all would be an article on the difficulties of convincing an able-bodied, blue-blooded American lumberjack that his place is not in the front line trenches.

### PLANT BLACK WALNUT

**B**ECAUSE of the very high lasting qualities of its wood and the moderately rapid rate of growth of the tree in good locations, black walnut is one of the few most desirable trees to plant on the farm, says the *Weekly News Letter* of the Department of Agriculture. Small patches of rough, gullied, or unused land about the farm and narrow strips along fence rows and highways or corners of barnyards and stock lots make ideal places for planting this valuable tree. The method is simple, and the present heavy crop of nuts makes this year a most favorable time to begin work along this line. The region where walnut growing is practicable extends from southern New England west to the Central States and south to South Carolina and along the northern portions of the Gulf States to Oklahoma. The finest growth takes place in the rich coves of the lower Appalachians and over the Ohio and central Mississippi basins.

The black walnut tree is comparatively free from insect attack, particularly the wood. The price of black walnut lumber in recent years has been consistently high. Another factor to be considered is the rapidly diminishing supply of walnut trees over practically its entire range in the United States, due to recent cutting in order to meet the demand for gun-stock material. The tree yields durable wood which may be used for posts and for a wide variety of purposes about the farm, in case it is not sold in the lumber market.

In order to succeed well, walnut requires a rather good grade of soil, hence no attempt should be made to plant it on poor, thin soil or on hot, dry exposures. Favorable situations for rapid development are on strong limestone soils, deep alluvial soils, and stony loam soils along the margins of highlands. Since the walnut tree requires a large amount of light, it may successfully be planted on open tracts recently cleared of old growth and on recently abandoned fields. In this respect it resembles black locust, which, however, grows faster, but in many localities is more or less subject to serious attack by a wood-boring beetle.

The walnut crop was particularly heavy this year, affording a splendid opportunity to gather or buy seed for planting. Nuts should be stored over winter and planted the following spring. They are best stored in pits dug in the ground, the bottom of the pit being covered with leaf litter or straw, on which a 3-inch layer of nuts is placed, then a layer of litter, and so on, covering the whole with soil so as to leave the surface a few inches higher than the general level. Planting should be done about the time germination begins. In eastern

United States north of the Gulf States, this is during the months of March and early April. Squirrels, chipmunks, and hogs are serious pests, if present in numbers and would more than likely succeed in making away with a majority of the nuts if they are planted in the fall. Small tracts, however, surrounded by cultivated fields and other places where these animals are known to be scarce might safely be planted in the early or late winter when labor is more accessible than in the spring.

To plant the nuts, make a small hole with a mattock or hoe, drop one or two nuts in each hole and cover them with about 2 inches of fresh, firmly packed soil. For the larger areas, a good spacing in forest plantations is to dig the holes 8 feet apart each way or 8 by 10 feet, which amounts to 680 and 545 holes per acre for the two spacings. For small areas, or along fence rows and highways, the spacing should be about 8 feet in the row, unless permanent shade is desired, in which case the distance should be 20 feet during the early period of growth and subsequently increased to 40 feet by removing the alternate trees. For purposes of nut production the trees should be spaced at distances of from 40 to 60 feet apart, and should be given a due amount of cultivation. Requests for information along this line should be addressed to the Bureau of Plant Industry of the Department of Agriculture at Washington. The number of nuts required can easily be found by knowing approximately their quality, the area of ground to be treated, and the spacing. Care should be taken not to plant under shade. Where the trees in the old wood lot are to be cut during the next year or two and are moderately open, planting might begin now, so as to get a start in advance of the removal later of the overhead protection against early frosts and excessive drying of the soil in midsummer.

While the best results are usually obtained by completely preparing the soil and cultivating it for a few years after planting, farm owners should be aware of the possibility of starting hundreds of young walnuts in their wood lots and elsewhere at the expense of only a little labor. This will be a good step in the process of securing useful and money-making trees on parts of the farm which would perhaps otherwise be waste land, making no return at all to its owner for its cost in care and taxes. Further information in regard to methods of storing and planting the nuts and caring for the wood lot can be obtained from the state foresters of the various States or from the Forest Service, Department of Agriculture, at Washington.

# CANADIAN DEPARTMENT

BY ELLWOOD WILSON

PRESIDENT, CANADIAN SOCIETY OF FOREST ENGINEERS

THE first regular meeting of the Woodlands Section of the Canadian Pulp and Paper Association was held in the Windsor Hotel, Montreal. The morning session was taken up by the address of the President, Gerrard Power, a report by Dr. Howe, of the University of Toronto, on the results of his summer's work on cut-over pulp wood lands and an introductory talk designed to start discussion on the most pressing problems which confront those in charge of woods operations. The discussion which followed was most interesting and the spirit of co-operation manifested was most encouraging. Such topics as the use of machinery for felling and other woods operations: slash burning; the use of hardwoods for pulp and other products; log rules and scaling; labor and the respective merits of jobbers or company camps were discussed. It was felt and said that too long the woods operations had been carried on by rule-of-thumb, antiquated methods and that the time had come to bring this most important industry up to date and even a little beyond. A scheme was discussed for having a central co-operative bureau which could try out new logging machinery and implement, study such questions as slash burning, planting vs. natural regeneration, the utilization and transport of hardwoods, etc. After a joint luncheon, the afternoon session was spent in a discussion of the prospective Government food regulations for lumber camps and in ways and means to bring into practical being some of the points discussed at the morning session. A resolution was passed asking the Commission of Conservation to continue its studies and sample plots on cut-over and burnt forest lands and offering to contribute toward the work. A committee was also appointed to make a study of the logging industry and to try and devise practical means for cheapening operations and improving the condition in which cut-over lands are left. This committee consists of Messrs. Dalton, Grogan, Kenney, Kane and Ellwood Wilson. Mr. Clyde Leavitt was one of the guests of the meeting and gave a very interesting address.

The special Fire Protection instruction car which is going the rounds of the Eastern Provinces under the auspices of the Canadian Forestry Association, is meeting with the most pronounced success. Mr. Black, the secretary, who planned this work deserves the greatest credit for the idea and for the way in which it has been carried out.

The interest at present being taken in the use of small tractors, particularly those of the "caterpillar" variety, for handling logs is really remarkable. Many large and small firms in eastern Canada have purchased them and they have given excellent satisfaction during the past summer. Their performance during the winter in intense cold and over the deep snow will be watched with great interest.

The Laurentide Company has laid out a number of experimental plots where experimental plantings of a great variety have been and will be made and it is hoped that the Commission of Conservation will place a trained observer permanently in charge of them. Spruce of several varieties has been planted on different soils and underplanted under different light and cover conditions, experiments with fertilizers are being tried, some new seedbed experiments have been laid out, a large peat swamp has been drained and different methods of treating and planting it will be tried. It has been noticed in the draining of this swamp that black spruce growing on it for a long time at an average rate of about three inches in height per year, commenced to grow at the rate of a foot per year after the water level was lowered.

Mr. E. H. Finlayson, Supervisor for the Dominion Forestry Branch in Alberta, publishes a typewritten magazine for distribution among the men in his District and those who have gone over seas. Its motto is "Our only rival is our last issue." It is a splendid example of what an intimate local journal can do to keep men together and build up an *esprit de corps* and Mr. Finlayson deserves much credit for the labor and time he spends on it. The men at the front certainly appreciate news items about their old work and localities.

R. H. Campbell, Director of the Dominion Forest Service, while on a trip of inspection in the west and traveling on a power speeder on the Hudson Bay Railroad at night, ran into a fire-ranger on a foot velocipede who was said to be traveling without a light. Mr. Campbell was thrown off and his skull fractured. He was taken to the Hospital at La Pas and specialists rushed there from Winnipeg. At last accounts his condition was hopeful. Mr. Campbell was indefatigable in visiting the remotest corners of his bailiwick and it is hoped that he may soon be able to take up his work.

## NEW BRUNSWICK FOREST SERVICE IS INAUGURATED

THE formation of the New Brunswick Forest Service was recently announced by the Minister of Lands and Mines, Hon. E. A. Smith. The supervision of the Inspectors and Rangers will be carried out by a Provincial Forester and Fire Inspector, a Chief Provincial Scaler and a Chief Provincial Game Warden.

The Province, divided into 36 districts, will be under the supervision of 5 inspectors. Forest Rangers are elected by competitive examinations.

The Rangers and Inspectors were obliged to attend both written and oral practical examinations in logging, scaling, cruising, fire protection and game protection, also ability to prepare reports.

The Examining Board appointed by the Advisory Committee consisted of R. A. McFadgen, Fredericton, Chief Scaler of the New Brunswick Railway Company, which owns over a million acres of Crown Granted Forest Lands; Mr. J. W. Vanderbeck, an experienced timber cruiser, logger and woodsman of Millerton, New Brunswick, with the Provincial Forester as Chairman of the Board.

Over two hundred applications were received for Permanent Forest Ranger positions; 139 were examined, and of this number 63 passed the examinations. The large number that did not qualify was due to the fact that many of the applicants presented themselves for examination who did not have sufficient previous experience in scaling, and as the scaling is one of the most important duties of a ranger, the Examining Board did not qualify any who could not qualify on the scaling part of the examination.

The names of those who qualified in their order of merit was then submitted by the Examining Board to the Advisory Commission, which made the selection absolutely by merit without reference to politics or religion.

Up to the present, 30 members of the Permanent staff have been selected and given their commissions. Their appointments will not be made permanent until after a probationary period of satisfactory service for six months from the date of their appointment.

The Forest Act which made possible the selection of the Rangers and Scalers by competitive examination is considered one of the most advanced steps of legislation that has been passed in Canada in recent years.

The development of the Forest Service in New Brunswick will be watched with interest by all those who are interested in Forest Conservation and Forest Fire Protection.

The new service is determined to protect the forests from fire and although it does not desire to prosecute anyone it will see that the laws are enforced.

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A resident of Nashwaak appeared before the magistrate at Fredericton on September 17th to answer to a charge of having set a fire without the necessary fire permit on the 26th of August. As it was a very dry windy day, this fire would have done very serious damage to the surrounding forest if twenty-five men had not gathered quickly to extinguish it. The surrounding residents are much aroused over the carelessness of their neighbor, which might have been the cause of very serious results.

A similar case was heard in Anderson, Restigouche County, on the same date, against a settler who, after being personally warned, set fire to his slash without a permit on another dry windy day, the 22nd of August, and this fire was not extinguished until after five hundred dollars damage was done.

In both cases the offenders pleaded guilty and were fined \$20 and costs.

There is little excuse for this neglect, as the law was thoroughly published in both sections. The maximum penalty for setting a fire in the closed season, April 15th to October 15th, without a fire permit, is two hundred dollars and costs.

An unusual announcement to come from the Department of Crown Lands for the Province of New Brunswick and one also of unusual interest, not only to lumbermen, but to the people generally, was made under the signature of the Minister of Lands and Mines. This announcement advertises the fact that the lands located in different sections of the Province which were advertised in the Royal Gazette to be sold on the 5th of September under the lease plan as authorized by Legislation of 1913, will now be put up to competitive bidding on the basis of straight stumpage rate per thousand superficial feet, the upset price of which will be announced at the hour of the sale. So far as these lands are concerned at any rate, this is a decided change of policy from that which has been followed by the Crown Land Department since the days when Honorable A. G. Blair was Premier. There are many hundreds of thousands, probably millions of acres of private lands in the Province, the lumber of which is cut upon the business basis which the present Minister of Lands and Mines is at least determined to experiment upon, as evidenced by the terms and conditions of the announcement he is now making to the public. It will, of course, be seen in a very short time, whether the departure from the mileage method is to the advantage of the Province or not, and the explanation of the postponement of the sale advertised for September 5th can be found in the present sale announcement of the Minister of Lands and Mines.

The lands, the lumber of which is now being offered for sale, did not come within the bonus arrangements of 1913, and not

being under lease after the first of August, 1918, the Government of today is entitled to deal with them as they see fit.

*Lieut. F. Bruce Robertson* has been reported killed in action. He enlisted three years ago and went over with a draft which reinforced the Princess Patricias. He was killed September 9th, his 26th birthday. He was a graduate of the Faculty of Forestry at Toronto, in the class of 1914. Up to the time of his enlistment he was employed by the Dominion Forestry Branch, at Albert, Saskatchewan.

*Lieut. H. R. Christie* was formerly a member of the head office staff in the British Columbia Forest Branch, in charge of the office of Operation. He enlisted in one of the field companies of civil engineers and has seen about three years service in France. He has just returned to Canada after having received the Military Cross and having been slightly wounded. He is to join the Canadian Expedition to Siberia. He is one of Dr. Fernow's graduates.

*Lieut. Wm. Kilby* of the Royal Air Force is now completing his course of training in Canada for pilot. He was formerly fire inspector for the Canadian Northern Railway, and secured a commission with one of the battalions of Highlanders, being afterwards transferred to the Royal Air Force, where he had experience in France as an observer.

## BLACK WALNUT BEING ROUNDED UP

**A**NATION-WIDE canvas for black walnut is now going on. From Maine to California they are searching the back lots in every village, hamlet and town for the big walnut trees that have long been thought of little use except for shade purposes.

This sudden activity is in response to urgent requests on the part of the War Department for black walnut timber from which to manufacture gun stocks for the United States Army. The fact that there are few, if any, commercial growths of this timber, makes the task before the Government most difficult.

Added to this, it is now stated that Germany had been quietly, but certainly picking up black walnut timber in this country for years, and shipping it to her own munition factories, with the result that German army rifles are mostly built from American walnut.

## WOOD FUEL A FARM PRODUCT

**F**ARMERS are asked again to help out in the fuel shortage by producing more wood. The scarcity of labor makes this a serious problem, but the prices of wood are such that considerable sacrifice can be made to get wood. The Fuel Administration announces that many important industries will be short of coal. Wood

will, therefore, be used industrially on a larger scale than ever before. Many manufacturing concerns in Massachusetts used wood mixed with soft coal last winter. Although the use of wood increases the expense, it is far preferable to closing down an essential industry.

From the farmers' standpoint this market is a desirable one, as 4-foot wood is used. The domestic requirements for wood will undoubtedly also be greater than ever. For this purpose wood in short lengths is required, and can most economically be produced with the use of a power mill. In many communities municipal wood yards were established last winter. The farmers brought their wood into these yards in log lengths, and sold it to the municipality. It was sawed by a municipal machine and sold at cost. In this way the farmers were guaranteed a market for their wood, and were relieved of the burden of sawing or investing in the necessary machinery. There should be an extension of this idea during the coming winter as a means of saving labor.

#### HOW THE FOREST SERVICE HELPS IN WAR

THE Forest Service of the United States Department of Agriculture is mobilizing the country's forest resources for war by helping the War and Navy departments and munitions manufacturers get the kinds and quantities of wood needed for rifles, airplanes, wheels and other specialties; finding out what kinds and grades of wood are suitable for war-time's special requirements; training inspectors of wood materials; improving timber specifications; and investigating and testing material, processes, and products used in manufacture of war supplies derived in whole or in part from wood. It is also stimulating the production of meat, wool, and hides on National Forest ranges; co-operating with stockmen to lower losses from poisonous plants; aiding the Fuel Administration to increase fuel supplies through use of wood; and is teaching the conservation of natural resources. It has helped recruit two regiments of forest engineers for service abroad, and is now contributing in the recruiting of the third and it contributed more than 375 members to the colors.

#### TEACHING ITALIAN WAR CRIPPLES WOODCRAFT

WOOD-WORKING establishments are being erected at various points back of the Italian lines for the express purpose of teaching Italian war cripples wood-carving, box-making, and other industries requiring the use of timber, says a dispatch from Rome.

It is said that many of the Italian soldiers show themselves as adepts in the wood-working art, and it is the purpose of the Italian Government to encourage these propensities as much as possible and at the same time assure the establishment of an industry which will be of direct benefit to the entire population.

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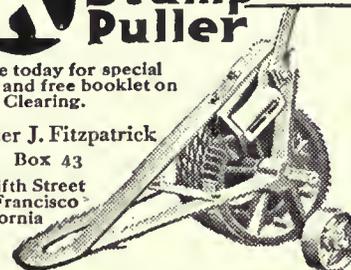


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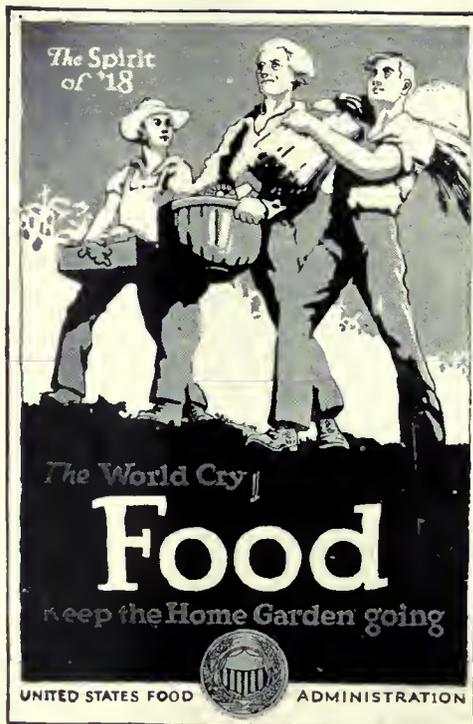
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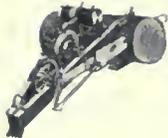
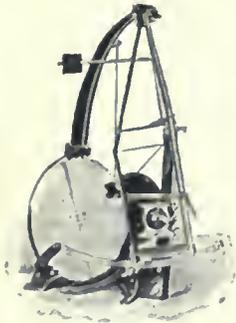
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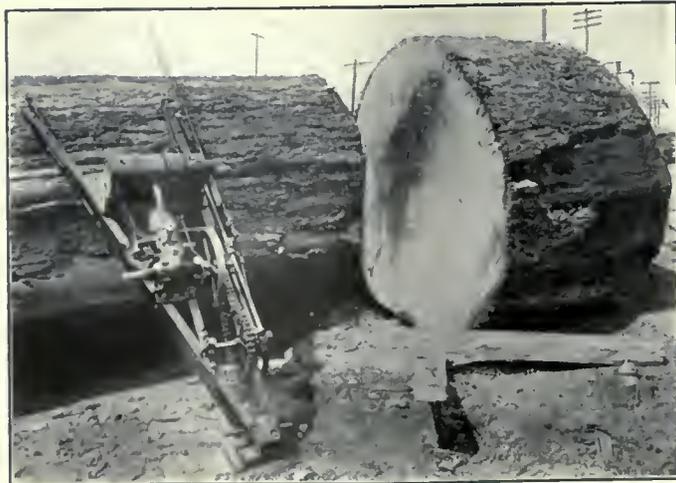
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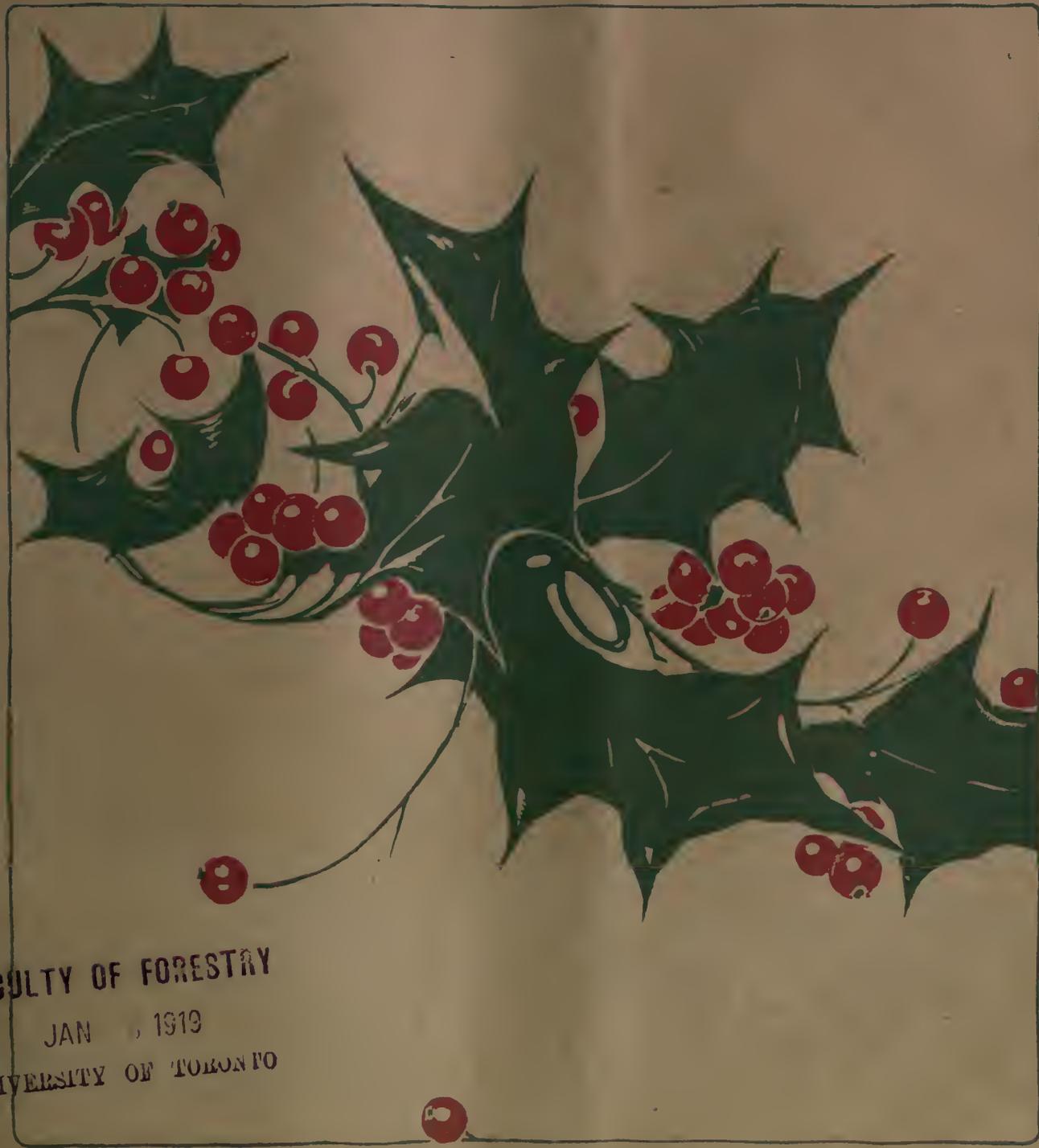
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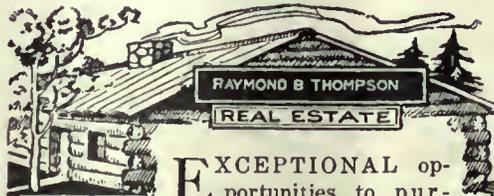
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## *To Our Members, Greeting!*



**L**OOKING back over the past year the members of the American Forestry Association have much to be thankful for. Looking forward to the New Year they have much to hope for.

For their loyal support, which has never been firmer than in the days when it was of most service to their country, we desire most cordially to thank them. We are confident that this support will be continued in the future and that it will grow stronger with the passing of the years.

In various ways, as it was able, the Association has contributed to the cause of Democracy and of Freedom. Its assistance in the fight for Right and Justice has been possible only because of the consciousness that all its members, every last one of them, were with the Association in this patriotic work.

What the American Foresters have done in this country and in France in getting out the timber for airplanes, wooden vessels and other war needs, is the subject of just pride to the entire nation. For the encouragement given these strong and noble men and for the deserved comforts provided for them through the Welfare Fund, we thank our members most heartily.

