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# American Forestry



An Illustrated Magazine about Forestry and Kindred Subjects Published Each Month by the American Forestry Association

CULTY OF FOREST... Washington, D.C.



Simple Open-Tank Creosoting-Plant. Tank 2'6" deep, 4' wide and 22' long, constructed entirely of wood and lined with galvanized sheet iron, soldered at all joints. Used for treatment of timbers and boards for roof over machine-room of paper-mill.



8 x 12 inch timber destroyed by decay after nine years' service in a paper-mill.



Open-Tank Creosoting-Plant. Note the steam supply-pipes in the foreground and the steam-pipes in bottom of tank arranged in two coils of three lengths each; also the overhead two-ton chain-block traveling-hook.

# "Fungous Growths Destroy Many Wooden Roofs

"New England Structures Suffer Heavy Damage from Dry-Rot"

The above quotation is the caption of an article which appeared in the *American Lumberman*, issue of January 6, 1917, describing in detail the large loss, due to decay of roof-boards and timbers in cotton- and paper-mills.

Creosoting such material properly will prevent this loss and probably more than double the life of roofs so exposed. This may be done by the Open-Tank system of treatment, which is economical and adaptable to nearly all conditions.



Creosoted wood *does not increase* the fire-hazard. When thoroughly seasoned after treatment it will not ignite more readily than untreated wood, and in fact treatment with creosote tends to retard combustion.

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" \* \* \* a heavy plank roof is the ideal covering for a cotton-weave shed, provided that it won't rot." (Quoted from article mentioned.)

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# AMERICAN FORESTRY

THE MAGAZINE OF THE AMERICAN FORESTRY ASSOCIATION

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JULY 1917 VOL. 23

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## SALE OF TIMBER RED LAKE INDIAN RESERVATION.

SEALED BIDS, MARKED OUTSIDE "BID, Red Lake Timber," and addressed to Superintendent of the Red Lake Indian School, Red Lake, Minn., will be received until 12 o'clock noon, Central Time, September 26, 1917, for the purchase of timber upon about 51,300 acres within Township 150 N., Ranges 32, 33, 34, and 35 west; Township 151 N., Ranges 32, 33, and 34 West. The sale embraces approximately 72,000,000 feet, of which about 65% is white pine, about 27% Norway Pine and the remainder Jack Pine, Spruce, Balsam, Cedar and Tamarack. Each bid must state for each species the amount per thousand feet Scribner decimal C log scale that will be paid. The minimum prices per M feet, B. M., which will be accepted are as follows: White Pine \$10, Norway Pine \$8, Spruce \$5, Tamarack \$3, Jack Pine \$3, Cedar \$3, Balsam \$2.50, Cedar and Tamarack ties \$0.08, Spruce and Balsam pulp \$1 per cord. Cedar tops, 7 feet long, 3 and 4 inch tops, \$0.01; 7 feet long, 5 to 7 inch tops, \$0.015; 8 feet long, 4 to 7 inch tops, \$0.02; 8 feet long, 8 and 9 inch tops, \$0.05; 10 feet long, 4 to 7 inch tops, \$0.025; 10 feet long, 8 to 10 inch tops, \$0.08; 12 feet long, 4 to 7 inch tops, \$0.03; 14 feet long, 4 to 7 inch tops, \$0.035; 1. feet long, 4 to 7 inch tops, \$0.04; 18 feet long, 4 to 7 inch tops, \$0.06. Cedar pulp, 20 feet long, 4 to 8 inch tops, \$0.08; 25 feet long, 5 to 8 inch tops, \$0.12; 30 feet long, 6 to 8 inch tops, \$0.30; 35 feet long, 6 to 8 inch tops, \$0.60; 40 feet long, 7 to 9 inch tops, \$1.25; 45 feet long, 7 to 9 inch tops, \$1.50; 50 feet long, 7 to 10 inch tops, \$2.25; 55 feet long, 7 to 10 inch tops, \$3; 60 feet long, 7 to 10 inch tops, \$4.50. Each bid must be submitted in triplicate and be accompanied by a certified check on a solvent National Bank in favor of the Superintendent of the Red Lake Indian School in the amount of \$2,500. The deposit will be returned if the bid is rejected, but retained if the bid is accepted, and the required contract and bond are not executed and presented for approval within thirty days from such acceptance. The right to reject any and all bids is reserved. For copies of the bid and contract forms and for other information, application should be made to the Indian Superintendent, Red Lake, Minnesota, Washington, D. C., July 13, 1917. CATO SELLS, Commissioner of Indian Affairs.