These efforts have helped to bring to the World once more a Merry Christmas and a Happy New Year. For this great Gift we are most sincerely thankful.



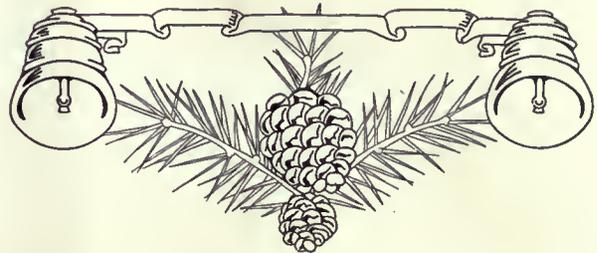
# AMERICAN FORESTRY

THE MAGAZINE OF THE AMERICAN FORESTRY ASSOCIATION

PERCIVAL SHELDON RIDSDALE, Editor

DECEMBER 1918

VOL. 24, No. 300



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ON THE SAN JUAN NATIONAL FOREST  
A beautiful water fall, with a drop of three  
hundred and fifty feet

Entered as second-class matter December 24, 1909, at the Postoffice at Washington, under the Act of March 3, 1879. Copyright, 1918, by the American Forestry Association. Acceptance for mailing at special rate of postage provided for in Section 1103, Act of October 3, 1917, authorized July 11, 1918.

## THE REFORESTATION OF FRANCE

*To the Members of the American Forestry Association:*

**T**O OFFER to the French Government the services of the American Forestry Association in aiding to replant French forest land destroyed by the contending armies, Mr. Percival S. Ridsdale, editor of American Forestry magazine and Executive Secretary of the American Forestry Association, sailed for France on December 16 for a conference with French Government officials in Paris. France lost more than 1,250,000 acres of forest through war's destruction and over 60 per cent of the merchantable timber in the remaining forests was cut for military uses. Because of this condition France needs large quantities of forest tree seeds to restore this large area in its Northern and Eastern sections. American Forestry Association officials have devised a plan by which there may be gathered in this country the great quantities of such tree seeds as may be desired by the French Forestry Department.

**W**HAT the destruction of these forests means to France is eloquently told in an article by Henry S. Graves, United States Forester and Vice-President of the American Forestry Association, on the adjoining pages. These facts will emphasize in the mind of every American who appreciates the great sacrifices that France has made in the war, the manner in which the American Forestry Association and its members may be of assistance in restoration work in that country.

**M**R. RIDSDALE will, while abroad, not only make a tour of the forest regions in the war area of France, but also of the area in other sections which has been largely cut over by United States and Canadian forestry regiments. He will investigate the forestry situation in Great Britain, Belgium, and Italy for the purpose of preparing a series of articles and of securing a quantity of photographs to illustrate them. These articles will be presented upon his return in AMERICAN FORESTRY and are expected to be of great general and economic interest to all the members of the Association and to all the readers of the magazine. Further announcement regarding these articles will later be made in the magazine.

**I**T gives me pleasure to wish the members of the Association a very happy Christmas and a prosperous New Year, and I hope that their co-operation in the work of the Association will be inspired by the very important work which the Association as I have outlined has undertaken.

CHARLES LATHROP PACK, President.

# AMERICAN FORESTRY

VOL. XXIV

DECEMBER, 1918

NO. 300

## EFFECT OF THE WAR ON FORESTS OF FRANCE

BY COL. HENRY S. GRAVES, CHIEF FORESTER

FRANCE has given her forests to the needs of the war. It is one of her many great sacrifices. The consequences of the depletion of her splendid forests will be far-reaching and will be felt by the nation for many years. The burden is already felt by the people through local scarcity of forest materials and through high prices. France will have to import most of the timber needed for reconstruction. Many home industries

War always makes serious inroads into the forests of a country at war. This is especially true of the country in which the fighting is carried on. This is partly due to the destruction of forests in the fighting area, and partly to the great demands for lumber and other wood products of all kinds for temporary engineering work.

No war in the past has ever made such a call upon



Photograph by Underwood and Underwood

### AFTER THE GOD OF WAR HAD PASSED

The forests of France, like the ruined villages, must be rebuilt. From those that were under severe fire almost no salvage is possible. What was not split or smashed was filled with shrapnel splinters making it impossible to saw a board or cross-tie. Even when the fighting was less severe the destruction was great. This is a view in *Le Bois Etoile* (Wood of the Star) on the Somme.

dependent upon wood have ceased to exist. Thousands of people supported by work in the forests and wood-using factories have lost this source of employment. The high cost of wood, which must be imported, is an added burden on every undertaking requiring the use of forest products in any form. And if the continuance of the war had required the cutting of the forests within the protective zone of the mountains, there would have been a repetition of the same damage through floods which France has at great cost been struggling to control.

the forests for materials. There is no combatant country in Europe that was not during the war heavily drained of its available forest resources, and this applies as well to a number of the neutral countries and the drain will continue during the reconstruction period. The greatest burden fell upon France. Extensive forest areas in the fighting zone have been utterly ruined, but the forests in the rear were also drawn upon to supply nearly all of the wood materials used by the Allied armies on the west front, as well as the local war industries.

**Shell-fire  
Destruction**

The forests of Northern France within the fighting zone shared the fate of the fortresses and towns for these forests were of great importance in the military operations. They were used to conceal the movement of troops; batteries and machine guns; headquarters shelters and temporary buildings in great variety were hidden under their cover; their very character, thick standing trees often with dense undergrowth of small trees, made them natural positions for defensive works. They became objectives for attack and came under heavy shell fire. Under such conditions they were utterly demolished. A few snags, splintered stumps, shattered trunks and limbs now remain as testimony that once a forest existed. When a forest was under severe fire the damage was so great that there was almost no salvage. What was not split, cracked or smashed, was filled with shrapnel splinters, making it



HEROES OF THE WAR

Shattered remains of once stately trees that covered a beautiful hillside in France and sacrificed their lives to the cause of humanity and justice—as did the men who fought and fell near them. Thousands of square miles in northern France present a similar desolate appearance.

impossible to saw a board or cross-tie. Where the fighting was less severe and the movement of retreat swift, the damage was less, but inevitably the forest was so badly broken that it was ruined. It must be cleared and a new forest started, like the rebuilding of a demolished village.

The armies swept back and forth over a vast strip of country leaving ruin in their path. Behind the German lines the enemy drew freely on the French forests for materials needed in the military operations. The victorious Allies found the German trenches constructed of heavy timbers. It was from the French forests. As the enemy was pushed back, ruin awaited the forests like those already wiped out. And the same was true of the orchard and roadside trees. What did not fall victim to shell fire was deliberately destroyed. The cathedrals of nature like the cathedrals built by man became the object of the de-



Photograph by International Film Service

RUINED FOREST IN NO MAN'S LAND

France had built up her forests by years of thrift and careful planting and conservation. Even before the war she had been compelled to import annually a considerable amount of lumber for various purposes. The sacrifice of her trees was an almost priceless gift to the cause of the Allies. These she gave freely, as she gave her sons.

structive genius of the Hun. Altogether about one and one-quarter million acres of forest were within the territory occupied by Germany, including her advance of 1918. There will be some salvage from these forests, but mostly in the form of cordwood or other small material. Formerly, each year the annual growth expressed in material large enough for saw logs and cross-ties, aggregated  $17\frac{1}{2}$  million cubic feet, or roughly 120 million board feet. The forest capital, with its power to produce annual growth, was largely destroyed and will have to be rebuilt through long years of patient effort.

forward over an utterly devastated land. Where formerly the men immediately in the rear could be billeted in villages, there existed no longer any villages near enough for the purpose. Demountable barracks were needed in vast quantities. In their absence tents had to be used. With the arrival of the United States army in France there were required many buildings in the rear, for training camps, hospitals, storehouses and innumerable other buildings of a temporary character. Great docks had to be constructed, requiring piling, square timbers, and lumber in large quantities. The



Photograph by Underwood and Underwood

"THE DEAD HILLS OF THE MEUSE"—ONCE FAIR-WOODED HILLSIDES

In such pitiable condition have hundreds of square miles of hillside and valley been left in the land over which the German vandals advanced. There were about 1,250,000 acres of forest within the territory in France occupied by Germany. Splintered stumps and shattered trunks and limbs bear witness to the noble forests which once existed.

**Forest Depletion  
Behind the Lines**

The depletion of France's forests is by no means confined to the fighting zone. The forests in the rear, from the battle line to the Pyrenees, from the coast to the Swiss border were during the war filled with wood cutters feverishly bringing out material for the use of the armies, for the Navy, for the war industries, and for essential domestic use.

The demands for wood materials by an army are almost limitless. For barracks alone there is always a call for more and more lumber, especially when as in the war just ended literally millions of men were moving

engineers had to have hundreds of thousands of cross-ties for the railroads, poles for new telephone and telegraph lines, lumber and timbers for tunnels and bridges, plank and logs for repairing roads, pole-wood and lumber for trench construction, firewood for fuel, and so on in a long list of varied uses of the products of the forest.

Practically all of this material for the armies of the West had to come from the forests of France because importations by sea were necessarily cut down to the minimum on account of the need of shipping for men, equipment and supplies that could not be secured locally.

Early in the war France, just as England, was able to import considerable quantities of lumber. By 1917 shipping could no longer be spared for the purpose, and at the same time, especially through the entry of this country in the war, the requirements for wood products were enormously increased. It was then that France opened her forests to the Allies.

Canadian forestry companies were transferred from England and Scotland to France with their saw-mills and logging equipment. American forestry

#### France's Forest Resources

Relatively speaking, France has extensive forests. These she has built up by years of thrift and careful forestry. Areas formerly denuded were reforested, abused forests were gradually brought into productive condition and from year to year France was increasing her home production of forest materials. The total of land classed as forest in France aggregates nearly twenty-four million acres. Of this only about one-third, or eight million acres, is classed



Underwood and Underwood—British Official Photograph

#### LAND TO BE REFORESTED

Great stretches like this in northern France remain showing some of the vast work of reconstruction which must be undertaken to put the country back on its feet again. This shows British soldiers on the battlefields near Ypres setting out to put up wire entanglements.

regiments were organized and about eighteen thousand of our foresters and lumbermen were soon operating in France.

In addition to the American and Canadian loggers and millmen, there were large forces of French engineers, civilian lumbermen, foreign laborers, and German prisoners working in the forests.

as high forest, that is, forest producing primarily trees of the larger sizes and better quality. About twenty-five per cent of the forest is so-called coppice, or hardwood sprouts, grown on short rotations of twenty-five to thirty years, chiefly for fuel. The balance is a combination of two forms of forest, an understory of coppice with a light cover of older trees, called coppice under standards.

The area actually carrying trees large enough for the saw is therefore not as large as is suggested by the total forest area of the country. When, too, one speaks of eight million acres of high forest, it should be recalled that only a proportionate part carries merchantable

France has several main centers of timber production. The largest is in the flat, sandy plains north of the Pyrenees Mountains. Here is an area of some two million acres largely covered with Maritime Pine, a region once unproductive and backward and now the



*Photograph by Underwood and Underwood*

#### WOOD HAD A THOUSAND USES

The forests of France, not only in the fighting zone but far behind the lines, were called on to supply the timber needed for trench construction, for cross-ties, poles for new telephone and telegraph lines, planks and logs for repairing roads, firewood for fuel and so on through a long list, importation of timber being cut to a minimum.

timber, the balance being covered with middle-aged and young growth.

The total actual amount of wood materials grown in France annually aggregated before the war about nine hundred million cubic feet, and approximately this amount was utilized each year. Of this amount, however, only about eighty million cubic feet was in the form of material for lumber, the balance being used for railroad cross-ties, poles, mine props, fuel and by-products. While France has been well off in the smaller forest materials, she has had a deficit in lumber production amounting to eighty million cubic feet, or almost exactly the amount she produces from her own forests. This amount of lumber she had to import.

center of a thriving turpentine and lumber industry.

A second large center of timber production is in the eastern mountains; the Vosges with an area of some two hundred thousand acres, and the Jura with probably an equal aggregate area. Here the forests are composed of the admirable silver fir, mixed with spruce, beech and pine. The silver fir is a real lumber tree, carrying when ripe one thousand to fifteen hundred board feet. Not uncommonly it reaches a height of one hundred and thirty, and rarely one hundred and fifty feet. It rivals in size our own eastern white pine. Scattered throughout France are excellent woodland tracts of splendid oak and beech, some of the trees one hundred and fifty to two hundred years old. There is also abundant Scots pine that often yields twenty thousand board feet per acre.

Finally, in the high Alps, the Maritime Alps, and the Pyrenees, the slopes are clothed with forests that have been conserved, partly because of their inaccessibility, partly because they are needed to control the flow of the rivers and prevent disastrous erosion and land slips.

The French Government owns about twelve per cent of the forests. Forty-three per cent is owned by communes and public institutions, and the balance is private. The Government, however, exercises control over the communal forests and in a limited measure over the private forests.

The foregoing are briefly the essential facts necessary to appreciate the effect of the war operations in the French forests.

Except within the fighting zone the forests have not actually been stripped off. But the merchantable timber has been and is being cut; and this includes both the mature trees and often a large part of the immature trees which are large enough for use. Where these older trees are mingled with younger trees, the latter are carefully spared and the cutting is merely selective. When the merchantable trees are of an even age in stands or groups, they are often cut clear. Thus, in the Maritime Pine Belt, the clear cutting system has

been used, followed by natural reproduction and supplemented by sowing and planting. Areas of from ten to fifty acres are the ordinary clearings. These are interspersed with similar areas carrying trees of younger age-classes. In the silver fir forests of the eastern mountains, largely publicly owned, the trees are marked for cutting by the French foresters, and selected in small patches, groups, or by single trees.

#### Effect on the Forests

The effect on the forest is twofold; first to remove the stock which would otherwise be available in the immediate future, and second, to reduce the actual productive power of the forests. Both will be reflected in serious economic consequences throughout the country. Before the war the cutting was so regulated that the annual cut and annual growth about balanced. There was a stable output that

was sustained and was being increased year after year. Under the pressure of war necessity there was removed not only the interest represented by growth, but a deep cut was made in the forest capital. The income producing power of the forest is correspondingly reduced. How much, varies from forest to forest. In some cases as much as thirty years production has been removed. That is, when normally only trees over 70 years old are cut, now all those over forty years have been taken. In other cases, in state forests, the cutting has been more conservative and only five years production used ahead of time. On an average it will take from ten to twenty years for the forests of France to recover.



OUR CHIEF FORESTER

Henry S. Graves, head of the United States Forest Service, who points out the seriousness of France's forest problems, declaring there is the necessity not only of securing wood supplies for reconstruction and for her current industrial and domestic use, but also for rebuilding her forests.

#### Economic Consequences

France will thus be unable for a decade or two to supply from its own forests more than a limited part of the timber needed for reconstruction and for current industrial and domestic uses. Lumber and other wood products must be imported to meet her needs. At first thought it would seem that the effect of the depletion of the timber resources in France would

be chiefly manifested in higher prices for raw materials and of finished products made out of wood. That the prices will be high and a burden on the people of France goes without a question, and it is vital to the country that arrangements be made with exporting countries to secure material at the lowest possible prices. But the most serious consequences of the cutting of the French forests is to be found in the effect on the local industries, the loss of employment to peasants and others

who depend on the forest and wood-working enterprises for a part of their livelihood, and the economic set-back to hundreds of communities which have been largely built up through the existence of tributary forests. The widespread injury to France can only be appreciated when it is understood how intimately the French forests are related to the everyday life and the well-being of the rural districts.

The forests of France are widely distributed. There are, as already pointed out, several large forest centers, but elsewhere there are woodland tracts which produce each year a steady output for

some lumber and wood-using industries. The lumber industry is not like that in this country, with large operations that usually are more or less temporary in character and last only until the resource is exhausted. The lumber industry in France is composed of many

enterprises, stable and permanent in character, and adapted in size to utilize the material that regularly may be taken from the forests. Compared to American standards individual sawmills and their contributing logging operations are small. The industry, however, has become an essential factor in the community. Labor is local and permanent. Many persons work in the woods and in the mills a part of the time and at other seasons on the farms and in other undertakings. Thus, in many mountain

sections, the woods work is pretty largely carried on by the peasants. The trees are cut at one time of the year and brought to the roads, and later on are hauled out by the peasants when their oxen, horses or mules are not used for farm or other work. So, also, many local people work part time in the sawmills and the concerns that make a great variety of products from the forests.

The official statistics before the war indicated that about 710,000 persons were employed as wood workers, but this did not include many thousands of farmers and peasants who worked part time in the woods and



*Photograph by Underwood and Underwood*

#### THE SENTINEL OF DEATH

Overlooking a valley in the Champagne region in France where artillery fire of the opposing armies swept the area clean of tree life except for a few scattered trunks. Destruction of these forests means loss of employment to hundreds of thousands of French peasants who depended for their livelihood on forest and wood-working enterprises.

mills, or participated in the home wood industries. So intimately related to agriculture are the forest industries that the statistics of forest labor cannot wholly be separated from agricultural labor. There are in the Vosges, the Jura, and the Landes many mills manu-

facturing chiefly lumber. Throughout the country also are local industries manufacturing a great variety of articles of wood used in every day life. Among the larger wood-using industries are those manufacturing vehicles and farm implements. Some of these are on a large scale, bringing in material from considerable distances. Others are on a small scale, comparable to the small wagon maker of this country. The manufacture of barrels and casks in France is of great importance, especially to take care of the large annual wine crop. Furniture and cabinet shops are found in nearly all large towns and in many small ones. Some factories manufacture musical instruments, others packing boxes and containers in great variety. Quantities of wood are used also in the manufacture of wooden shoes and wooden soles and heels. Fully 52,000 people have been employed in the wooden shoe industry alone. The building of ships and boats is more localized than the foregoing industries, but consumes each year large amounts of lumber of high grade. The forests furnish material also for the manufacture of paper at certain industrial centers, though a considerable percentage of the total wood pulp used has to be imported.

The industries mentioned in the foregoing paragraphs are those which consume wood material in large quantities and employ the most men who are exclusively wood and forest workers. In addition there are thousands of small wooden-

ware factories and a multitude of home industries that use wood. Great quantities of toys, fans, paper knives, brushes, spoons, handles, spindles, funnels and boxes of various kinds are turned out by the peasant workman all over France. Wood is obtained from the nearby forests and mills, the peasant workers having their own lathes which they use at odd times.

For example, in the wooded regions of the Perche and the Maine (northwestern France) there are all sorts of wood-using industries which are maintained as a result of communal possession of the woods. Near the forest of Perseigne there is a small town, Fresnaye, near Alencon, which is entirely peopled with workers in wood. "There is not one house in this town," Ardouin Dumazet writes, "in which wooden goods would not be manufactured. Some years ago there was little variety in their produce; spoons, salt-boxes, shepherds' boxes, scales, various wooden pieces for weavers, flutes and hautboys, spindles, wooden measures, funnels and

wooden bowls were only made. But Paris wanted to have a thousand things in which wood was combined with iron; mouse-traps, cloak-pegs, spoons for jam, brooms \* \* \*. And now every house has a workshop containing either a turning-lathe, or some machine-tools for working wood, for making lattice-work, and so on \* \* \*. Quite a new industry was born, and the most coquettish things are now manufactured. Owing to this industry the population is happy. The earnings are not very high, but each worker owns his house and garden, and occasionally a bit of field."

The basket trade flourishes in various parts of France. It is an important cottage industry. Thus, in one locality practically every one is a basket maker and all the basket makers belong to a co-operative society. There are no employers; all the pro-

duce is brought once a fortnight to the cooperative stores and there it is sold for the association. About 150 families belong to it, and each owns a house and some vineyards.

One of the striking illustrations of the close dependence of local prosperity to the forest is found in the Pine plains of southwestern France. Here is grown the Maritime Pine that has made France second only to the United



Photograph by Underwood and Underwood

#### A SKELETON FOREST

Like bare and whitened bones lying by the roadside is this forest in Flanders, devastated by artillery and small-arm fire. Thus wherever the Hun passed, the path is marked by ruin and wreck.

States in the production of turpentine. The turpentine industry of France is essentially a peasants' industry. Not only are there many small properties, but the farmers and their families earn a part of their livelihood by gathering turpentine. Through this auxiliary resource peasants have been able to develop farms that alone would not sustain them. It is in this pine belt that a large number of allied mills operated during the war. Already the people of the region are expressing grave concern over the local economic injury resulting from these operations.

Probably the first effect of the depletion of the forest supplies will be a shifting of many wood-using industries to certain large industrial centers. The necessity for importing raw material will tend to centralization of plants at points convenient for transportation. There will be a tendency to substitute machine-made articles for those made by hand. There will be fewer and larger factories to make wagons, furniture, wooden shoes barrels, boxes and the like. Large numbers of small factories will probably go out of business. Communities thrifty because of the presence of these industries will suffer or have to find some substitute for the industry. In some cases farms will probably be abandoned as has been the history in the Landes when forests have been destroyed. The home industries dependent on wood will in many places disappear, perhaps permanently, as the skilled carvers, turners and cabinet makers pass on.

This dislocation of local industry, the upsetting of an established economic equilibrium through the exhaustion of a natural resource will cause embarrassment, even suffering. It may be far-reaching on the industrial and social condition of rural France.

**Future Supplies** Where will France now obtain the needed supplies of timber? Before the war France imported lumber from a number of countries. Nearly one-half of it came from Russia, one-fourth from Sweden, one-eighth from the United States, one-tenth from Germany, and relatively small amounts from Austria-Hungary, Belgium, Norway, Switzerland and other countries.

France now needs for current industrial and domestic purposes to import from two to three times the previous amount of importations to cover both the amount of her previous importations and what had been produced from the local forests. In addition she will have to import for several years a large amount of material for

reconstruction, an accurate estimate of which cannot be made at the present time. Large amounts of lumber will also have to be imported by Belgium, Great Britain, Italy and several of the neutral countries whose forest resources have been also drained during the war. Practically all countries whose forest resources are large enough to enable them to make exports of lumber will be called upon to furnish material to France and other countries of western Europe.

The first and most logical sources of supply are the Scandinavian countries and Russia, with the United States and Canada second. Fortunately, northern Russia contains an enormous supply of timber which will be available if developed in the right way. Political conditions in Russia are such that it is impossible to predict to what extent these resources will be available in the near future. There is a large center of manu-

facture at Archangel, with 40 to 50 sawmills, some of which are of large capacity and of modern construction. The problems of transportation of logs to Archangel are peculiarly favorable on account of the streams and rivers which can be driven or rafted. It will be of very great importance to France and other countries of western Europe to have a large lumber industry developed in Russia. The suggestion has already been made that the Allied countries have a joint consideration of their forest and lumber problems. Such action would be very desirable not only to prevent high prices that would result from competition by them in a single field, but to aid the lumber exporting countries plan for the production of the needed materials.

France has not only the problem of securing wood supplies for reconstruction and for her current industrial and domestic use, but she must rebuild her forests. This will involve in many cases extensive seeding and planting, followed by careful protection and intelligent tending. Oftentimes this will require annual outlays of money with material returns long deferred. The United States in joining France and her Allies in the fighting, required and used large quantities of materials from the French forests. The depletion of these resources in which we have had to participate, under the pressure of war, presents to every American who appreciates the great sacrifices of France in the war a powerful appeal to facilitate the acquisition of materials for reconstruction and also to contribute in some practical way to the rehabilitation of the French forests.