## SALE OF TIMBER FLATHEAD INDIAN RESERVATION

SEALED BIDS MARKED OUTSIDE "BID Flathead Timber, Ronan Unit" and addressed to Superintendent of the Flathead Indian School, Dixon, Montana, will be received until twelve o'clock noon, Mountain time, Tuesday, September 11, 1917, for the purchase of the merchantable timber upon tribal and allotted lands situated within Sections 4 and 5 T. 19 N. R. 19 W.; Sections 5, 6, 7, 8, 9, 10, 15, 16, 17, 18, 19, 20, 21, 22, 27, 28, 29, 32, 33, and 34 T. 20 N. R. 19 W.; Section 21, 22, 27, 32, 33, and 34 T. 21 N. R. 19 W.; Section 1 and Section 12 T. 20 N. R. 20 W. M. P. M. containing approximately 57,000,000 feet of timber, over 80 per cent Western Yellow Pine. Each bid shall state the amount per thousand feet B. M. offered for Yellow Pine (including "bull pine") and the amount per thousand feet offered for Fir, Larch and other species. Each bid must be submitted in triplicate and be accompanied by a certified check on a solvent national bank, drawn in favor of the Superintendent of the Flathead Indian School, in the amount of \$2500. The deposit will be returned if the bid is rejected, and retained as a forfeit if the bid is accepted and the bond and agreements required by the regulations are not furnished within 60 days from the date when the bid is accepted. No bid of less than \$3 per thousand feet for Yellow Pine and \$1.25 per thousand feet for Douglas Fir, Larch and other species will be accepted. The right to reject any and all bids is reserved. Copies of regulations and other information regarding the proposed sale including specific description of the sale area may be obtained from the Superintendent of the Flathead Indian School, Dixon, Montana.  
Washington, D. C., May 4, 1917. CATO SELLS, Commissioner of Indian Affairs.

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# AMERICAN FORESTRY

VOL. XXIII

JULY 1917

NO. 283

## CAN AND CANNON; DRIER AND DREADNAUGHT

BY NORMAN C. McLOUD

**I**NSPIRED by the success of the Home Gardening campaign the Conservation Department of the American Forestry Association is now coöperating with the National Emergency Food Garden Commission in giving attention to the proper handling of the national abundance produced by 2,000,000 or more food gardens. In this work lies Conservation in its highest form. Production is but the first step in the fight against possible war-time scarcity of food. The next step is to insure the wisest and best use of nature's abundance. Waste must be eliminated. Every pound of foodstuffs must be utilized for food. In no other way can the nation reap full reward for the labors of its Home and Community Gardeners. To do this calls for Home and Community Canning and Drying on a national scale. To bring this about is the present aim. In this movement there is need for help from the individual membership of the American Forestry Association. By spreading the gospel of Food Thrift, by encouraging the people of their communities to can or dry all vegetables and fruits that can be canned or dried, and by helping to give the widest possible circulation to the Canning and Drying Manuals issued by the Commission the members of the Association will be making constructive contribution to the cause of Food Conservation.

**F**OOD Conservation by Canning and Drying in the homes of America is the object of a nation-wide campaign now being conducted by the National Emergency Food Garden Commission of Washington, D. C. In coöperation with the Conservation Department of the American Forestry Association the Commission has been instrumental in causing the most remarkable Home Gardening movement the world has ever known. Comprehensive survey of the country has enabled the Commission to announce that more than two million food gardens have been planted and cultivated this year. Most of these were on ground on which no planting had been done in the past. The estimated value of the crop is over \$250,000,000. The present aim is to insure the wisest and most effective use of the vast surplus of garden stuff created on this newly discovered planting area.

Even a small garden plot will produce more vegetables than the average household can consume during the growing season. This is Nature's way of providing for the future. It is no part of Nature's scheme of things that the surplus should go to waste. The obvious intent of summer's over-abundance is that it should be converted

into an unfailing source of supply for the needs of the winter. To do this calls for an army of Home Canners and Home Driers. These are as important as the army of Home Gardeners. In some respects they are even more important. For this reason an urgent summons has gone forth drafting the Soldiers of the Soil to the battle against waste. The can is as much needed as the cannon; the drier is as important as the dreadnaught or the submarine.