LIEUT. COL. GRAVES IN FRANCE

The Chief Forester of the United States went abroad shortly after this country entered the war to organize the work the American foresters were to do in helping to get out the timber needed for war purposes.

## NORTH CAROLINA WOMEN URGE PROTECTION OF BIRDS AND ROADSIDE TREES

**T**HE Conservation Department of the North Carolina Federation of Women's Clubs sent out a broad appeal to the women of the State to co-operate in the observance of Arbor Day, particularly through the schools, to the end that a love of trees, woods and forestry and an understanding of these things shall be instilled into the coming generation. Co-operation in the protection of the Birds is urged and it is stated that "the food destroyed in America by insects and small rodents would feed the

from that community. What more beautiful, living and lasting tribute could we pay to our men "over there" than to keep green and growing trees planted in their honor and bearing their names in the communities from whence they went forth. These might be planted on a "Service Avenue" in the city or county, or a grove or park might be created in this way.

And making a strong and urgent plea for the protection of the roadside trees of the state, a matter pro-



**"CALIFORNIA SNOWS"**

This beautiful picture took the first prize in the photography contest conducted by the Cleveland Plain Dealer. It was made by Mr. George J. Reichel, of Cleveland, Ohio, in May, 1906, in the wonderful Mariposa Grove of Big Trees of California.

people of Belgium! Birds are the great natural enemies of these pests. The laws of the state and the nation protect insect-eating birds, but many are being shot wantonly and for food. Let us create such a spirit of bird protection in our schools that each child will consider himself an honorary game warden, reporting through his teacher violations of the game laws." And for "Tree Tributes" stating that "last year several clubs planted "Pershing" and "Liberty" oaks. It may appeal to many to plant a tree for every man in the service

posed by State Forester J. S. Holmes, and heartily endorsed by civic associations and commissions.

"Let us plant a tree by the wayside  
Plant it with smiles and tears,  
A shade for the weary wanderer  
A hope for the coming years."

Mrs. Ethel Reed Jasspon, the State Chairman of Conservation, makes the point, especially significant in war time, that in 1910 the roadside fruit trees in the little country of Belgium made a return to the government of two million dollars.

# Bayberrie Candle Lore



Aries



Virgo



By Catharine Cornish



## I. THE BAYBERRIE AND THE ZODIAC

Bayberries burned the first month in the year  
 Mean twelve months of happiness, health and cheer.  
 Bayberries burned in month number two  
 Will bring unexpected pleasures to you.  
 When Aries, the ram, rules overhead,  
 A bayberrie candle brings luck to the wed.  
 When the Sun's in Taurus, in April and May,  
 Bayberrie candles keep worry away.  
 When Gemini's ruling up in the skies,  
 Bayberrie candles aid enterprise.  
 When the Sun's in Cancer, bayberries green  
 Pleasant journies and visits mean.  
 When the Sun's in Leo, a bayberrie light  
 Will keep your Love's affection bright.  
 When Virgo's ruling, a bayberrie dip  
 Will guard 'gainst mishap on sea or ship.  
 When Libra's ruling in the Fall,  
 A bayberrie candle means luck for all.  
 Scorpio's sting will be less strong  
 When bayberries burn the evening long.  
 When Sagittarius sheds his rays,  
 Bayberries candles bring lucky days.  
 When the Sun's in Capricornus' sign,  
 It's lucky to let the bayberrie shine.  
 Aquarius' month should always see  
 Bayberrie candles burning three.  
 When the Sun is shining in Pisces the fish,  
 A bayberrie candle will bring your wish.



Taurus



Libra



Gemini



Scorpio

## II. THE BAYBERRIE AND THE NUMBER SEVEN

One bayberrie candle stands for wealth,  
 Two bayberrie candles token health.  
 Three bayberrie candles equal fame,  
 Strength is hid in the fourth's gold flame.  
 Five bayberrie candles stand for strength.  
 Six bayberrie candles show life length.  
 Seven bayberrie candles symbolize  
 Love that never, never dies.

## III. THE BAYBERRIE AND CHRISTMAS EVE

The Christmas Eve that's lighted by  
 A candle made of bay,  
 Is one whose joy and blessedness  
 Will never fade away.



Sagittarius



Cancer

## IV. A BAYBERRIE SEED IN ONE'S PURSE

If a bayberrie seed in your purse you tuck,  
 You'll always have plenty of money and luck.

## THE BAYBERRIE AND HOSPITALITY

A bayberrie candle for every guest  
 Shows hospitality the best.  
 Greet your friends on Christmas night  
 With bayberries shedding welcome bright.



Leo



Pisces



Aquarius



Capricornus



#### WHILE THE WORK WAS UNDER WAY

The Parkway Commission of the Borough of the Bronx is to be highly commended for the particular care it exercises to protect trees to the fullest possible extent. This photograph shows clearly the method employed to protect the roots of a beautiful old elm.

## SAVING AN OLD ELM

**T**HE accompanying illustration shows a method recently employed by the Bronx Parkway Commission to save from destruction a large elm tree which stands just inside the boundary line of the parkway reservation.

The thoroughfare to the left of the picture is Gun Hill Road where it crosses the Bronx River, in the Borough of the Bronx, New York City. In connection with the raising and widening of this road it was necessary to build a large retaining wall, the base of which is shown in the middle foreground. Many of the main roots of the large elm tree in the picture lay directly across the foundation excavation for the new wall. To have severed these roots would have meant the death of the tree.

The Parkway Commission naturally follows a policy of saving trees wherever possible, and it was recognized that this particular tree would be especially valuable for screening the proposed retaining wall and an elevated structure. The saving of it involved the problem of providing adequate foundation support for a heavy wall having a base 12 feet wide, and at the same time providing adequate spaces to prevent pressure or constriction of the tree roots.

When the foundation excavation was approaching the tree, care was taken to remove the earth carefully and with minimum possible injury to the roots. Some of this work had to be done with trowels. As the roots

became exposed they were firmly wrapped with a jacket of straw and kept moist. Thin wooden sheeting was driven vertically so as to completely enclose the main roots in channels or compartments. Adjacent smaller roots were deflected without injury, to make them also occupy these channels, the idea being to divide the available space equally between tree roots and wall supporting piers. The channels were then filled with soil well tamped and compacted. Concrete was placed in all

of the foundation spaces not occupied by the root channels. Above the channels old steel rails were laid in the concrete, thus forming a heavily reinforced slab, supported by irregular shaped piers outside of the root channels. These channels are, of course, open on the bottom and give the roots perfectly free access to ground water, and as the channels pass entirely through the wall there is free access to good soil beyond the wall.

On this foundation which bridges over, and relieves the tree roots of pressure, a heavy, dry wall about 30 feet

high has been built. The work was done early in the spring, and the appearance of the tree in late summer indicates that it has not suffered. It is a large old elm and well worth the effort made to save it. The method used was devised by Mr. Hermann W. Merkel, Consulting Landscape Architect and Forester of the Bronx Parkway Commission.



*Courtesy the Davey Tree Expert Company*

### A MAGNIFICENT BLACK MAPLE

It is almost impossible to compute the value of such a tree for far and above its commercial valuation lies its esthetic contribution to the joy and pride of its owner, varying with the individual in every case.

## TREE VALUES

BY ALBERT F. W. VICK

**T**REES are like human beings in many ways, they occupy the same relative position in their particular spheres; one is the greatest of plants, the other the greatest of animals, and their worth-whileness is reckoned in much the same way as we calculate a man's momentary value.

The big contractor or manufacturer who employs thousands and thousands of laborers, if asked how much men are worth will immediately quote you the maximum price being paid to day workers. Just one man is not worth much when there are millions of other men who can fill his place on a moment's notice. This is exactly the situation of our forest trees. Go to the forester whose life work is the raising of timber for market, or to the lumberman whose business it is to sell the saw-mills' output, and they will give you accurately the correct commercial values of the raw and finished products, at best a pitifully small amount per tree, for a single tree is not worth much when there are millions of others already leaning to the woodman's ax.

Ask the man who hires only skilled workmen or expert mechanics what his men are worth and you will find that because of their special merit these men are receiving four or five times as much as common laborers. Talk with the intelligent farmer of today and you will see that while he may be fortunate in the possession of many trees, he estimates the production of none of them in timber terms. From his maples he receives syrup and sugar; his fruit and nut trees return a substantial profit; his groves of catalpa and oak give him not only fence posts and firewood but leaf-mould, an almost priceless fertilizer; and he knows that for his own comfort and the well being of his cattle, shade around his house and at the proper places in the pastures is of much importance. To him each tree has a definite value far in excess of the lumber it might yield.

There is no cut and dried salary limit for the men of creative ability, for whether they pursue art or business they are priceless, because upon these men development itself is dependent. It is the same with the important trees about a home, in a park, or on a private estate. They are the fundamental reasons for the investment of all the money which has been or will be expended upon the property, and upon their size, shape and variety development of that property must depend if the most ideal and picturesque results are obtained. Not long ago I asked a well known landscape architect, who had charge of



*Photograph by courtesy of the New York Sun*

WHILE THE WORK WAS BEING DONE

This shows the famous old elm in the yard of the "Little Church Around the Corner" in New York City with the scaffolding erected for treatment.

laying out one of the most famous estates in America, how much a certain tree was worth. "Worth!" he said, looking at me in astonishment, "it is worth the whole place, for it is creative of beauty, and around that tree I build everything."

Improper advice from irresponsible parties, who for their own benefit, often recommend large expenditures of money on trees, which are hopelessly gone or relatively unimportant, has been the excuse for many a man saying, "None of my trees are worth much to me. What do I care if one or two die, I have lots of other trees." This is an erroneous idea and likely to be as costly an error as the mistake made by the man who thinks he does not need trees about his home at all and builds himself a palace in a barren spot, only to find that after all his money has brought him little more than an Arab's tent set in a desert waste, so that finally he has to rely entirely upon the skill of the tree-mover to supply him with trees of barely sufficient size to hide the nakedness of his dwelling. A man should know his own trees and should learn from careful surveys of the situation just which trees could be easily replaced and which trees are priceless to him. Then certainly, as far as these priceless ones are concerned, expert attention when necessary and continuous care is the most logical and economical program for him to follow. I do not believe that there is ever an excuse for dehorning shade trees. If a tree is not wanted it should be removed and a more desirable variety planted in its place. Whatever is done to trees should be done right or not at all. How far a man should go along the line of tree preservation should be as easy for him to determine as to whom among his employes a raise will be given next pay day, and who among his partners or business associates are the indispensable backbone of every movement for the further development of his own best interests. To know trees well, only an intimate study of the trees themselves is necessary, and to study trees carefully is to love them.

For years an old English elm, *ulmus campestris*, has shaded the little church yard and added to the picturesque beauty of the "Little Church Around the Corner," so known throughout America, says the *New York Sun*. It is on Twenty-ninth Street near Fifth Avenue.

The English elm, as well as our American elm, is subject to splitting crotches. There are two distinct types of crotches, one somewhat resembling the form of the thumb as it is attached to the hand, a strong, durable fork. The other resembles the fingers stretching from the hand, which are most certain to split, permitting dirt to enter at the top of the crack producing decay. Once started the decayed wood



Photograph by courtesy of the *New York Sun*

#### AND AFTER IT WAS FINISHED

When the work was completed and the scaffolding removed. In the course of time the wound will be almost entirely covered with bark.



Photographs by courtesy of the Davey Tree Expert Company

BEFORE AND

This is a close-up view of the wound in the big old elm in the yard of the "Little Church Around the Corner" in New York, after the decayed wood was removed and the interior disinfected and braced.

AFTER

And this is the finished work of the tree experts—a fine, clean job, done in the most approved manner—which resulted in saving for many years to come the famous old elm.

holds moisture and the decay spreads until the branch finally falls and is torn from the tree. This is exactly what happened to the old elm in the yard of the Little Church Around the Corner.

The tree extends to a great height above the broken crotch and was in danger of blowing over, causing loss of life and damage to property, and the question was what to do. Every one admitted that the tree added greatly to the appearance of the place and that it would be unfortunate if it had to be cut down. Tree experts were called. A scaffolding of light material was quickly erected for the workmen to stand on. All the decayed

wood was removed, leaving only the sound wood exposed. The interior of the cavity was disinfected, preventing further decay.

The tree was then thoroughly and substantially braced with steel straps to prevent its blowing over in any direction. The cavity was then filled with layers of concrete, so placed that the natural swaying motion of the tree would not be interrupted, without breaking the cement. The cement was laid in a manner to keep out all moisture which might cause decay. In time the cement will be entirely covered with bark, entirely healed, and the tree saved.

### FREAK LIGHTNING FATAL TO SHEEP

**L**IGHTNING recently struck into a band of about 1,250 old sheep on the Wasatch Forest killing 504 head outright. About 400 head were yearlings and two-year-old ewes. The lightning was forked and made two

streaks of dead sheep across the bed ground, leaving a space in the center where no sheep were killed. The loss is estimated to be about \$10,000. The herders who were sleeping about 200 feet away escaped unscratched.

The "Roster of American Foresters in Military Service" which has been published regularly in **AMERICAN FORESTRY** during the period of the war, has been reprinted in its final form, with corrections and changes received up to November 30th, and copies of this reprint will be sent on request.

# HOW FORESTRY AND TREE CULTURE CONCERN THE DISABLED SOLDIER

BY W. M. HUSSIE

OF THE RED CROSS INSTITUTE FOR CRIPPLED AND DISABLED MEN,  
311 FOURTH AVENUE, NEW YORK CITY.

AS the world has been thrown into war, so it has been forced to undertake the serious consideration of one of the most important by-products of war, the rehabilitation of the disabled fighting man. There is not a trade, an occupation or an industry that has not engaged the serious attention of the experts who, in all the combatant nations, are engaged in the constructive work of fitting for civil life the men whose physical powers have been impaired by their period of service with the colors.

According to the vocational rehabilitation act recently enacted by Congress those disabled in the military and naval forces of the United States have been placed under the joint authority of the Surgeon-General of the Army and the Federal Board for vocational education. The Surgeon-General has jurisdiction from the time the person is injured until

he is restored to good physical condition, when he receives his honorable discharge from the service. The Federal Board then offers him vocational re-education and training which will enable him to return to useful active employment, and the U. S. Employment Service will find him a job.

It is high time we Americans make an examination of the possibilities of educating certain of our war disabled men to bear their part in the actual work of afforestation, which we shall have to come to, it appears, if we are to provide for the requirements of the future. If such a course lends new impetus to a forest conservation program, so much the better all around.

Other countries have sensed the pressing need of conservation of timber, and are trying to link up re-educational processes with future government activity in that field.

The connection between forestry



THE WONDER OF HUMAN RECONSTRUCTION

This remarkable photograph, furnished American Forestry by the Red Cross Institute for Crippled and Disabled Men, shows a "mutilé" with double fore-arm amputation, working in the field and handling a spade with dexterity, using a single hook on the right arm and a ring hook on the left.

and the soldier seems to have been perceived in England and Australia. Hon. Col. W. Fitzpatrick, C. M. G., of Australia, struck by the alarming condition of affairs in the United States caused by the wholesale destruction of timber, has pointed out in a report on conditions in Australia, that the same disastrous condition must be inevitable there, unless the lesson taught by American recklessness in stripping our timber acreage without replenishment, for mines, railroads, and what not, be learned. He is an authority who places himself flatly on record of uniting the required program of afforestation in Australia with the re-education of disabled soldiers, an authority whose word should have considerable weight. From Australia's investigation in this field we should receive valuable hints for use in our own work of rehabilitation. For, in truth, our forests need rehabilitating quite as much as our permanently disabled soldiers. It may be that the twin objectives will be reached together.

Australia, despite the protests of experts, has muddled into a deplorable condition, in respect of its wood-bearing acreage. In this is seen an opportunity for the returned soldier. Australia's denuded forest acreage provides a great source of remunerative employment for thousands of properly educated Australian disabled soldiers. Along the coast of New South Wales, Victoria, South Australia and Tasmania there are nearly 2,000,000 acres of waste Crown lands now unproductive, waiting the hand of the forester and tree planter. In Victoria alone there are 300,000 acres of such land, stretching from the mouth of the Glenelg River, near the South Australian border, and extending eastward through the Portland, Port Campbell, Otway, South Gippsland and East Gippsland districts.

These lands, lying behind the sea dunes, consist of long wide tracts of gently undulating country, the surface composed of pure sand, or sandy loam, and covered with rough vegetation, such as heather, and at intervals ragged belts of low scrubby timber.

Much of it, however, is treeless, and the first cost of preparing the ground would be light, concerned with fencing and burning off the heath.

These coastal lands also have the advantage of an ample rainfall, from 30 to 45 inches annually, and have the coolness which is essential to the growth of conifers. Owing to the mildness of the Australian winters, furthermore, there is but a short period of rest in tree growth, and pines and firs which are native to North America mature and yield timber in that climate in three-fourths of the time required for harvesting the timber crop on their original habitat. The cost of planting those lands, including enclosure, preparation of surface, raising of tree plants and planting it is estimated to be only about five pounds per acre. Including all charges of upkeep and maintenance and allowing compound in-

terest at 5 per cent per year the total cost throughout the growth period is estimated at but 17 to 20 pounds per acre.

Thinnings are obtained from the 16th year onwards, and the final crop is harvested from the 25th to the 30th year according to the stem girth and size of the trees.

The actual net yield obtained in Victoria from medium class pine ranged from 100 to 120 pounds an acre. The work connected with this cultivation is, in that climate, pleasant and healthful, an additional source of benefit to the re-educated soldier.

In the same State of Victoria, a good illustration of conditions in the others, the utilization of the poor coastal lands described would easily provide employment for 2,000 men all the year round (for a large acreage must be prepared each year in advance). An additional 1,000 men would be required during the three months of the planting season, and at least the same number

could be usefully employed throughout the year in the improvement of the young natural forests.

Such force could, under skilled guidance, quickly transform the barren wastes described, planting them with useful trees at the rate of 20,000 acres yearly, and repeating, in a smaller way, what Napoleon did to the enormous barrens of the Gironde region in western France, now one of the most productive regions of that rich country.

Thus Col. Fitzpatrick outlines the possibilities for the returned Anzac who may be turned into civil life as a forester. While far off Australia points to the practical possibilities afforded by the field of arboriculture, the French have been busy applying their inventive genius to the provision of appliances rendering pos-

sible the employment of a maimed re-educated soldier in tree culture.

Wonderful progress has been achieved. It has become a matter of delicacy to hint that a man, however badly impaired, is useless in out of door employment.

Arboriculture, viticulture and horticulture have engaged the minds of the French re-educationalists with such success that thousands of disabled soldiers have found their way back to usefulness in those lines of endeavor, despite even the loss of an arm. It is not that they are tolerated, that charity permits them to engage in such pursuits, but that they have proved their ability to hold their own, day after day, and to do efficient work, and receive full wages for the work done. Science, inspired by the appealing necessity of the case, and moved by patriotism and love of country has accomplished marvelous things for those maimed men.

Arboriculture is considered generally desirable from the necessities of all French re-educational work in the agricultural institutions for disabled and mutilated soldiers.

The pruning of trees is easily accomplished by a man

## THE FORESTS OF FRANCE

(Rondeau)

By Henry L. Sweinhart

The Forests of France with beauteous grace,  
From sun-kissed mountain's top to base,  
Waved in the winds of Heaven free  
And birds sang in their ecstasy  
Among this soft, rich, branch-made lace,

Until the hordes of Hunnish race,  
Mad in their vengeance to efface  
All sacred things, tore ravishly  
The Forests of France.

Brave stood, brave fell these trees, strong place  
In battle held. Come, Freeman, trace  
Your joy of new-won Liberty,  
Your regained Freedom of the Sea,  
From this great gift, and help replace  
The Forests of France.

with only one hand, the hand which holds the pruning scissors. Grafting, on the contrary, requires the simultaneous use of one hand to hold the grafting knife, and the other, possessing at least the thumb and one or two fingers, in order to grasp the stalk. Nevertheless re-educated French *mutiles* are successfully doing their work, even though deprived of one arm. Doctor Boureau has devised an artificial work arm (le *Viticulteur*) which enables a soldier, with an upper arm amputation to hold a stalk perfectly, while operating a knife with the good hand. In all such cases the artificial arm and hand is trained to do the work of a normal man's left arm, the sound arm and hand being trained as the right one. With other clever work arms a man can handle with ease the heaviest ax or spade, and other implements. There are a score of effective workarms. These scattered references

sufficiently indicate the possibilities in this field for the carefully trained disabled soldier. The possibilities of the work having been pointed out by the Allies, a new impetus to organized effort simultaneously to put our own factory conditions and some of our disabled soldiers on a sound and healthy basis may ensue. Men who decline to engage in general agricultural pursuits may be quite willing to become occupied with problems of forestry. In our practical program of re-education the possibilities of this sphere should by no means be overlooked.

An American re-education program combining such training, with widening opportunities for its application, such as are proposed by Australia, should help in extending the work of national conservation, thus proving of tremendous value not only to our returned disabled soldiers but to the nation.

## THE CHRISTMAS ROLL CALL OF THE RED CROSS---JOIN NOW!

**T**HOUSANDS of square miles in France have been utterly denuded of trees, for the Germans in their incursions of hate, destroyed every living thing, especially when forced to retreat from the territory they had conquered in their first rush and subsequent drives. Then too, the war demanded every foot of lumber a v a i l a b l e—for bridges, for buildings—for all the needs of the war god. In consequence, France now faces a serious condition, with one-quarter of her trees gone, with many of her orchards non-existent.

After a careful survey of the French nurseries those interested have found available 925,270 fruit trees, located in 125 nurseries. In order to concentrate resources and to make them available in all parts of France, it is proposed to establish a central nursery where trees

from other nurseries will be stored. This central depot will be located at Noisy-le-Roi (Seine et Oise) in the beautiful 12-acre section close to the main line of the Grand Ceinture (Grand Belt Line) railroad. Local nurseries will also be established at various points.

Thus France will follow the example of Germany which planted 20,000,000 fruit trees in 1915.

The planting of 2,000,000 trees will cost about eight million francs. The Government has already placed at the disposal of the minister of the liberated districts 300,000,000 francs, but this money will be used to purchase trees for devastated districts only. Advances will be reimbursed by reductions made upon payment of

war damages. The Touring Club of France and other friends have given support to the movement. The American Red Cross not only gave \$10,000, but aided in the actual labor of reconstruction in the devastated districts.

All through France, the Red Cross has helped to the fullest extent of its great resources. When the year is done, it will have expended more than \$71,000,000 in France and \$20,000,000 in Italy. To continue its work for humanity,

the Red Cross must have the united support of the American people. With this end in view, it will hold the second annual Christmas Roll Call during the week of December 16 to 23. It is hoped and perhaps expected that last year's record of 22,000,000 adults and 8,000,000 children who affixed their signatures to the Red Cross roster will be broken.



THE RED CROSS GAVE THEM INFINITE SUCCOR—HELP THE RED CROSS NOW

Just as long as war is fought from holes in the earth instead of in the open there will be an ever increasing use of trees and cut lumber for trenches and dugout construction. Rough work and little glory for many who went forth gladly to offer the highest sacrifice. Lend strength to the arm of the merciful organization which bind their wounds—the American Red Cross.

# MEMORIAL TREES FOR

**T**HE American Forestry Association has suggested that Memorial Trees be planted in honor of the sailors and soldiers who gave their lives in the great war and the idea is sweeping the country and receiving the indorsement of governors, forestry and other state officials and various organizations. Many newspapers are commenting editorially upon the plan. Members of the American Forestry Association can do a great work if each will write to his newspaper urging that the American Forestry Association's plan for memorial trees be carefully considered in adopting local plans. Each member will help the association if he will forward to the secretary marked copies of newspapers carrying articles on memorial trees or editorial comment. Then start a campaign in your own community, get a resolution before your city officials and report progress to the secretary. The Lincoln Highway Association has indorsed the plan for tree planting along that motor route. Other suggestions include county tree planting and others for trees as the proper setting for any memorial that may be adopted. Here follow excerpts from letters the association has received:

**WILLIAM HOWARD TAFT**—One fitting and appropriate memorial to our soldier dead would be rows of fine trees planted along the great through highways of the various states. They will stand there for many generations to come and keep fresh in the minds of all passers-by the heroic deeds of those young Americans who gave their lives that freedom and justice and truth might not perish from the earth. I most heartily commend the plan.

**ARTHUR CAPPER**, Governor of Kansas.—I am most heartily in accord with the idea. It is most appropriate, I feel, that we should have living trees as memorials for our soldier dead whose deeds will live for all time.

**C. R. PETTIS**, Superintendent, State Forests, New York.—We must hold dear the memory of those who gave their lives for our country. Monuments of granite and bronze will be raised in their memory but we should consider living memorials that may be useful.

**T. GILBERT PEARSON**, National Association of Audubon Societies.—The planting of trees means more to bird life than can be estimated. The Audubon Societies most heartily indorse the plan.

**MISS E. F. WHITE**, Agricultural College.—I note with pleasure your campaign urging the planting of memorial trees throughout the country in honor of the soldier and sailor dead and we stand in readiness to be of service.

**JOHN H. WALLACE, JR.**, Commissioner, Alabama.—The patriotic citizens planting trees will reap a rich harvest in perpetuating the sacred memory of the manhood which achieved the glorious victory.

**ROBERT S. CONKLIN**, Commissioner of Forestry, Pa.—We feel there is no more beautiful method of commemorating the deeds of heroism

of our soldiers and sailors in the great war than by erecting to their memory a memorial which will remain green and flourishing for years.

**J. B. MOWRY**, Commissioner of Forestry, R. I.—I am, to be sure, glad to co-operate in any way that may be desirable as I think the plan is a very good one.

**M. B. PLATT**, Deputy State Forester, Cal.—I believe that now is the time to urge that these public parks be made lasting memorials to the young men who so gallantly acted in the defense of our country.

**FRANK WILLIAM RANE**, State Forester, Mass.—The idea is an excellent one. Surely

do not stop with a single tree or small groups—why not have memorial forests.

**FREDERICK G. GARDNER**, Governor of Mo.—The planting of Victory Trees is a fitting means of perpetuating the memory of our gallant men who gave their lives that we and the nations of Europe might enjoy the blessings of freedom and liberty.

**F. W. BESLEY**, State Forester, Md.—I should like to see, not only individual trees planted in honor of those who have given their lives to the liberty of the world, but I would like also to see avenues of trees planted along some of our important highways.

**H. M. DORSEY**, Governor, Ga.—I am very much in favor of the plan outlined in the communication.

**JAMES WITHYCOMBE**, Governor, Oregon—I assure you that I am heartily in sympathy with this movement.

**SIMON BAMBERGER**, Governor, Utah—On the whole I am very much in favor of such a plan as you have outlined.

**GEORGE COUPLAND**, Vice-Chairman, Neb. State Council of Defense—The Council of Defense is heartily in favor of doing as you suggest in the matter of memorial trees.

**SAMUEL W. McCALL**, Governor of Mass.—I think your suggestion of planting memorial trees in honor of our soldiers who died in the great war an excellent one.

**RICHARD LIEBER**, Indiana Board of Forestry—Governor Goodrich is very much in favor of planting memorial trees. He suggests that it might be possible to gain the co-operation of each county in setting aside a well selected plot for the purpose of maintaining a county memorial park.

**GEORGE F. KUNZ**, President, American Scenic and Historic Preservation Society—The plan of the American Forestry Association to plant memorial trees for the nation's dead sailors and soldiers I believe an admirable one.

**TOM C. RYE**, Governor of Tenn.—I shall be glad to co-operate with the American Forestry Association for getting memorial trees planted.

**J. E. BARTON**, Commissioner of Forestry, Ky.—I am heartily in favor of the plan which you suggest for the planting of memorial trees in commemoration of our soldier dead.

**FRANK O. LOWDEN**, Governor of Ill.—I am heartily in sympathy to the general idea.

**FORREST H. COLBY**, Forest Commissioner, Maine—I believe the plan of planting of memorial trees for our soldier dead is a splendid one.

**J. A. A. BURNQUIST**, Governor of Minn.—Your proposal meets with my hearty approval. The beautiful tree is always a fitting memorial.

**P. G. PLEASANT**, Governor of La.—No more fitting memorial could be paid to our soldier dead and living. We are planning 116,000 Victory Oaks along the 440 mile route of the Jefferson Highway in Louisiana.

## Trees

By Joyce Kilmer

Whom Gave His Life  
in France

I think that I shall  
never see  
A poem lovely as a  
tree.

A tree whose hungry  
mouth is prest  
Against the earth's  
sweet flowing breast.

A tree that looks at  
God all day  
And lifts her leafy  
arms to pray;

A tree may in summer  
wear  
A nest of robins in her  
hair;

Upon whose bosom  
snow has lain;  
Who intimately lives  
with rain.

Poems are made by  
fools like me,  
But only God can make  
a tree.

# SAILORS AND SOLDIERS

## TO PLANT MEMORIAL TREES ON ARBOR DAY

Washington, Nov. 22.—Details of a program for the planting of memorial trees for soldiers will be outlined at a meeting to be held today at the headquarters of the American Forestry Association. It is announced that the various states and by means of war veterans clubs.

## PLANT A TREE FOR ARMY DEAD

Moving to Raise Memorial Trees in Honor of Soldiers Who Died Spreading Plague

Washington, Nov. 22.—"Plant a tree in honor of a soldier who died spreading plague," is the slogan of the American Forestry Association, which has a plan to plant trees in honor of soldiers who died spreading plague.

## URGENT PLANTING OF TREES IN MEMORY OF SOLDIER

By Associated Press NEW YORK, Nov. 22.—Directors of the American Forestry Association today urged the planting of memorial trees for soldiers who died spreading plague.

## PLANS LONG RANKS OF TREES TO HONOR DEAD

(By United Press) WASHINGTON, Nov. 22.—A nation-wide movement has been started by the American Forestry Association for the planting of memorial trees for the soldier dead.

## RANKS OF TREES TO HONOR DEAD

Nation-wide Movement Has Been Started by the American Forestry Association

WASHINGTON, Nov. 22.—The American Forestry Association today urged the planting of memorial trees for soldiers who died spreading plague.

## Plant the Trees

Washington, Nov. 22.—"Plant a tree in honor of a soldier who died spreading plague," is the slogan of the American Forestry Association, which has a plan to plant trees in honor of soldiers who died spreading plague.

## HERO TREES APPROVED BY FORESTRY OFFICIAL

State Commissioner's Trees Memorial for Every Prominent Place

## STATE HEADS FOR MEMORIAL TREES

Washington, Nov. 22.—A nation-wide movement has been started by the American Forestry Association for the planting of memorial trees for soldiers who died spreading plague.

## BIRD LOVERS FOR HERO TREE PLAN

Monuments Would Propagate Afghan Life

## AUDUBON NOW LAUDS PROJECT

Foresters and Others in Favor

## PLAN LONG RANKS OF TREES TO HONOR DEAD

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## TREES AS MEMORIAL TO AMERICAN DEAD

Suggested That Each State Plant Its Highways With Oaks Or Elms

## MEMORIAL TREES PLAN IS INDORSED

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## MEMORIAL TREES ON GREAT HIGHWAYS TO HONOR DEAD HEROES

NEW YORK, Nov. 22.—Governors of all states have been asked to cooperate in a plan to plant memorial trees for soldiers who died spreading plague.

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## PLANS LONG RANKS OF TREES TO HONOR DEAD

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## Thousands of Memorial Trees Throughout Nation Will Honor Soldier Dead

American Forestry Association Proposal Meets With Wide Approval as States Prepare to Pay Tribute to Troops in Great War.

## PLAN LONG RANKS OF TREES TO HONOR DEAD

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## NATION-WIDE MOVEMENT STARTED BY THE AMERICAN FORESTRY ASSOCIATION

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## MEMORIAL TREES FOR THE LINCOLN HIGHWAY

WASHINGTON, Nov. 22.—National roads will be given the honor of memorial trees for soldiers who died spreading plague.

## URGENT MEMORIAL TREE PLANTING FOR SOLDIERS

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## ALL NATION PLANS MEMORIAL TREES

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## FRANCE'S GREAT FORESTS GONE

Writors and a Quarter Acres Forest Swept

American Forestry Head Tells of Destruction

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Forestry Association Appeals to Chicago Committee to Adopt Plan as "Finest Tribute"

## SUGGEST MEMORIAL ALONG PUBLIC TRAILS

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## MEMORIAL TREES IN EVERY STATE URGED

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## WAR MEMORIAL TREES WILL HELP SAVE U. S. BIRD LIFE; LESSON IN LOSSES OF FRANCE

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## TREES FOR ALLIES IN CAPITAL URGED

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## FORESTERS URGE TREE FOR EACH DEAD HERO

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## FRENCH FORESTS IN THE WAR

THE forests of France have suffered terrific destruction in this war, and the price they have paid and their possible rehabilitation is the subject of an article in *Le Matin*, recently discussed in *The Christian Science Monitor*. The annual consumption of wood in France, in times of peace, amounted in all to 12,000,000 cubic feet, 4,000,000 of which came from other countries.

French soil is so fruitful that forests have been cut down to make room for wheat. The danger became apparent in the Sixteenth Century and protests were raised on the matter by Bernard Palissy. Two centuries later Bremon tier made a forest in Gascony with the object of fixing the sand dunes, and this is the largest forest in France at the present time. The foundation of the school of Nancy in 1824, and three years later the drawing up of the forestry code were factors which made for an increase in the woods of France.

Just before the war, the forests of the state and those belonging to the communes and public institutions amounted to about 3,115,000 hectares which were administered according to the code of 1827; there were, however, 6,000,000 hectares of wooded country in private hands which were subject to no supervision. At this time the afforested area in France amounted to 17 per cent of the whole territory, to 20 per cent in Switzerland, 26 per cent in Germany, 33 per cent in Austria-Hungary, 40 per cent in Russia, 48 per cent in Sweden, and 53 per cent in Scotland and Ireland.

The result of the reassessment of the afforested areas after the war will, the writer thinks, be sufficiently sad. The forest of the Ardennes has suffered badly, that of Artois is destroyed, the fruit trees of the Nord and the Aisne have been torn up; a great part of the beauty and wealth of France ruined by the passage of the barbarians. In other parts matters are bad enough but not so bad. The forest of Argonne has suffered in the north from the battles and in the south from the necessities of the armies. All the woods which border on the front, in Champagne, the Isle-de-France, the Vosges, and elsewhere have had great inroads made upon them, for the front seems to eat up wood which is needed there for all kinds and purposes. In the interior of the country, the same sacrifice has been going on. In other times Germany and Austria sent wood to France, and now, for lack of freightage, neither Scandinavia nor Canada send either deal or wood pulp, and the scarcity of coal leads to the consumption

of wood in the household fires. The vast forests of Burgundy, and the great chestnut woods of Auvergne are being thinned, and the pines are falling in the Jura and Bugey and the Landes, while the cork woods of Province are being cut down.

The high price paid for wood is another factor in bringing about the trees' downfall, and a law has been passed to protect the olive trees of the South as well as the precious mulberry trees. The demand for wood will be even greater in the post-war period, the writer maintains, for then reconstruction will be going on. Fourteen million cubic meters will be needed of which barely 6,000,000 will be supplied by the French forests, and the remainder, if it is bought from other countries at the reasonable price of 200 francs, would require an annual output of a milliard and a half.

In such a situation attention is turned toward the inexhaustible forests of the colonies: Indo-China, Madagascar, Guyane, the ivory coast, and above all Gabon, possesses a vast wealth of trees as beautiful as they are varied. France's colonial possessions can, as a whole, supply her with 50,000,000 hectares of forests. These will be made use of and attention is already being given to the matter. The minister for the colonies is asking for a credit of 40,000,000 francs in order to begin the exploitation of these woods and to export them to France. Therefore, the writer declares, thanks to her colonial brother, the French trees will be able to have a time of rest after the war, during which so much has been asked of her. Help must be given to her, too, to regain her former position.

In France there are 6,000,000 hectares of uncultivated land. The state is slowly re-afforesting those which belong to it and the forest department has transformed entire regions in the mountains, but owing to various causes what is gained in one place is lost in another. Colbert said that France would perish for lack of wood, but he had reckoned without her forester. If Bremon tier planted pines in the shifting sands, they have made black pines, beeches, and oaks grow on the bare granite, and other kinds of trees on the marshes. They have already done much and in the future they will make new conquests, for as the Convention said: "Upon the preservation of the forests depends the success of agriculture, commerce, manufacture, and the arts, the navy, navigation in the interior, all the conveniences of our existence."

### THE GIANT "GENERAL GRANT"

A NATIONAL park containing only four square miles, and created to protect only one tree is the General Grant which, except for two small national reservations made for the conservation of curative springs, is the smallest national reservation in the country.

But the General Grant tree is worth a national park all to itself. It is a giant sequoia, and next to one, is the biggest and oldest living tree in the wide world. It is thirty-five feet through from bark to bark, and two

hundred and sixty-four feet high. It is not far from four thousand years old.

The one living thing that is bigger and older is the General Sherman tree in the Sequoia National Park, a few miles to the east. That is a foot and a half thicker and sixteen feet higher.

The General Grant tree is not the only sequoia in the little national park, however. It is the biggest of a pine grove of sequoia trees. Small though the park is, last year, more than 17,000 people visited it.

# THE USES OF WOOD

## WOODEN FURNITURE AND THE PLACE IT FILLS

BY HU MAXWELL

**Editor's Note.**—This is the eighth story in a series of important and very valuable articles by Mr. Maxwell on wood and its uses. The series will thoroughly cover the various phases of the subject, from the beginnings in the forest through the processes of logging, lumbering, transportation and milling, considering in detail the whole field of the utilization and manufacture of wood.

**M**ANUFACTURERS seldom design lines of furniture for special occasions, in the same way that milliners make Easter hats, which are in season during a few days, but never again. The buyer of furniture, however, if he is posted, and if he is gifted with taste and judgment, should never be at a loss in selecting suitable things for his own house or for a friend's. The field permits wide choice. Time, place, circumstances, and persons must be taken into account. What might look well in one house would be out of harmony in another. The taste of one person might be pleased with things for which another would have little use. A country home, unsupplied with electricity, would not exactly

fit an electric lamp or an elaborately carved walnut or mahogany pedestal. In that case, would not an old pattern of candlestick, of fine wood and on a pedestal, be more suitable? Or would not a cedar clothes chest be appropriate and more in conformity with the surroundings? The electric lamp might, with perfect harmony and in excellent taste, decorate the home of the city friend.

Take the case of children who are made the recipients of presents. It is pretty hard to induce them to believe that a clawfoot dining table, or a folding bed, or a curved-glass china closet, was really meant for a gift to them, though their names may be on the shipping tags when the expressman delivers the presents. It would be



APPROPRIATE CHRISTMAS GIFTS OF WOOD

This charming picture of an interior contains some good suggestions for Christmas gifts all the way from the fine four-poster bedstead and the practical and comfortable looking chairs, to the small table with the attractive electric lamp made of mahogany and the writing-desk on which stands a handsome mahogany clock and a pleasing, but inexpensive, little camouflage for the telephone—all made of wood.

a pretty dull child that would not see through the sham and know that the present was for the house, with nothing personal about it. It will be different if the present which arrives the day before Christmas is something distinctly for a child, a little rocker, a low writing desk, or a bed only a little larger than the one outgrown. That will appeal because it suits. Children learn at an early age that "consistency is a jewel."

Therein lies the secret of successful giving, and nowhere more than in selecting presents at Christmas, which

fireplaces, a book, and a quiet hour after the day's work was done. Times have not so greatly changed that the spirit which prompted the giving in the old way should not hold yet. Some of the very old stories are always new, and one of them relates to that kind of giving.

Most furniture makers imagine that they must keep their line up to date, yet it is as well to be a little old fashioned in some things, for among the old fashions are some rich in memories.

A discussion of furniture might be based on two wholly



WILLOW AND REED FURNITURE

Most willow rods of which furniture is made have been imported from Europe, though a few holts have been cultivated in this country with good results, and no reason exists why adequate supplies might not be grown here, where there is always a good market for willow furniture.

by common consent the world over is the most appropriate time for making presents. Utility is not barred. A gift is none the less welcome because it is useful. During all changes in patterns and fashions, the same rule has held which was true when our great-grandfathers made presents of andirons, rocking chairs, and brass candlesticks. These suggested evenings at home, with open

different points of view. The subject could be dealt with historically, and that would call for an account of changes in fashions and styles during different periods. Such a treatment would make much of the varying tastes of peoples in certain countries from time to time, as those tastes were expressed in furniture. Or, approaching from the other viewpoint, the furniture industry might

be considered as it now exists in the United States, with no further reference to past years, periods, styles, and fashions than is necessary to illustrate certain features of the subject. Treatment from that angle would deal with materials, statistics, and methods; the resources of rough timber and the same resources transformed into finished products; the forest put to its highest use in the service of the people.

This article is written from the viewpoint of the present rather than of the historical, and it is therefore necessary to deal in statistics sufficiently to show the economic as well as the esthetic side of the subject. It is necessary, also, to eliminate from consideration all furniture

made of materials other than wood; but that does not take much away, because wood is now, and has always been, the leading dependence of furniture makers.

It seems appropriate, however, to devote a few introductory paragraphs to a review of furniture's place in human progress, for it has had a place; and the full value of what we possess cannot be adequately appreciated unless it is compared with



ple; and down to the present time furniture has been a measure of a people's culture in a greater degree, perhaps, than anything else, except books, and the existence of literature presupposes the existence of furniture. The Japanese had writing desks six inches high before they had any other furniture, except skins and rugs to sit on. The Egyptians used doveled, carved, and veneered furniture 5,300 years ago. A bedstead dating from that period is in existence. It is twelve inches high, 26 inches wide, and 63 inches long. If it was made for an adult, his feet must have hung over the footboard; but it would fit a child, and it is known that the Egyptians made furniture for children, for a child's chair, 3,400 years old, still in existence, had a back 23 inches high, a seat seven and a half inches high and 17 inches wide. The back was constructed of panels one-fourth of an inch apart. The old furniture of the Nile was principally of cedar but other woods were used, among them being ebony, while walnut and

teak, believed to have been brought from India, were occasionally used.

The Greeks had faultlessly planned and exquisitely made furniture, but not much of it. Perhaps their



A FAVORITE GIFT

A handsome electric floor lamp would delight almost any woman's heart.

what went before. Wild men never used furniture, and nomads had little. They could not move it about with them in their wanderings. The use of furniture has always indicated a fair degree of civilization in a peo-



AN ARTISTIC COMBINATION

Wood, reed, and upholstery blend well together when skillfully worked into furniture, particularly when the piece of furniture is of large size. Woods may be had in colors to match nearly any surroundings that can be met with, from birds-eye maple and holly, the lightest, to walnut and ebony, the darkest, and all shades between.

cheaper sorts, which were used by the common people, have not been preserved, even in pictures and records. The Greeks employed the lathe in their furniture shops, made folding chairs on the order of modern campstools, and being mathematicians, they liked three-legged tables which would stand firmly on any sort of uneven floor.

The Romans went in for novelties in furniture. Their tables had one, three, or four legs, tops circular, hexagonal, or rectangular, and extremely fine veneers were used by the rich who could afford it. Excavations at Pompeii disappointed those who expected to find large



HEPPELWHITE WOODEN DRESSER

No one can think of this piece of beautiful furniture as being made of anything but wood. Its delicate lines suggest nothing else, whether it is of maple, gum, walnut, cherry, or any one of numerous other excellent furniture woods native of this country or imported from overseas.

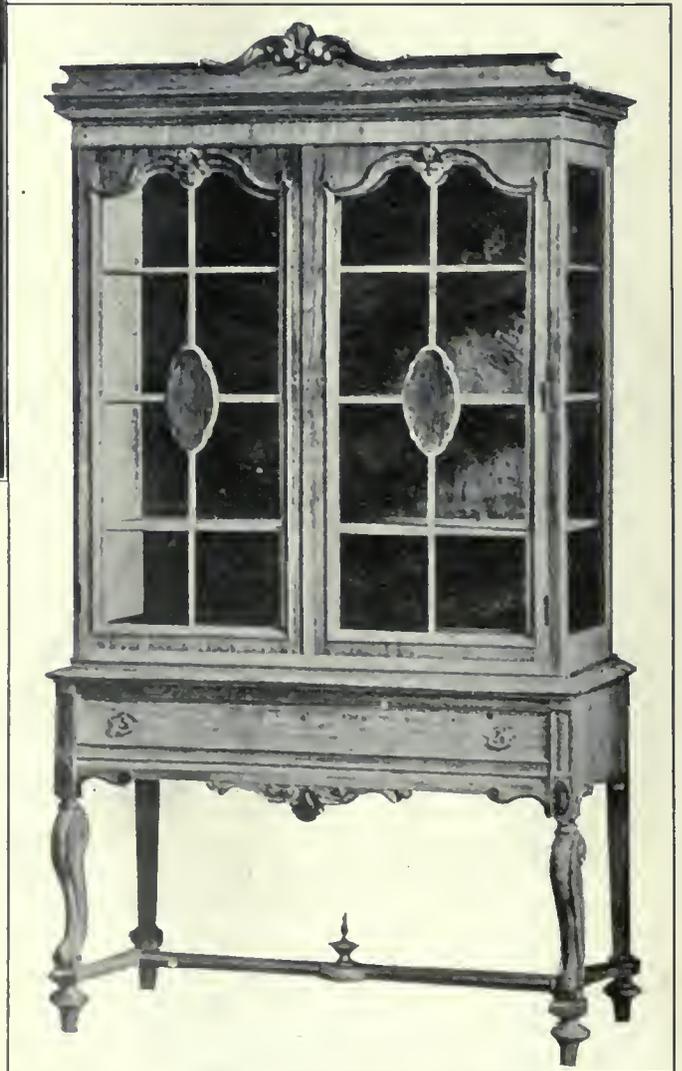
quantities of fine furniture made of wood. A few fragments were unearthed, but apparently the volcanic ash which buried the city contained chemicals which decomposed wood and reduced it to brown dust. The few fragments of furniture that were recovered sufficiently intact to be restored, served as models after which much of the Louis XVI furniture was designed seventeen centuries later. A wooden bedstead dug up at Pompeii was four feet wide, one and a half feet high, and seven and a half feet long, had turned legs, and was equipped with wooden pillows; but the pillows were not copied by the Louis XVI furniture makers.

Changes in furniture styles and fashions have been many, ranging through the Italian Renaissance, French Renaissance, Gothic, Elizabethan, Jacobean, Louis XIV, Louis XV, Louis XVI, Charles II, William and Mary,

Queen Anne, George, Chippendale, Sheraton, and Heppelwhite. These all mean much to persons interested in furniture fashions and styles, but they cannot be discussed here.

Furniture represents the fourth largest wood-using industry of the United States, the total annual demand for wood in this line approximating 950,000,000 feet. The industries whose demands exceed that amount are planing mill products, car construction, and box making. Of the woods which supply the furniture factories, slightly more than 17,000,000 feet a year are of foreign origin, leaving more than 98 per cent to be supplied by our own forests. Hardwoods largely predominate over softwoods in the furniture business; and of the domestic stock, softwoods aggregate 57,000,000 feet, hardwoods 870,000,000, or about six and a half per cent for the former to the latter's ninety-three and a half per cent. Practically all that comes from foreign countries is hardwood.

The native hardwoods which contribute to the furniture industry with the annual amount of each are



THE CHINA CLOSET STYLE

Wood and glass form an excellent combination in the china closet where an attractive outward display is wanted, and likewise a pattern of construction that will give a good view of the ceramics and cut glass within. Metal never was in much evidence in this kind of furniture.

listed in the table which immediately follows:

Hardwood	Feet
Oak.....	431,053,283
Red gum.....	102,237,867
Maple.....	87,571,456
Birch.....	54,677,450
Yellow poplar.....	53,374,850
Chestnut.....	44,734,180
Basswood.....	33,146,276
Beech.....	21,103,204
Ash.....	15,668,588
Elm.....	12,154,102
Cottonwood.....	5,188,309
Tupelo.....	2,520,000
Black walnut.....	1,689,957
Sycamore.....	1,474,957
Hickory.....	843,600
Red alder.....	792,500
Cherry.....	622,530
Butternut.....	593,500
Magnolia.....	477,100
Buckeye.....	415,000
Hackberry.....	70,000
Willow.....	40,000
Persimmon.....	35,000
Cucumber.....	16,000
Hornbeam.....	15,000
Osage Orange.....	1,000
Miscellaneous.....	15,650
<b>Total.....</b>	<b>870,570,284</b>



Photograph by courtesy of the Gum Lumber Manufacturers' Association, Memphis, Tennessee.

UNIQUE PATTERNS IN CHAIRS

Novel patterns in chairs afford opportunities to display the beauties of woods to excellent advantage. The chairs in the accompanying cut are of gum. Plain as well as figured material is used. Some chair manufacturers finish gum in imitation of quartered oak, black walnut, and cherry, as well as of the foreign wood, Circassian walnut.

The softwoods fill a minor place in the manufacture of furniture. They have two main uses: first, for cheap articles like kitchen tables; and, second, as the inside, unseen portions of high grade furniture, notably as backing or core stock on which to

glue veneers. The annual call for native softwoods in this industry is shown in the following table:



A FIGURED GUM BEDSTEAD

When this wood is exported to Europe it is usually known as satin walnut, and sometimes as hazel pine. The surface finishes so smoothly that it suggests satin, and it also resembles walnut. The tree belongs to the hazel family and its other name is due to that fact. It has two names in this country, red gum and sap gum, the former being the heartwood, the latter the sapwood, but all from the same tree.

Softwood	Feet
Pine.....	30,442,703
Fir.....	11,390,290
Hemlock.....	7,953,446
Cypress.....	3,477,800
Spruce.....	2,270,500
Cedar.....	1,856,100
Redwood.....	355,250
Larch.....	154,000
<b>Total.....</b>	<b>57,000,089</b>

A complete list of the foreign woods demanded by the furniture makers of the United States would contain more than fifty species, but many of them are used in quite small amounts and are distributed among numerous shops and factories. Mahogany is by all odds the most important and a number of woods are included under that name which are not true mahoganies. Nevertheless, genuine mahogany exceeds in quantity the aggregate of all other foreign woods in the industry, as the following list shows:

Foreign woods	Feet
Mahogany.....	15,637,125
Lignum-vitae.....	593,603
Circassian walnut.....	452,040
Padouk.....	230,000
Prima vera.....	67,500
Satinwood.....	22,070
Rosewood.....	15,280
Eucalyptus.....	5,500
Ebony.....	5,450
Spanish cedar.....	1,090
Miscellaneous.....	46,580
<b>Total.....</b>	<b>17,079,498</b>

Woods listed as mahogany come from countries bordering on the Gulf of Mexico and the Caribbean sea, from Africa, and from the Philippines.

Lignum-vitae is a heavy, hard wood from the West Indies and tropical America.

Circassian walnut is brought from Asiatic Turkey, cut principally in old orchards of planted trees. It is botanically the same species as English, French, and Italian walnut, it having been planted in those countries.

More than a million Circassian walnut trees, cultivated for their nuts, are growing in California. The European war has interrupted the supply of this wood

and it is now very scarce in the United States. Red gum is a substitute.

Padouk, sometimes known as vermilion, is procured in the Andaman Islands, and is valued for its fine color and its susceptibility to exquisite polish.

Prima vera, called also white mahogany, is a native of the southern Pacific coast of Mexico and the adjacent parts of Central America. It made its appearance in furniture factories within recent years.

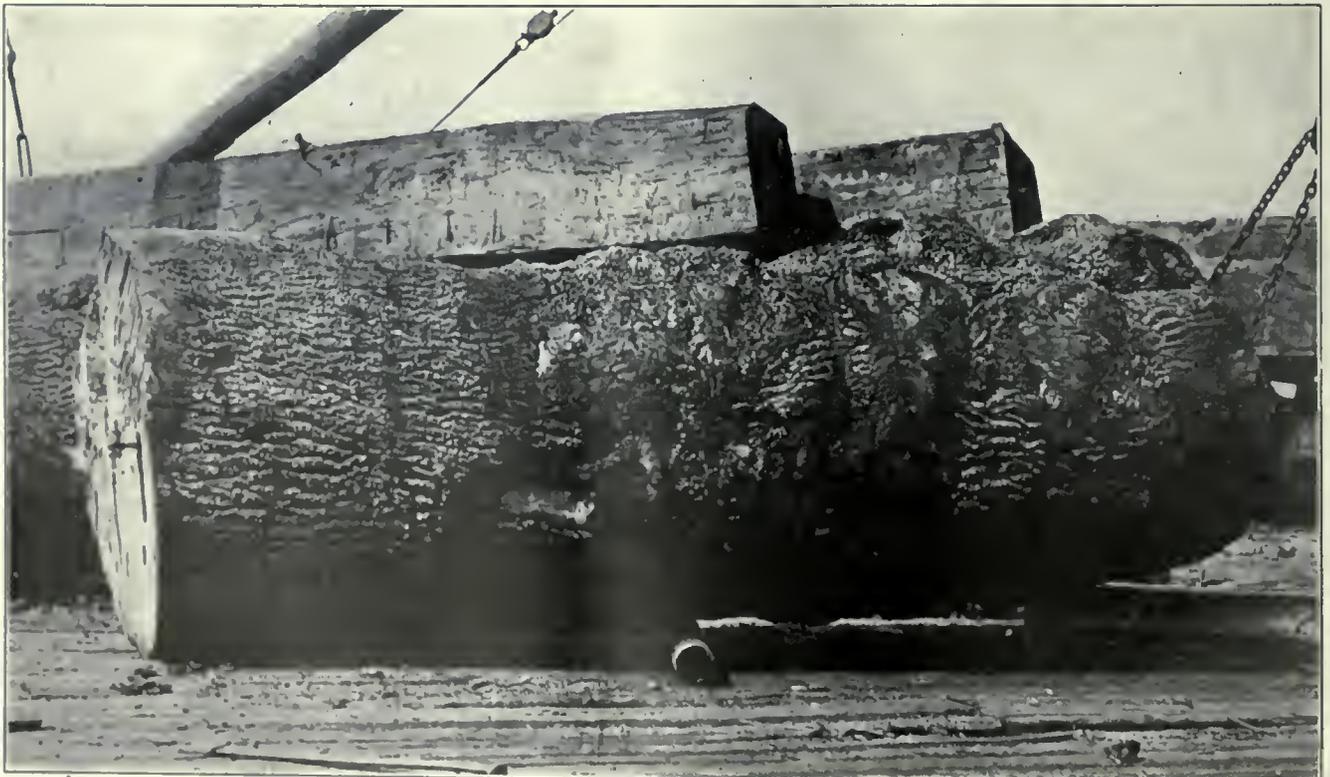
Different species pass as satinwood, but that most used by American furniture makers comes from the West Indies. It is very hard and heavy and in color ranges



A FURNITURE FACTORY'S VENEER STOCKROOM

Figured veneer must be carefully matched in selecting stock for fine furniture. The figure of no two logs is exactly the same, and it is customary to keep the product of the various logs in separate piles in order to have at hand stock that will match. Consequently it is necessary to keep large stocks on hand.

by American furniture makers comes from the West Indies. It is very hard and heavy and in color ranges



LOGS OF ENGLISH OAK

These logs present a rough appearance, but they contain high-class and costly stuff. Only small quantities of this oak find their way to the United States. It is a native of England and of the continent of Europe. Its value is measured more by the wood's color than its figure, consequently little emphasis is laid on quarter-sawing such stock.



THE KITCHEN CABINET

Kitchen and pantry furniture is frequently made of such softwoods as pine, spruce, cedar, and eypress, though a number of the hardwoods serve equally well where frequent scrubbing are necessary. Among such hardwoods are gum, cottonwood, tupelo, beech, yellow poplar and elm. They are rated as sanitary woods because they have small pores.

due to the wood's odor and not to its color which ranges from black to purplish brown.

Ebony belongs to the same family as persimmon, and there are numerous species in many countries, and the woods are of various colors. The black ebonyes are most popular, and most people suppose that all ebonyes are black. The supplies coming to the United States factories are procured in India, Ceylon, and Madagascar.



THE CHILD'S TABLE CHAIR

Wood is preferred above all other materials for children's chairs. It is not so hard, rigid, heavy, or cold as metal, and it is sanitary, substantial and handsome. It may be finished plain, without paint or varnish, if so desired, or it may be enameled a clean, beautiful white as in the illustration.

from brown to yellow.

Eucalyptus is an Australian wood and there are more than 150 species in that country. One with rich, red color is liked best for furniture. Planted eucalyptus trees flourish in California and Florida.

Rosewood is imported from Brazil principally, but woods of the same name and similar appearance, but of different species, are cut in many countries. The name is

due to the wood's odor and not to its color which ranges from black to purplish brown. Spanish cedar's name indicates that it is a softwood, but the tree bears broad leaves, and according to the general definition, it is a hardwood. Its home is in the West Indies and Mexico. It is so soft that when used as furniture it must be protected against chafing or it will scratch badly.

Teak is an East India wood, handsome in color, and about as hard and heavy as oak. When freshly cut, it emits an offensive odor, but that is not noticed when the wood has been seasoned.

Among the foreign hardwoods in-

cluded under miscellaneous in the foregoing table are African walnut, hazelwood, English oak, a maranth, Madagascar tulip, Australian plumwood, marblewood, and tonquin.

Oak is king of the domestic furniture woods. In amount used, it nearly equals all other domestic hardwoods combined. Red gum is second to oak in quantity going into furniture in this country. Probably two hundred species of American hardwoods find places as material for furniture, though no list contains the names of that many. Sta-



BENT-WOOD FURNITURE

Several patterns of chairs, and articles of other kinds, require bent-wood in their construction, and the manufacture of furniture of that class amounts almost to the dignity of a separate industry. The wood is prepared for bending by first being rendered soft and pliable by a bath of hot steam.



WHEN NATURE DOES HER WORK

The finest furniture stuff comes from hardwood forests similar to the one shown above. The hardwoods are the hardwood trees, like walnut, gum, maple, birch, cottonwood, and yellow poplar and more than 400 others in the forests of the United States. The scene represented in the above picture is in Wisconsin.

tistics often group many related species as a single wood, as oak, or ash, or elm, or maple, or birch, or pine, though each name represents several species in actual use. There are, for example, fifty-two oaks, half that many pines, several elms, ashes, maples, and birches, and most of them figure in the furniture making of this country. There are numerous minor woods, not widely known because of their local occurrence or scarcity. Some of them are beautiful in color and figure, and in localities where they grow they are in more or less demand by furniture shops. Though few of these minor woods are named in statistics, they may be in much greater use than some of the foreign species which are on the lists. The wealth

from our own forests which are only superficially understood and appreciated by most people.

Furniture is classified in several grades or sorts, and most manufacturers specialize in certain kinds. Though chairs are furniture, most chairs, particularly of the common sorts, are not the product of factories which make other kinds of furniture. Chairmaking is sometimes considered to be separate and apart from the general furniture industry, or at least as a distinct branch of it. The moderate-priced dining room or kitchen chair is an interesting product, if its method of manufacture is taken into account. Much of the stock of which these chairs are made never passes through the ordinary sawmill, but



CENTER TABLE OF FIGURED GUM

Veneer is put to its best use in furniture like this, where the finest figures are matched for display. The gum paneling on the walls completes the harmonious grouping. The photograph for this illustration was furnished by the Gum Lumber Manufacturers Association, Memphis, Tennessee.

of wood in this country cannot be fully appreciated unless account is taken of the lesser species as well as of the greater. More of these little-known woods are given a place in furniture making than in any other industry. Among species of this class may be named yew, torreyia, yucca, mulberry, redbud, Santa Cruz ironwood, witch hazel, featherwood, devil's claw, junco, mesquite, red bay, yellowwood, holly, bluewood, mangrove, madrona, and manzanita. The list could be extended fourfold without getting outside of possible furniture material

is the output of small, usually portable chair mills which work out the blank dimensions for the rounds, backs, bottoms, posts, spindles, and braces. This rough stock is sent to central factories to be made into finished chairs ready for use. One such factory may take all the stock cut by dozens of the small chair mills located within a radius of a hundred miles. These small mills are equipped with special machinery for cutting the various chair parts. The majority of such mills move from place to place, working up patches of timber which are not ex-

tensive enough to attract lumber mills. Or, as frequently happens, the chair mill follows after the sawmills and works up the left overs, such as short and crooked logs, small trees, and large branches. The chair dimension stock is of such small sizes that nearly any odds and ends from previously cut-over lands can be handled. In that way the chair mill utilizes what otherwise would be waste. Such mills operate in hardwoods almost exclu-



A HIGH GRADE VENEER PLANT

This veneer mill is located at Escanaba, Michigan, and it specializes in birds-eye maple veneer for furniture and house finish. Experts locate figured trees in the forests of maple and the selected trees are taken to the mill and are converted into thin sheets to constitute the visible parts of finish and furniture.

sively, because few softwoods are strong enough for chair stock.

Chairs of special kinds are made in large numbers, among them being theater and hall chairs, those for camps and resorts, rustic, porch, and lawn chairs, and many other kinds that are in constant demand. Parlor rockers and others for living rooms, arm

chairs, and high class pulpit and rostrum chairs are some of the kinds included in the chair branch of the furniture



MAHOGANY FOR VENEER

During the past 200 years mahogany for furniture has never gone out of fashion in America, though the demand for it has varied from time to time. The picture shows a flitch of this wood going against the knife in a mill to be converted into furniture veneer. Mahogany comes from west Africa and tropical America.



THE FOLDING CHAIR

Immense numbers of folding chairs are made for camps, halls and other places of meeting. Most chairs of that kind are of medium priced woods, rather plainly finished, and they are not intended for show. Others, like opera chairs, are of the finest woods and of the best workmanship.

trade. The higher grades are generally made in regular furniture factories.

Furniture manufacturers who produce on a large scale, generally concentrate upon certain

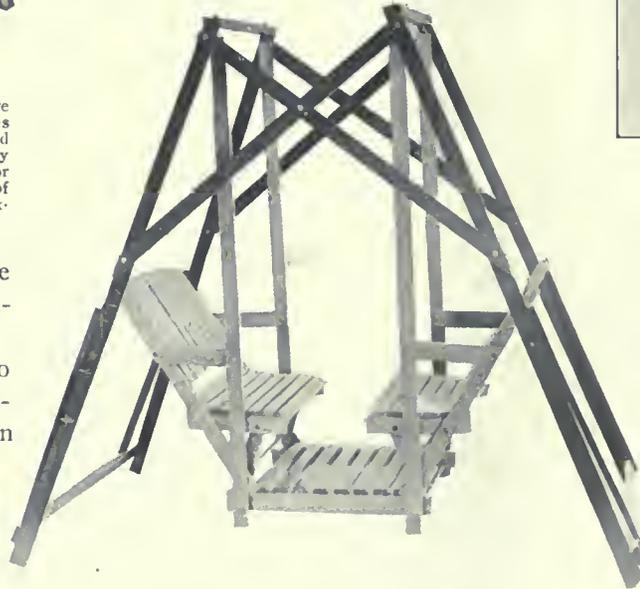
kinds. Statistics which give the details of furniture manufacture in Illinois will show this, and the situation there is typical of the industry throughout the nation. In that state furniture is divided for statistical purposes in eight classes. The table which follows names the classes in Illinois, shows the annual consumption of wood by each class, and the average costs of the rough material delivered at the factories:

Kind of Furniture	Ft. of Lumber	Av. cost per M ft.
Chairs.....	16,262,000.....	\$41.99
Tables.....	8,167,500.....	41.11
Couches.....	7,826,000.....	22.11
Schools.....	7,800,000.....	28.06
Parlor.....	6,207,666.....	39.36
Barber.....	1,457,000.....	41.99
Kitchen.....	1,150,000.....	20.57
Willow and Reed.....	217,000 lbs. 12½ cts. a pound	



A WELL NIGH UNIVERSAL ADJUNCT

The little wooden wheel known as a castor is found nearly everywhere that furniture is used and its importance should not be underestimated. Some are of metal, but the best are of wood, and the harder the wood, the better. Lignum-vitae ranks highest, and Turkish boxwood is next, but maple, birch, beech, persimmon, and dogwood are satisfactory.



POPULAR FURNITURE FOR OUTDOORS

There is a growing demand for outdoor furniture for parks, lawns and porches. Swings, chairs, and benches are combined in numerous patterns. For furniture of this kind wood is wanted which will resist decay when exposed to the weather. The swing shown in the accompanying cut is of Douglas fir.

Clothes chests, movable wardrobes, and other receptacles for clothing, fill places as furniture in modest as well as in costly houses. The woods of which these are made are carefully selected. Fine polish and exquisite carvings are freely bestowed on them, and they display these artistic touches to excellent advantage. Mahogany, oak, walnut, and cedar are the favorite woods for furniture of this class. Southern red cedar, incense cedar, and Port Orford cedar are popularly believed to emit odors which drive away or kill moths and other insects which are liable to injure clothing. Because of this belief, the cedar chest has become one of the most extensively used articles of household equipment. The sharp contrasts in the colors of cedar wood when heartwood, sapwood, and knots are dispersed over the exposed surfaces, are unique and attractive. Cedar is one of the few woods which are the more valuable for chests the more knotty they

are. This is true particularly of the southern red cedar.



THE DINING ROOM CHAIR OF QUARTERED OAK

Chair making and furniture making are often considered as separate industries, because plain chairs are frequently produced in factories which make little else, but it is not necessary to consider the two industries as distinct, for no hard and fast line divides them. There are scores of styles of chairs.



QUARTERED OAK ROCKING CHAIR

Quartered oak differs from other oak principally in the way it sawed, though the figures of some are much finer than of others. Sawing on radial lines exposes the bright rays to view. The quartered wood shows to best advantage in large surfaces, and only a few woods possess figure that can be so brought out, among such being oak, ash, chestnut and sycamore.

The real efficacy of cedar's odor in ridding premises of insects is a matter of opinion, but the concensus of opinion seems to be that its reputation is well founded.

Furniture makers consume great quantities of veneers. It has not been so always, though some veneer has been worked into furniture "since a time whereof the memory of man runneth not to the contrary;" but until a few years ago, an occasional band or strip of inlay constituted the principal employment of veneer by the makers of furniture. It was once commonly believed that the use of thin sheets of wood glued upon surfaces indicated sham and cheapness. The belief was erroneous, but it did not disappear until quite recently.

At the present time most good furniture is veneered, but all is not; and instead of regarding veneer as something snide, sleazy, and cheap, it is now accepted as an indication of quality. The use of these thin sheets has been responsible for the division of furniture in two classes, "veneered" and "solid," and it has led likewise to much controversy as to what is the precise meaning of these terms. Solid furniture may be made of thick lumber without veneer facing or laminated panels; or it may be constructed of built-up sheets of veneer, all of the same wood. These are the two ways of looking at it; some hold one view, some the other. If furniture which is built up of veneer sheets is to be considered as "solid," it is held that it must consist of one wood only. Thus a table made of thin sheets glued one upon another, may properly pass as solid mahogany if no wood except

mahogany is used; but some persons do not consent to that interpretation of the term and insist that solid furniture must be made of lumber and contain no veneer.

By the use of veneers to cover the outside, visible parts, fine furniture may be had at less cost than would be possible if the whole article were made of lumber; because the hidden parts may be constructed of cheap material while the thin sheet of costly wood forms the outside layer only. For example, a finely figured walnut

board one inch thick is required for a table top, if lumber is used; but the same board may be sliced into thirty sheets of veneer, every sheet as handsome as the original board, and the product is sufficient to give a figured walnut finish to thirty table tops, instead of only one, as would be the case if thick boards were used without slicing.

The use of veneer for furniture is economical, because a little fine wood can be made to go a long way. The built-up panel, with costly wood on the surface and cheap kinds in the hidden part, are as good as solid lumber, and often better, for the reason that laminated panels are less liable to warp, crack, swell, or shrink.

The wood upon which veneer sheets are glued is called backing or core stock. It may be cheap, but it must be well suited to its purpose, and must be seasoned before it is used. Numerous woods are employed as backing, but if manufacturers were asked to choose by ballot the best, the vote would probably designate white pine, chestnut, and mahogany.



STYLE OF RUSTIC FURNITURE

Householders on the frontiers used to make rustic furniture for their own homes, or go without. In recent years factories have revived the backwoods styles and they have become quite popular. This chair is of hickory and the picture is from the catalogue of the Old Hickory Chair Company, Martinsville, Indiana.

## DONATIONS TO THE WELFARE FUND FOR LUMBERMEN AND FORESTERS IN WAR SERVICE

**A**MERICAN FORESTRY will publish each month the list of those making donations to this fund. Many of the donations from members of the American Forestry Association so far received were made without solicitation and were inspired by reading in the magazine that a relief and comfort fund for men of the forest regiments was being collected. Many substantial contributions are being received from the Forest Service and from lumber companies and lumbermen following requests sent to them by the Secretary of the Welfare Fund for Lumbermen and Foresters in War Service, by the lumber organizations of which they are members, and by the committees of lumbermen which had charge in various sections of the United States of securing enlistments for the forest regiments. Contributions should be sent to P. S. Ridsdale, Treasurer, 1410 H Street, N. W., Washington, District of Columbia.

Contributions to the Welfare Fund to December 5, 1918, are as follows:

Previously acknowledged .....	\$20,684.06	Simmes, Frederick R., Kent, England... ..	6.50
Daniels, C. D., Hoquiam, Washington.....	2.00	Thorn, M., Philadelphia, Pennsylvania.....	25.00
Kellogg, R. S., New York City.....	10.00		
		<b>Total .....</b>	<b>\$20,727.56</b>

## CHRISTMAS BOXES FOR THE FOREST AND LUMBER REGIMENTS

SOME time ago P. S. Ridsdale, of Washington, District of Columbia, Secretary of the American Forestry Association and Treasurer of the Committee having in charge the Welfare Fund for Lumbermen and Foresters in War Service, cabled to headquarters of the 10th and 20th Engineers (Forest) in France and notified the military commander that the Committee would be glad to have any of the men of these contingents who were otherwise unprovided for send their Christmas labels to the Committee. This notification was posted on the bulletin boards of the various camps and resulted in the sending in of 434 labels. Two hundred and eighty-three labels were received in time, to send off the Christmas boxes, but the remainder unfortunately were not received until after November 30, the very last day on which Christmas packages for the men overseas might be mailed. The Committee, therefore, purchased one hundred and fifty-one three dollar express money orders, and one was sent to each man whose label came too late for a Christmas box, together with a little card bearing the greetings and good wishes of the Welfare Committee.

A committee of Forest Service women, under the general chairmanship of Mrs. Henry S. Graves, wife of the Chief Forester, very kindly volunteered to pack the boxes for the boys, and this work was done under the personal direction of Mrs. Lilian T. Conway. An effort was made to have each box a little different but in each there was one substantial gift, like a good knife, a fountain pen (six ink tablets were sent with each pen), a nickel-plated watch with khaki strap, or a flash light, together with the following: Khaki handkerchief, Christmas card, one cake soap, one shaving stick, one pack playing cards, one package Lucky Strike cigarettes, one package Pall Mall cigarettes, one tube tooth paste, one pencil with metal holder, one box candy (one-half pound), loose candy, three packages

chewing gum, and three packages mints (Life Savers or Scotmints).

Everyone who has contributed to the fund which made it possible for the Committee to brighten Christmas a bit for the boys of the Lumber and Forest Regiments will be glad to know that the Committee has already received many enthusiastic letters of appreciation from which the following excerpts are taken:

"A notice was posted on the bulletin board in our camp to the effect that you would be glad to send Christmas packages to any member of forestry organizations and since I have no relative in the United States I am sending my coupon to you. I assure you that I appreciate deeply your kindness in making the offer."

"I will more than appreciate one of the Christmas boxes offered by the Forestry Welfare Fund. Thanking you in advance," etc.

"I have read your kind offer and will take advantage of it. I am enclosing my Christmas coupon.

"At the rate we fellows are going the Kaiser ought to be hanging on a Christmas tree as a display for the A. E. F. that would be our best package. We are all in it to do our best and lick him good and proper.

"My kindest regards to all back in grand dear U. S. A. and to yourself a Merry and Happy Christmas."

"Your kind offer to send us Christmas packages received at our camp here in France, if we have no one we would like to bother, or who needs the cost of a Christmas box more than we do over here. I feel as though the circumstances are that way so I will take advantage of your kind offer. I am sending my Christmas package coupon in this letter. I have been in France since last January and have been working as cant hook man most of the time. We have had a very pleasant summer but are again due a rainy and nasty winter. Our hope is that the Kaiser will kick in by next spring so we will be on our way home by next year at this time. My home is in Montana. I am sending my thanks in advance. With best wishes,

"(Signed) A LUMBERJACK."

"In accordance with instructions contained in your cablegram enclosed please find a number of Christmas package coupons from some of the members of our Company who have no relatives or friends to whom they can send their coupons. These men requested me to convey to you their deepest appreciation for anything that you may send them."



PACKING CHRISTMAS BOXES FOR MEN OF THE LUMBER AND FOREST REGIMENTS

Christmas boxes for 283 men were filled with good things from home purchased with money supplied from the Welfare Fund for Lumbermen and Foresters in War Service. The articles were selected and packed by ladies of the Washington office of the Forest Service, co-operating with the Welfare Committee.



# CHRISTMAS WITH THE BIRDS

BY A. A. ALLEN, PH.D.

ASSISTANT PROFESSOR OF ORNITHOLOGY, CORNELL UNIVERSITY



THE north wind whistles about the caves. The snow crunches under foot. The leafless branches are whitened with ice and Jack Frost has been decorating the windows. It is winter; it is Christmas time. Our thoughts are upon good old Santa Claus or upon the shrinking coal bin. Birds have been dismissed from our minds. They have gone the way of the green leaves, the wild flowers, and the parasols. They were not meant for winter weather.

How we envy them their freedom of movement. They have but to spread their wings to satisfy their craving for warmth or for company. Palm Beach, Jamaica, the Tropics, are theirs for the effort. No ties to bind them to the frozen north country, no responsibilities to hold them, what a life it must be!

We sit by our fire places and think of our robins fattening on the mistletoe berries along the Gulf. We picture the orioles flitting among the banana palms and the coffee trees of Costa Rica, and we see the bobolinks picking the rice at the equator. We look through the frosted windows upon the whirling snow and stiff swaying branches and say to ourselves, this is no place for birds.

But even as we say it, a chorus of mellow notes announces a flock of snow buntings. They whisk overhead to some

wind-swept field where the tops of the weeds still project above the snow to afford them a frugal living. A few shrill peeps tells of a tiny chickadee or a kinglet clinging to the swaying branches and searching for scales and insect eggs. The "yank-yank" of the nuthatch and the sharp calls of the downy and hairy woodpeckers tell us that at least some of the birds are still with us.

Some, like the snow buntings and tree sparrows, have come down from the far north to spend the winter, but others, like the chickadees and nuthatches and woodpeckers, have been with us all summer and yet seem to prefer braving the long winter to moving south. We should not

then have dismissed the birds from our minds, even though it is winter and the fire-place so fascinating; even though it is Christmas day.

For nineteen years the bird lovers of this country have set aside Christmas morning for a walk with the winter birds. The making of a Christmas bird census is now a part of the life of every ornithologist and the year is not complete until the list of birds which he

has seen on Christmas day has been sent to headquarters to be published in the January number of *Bird Lore*. From Nova Scotia to California and from British Columbia to Florida, hundreds of these reports are sent in. By referring to



SNOW BIRDS IN A SNOW STORM

Juncos are often called snow birds because they most often come about the house during snow storms. In this sort of weather birds need food and many perish if the weeds get entirely covered.



SNOW BUNTINGS AND HORNED LARKS ENJOYING THE SEEDS SCATTERED FOR THEM ON THE SNOW

The snow buntings are the whitest of all our small birds and earn for themselves the name of "snowflakes."

them, one can tell at a glance the winter birds that have been found each year in every part of the country.

Herein lies the value of the census, for while some species of birds are more or less uniform in their winter distribution and are seen abundantly every year, many species are very erratic, one year being very abundant in a locality and the very next year being entirely absent. Thus last winter there was a flight of



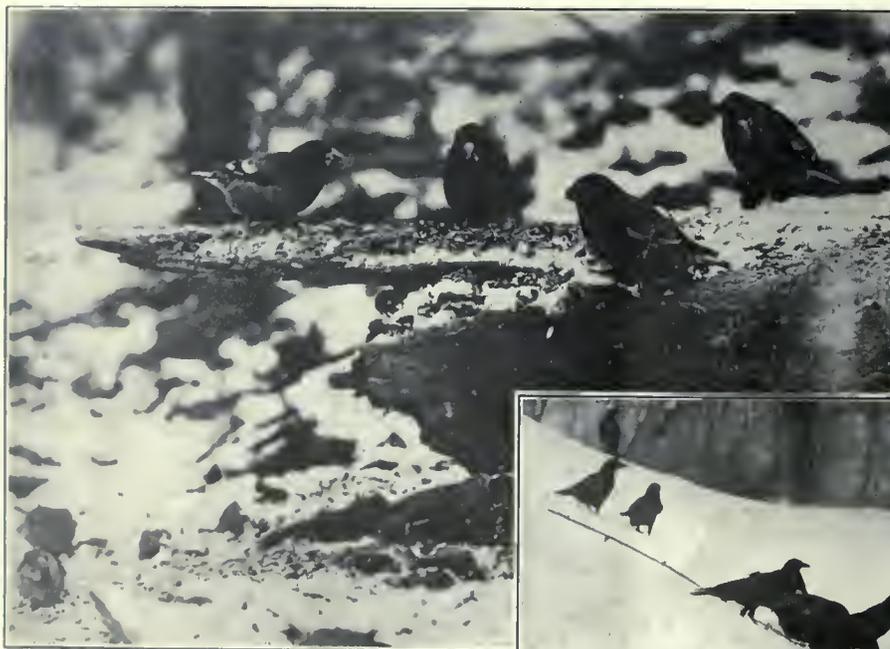
A BANQUET FOR THE GULLS

Table refuse has been spread on the snow and the gulls have come up from the lake, which can be seen in the distance, to dine. The crows are waiting their turn at a safe distance.

remains to be seen but it is quite likely that some unusual species will appear in considerable numbers. Herein lies the sport of winter bird study. Birds, as a rule, are not numerous, but those that are present are rather conspicuous and one can tramp the woods and fields with the assurance of finding all the birds of the vicinity.

There are four types of birds to be found in winter. First, those that frequent the open fields a way

from bushes or shelter of any kind and live upon the seeds of such weeds as project above the snow. Secondly the woodland birds that feed upon hibernating insects, upon dried berries and fruits, or upon seeds. The third group consists of the water birds, the ducks, grebes, loons and gulls that are able to withstand the winter and find their food of fish and aquatic life where the waters never freeze.



SOME UNUSUAL VISITORS

Evening grosbeaks on a feeding log. They are birds of the Northwest and wander into Eastern United States rather erratically.

northern shrikes over the entire Northeast and in Ontario and New England, there was a flight of great horned owls and goshawks. The winter before was remarkable for the great influx of brown-capped chickadees from the north and the unusual numbers of redpolls, pine and evening grosbeaks, crossbills and pine siskins. What this winter will bring



A CROW FAMILY REUNION

The right caws will start a crow reunion almost any day. Here a little grain intended for wild ducks got spilled on the snow.



WITH US THROUGHOUT THE YEAR

Some of the winter birds are those that come down from the North, but others are species which have nested in the vicinity and prefer braving the winter to moving South. Here are a hairy woodpecker and a white breasted Nuthatch.

Lastly there are the carnivorous birds, the hawks, the owls and the shrikes that feed upon other birds or upon small rodents.

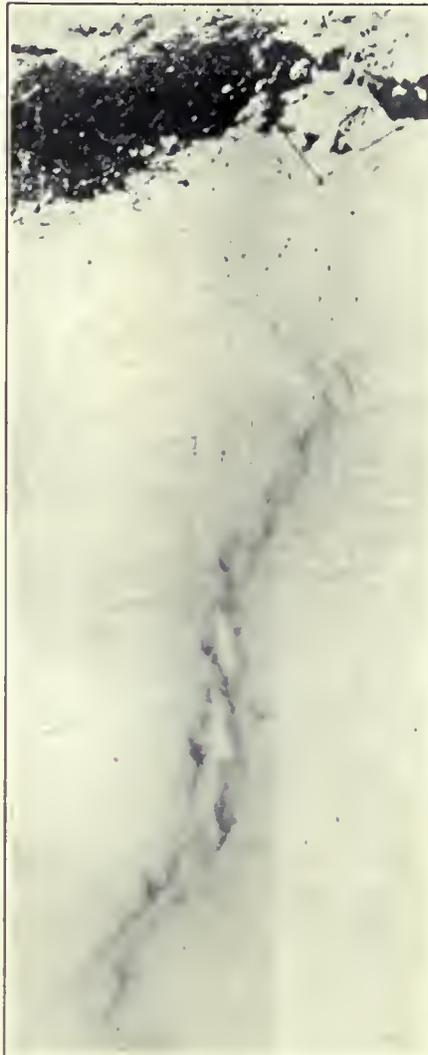
In the northern states where the



A WINTER ROBIN

In the south robins are common all winter, but in the snow states only an occasional bird is found in sheltered spots where berries are plentiful.

snows are deep, the field birds are always few in number. Some winters they are almost absent though not because of the severity of the winter, but usually because it is so mild in the far north that it is not necessary for them to come so far south even as northern United States. In the southern United States where snows are infrequent and there is an abundance of seed

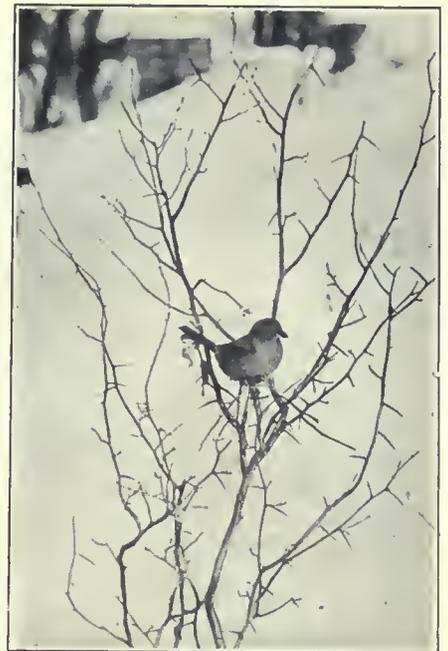


AS THE CROW WALKS

If he flew no straighter than he walks the old adage would have little meaning. Note the narrow angle made by the toes, the mark of the hind toes and the dragging of the feet, all of which are characteristic of Jim's tracks.

available all through the winter, the numbers of field birds is often large for most of the seed-eating species that nest in the northern states are content to go on further south than the southern states for the winter.

Of the snow-loving species, none is more typical than the snow bunting whose very coloration is sug-



A NORTHERN SHRIKE OR BUTCHER BIRD

Many of the winter birds are erratic in their wanderings and are not seen every winter. Last winter there was an invasion of Shrikes over the entire Northeast. This bird was attracted by the mouse fastened in the thornbush.

gestive of an animated snow flurry. The more blustery the day, the better they seem to like it as they crouch or run across the crust or take wing with a sweet rolling



PEEK-A-BOO IN BIRD LAND

A downy woodpecker and a chickadee are uncertain as to the nature of the bird on the opposite side of the tree.

twitter. The large white patches in their wings, added to their white heads and breasts, give them a very wintry appearance. With them are sometimes a few of the sparrow-like Lapland longspurs, especially in the north-



GOOD WEATHER FOR TAMING BIRDS

Birds lose their fear when food gets scarce and the easiest time to tame them is during the long heavy snow storms.

western states, for in the east they are very erratic. Horned larks and redpolls are much more likely to be seen than the longspurs although even they are irregular in their appearance.

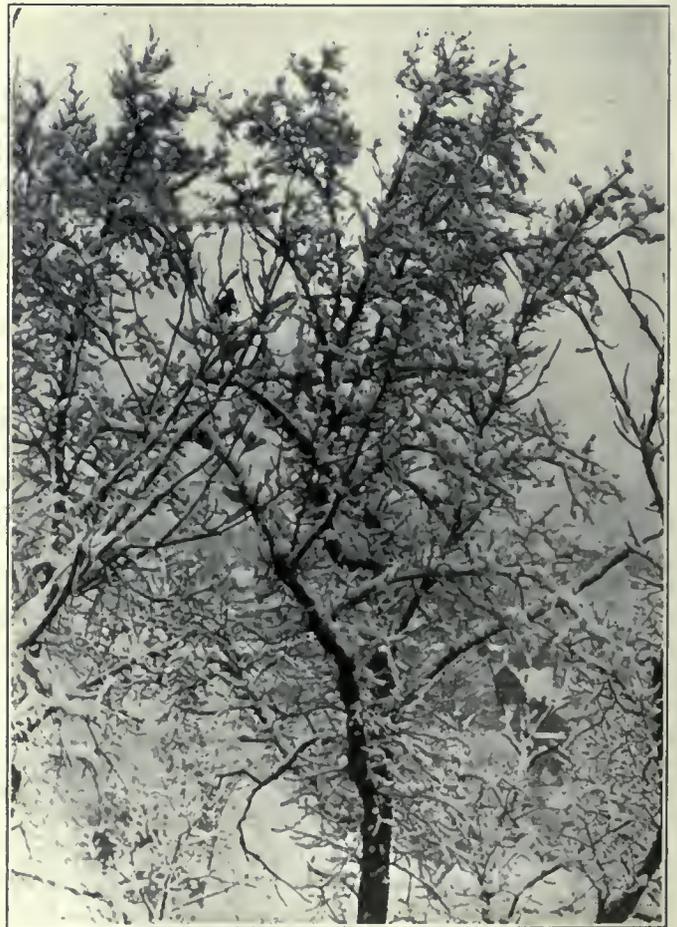
Along the borders of streams and marshes in the northern states, along the edge of the woods, or wherever there is shrubbery, tree sparrows, juncos, and occasional song sparrows are almost sure to be found. Further south the white-throats, fox, swamp, field and chipping sparrows, meadowlarks, towhees, cardinals and many other birds can be expected. Where berries still cling to the vines and bushes, robins, bluebirds, mockingbirds, hermit thrushes and myrtle warblers will be found in the south, but in the snow states, fruit-eating species are scarcer. One is lucky if he runs upon a flock of cedar waxwings, a grouse, a pheasant, a blue jay or a lone robin, though, of course, the omnivorous crows are everywhere abundant.

Down on the bay or out on the lake are flocks of ducks—redheads, scaup ducks, canvasbacks in large flocks over the weed beds; small groups of black ducks, mergansers, goldeneyes, old squaws and occasionally other species. With them are a few loons and grebes which seem to spend as much of their time beneath the

water as above and, coursing overhead, are numbers of graceful gulls ever ready to pounce upon any floating fish or dying waterfowl.

The carnivorous birds are less numerous than any of the others and it is usually a red letter day when one finds a hawk, an owl or a shrike. Once one has located their winter haunts, however, he can tramp with reasonable certainty of finding them. The little screech owl usually has some particular knot-hole that he is fond of sitting in, the short-eared owl roosts in the same corner of the marsh, and the long-eared in the same evergreen thicket, week after week. The hawks and the shrikes often have a rather definite circuit which they follow and though it may cover miles of territory, they often arrive at the same place at about the same time every day.

But if one is fond of the winter birds, it is not necessary that he should go far afield. If he commences in the fall to put out the foods that they like, he can expect to attract almost any species to his own windows during the course of the winter. If he delays putting out the food until the birds have formed more or less definite circuits which they follow for the rest



A STUDY IN BLACK AND WHITE

Never is a crow so black as when seen against the snow covered branches.

of the winter, he is apt to be much less successful in attracting them unless his garden happens to lie in the circuit. Suet for the woodpeckers and other insectivorous birds; millet, chick feed, or screenings from grain,

for the seed-eating species will prove most successful lures. Crumbs of raw peanuts and sunflower seeds are relished by all species. If one succeeds in attracting a few birds to his feeding station others are apt to follow them and surprise follows surprise. One awakes to hear a new voice and finds a stranger at his board and always the stranger is welcome. The flocks of juncos and tree sparrows grow in size, the numbers of chickadees and nuthatches are slowly augmented, woodpecker follows woodpecker until one has a goodly number of pensioners that come right to his window sill and invite him to come out and enjoy the Christmas weather. Many of them will become tame and some may even learn to take food from one's hand without a sign of fear.

Indeed one need not be surprised when tramping at some distance from home or any of the feeding stations to have a little chickadee fly down and alight on his head or his shoulder as though he recognized him even out there in the woods.

On Christmas day the children delight in adding a Christmas tree for the birds to the feeding station. Melted suet into which sunflower and other seeds have been stirred can be poured over the branches of the evergreen to which it will adhere. It will last for many days and the birds enjoy hopping among the branches and picking the tidbits from the boughs. Surely, if one cannot tramp the fields,

it is well worth while to have a Christmas with the birds at home.



SOME CHRISTMAS WATERFOWL

Scamp ducks enjoying a dinner that has been spread for them along the edge of the ice.

### SUPERVISOR McMILLAN GIVES HIS LIFE FOR HIS COUNTRY

**F**IRST Sergeant Lanning Ross McMillan, Co. B, 29th Engineers, U. S. A., was killed in action in France on August 16th by an exploding shell fired from the enemy's guns.

He was born in Buffalo, New York, August 9, 1877, and was the youngest son of Hon. Daniel H. McMillan, formerly a state senator and for many years attorney for the New York Central and Lake Shore Railroads, and subsequently United States district judge for New Mexico.

Young McMillan attended Cornell University, afterwards entering the United States Forest Service, finally becoming supervisor of the Jamez, Pecos and Carson National Forests, with headquarters at Santa Fe, New Mexico.

He enlisted last November in the 29th Engineers



LANNING ROSS McMILLAN—A HERO OF THE WAR

from Camp Devens, Ayer, Massachusetts, and was sent overseas in February. He had been advanced steadily and would shortly have received his commission as second lieutenant.

Surviving him are his mother, one brother and three little children, all residing at Corona, California.

**S**ELECTED white birch, obtained in this and other sections of New England, is playing a highly important part in the work of mercy being carried on in connection with the European war. This wood is finding its way to the battlefields of France in unprecedented quantities, after having been transformed into boxes and containers for drugs and medicines used in hospital and Red Cross work.

# PICTURES AND PLANTS FOR CHRISTMAS, WITH AN ELK STORY.

BY MAJOR R. W. SHUFELDT, M. C., U. S. ARMY.

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(PHOTOGRAPHS BY THE AUTHOR)

WITH December and Christmas time at hand, there often comes over us a disposition to live again the pleasant outings and collecting trips we enjoyed during some of the previous months of the year; at other times, during the season, we perhaps indulge in anticipating the pleasures that may be in

Passing from such a scene, the mind may next carry us to some deep, rocky gorge, where one day during the previous April was spent. Every trace of the past winter's snow has melted away, and the warm breath of spring has called to life once more one of the very earliest flowers that will, with marked certainty, be



ONE OF THE MOST WONDERFULLY BEAUTIFUL FLOWERS OF EARLY SPRING IS THE GROUND OR MOSS PINK, HERE SHOWN IN ALL OF ITS LUXURIOUSNESS

Fig. 1—Moss Pink is a well-known representative of the Phlox family (*Polemoniaceae*), of which we have nearly a dozen species in eastern United States.

store for us after January, February and March have passed by, when we can, once more, enjoy the balmy days of an early spring. When one of the latter reveries takes possession of us, the earliest spring flowers naturally enter into the picture. Up the bare hill-sides or in the open forests, long before the oaks, the chestnuts, and the beeches begin to feel the effects, in bud and bark, of their rising sap, the anemones, the early saxifrage, and bloodroots are there to be seen, smiling upon us in charming little scattered groups, made all the more conspicuous by the dark earth where they are found.

found growing in great luxuriance in regions of this character. It is not difficult to guess the name of this plant—it is none other than the widely known moss pink, so named and described by botanists and by all those who are at all familiar with it.

A few miles above Washington, in the rocky gorges of the Potomac River, one will find, early in April, this elegant Ground or Moss Pink, flourishing in all of its native beauty as it is here shown in Figure 1, and, upon nearer view, in Figure 2. These pictures tell their own story and with far greater vividness than any pen could do.

*Phlox* is one of the three genera of the Polemonium family occurring in the Atlantic States region and as far westward as Kentucky. Gray describes the group as an "insipid and innocent" one, while we are all aware of the fact that many species of them have long been under cultivation, and among these the species now being described. The various varieties of "Sweet William" are others, the wild type of which is *Phlox maculata*. Then there is the Blue Phlox (*P. divaricata*), and the tall species we are all so familiar with, occurring, as it does, in many gardens in the country. As may be noted from Figure 1, the Moss Pink grows usually in masses, resembling some great pink—or perchance white—mat, with

ing along roadsides and in pastures. Polemonium, or Greek Valerian, is also generally associated with the phloxes, and we meet with two species of it in the north-eastern sections of the country and southward.

Some of the wintry days of December may, with marked profit, be spent in strolls about the famous National Zoological Park of Washington, more widely known as the National "Zoo." Here we see scores of examples of how animals of many species and families pass the winter months in captivity. Some of them spend



HERE IS HOW THE MOSS PINK FLOWERS APPEAR WHEN WE COME UP CLOSE TO THEM; THE RECESSES AMONG THE ROCKS GIVE THEM A FINE SETTING IN THIS PICTURE

Fig. 2—The flowers are not always of a pink color; they may be of a pink-purple shade, ranging through various lighter shades to a pure white.

its flowers so numerous as to almost entirely conceal the modest stems and leaves beneath them.

In the Polemonium family we also have arrayed the genus *Gilia*, a group dedicated to a botanist of Spain—Senor Felipe Gil. Standing Cypress is one of these (*G. rubra*), a plant carried into certain restricted areas of Ohio and Massachusetts, where it is now found grow-



Fig. 3—Both in nature and in captivity the American Swan is capable of enduring great cold.

throughout the entire winter, however cold it may come to be. (Fig. 3). In nature, as well as in captivity, there is no more memorable sight of the kind than to observe several of these superb birds, as with arched necks and wings erect, in the most perfect silence they keep their course down mid-stream, with glistening ice upon either side, and both banks covered with an

their entire time out-of-doors, while others only occasionally enjoy this privilege. On the other hand, some must be coddled under cover with the greatest care, or their lives will indeed be cut short long before the warm days of spring again put in an appearance.

The wild swans, those most elegant and graceful of aquatic birds, when in their natural element delight in remaining in the open

unspotted snow lain down by a silent storm still unfinished. We have three species of wild swans in our national bird fauna, and they are each and all becoming very rare in nature; indeed, one of the species is already nearly extinct. The merciless weapons of gunners have almost exterminated them, and this senseless slaughter still goes on. Our wild swans (*Cygninae*) all fall into the genus *Olor*, and the three species referred to are the Whooper Swan (*O. cygnus*), the Whistling Swan (*O. columbianus*), and the Trumpeter Swan (*O. buccinator*). It is hardly necessary to say that their nearest allies are the geese and the ducks, of which latter we have a great many species.

In these days we find grey squirrels not only throughout the broad expanse of the "Zoo," but all over the city of Washington. They are abundant in most of the parks; on the grounds of homes having sufficient area to accommodate a tree or two, and still more plenty in the near-at-hand timber of the suburbs. In Figure 4

we have a "Zoo" specimen of this favorite species, and throughout that domain the animal has become quite as tame as the ones in the parks of the city. In some parts of the Smithsonian grounds, you are hardly seated on one of the benches before two or three little fellows will run toward you and beg for peanuts—a food of which they are very fond. Several albinos among them—or rather partial albinos—are to be seen in that locality, one in particular being an especially handsome creature. There is a black variety of this squirrel, which is a very handsome animal when in full pelage. A few of these are also to be seen in the

"Zoo" grounds, but more particularly on the fine estate adjoining it along its western boundary.

There are some wonderfully attractive scenes in this National "Zoo" of ours at this season of the year, which are never better appreciated than after a quiet fall of a few inches of snow. Those who have availed themselves of the opportunity to visit the place at such a time, will be sure to recognize the structures here shown in Figures 5 and 6. The first indicated is that of the 'Coon Cabin, and the second is the Llama House. None of the occupants were in sight at the time these pictures were obtained, which is too bad, as it would, in either case, have greatly enhanced the interest in the results. It will be admitted, nevertheless, that as snow scenes, where so many people find pleasure and instruction at all times of the year—even during snowy December days

—these cuts will surely appeal to a large constituency of those who may be among that number.

Racoons are animals that possess decided arboreal habits; and so, when the little cabin was built for them, to which the reader's attention has been drawn, care was taken to erect it close to a big tree (Fig. 5). And so there are many who are, during certain seasons of the year, familiar with the sight of several old 'coons sunning themselves up among the branches of this tree, some fifty feet or more above the ground. Racoons are still to be found wild in certain parts of this great zoo preserve, as are also weasels, mink, skunks, and other small predacious mammals. It is also remarkable how many different species of birds breed within the limits of the Park—even Night Heron, and such forms as crows, blue jays, owls, mourning doves, and no end of smaller birds.

In Figure 7 we have an unusually fine example of common commercial cotton in full seed, and it is

quite fair to demand an explanation of its appearance in this our Christmas story for AMERICAN FORESTRY. Yes, it is surely wintry-looking in a way, for it is pure white and fluffy, but this is not altogether the reason. Guess again. Think of the demand for bates upon bales of cotton along about the end of December, which is greatly in excess of the usual monthly market demand for that staple product. Of course this does not refer to war times, when immense savings are being made along all lines, and to which enforced economy cotton forms no exception. The answer is not far to seek. A moment's reflection will bring



Fig. 4—This old grey squirrel is a good poser, as he cracks the first nut of his winter's supply.

to mind the mass of cotton we use—or rather did use—during the good, old Christmas times to trim the Christmas trees with; to decorate the homes and not a few public places with—and it would make a bale of no mean dimensions were we to gather together all the cotton that had been used to furnish beards for those who had, throughout the land, played the part of Santa Claus, to add to the joy of thousands of children from one end of the country to the other. Such a custom is not dead by any means; and when the happy days of peace come to us once more, and a tumble in cotton takes place, as well as in a thousand and one other commodities, this custom of the good old days will be established once more, with all the joyousness that was associated with the time-honored holiday season of antebellum days.

## THE ELK HERDS OF WYOMING OF FORTY YEARS AGO

(PHOTOGRAPHS BY THE AUTHOR; CLARK'S GROUP IN THE U. S. NATIONAL MUSEUM USED AS A MODEL)

**T**HERE was a time in the history of our kind—in so far as it referred to the higher races of man—when no effort whatever was made to preserve and protect any of the other living forms on the earth. From cave men and before, down to an age that might easily fall within the period of latter-day history, in all regions inhabited by mankind, a ceaseless warfare upon the world's big animals has been carried on by man. They have been the object of his chase, whether for food, for sport, or from sheer wantonness, and there were probably no exceptions to this rule. Mammoths, moas, cave bears, buffalo, elk and the rest, were indiscriminately slain with the crude weapons of those pristine hunters. Form after form disappeared through this and other agencies, while man persisted, vastly multiplied and spread, from a number of centers, far and wide over the earth.

After the passing of many centuries, man began to realize

what he was doing in such fields, and steps were taken, in a few instances, to stay the extinction of certain large mammals. Within comparatively recent time, the aurochs



THIS IS ONE OF THE MEMORABLE FEATURES OF THE NATIONAL ZOOLOGICAL PARK AT WASHINGTON

Fig. 5—Few would guess what this attractive little cabin was built for; but an old racoon or two coming out from beneath it soon tells the story.



THE LLAMA HOUSE AT THE NATIONAL "ZOO" IS ONE OF THE MOST ARTISTIC STRUCTURES TO BE SEEN IN THAT FAMOUS PRESERVE

Fig. 6—At one time a splendid specimen of the Black Llama was kept here, with several other species in the adjoining paddock.

or bison of Europe furnish a well-known example of this pious step. "This is the most interesting survival of the primitive fauna of the Old World," says a writer at hand. "It is still found wild, though protected, in a large forest in Lithuania, the property of the Czar of Russia, called the Forest of Bielowitza. A few are also left of the purely wild stock in the Caucasus. Those in Lithuania have been protected for several centuries, and the herd is numbered from time to time. In 1857 there were 1,898 of these bison left; in 1882 there were only 600; the bison in the Caucasus had been almost forgotten till Mr. Littledale and Prince Demidoff gave accounts of hunting it there quite recently."

I am not informed as to how these European bison have fared

during the present war. This much is certain, however: the Czar of Russia is no more, and meat has been greatly in demand in all parts of that country; so one need not be surprised to hear that not a single specimen of the aurochs or European buffalo are now to be found anywhere in the world.

Thus it has gone, too, with many other large mammals, and those of the United States form no exception. Our antelope have been well-nigh exterminated, and a dozen other big species are following fast. Very well do I remember how plentiful the wapiti or American elk were in the mountainous regions of Wyoming during the latter part of the 70's. On one occasion,

Several years later, I accompanied Lieut. Lewis Merriam, of the 4th U. S. Infantry, on a hunting trip in the Medicine Bow Range of Wyoming, our Post being at Fort Fetterman, where I was stationed at the time as surgeon. It was a bitterly cold winter, the mercurial thermometer having registered over sixty below zero on one or more occasions. Merriam and I were companions on many hunts; he is now living in Washington, being a retired major in the Army, and he will remember some of the incidents recorded below.

On the occasion, I refer to, there had been a heavy snow, and the first night we made camp in the Range the mercury fell to 40° below zero. We had with us



OUR ELK IS ONE OF THE GRANDEST REPRESENTATIVES OF THE AMERICAN *Cervidae* OR DEER FAMILY; IT IS *Cervus canadensis* OF SCIENCE

Fig. 8—These magnificent animals at one time ranged over the entire United States, sometimes in herds of several thousands. In the Jackson's Hole region, Wyoming, the Federal Government is making an attempt to save a few of them, with varying success. (Photograph by the author, using Clark's group in the U. S. National Museum as a model)

when serving as Post Surgeon at Fort Laramie, we had a very hard winter, and, during a heavy snow storm, a big bull elk trotted across the parade ground, between the barracks and officers' quarters. No one got a shot at him, and he was soon out of sight. The winter before, during another storm, a big bull buffalo entered half-way through the door of the officers' club room; it was snowing on that occasion, too, and the animal made good his escape.

Sergeant Mitchell and another enlisted man. To take back such game as we shot, we had an army wagon and a team of mules. At an early hour, after the first night's camp, Merriam and I, each with a fine mount, started out for the foot-hills of the first range of mountains, near which we had pitched our "A" tent. It was a superb day, and distinctly of a kind peculiar to the mountainous regions of the Middle West. It was not likely that any one else had been in that part of the

country for a year or more, and game was in great plenty—everything from an Abert's squirrel to a grizzly. As we came into the foot-hills, we followed a narrow game path along a frozen mountain stream; a willowy growth, higher than our heads, was upon either hand. Merriam was a short distance behind, leading his horse, and I was in the saddle ahead, with carbine loaded and ready for anything. We had proceeded but a very short distance, when a superb white-tail buck jumped up directly ahead of me—he ran but a short distance, when I downed him at the first shot. Merriam got into his saddle after that—so he could see better ahead of him! "Nuff sed."

About the middle of the forenoon we were well up the side of the mountain; arctic temperature still prevailed, and a good breeze was blowing. We were ascending a path from which we could overlook the entire valley below; both of us were now mounted, and my companion

was well in the lead. Suddenly he stopped, wheeled, and beckoned to me to catch up with him, pointing into the valley—and well he might. There was no mistaking what the long line of big animals were, as there were many great-antlered fellows among them. Elk! At least 500 of them, marching in close order in a long column of fours. They were coming up the mountain, and would

soon be in the timber some half a mile ahead of us. They quickly winded us, massed, and pushed for the timber higher up, while we pursued at a stiff gallop, dismounting when we reached their trail. This we followed as best we could through the heavy pine forest to the top. Great boulders of rock were scattered through the timber, the animals making deep paths among them in the snow as they herded through. All deer emit a peculiar, pungent odor from their odoriferous glands when excited and chased, and this was powerfully in evidence as we halted among the big rocks at the hill-top, close together, with our carbines loaded

and belts full of cartridges. We crept into a position overlooking the shallow, timbered valley immediately beyond; it was literally packed full of elk, and the wind was coming our way. Merriam was plumb blown from the run we had had, and he most generously indicated to me not to wait a second for him, but commence firing. As we were out after meat for the garrison, I availed myself instantly of his invitation, pulling up on an immense buck with a cow on the off side of him, at short range away. He dropped dead at the shot—the cow running a few hundred yards and then following his example. Two with on ball! This sight gave Merriam fresh wind, and together we opened on them as they massed in a narrow divide just beyond us. We downed in a few moments something short of a dozen, which later on were dressed and loaded on the wagon. While this was underway, I made after the herd as they spread out over the rolling foot-hills lower down; and as

I came up with them I killed a fine doe at four hundred yards, the shot causing them to band, and head for the hills once more. As my horse was in fine condition, I followed at top speed—dragging a good part of my lariat and pin behind me for lack of time to coil it. Being now much excited and warmed up, the odor given off by the herd was more than oppressive. In their rapid ad-

vance they became more and more compact, and in this formation they made in between two foot-hills, with me hard after them. At the end of a few hundred yards, they discovered that they were in a gorge which did not admit of their escape—that is it was a blind ravine, with a steep and rocky termination. They very quickly reversed order, whereupon I promptly wheeled to get out of the way of their advance. Apparently it was only a part of the original herd, numbering a couple of hundreds or thereabouts; still, at that moment it looked like as many thousand to me. In less time than it takes to tell it, the leaders—a bunch of big bulls



COTTON, IN THE STAGE HERE FIGURED, FROM ITS VERY SNOWY APPEARANCE IN A WAY REMINDS US OF WINTER

Fig. 7—This beautiful specimen of American Cotton was grown in a garden of one of the Public Schools of Washington, District of Columbia.

and a few does—were close upon the heels of my thoroughly alarmed pony, stepping every few moments in my dragging lariat. It was useless to do more than keep ahead of them the best way I could without being jerked out of my saddle. The bulls crowded close together, and every once in a while there was a fierce racket as their antlers rattled together, which was more ominous of my possible fate than exhilarating. As necessity, or opportunity, offered, I downed one of the big fellows, either with my carbine or a revolver; and in a very short space of time we were out again on the

rolling foot-hills, where the herd made off to the westward in loose order, leaving me and my pony behind—very much bruised and rattled up generally. In no pleasant frame of mind, I dismounted and scored once more, as a parting shot, downing an old bull who was then a few hundred yards away. Next day the wagon party came up to the scene and gathered them all in for the use of the garrison during the winter.

Note—It was entirely due to lack of space that Dr. Shufeldt's flower article and Dr. Allen's bird article, which are regular features of the magazine, were omitted from the November issue of AMERICAN FORESTRY.—Editor.

## EDITORIAL

### AMERICA'S OBLIGATION TO THE FOREST OF FRANCE

FOR one hundred years the Republic of France has with infinite pains been engaged in creating forests out of sandy wastes, reclothing with trees the barren slopes of mountains and repairing the ravages of flood caused by denudation of these slopes.

With firm belief in what still seems to some Americans an impossible ideal, the French people through their Forest Service succeeded, solely through tree planting and protective measures, in repopulating and rendering habitable and prosperous, whole districts formerly abandoned to sands or floods.

Under the stress of the war these forests, and with them the security and livelihood of the local communes themselves were undermined again and in many cases destroyed. The loss of the forests by gun fire on the battle front was unavoidable, and the character of their destruction beyond the exercise of choice. But how about the methods employed in cutting timber back of the lines, which went on all over France, until the smallest woodlots were searched out and the protection forests in the Landes and on the high slopes of the Pyrenees helped to feed the front? Do we realize what it means to France that she opened the doors of her protective forest barriers to her allies, how great a contribution she made by this act to the common cause, and what effect our methods of cutting might have upon these French resources.

The enormous consumption of wood by the armies in France had to be met either by imports or by the utilization of these French forests. Had it been a physical possibility to ship wood from the United States to supply our army, there would have been no question as to our duty. But the U-boat warfare and the bulk of wood products made such a plan impossible, and the French agreed to sacrifice their carefully husbanded forests, so that tonnage could be devoted to transporting men and food.

The least we could do under the circumstances was to furnish the labor to get out our own wood supplies, and to do as little damage to French forests as possible in the process. America organized the 10th and 20th Engineers (Forestry), to cope with this problem.

Most fortunately for the reputation of our country, the first officers to reach France to organize this service were men trained in forestry, who fully appreciated the French point of view, and knew not only the distinction between a virgin forest and one which had been laboriously produced during a century of care, but knew also how to reap the harvest of mature timber without ruining the forest itself and converting it into a barren waste resembling some of our cut-over non-agricultural pine stump lands.

But we faced a very real danger in conducting this work, through the urgent necessity of getting out wood products at high pressure. The force of men and equipment worked day and night—records for production were smashed daily—and still demand outran supply and more wood was called for. Military necessity looked only to the immediate present—any sacrifices were justified, that supplies were on hand when needed.

The constant pressure, both by military authorities, and by the lumbermen selected as officers of the 20th, was to secure men skilled in logging and milling, who could at once jump into the harness and produce lumber. In the selection of officers for the 20th Engineers, men of this type were chosen almost exclusively.

The most striking difference between the French poilu and the American doughboy is that the American is careless of his possessions and tends to extravagance, while the French waste nothing, and even in battle guard their equipment against loss. To an even greater degree this difference was shown in the war emergency cutting of timber. The French foresters and woods workers never lose sight of the future of their stands, and no one could distinguish between their "war" cutting and the ordinary operations of peace, except in the greater areas cut over. But American lumbermen start with little conception of conservative cutting. Their training leads them to neglect and brush aside all measures which interpose the slightest obstacles to speed and thoroughness in logging. If officers of this type had been placed in complete control of cutting, unrestricted either by French liaison officers or by trained foresters from America, great damage might have followed.

The possibilities may be illustrated by one instance where this actually occurred, as set forth in an article in the *Country Gentleman* for October 12, 1918, in which the writer states, "Frankly I have never seen greater pain written on human countenance than when I went with two French forestry officers attached to the army, through what was left of one of the most magnificent forests in all France. 'See'—exclaimed one of the officers—"it is gone—the work and care of a century. It will take a hundred years to restore the forests of France after the war.'"

That France might be willing to stand by and permit such devastation does not mean for an instant that she would excuse or forgive. The French people through painful experience following the Revolution learned that denudation must not be permitted even in time of war. What would be their thoughts had they been forced to view the highly efficient lumbering of crack American and Canadian forest regiments, *should it happen that this efficiency meant nothing more than making a clean sweep*

*of their priceless forest possessions in record time?* It has taken them a century to acquire the *art of forestry* which carries with it the ability to distinguish between lumbering as the sole objective and lumbering as a means of reproducing the forest and as the mere final step in this process. *They know* that "clean logging" such as practiced by our lumbermen on private holdings nearly everywhere in this country would ruin their forests and put them back to revolutionary times, and that it is wholly *unnecessary* and can be, and so far, fortunately, has been largely avoided, where men with a knowledge of forestry have been placed in control of the cutting on these French forests.

The French threw open their forests to the American army in the same spirit that they have given everything they have to the cause of civilization and the honor of our country was in the hands of these officers of the Forestry units to a degree hardly less than those on the firing line, and their work will stand for a century.

## THE MINNESOTA HOLOCAUST

FOR the third time the danger ever lurking in Minnesota's great expanse of forest has materialized in a whirlwind of death, sweeping away property valued at \$100,000,000, and causing over 1,000 fatalities. Again we read the grim tale of families completely wiped out, of helpless women and children burned to a crisp while fleeing on foot or by team, vainly seeking shelter from the flames, or of boats overturned in icy waters and benumbed unfortunates sinking to death in the waves.

Why should these things be, when the state has had this grim lesson driven home twice before—at Hinckley in 1894, and at Baudette in 1910? The answer is not far to seek. The same selfish and blind incompetency which as late as the winter of 1916 sought to destroy the independence and integrity of the system of state forest protection by making it a part of the spoils system, when balked in this attempt, took revenge in so reducing the appropriations for state fire protection that the mere skeleton of an organization was left to cope with the problem. An area of forest as large as England was left in charge of so few men that each ranger had to oversee districts equal to the state of Connecticut in size. The appeals of the State Forester for proper support fell on prejudiced ears.

The suppression of forest fires in northern Minnesota is an immense task. The worst feature is that in dry times creeping fires penetrate the numerous peat bogs and there burn all summer, and can only be killed out by expensive trenching, yet at any time, when a hurricane arises, *any* of these fires can develop into the typical cyclonic sweep of flame which travels faster than a running horse and leaves not a living thing in its path.

The state forester called public attention to the existence of hundreds of these bog fires a few days before the holocaust, and warned the public of the extreme danger

of permitting them to burn. *No funds were left in the meagre state appropriation for extinguishing them.* Almost in echo to his warning came the unbelievably frightful destruction in the region south and north of Duluth.

The first step in preventing a repetition of this tragedy, doubly regrettable in war time, is the proper equipment of the state forestry organization with the funds they have needed and asked for. The second, without which no expenditure or effort by the state force will avail, is the determination of every citizen of northern Minnesota that forest fire must be banished from the region. A small blaze smouldering in a bog in an inaccessible tract of waste land is just as dangerous in Minnesota as a time fuse attached to a powder magazine in a munition plant.

Rumors have it that these fires were the work of pro-German and I. W. W.'s. No such explanation is needed. This appalling tragedy resulted directly, first, from the cynical indifference of the state legislature to the welfare of the public, and second, from the culpable carelessness of the settlers and residents in the ruined areas in permitting "harmless" fires to burn for weeks unattended, for lack of organized effort in extinguishing them.

EXPERTS of the National Lumber Manufacturers Association state that yellow pine lumber sufficient to lay a bridge floor 25 feet wide and 1 inch thick from the United States to France with 4,000,000 feet to spare, or an approximate total of 400,000,000 feet, was cut in American forests and transported to ship yards on the Atlantic and Mexican Gulf Coast for construction of wood vessels in a little more than a year.

## DIGEST OF OPINIONS ON FORESTRY

LET US HAVE YOUR OPINION. WILL YOU NOT CO-OPERATE WITH US BY IMPRESSING UPON THE EDITOR OF YOUR NEWSPAPER THE IMPORTANCE OF FOREST CONSERVATION?

Newspapers are giving fine space to matters pertaining to forestry. The readers of American Forestry will do a great work by impressing upon the editor of their newspapers the importance of conservation at this time. Please send us any comment you see. Here follow comment and news articles:

### CONVICTS IN FORESTS

Boston Post

What should be done, in addition to what is being done, for the prevention of forest fires? It is not only the great financial loss entailed, but it is the irreparable devastation wrought that every effort should be made to prevent. One of the great menaces to our woodland, greatest, in fact, of them all, is the litter of dead timber and accumulated brush. This inflammable material removed and the danger of forest fires would be lessened considerably.

It has been suggested that convicts should be employed at this work. The suggestion seems a good one. There can be no objection by labor bodies and the work would be beneficial for the reformation of the men themselves. Certainly convicts can be reclaimed better in the open than cooped up in granite cages so deadening to hope and so full of gloom and despair. This matter of employing convicts in our forests is important enough to attract the attention of our New England law-makers.

### APPEAL TO STOP WOOD WASTE

St. Louis Globe Democrat

Julius Koenig, St. Louis city forester, made an appeal to the realtors of the city for co-operation in what he determines the proper disposal of trees and branches which annually are cut down and destroyed here. Hundreds of trees and dead branches every year are carted to the city dumps to be destroyed with rubbish or thrown into the river, Koenig claims.

"In these days of strife, when everyone is asked to retrench and conserve in every possible manner," Koenig said, "it appears that a matter heretofore not considered as important should be brought to the attention of the public and put into immediate practice.

"Each year hundreds of trees and branches are cut down within the city and are hauled away to the city dumping grounds to be burned or disposed of in some manner which benefits no one. As a matter of conservation, it would be wiser to arrange some means by which this wood could be utilized for beneficial purposes.

"It has occurred to me that this timber could be utilized to good advantage for heating purposes by those for whom it is difficult to obtain fuel. A system could be arranged by which the trees and branches, when cut down, could be taken to some specified location where they could be cut into stovewood and distributed among those who are unable to purchase coal.

"Such an arrangement would not only help to solve the fuel problem in certain districts, but would also save the city the time and expense of hauling the wood to the dumps. Many people would be more than glad to purchase the waste wood for fuel at any reasonable price."

### MEMORIAL TREES

THE American Forestry Association has a nation-wide campaign on for the planting of trees as memorials to the nation's heroic dead and the idea has met universal approval, to judge by editorial and other current comment in the leading papers of the country.

The Trenton, New Jersey, *Times* says, editorially, that this suggestion has been made:

Every soldier or sailor who dies in the service of his country, the municipality from which he came shall plant and care for a tree in the public parks or along the streets, the tree to be dedicated to the memory of the dead hero. The suggestion is an excellent one and should be taken up and pushed by some one of the numerous organizations that are engaged in war work. It has both a sentimental and a practical value, and all the more commendable because of the fact that the War Conservation Board has decreed that no bronze or stone memorials to the dead shall be erected until after the war is over.

### Manufacturers Record

But in America the necessity for reforestation is no less urgent and important to our national welfare. True, we have not been compelled to use our wood in quantity for fuel, but our consumption in other lines has been enormous, and we must be ready to supply our Allies with enormous amounts for wood for aeroplanes, gun stocks and for construction work. Hence it is seen what a drain is imposed upon America's forests. But it will not cease with the war. Rather, from present indications, the demand for wood in most lines will increase for many years after peace is declared. Hundreds of prospective builders are waiting for the war to close to build houses, and many manufacturing plants which would make frame additions are holding off until after the war. There will be a great demand for wood for constructing and manufacturing purposes in all countries, particularly devastated France and Belgium, which must be immediately rebuilt once victory is attained.

The situation, therefore, demands the immediate adoption of a nation-wide reforestation plan. No greater service could be performed to help the future civilization than to make certain a supply of necessary woods in America. The sooner this campaign is under way the better. Forests cannot be established as can other war-working institutions. We must insure a supply of wood for any and all future emergencies by reforestation now.

### WOMEN TO TAP MAPLES

New York Times

Work in the orange groves of Florida and tapping trees for maple sugar in Vermont and New Hampshire are lines of winter work for the farmerette which were discussed at a meeting of the Women's Land Army of America at the Cosmopolitan Club.

### YANKEE TREES FOOL FOE

A make-believe forest stands along the edge of the road at the entrance to the American camouflage station. It looks as natural as the real woods along the fighting front, with the shiny silver bark of the heeches, the rough, jagged trunks of the old apple trees and the sprouting tops of the dwarf willows, says a correspondent of the Associated Press.

Yet every tree in the camouflage forest has a steel core within which an observer peers forth to watch the movements of an enemy or a machine-gun is located to sweep forth from its hidden recess. They are only one of the many strange devices to deceive and mystify the enemy which this American camouflage station is sending forth to the fighting army. camouflage station. It looks as natural as ducts of the war, even in the name, which was used for the first time by General de Castlenau, Chief of Staff of General Joffre. The word is not good French, but comes from the argot, or French slang, the verb "camoufler" being used by French police to indicate any disguise used to capture criminals.

### THE NEED OF TREES

Notwithstanding the exigent state of affairs in which the carrying on of righteous war is the transcendent aim, writes John Y. Culyer in a letter to the *New York Sun*, our thoughts might well be shared at this season by a consideration of the practical value of tree planting, a matter of common interest, as of other necessities in fact, upon which health, comfort and happiness depend, such as food for man and beast, water supply, fuel in the form of coal, wood and oil, the means of shelter, etc. Not far removed in its dreadful significance from the appalling destruction of human life abroad is the devastation, and in many instances the complete destruction, of the woods and forests, the parks and gardens of France, Belgium and other fields of the sanguinary conflict in progress.

"In our own country we can no longer delude ourselves with the boastful claim of an exhaustless timber supply. The shifting scenes of the lumber interests, the story of which is so startling as evidencing the magnitude of such inroads upon this once incomparable resource as to force upon us the widespread need of reproduction and the unremitting service of wisest conservation. Great areas of our middle Western States once invested with dense forests of valuable timber are now so bare as scarcely to yield a local supply of firewood.

The Middletown, Ohio, *News Signal* says

An oak tree is being planted along Tiffin's new \$100,000 river improvement for each soldier in Seneca county who has given his life for the cause of democracy on the battlefields of Europe, and the suggestion of Mrs. Henry S. Howland of Montclair, New Jersey

That a tree be planted in the town as a memorial for every soldier or sailor from the municipality who dies during the war occasioned favorable comment at a meeting of the Montclair Town Commission recently. The suggestion, made in a letter, was referred to Commissioner Harrison for consideration.

## BIG FOREST RESERVE IN NEW YORK

A forest preserve of over 2,000,000 acres is assured to the people of the State of New York, and the purchase of more than 200,000 additional acres is now being negotiated with the owners, according to a summary just compiled by Conservation Commissioner George D. Pratt. The summary represents what has been accomplished by the Conservation Commission in the eighteen months since funds became available under the \$7,500,000 bond issue which the voters of the State approved for the acquisition of lands in the Adirondacks and Catskills for State park purposes, says an Albany dispatch to the Philadelphia Record.

The figures show that, since the approval of the bond issue, 460,731 acres of forest land have been offered for sale to the State, of which, after deducting such tracts as by their location were manifestly unsuitable for forest preserve purposes, 411,650 acres have already been examined and appraised by the Commission's foresters. This is an area almost one-quarter the size of the entire forest preserve owned by the State previous to the bond issue, which has gradually accumulated since the year 1833.

Of the 411,650 acres, of which the Conservation Commission has completed its inspection, it has agreed upon a price for 171,045 acres, and recommended their purchase to the Commissioners of the Land Office. This board has so far approved the acquisition of 156,398 acres—135,398 in the Adirondacks and 21,000 in the Catskills—and passed the cases on to the office of the Attorney General for the necessary examination of titles. The lands purchased in the Adirondacks average \$5.79 per acre, and those in the Catskills \$7.10 per acre. Altogether, a total expenditure of over \$900,000 is involved.

## GROW TREES, SAVE PAPER

Trenton Evening Times

Timely recommendations are being made by the American Forestry Association, looking towards the growing of trees and the saving of paper for the conservation of wood pulp and wood.

Following the recent recommendation that trees be planted along highways and elsewhere as memorials to men in the service, P. S. Ridsdale, secretary of the association and editor of the Forestry Magazine, now backs up his production plea with a new conserving scheme. He advocates the writing of the carbon of your answer on the back of each business letter you receive.

This not only saves much paper, but also conserves filing and filing room and gives a compact record of business transactions. Mr. Ridsdale takes his own medicine and finds this plan works admirably in his own department, as well as in his own private office.

The need of saving paper is apparent when it is known that in 1918 America will use seven million cords of wood in the making of paper, a truly tremendous drain on our forests.

## SAVE THE TREES

East Liverpool Review

The forest fires which swept Minnesota and Wisconsin recently were deplorable, not only for the tragic loss of life and the destruction of thousands of feet of lumber, but also because of the loss of the tree themselves. To love trees and understand their value, to be actively interested in their preservation, to guard in every possible way against their unnecessary destruction, and when a tree falls to plant a tree, is mere evidence of intelligence in man or nation

## PENNSYLVANIA TO PLANT WALNUT TREES

The project of John M. Phillips, of Pittsburgh, member of the State Game Commission, to have as many black walnut trees planted as possible by the people of Pennsylvania this fall, has been given the unqualified approval of that veteran woodsman and hunter, Dr. Joseph Kalbfus and the support of men connected with the State government, says a Harrisburg dispatch to the Philadelphia Inquirer. Robert S. Conklin, State Commissioner of Forestry, has been an advocate of tree planting, especially the nut bearing trees, for years and Dr. Nathan C. Schaeffer, State Superintendent of Public Instruction, is out with a proclamation that everyone should plant a tree next month.

"Mr. Phillips' idea of planting walnut trees is splendid and I hope everyone who can do so will plant as many as possible," said Dr. Kalbfus. "The tree is a valuable one, not only for its wood, but for its shade. This is the time of the year to get ready for it and I would like to see thousands planted. Ten years from now we would be thankful for it. The way to plant the tree is to have it so arranged that they can be thinned out and be spaced about forty feet apart. Get the nuts with the hulls on, crush the hull slightly and plant in about four inches of earth. Don't forget to plant hull and all."

## THE WOODS AND THE WAR

Washington Post

If you want to forget the world war, accept the welcome of the hospitable woods and leave your troubles to the wind and the trees. There are no first-page headlines there. No talk of armistice. No clamor of war. No peace negotiations. No transatlantic conversations. No electioneering. No Politics. No adjournment. No food and fuel conservations. No tirades from the President. No tirades from former Presidents. No rattle of sahors. No scratching of pens. No delays in the mails. No vain telephone calls. No crowded cars. No liquorless hars.

Just now autumn's gay robes are fading. Gold and scarlet are turning to lemon and brown. The great beeches are already bare, but the royal oaks still flaunt their crimson vestments. White caravels sail in the sapphire sky.

Listen, and the whispering leaves will tell you of peace. The sunbeams will dance in the shadowy mazes to convince you that life—real, free, fresh, open-air life—is still filled with rapture. Your eye will sparkle and your heart heat higher. The air has the rich fragrance of sun-kissed, purple Burgundy. The October tonic is a sovereign specific for all the ills of mind and heart. None here can be homesick or heartsick. The cool breezes will smooth the wrinkled brow and quiet the feverish brain. No crowds. No haste. No worry.

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## MAPLE SUGAR TREES

Investigations recently made in western North Carolina by M. W. Hensel, specialist in sugar plants for the Agricultural Extension Service, show that there are enough maple trees in this section to produce not less than 3,750,000 pounds of sugar annually, and that there is a strong possibility of this reaching 5,000,000 pounds. If properly worked these trees would produce this amount in a period of from four to eight weeks, or from about February 1st to April 1st, says a Raleigh dispatch to the Christian Science Monitor.

## PLANTING WALNUTS

Massillon, Ohio, Independent

There are comparatively few black walnut trees left in the United States. Many persons have feared that the widespread quest of walnut for gunstock material would result in the utter extermination of this valuable tree.

## SUSPICIOUS FOREST FIRES

St. Louis Post-Dispatch

Great destitution and suffering ordinarily follow forest fires of the extent of those reported from Minnesota. The appeal for the relief of the victims will be urgent and moving. State officials estimate that 100 square miles of territory have been devastated and 21 towns destroyed or damaged. They place the number of known dead at more than 200, expressing fears that it may reach 500. The most disquieting detail is that the fire, which wiped out vast amounts of timber useful for war purposes and other property was caused by incendiaries, presumably serving enemy ends. Domestic terrorism and destruction in the enemy interest would reach a climax in this disaster, if this charge is substantiated, exceeding even the scale of successful operations against steel works, munitions plants and docks.

The mere suspicion of a cause of this nature imposes the duty of a rigid sifting of the facts. A duty with priority even over this is to ascertain the measure of relief needed and supply it.

## TIMBER FORESTS IN IRELAND

The Christian Science Monitor

Dublin, Ireland—Lord Powerscourt recently entertained the Irish Forestry Society on their annual summer excursion to the Powerscourt demesne. Between 30 and 40 members were present, including Professor Henry of the Royal College of Science, Mr. Knowlden, secretary of the Irish Forestry Society, and Mr. R. J. Kelly, K. C. Lord Powerscourt, who conducted the party through the beautiful woods and plantations, said that he hoped they would make their visit an annual one. He told them that his father had done a bold thing in the forestry line. He had selected a barren rocky patch of mountain and had spent some hundreds of pounds in planting a wood of over 400 acres. He himself had reaped the benefit. The wood had tided him over many difficulties and had stood well by him in these times when the difficulties in timber were so great. People with money were scarce and he thought the only thing to do as regards forestry was to try and compel the Government to do its duty and set up a state forestry department. The timber problem was one of extreme importance and neither the Irish Forestry Society nor any other society could deal with it. It was a problem to be solved by the Government and by the Government alone.

## RICHES IN PINE WASTE

The industrial value of a full grown pine tree is no less than five times what we get from it, writes Arthur D. Little in "Chemistry in Overalls." If, of all the yellow pine cut, the entire trees were used not only as theoretical science teaches, but according to known and proved methods of applied science there would be added to the estate of the American people every day 40,000 tons of paper, 3,000 tons of rosin, 300,000 gallons of turpentine and 600,000 gallons of ethyl or grain alcohol, together with the fuel for these industries and the lumber we get as it is.

## SAVE THE BIRDS!

Charleston News and Courier

The advantages of preserving the insectivorous song and game birds have never been more apparent than now, and it is a gratifying fact that the last three or four years have shown a wonderful increase in bird life in this State.

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## BOOK REVIEWS

**Manual of Tree Diseases**, by Howard Rankin. The Macmillan Company, New York City. Price \$2.50. This volume treats of the diseases of the more common trees of the United States. The discussions are grouped into chapters under the common name of the tree affected and the chapters are in alphabetical order, which facilitates the use of the book for reference. In one general chapter are included discussions of the diseases common to all kinds of trees, such as sapping off of seedlings, temperature injuries to leaves and woody parts, smoke and gas injuries, woodrots, etc. The species of trees affected, their geographic distribution, the symptoms of the different diseases and their particular destructive qualities are presented fully and clearly. The casual agent of the disease is briefly described and when it is caused by a parasite, some descriptive details of the life history of the parasite are given, with valuable suggestions as to control, and tree surgery is given separate and special treatment.

**Our National Forests**, by Richard H. D. Boerker. The Macmillan Company, New York City. Price \$2.50. Dr. Richard H. Douai Boerker, who has for more than ten years been in close contact with the federal forestry movement, in his new book, "Our National Forests," covers the subject exhaustively and, at the same time, in a most readable manner. The book is divided into four parts: I. The Creation and Organization of the National Forests. II. The administration of the National Forests. III. The protection of the National Forests. IV. The Sale and Rental of National Forest Resources.

That the disappearance of forests means the ultimate disappearance of everything in civilization that is worth while may seem like a broad statement but that it is a truly accurate one is proved conclusively in Dr. Boerker's interesting and stimulating study. According to the author of this scholarly survey, the sins committed against a nation's forests are visited again, and swiftly and surely, upon the inhabitants thereof. The punishment may take the form of timber famine, or it may express itself in failure of water power. Floods are another terrible form of punishment visited upon those who neglect and misuse forest resources. Following closely in the wake of floods come the covering of fertile bottom-lands with gravel, boulders and debris ruining the land beyond redemption. Erosion of soil is another inevitable consequence of for-

est abuse and neglect. Last, but not least, the drying up of springs and the transition from a luxurious, well-watered country into a veritable desert is the inevitable result of forest misuse.

Solemnly biblical, Cassandra-like and out-of-date as all this may sound, it is, none the less, a very present and real danger, a following of cause by effect, the visiting upon the negligent, the prodigal and the unwary of swift and terrible penalties in the present and future as in the dim past.

### BURN WOOD—SAVE COAL

**W**OOD is to play a conspicuous part in the nation's work again this winter, according to an announcement of the United States Forest Service. An appeal has been issued to farmers who own woodlands and people in cities, towns and villages who can purchase wood from nearby farms to help in the coming winter—as last winter—to relieve the demand for coal and the strain on railway capacity by burning wood in place of coal. And responses to date indicate that the American people who can will do this very thing.

It is not expected that the substitution of wood for coal will be universal, but it is declared that for heating many kinds of buildings wood is the more convenient and cheaper fuel. This is particularly true in the case of churches, halls and other buildings for which heat is required only occasionally, but then is wanted in large volume on short notice.

The most common method of making cordwood is to cut the trees into four-foot lengths with an ax and split the larger pieces, which are then piled in a standard cord, eight feet long, four feet high and four feet wide. The contents are 128 cubic feet, of which 70 per cent is wood and 30 per cent air. Wood cut four feet long can be sold to brickyards, limekilns, metal-working plants and other industries, but is too large for household uses.

Another method, and one better adapted for old growth hardwoods, which are difficult to split, is to saw the tree into logs of convenient lengths, say from ten to fifteen feet. These are "snaked" out to the edge of the woodland and there sawed into lengths and split into sizes proper for the stove or furnace. The sawing is usually done by machine, driven either by gasoline or by electricity. The wood is piled four feet high and eight feet long, such a pile being called a "stove-wood" or "running" cord.

Firewood is expected to bring a better profit this year than ever before. It is a much less perishable crop than many which the farmer raises. When properly piled the better kinds of wood will last from two to three years.

## CANADIAN DEPARTMENT

BY ELLWOOD WILSON

PRESIDENT CANADIAN SOCIETY OF FOREST ENGINEERS

THE special propaganda car of the Canadian Forestry Association which has been touring the Eastern Provinces in the interest of forest protection, was unfortunately in a collision and somewhat damaged. Fortunately very little of the equipment was injured and Mr. Black, the indefatigable Secretary of the Association, immediately transferred his exhibits to another car and is continuing his trip. The success of the tour has been remarkable and much benefit is expected from it.

The epidemic of influenza has had a disastrous effect on logging operations. Labor

will be finished in the spring. The sample plots already laid out are most interesting and much information of extreme value to foresters and lumbermen will be obtained each year.

The Entomological Branch of the Department of Agriculture has just issued the second volume of Prof. J. M. Swaine's book of the Canadian Bark-Beetles. This is an extremely interesting and valuable work, well gotten up and illustrated, with keys for identification. Foresters will find it very useful. We are coming to realize



Underwood and Underwood—British Official Photograph

### TIMBER!

Falling a tree in a French forest, and the operation is being watched with great interest by the official party of Canadian journalists who recently visited France.

was already very scarce and so many men have been ill that the cut of logs for the coming winter will be very small. This is the time of year when the cutting goes ahead the easiest and the most rapidly and it has been practically lost. Sanitary conditions in the logging camps, none too good at the best of times, became very bad when the grippe attacked them and it has been necessary to send doctors and nurses in to help the men.

The Commission of Conservation had begun the building of a permanent camp near the sample plots established by Dr. Howe during the past summer and the frame is now up and a temporary roof on and this

more and more that insect ravages of our forests are only just secondary to those of fire and that measures must be taken to protect our trees from insects and fungi. We have so little knowledge of the life habits of these pests that much work must be done in many cases before any intelligent means for control can be taken. It would seem as if one of the first steps would be the destruction of all logging debris by fire so that many of the insects and fungous diseases would have no breeding place.

George Chahoon, Jr., President of the Laurentide Company, has given his services to the Government and is in charge of the



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executive work of one of the Government plants for making poison gas. Mr. Chahoon has always taken a great interest in the development of Forestry and is a member of the Canadian Society of Forest Engineers and a Director of the Canadian Forestry Association. The founding of the St. Maurice Forest Protective Association was in large measure due to his support and active co-operation. All movements for the protection and perpetuation of the forests had his active interest. Mr. Van de Carr, Superintendent of the Ground Wood Mill of the same company, has followed Mr. Chahoon into gas work.

The increasing interest being taken by lumbermen and pulp and paper manufacturers in forestry matters is very encouraging and it is safe to say that as far as eastern Canada is concerned forestry has made as much if not more progress than on any part of the continent and that future prospects for practical forestry are very bright.

### IMPORTANT FOREST LEGISLATION IN CANADA

**T**HROUGH the representation made by Clyde Leavitt, Chief Forester for the Conservation Commission, and the very active interest of the Deputy Minister, Col. T. G. Loggie, who has advocated such and Mines, Hon. E. A. Smith, a new Forest Act was passed, and the Forest Fires Act revised during the last session of the legislature. These two acts comprise the most advanced piece of legislation concerning forest protection on the continent.

The Forest Act provides for a Crown Land Advisory Board composed of the Minister of Lands and Mines, Deputy Minister, Provincial Forester and two others; one elected by the Crown Land licensees and one chosen by the Minister to represent the granted forest land owners. This advisory board has the power to make all permanent appointments and to supervise all matters in relation to the Forest Act.

It provides for a sufficient fund to carry on the administration of the Crown lands, for the division of the Province into districts, and for the appointment of Forest Rangers by competitive examination on a merit basis for these districts. The rangers' duties include fire protection, scaling and the protection of game.

The examination for forest rangers consisted of a written test on fire protection and scaling, an oral test and an actual scale of a large number of logs. The examination was modeled after the U. S. Forest Service examinations and worked out fairly well to all concerned.

The Board of examiners consisted of the Provincial Forester as Chairman, one expert scaler, and one practical lumberman and woodsman.

It is interesting to note that 152 men wrote the examinations, that 76 passed and that the appointments of rangers and inspectors to the thirty-six districts in the Province have been practically completed from the pass list irrespective of any political influence or patronage.

Moreover, it is the aim of the present Minister of Lands and Mines to keep the administration of his Department entirely free from politics and to build up a permanent organization on a strictly merit basis.

Through the continued co-operation of the New Brunswick Government and Railway Commission, the work of fire protection along the right of way was continued with beneficial results, and it is worthy to note that both the Provincial Fire Inspector and his assistant for the Railway Commission are university graduates in forestry. It was the first year that systematic locomotive inspection was carried out by the inspectors in New Brunswick.

The co-operation between the New Brunswick Government and the Canadian Government Railways was much improved. The concession of the General Manager of this Railway to the New Brunswick Government's inspectors to examine their locomotives for fire protective appliances resulted in considerable improvement in the fire situation; nevertheless it is felt that much better results can be obtained if the Canadian Government Railways were placed under the jurisdiction of the Railway Commission of Canada.

Much credit is due to the Canadian Forestry Association for the interest taken in the progress of forestry in this province especially so in the distribution of propaganda relative to fire protection and legislation. Through co-operation with the Dominion Forestry Branch, this Association had Mr. Doucet give a series of lectures on fire protection in northern New Brunswick. The operation of a demonstration car in conjunction with a series of illustrated lectures in this Province, during the latter part of the season, was the outcome of the Association's activities. The work of this Association is highly appreciated, and the Government hopes to continue in co-operation with the Canadian Forestry Association in the future.

In co-operation with the Dominion Branch of Plant Pathology the Government obtained the services of Professor R. B. Miller, Dean of U. N. B. Forest School for part of the time, and his investigation study of plant and tree diseases are of the greatest importance.

Mr. Tothill of the Dominion Entomological Staff has continued his investigations of the spruce bud worm in this Province. Mr. Swain spent nearly a month on areas in New Brunswick infested with the bud worm, making a study of the bark beetle and wood borer that follow in the wake of the pest.

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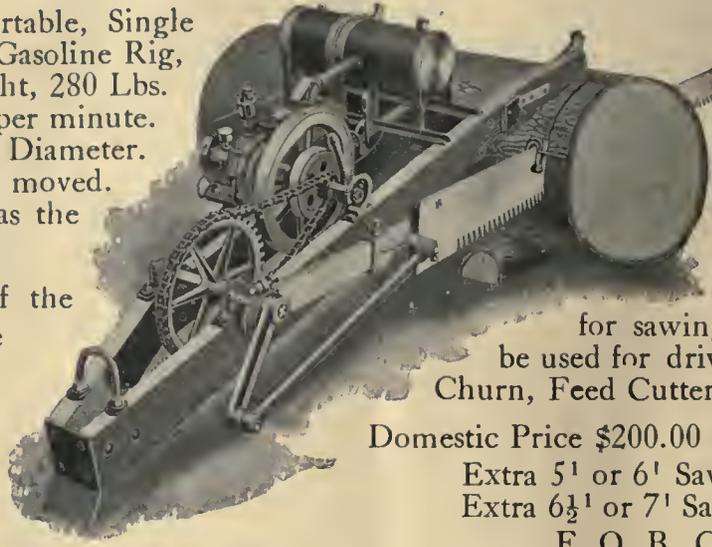
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