The battle cry of the home gardening movement was for food "F. O. B. the Kitchen Door." The new call is for food "F. O. B. the Pantry Shelf." Unless garden products are saved for winter use much of the labor of the Home Gardeners will have been for naught. They will have had the benefit of summer enjoyment of their

food products, but they will miss the greater benefit that comes from providing for the winter. With appetites adjusted to the unprecedented abundance of this year's growing season, American families can ill afford to go into the winter months without provision for a liberal supply of the vegetable products that have contributed so much to their summer enjoyment and physical health. Pal-



CARROTS FOR THE WINTER

When sliced lengthwise and properly dried, carrots appear as here pictured. Their appetizing appearance is enough to convert any household to the movement for food conservation by Drying and Canning in the home.

ates trained to home-grown vegetables, and pocket-books trained to the money saving made possible by Home Gardening, will find the sting of winter sharpened if they fail to save everything that can be saved. To effect this saving means that we must Can all food that can be Canned or Dry all food that can be Dried.

As a result of modern methods, vegetables and fruits canned at home closely resemble the products in their natural state. With most of them no cooking is required in preparing them for winter storage. The single period, cold-pack method, as developed by latter-day science, reduces home canning to its simplest terms. The name of the method indicates its simplicity. The vege-

kitchen oven or just above the top of the stove. In this way even so small a quantity as a handful of peas, a few sweet potatoes, or even a single turnip may be prepared for the winter. This affords an effective means of food thrift in that it makes possible the saving of left-overs. If small quantities are thus treated from day to day the household will be surprised at the ease with which a considerable quantity may be accumulated.

Drying operations on an even larger scale may be conducted with outfits made at home. A tray, consisting of strips of wood with galvanized wire bottom, may be used over the stove or in the sun. In a still simpler form this tray may be made of a piece of galvanized wire



CANNING ENTHUSIASM KNOWS NO AGE LIMITS

This is a picture taken at a canning demonstration in a school house. The demonstration was conducted by official leaders in cooperation with the school authorities. By no means all the enthusiasts here pictured are school children. In the group may be seen many of an older generation. All of those in the audience are eagerly seeking expert counsel and direction as to home canning.

tables or fruits are packed cold and uncooked. Vegetables are covered with boiling salted water and fruits with hot sugar syrup. The jars are then sterilized in boiling water or steam, to kill bacteria and prevent spoiling, and the finished product is ready for sealing and storage. The simplicity of the process commends it to every household.

Drying is even simpler than canning. It may be accomplished with little or no expense for outfits or containers. The simplest form is sun drying. On hot, dry days sliced vegetables and fruits are exposed to the sun, on sheets of unprinted paper or lengths of muslin. This will give a perfect product, if care is taken to prevent exposure to insects and to rain or dew. Insects can be kept away by a covering of cheesecloth. Another simple form of drying is to place vegetables or fruits in the

netting with the edges turned up for an inch or two on sides and ends. More complete driers for cookstove use may be made at home with slight outlay, or they may be bought for as little as \$3.50. Driers of larger size and more conveniences may be had at prices ranging from \$16.00 to several hundred dollars.

In canning and drying the work may be done in the individual home or by groups of families. By forming a club and carrying on the work at a schoolhouse or other central place any number of households may purchase the most improved equipment at slight individual cost and have the advantage that arises from the use of the best facilities as well as having the benefit of neighborly rivalry. Community canning and drying are especially recommended as producing the best possible results.

The imperative need for Food Thrift was recognized



by the National Emergency Food Garden Commission months ago. Anticipating the vast production that would result from its campaign for the planting of Home Gardens, the Commission began its propaganda for canning and drying before the first garden crops were harvested. The campaign has been conducted with the same nation-wide organization that made the gardening campaign so successful. It is now in full swing and will be continued throughout the season with a persistence and thoroughness that will cause it to reach practically every household in the United States.

As a part of the campaign of Home Education in saving food products for winter use, the Commission has issued two booklets for general distribution. One of these is the Home Canning Manual, giving detailed instructions for the conservation of vegetables and fruits by the single period, cold-pack process. In this pamphlet are embodied the results of research work by recognized experts, and every effort has been made to have the manual a complete guide to canning operations in the home and in community clubs. The companion booklet is the Home Drying Manual, intended to serve the same purpose in connection with the drying process. In this pamphlet explicit directions are given for the preservation of a large variety of vegetables and fruits by sun drying, by the use of artificial heat, and by the use of the electric fan. Directions for pickling and for storage are also included.

These manuals are similar to the Home Gardening Primer issued by the Commission during the planting season, several hundred thousand copies of which have been distributed throughout the United States. Copies of the Home Canning Manual and the Home Drying Manual may be had upon request from the offices of the National Emergency Food Garden Commission at 210-220 Maryland Building, Washington, D. C. Two cents for postage should be enclosed with each request for one of these booklets. There is no charge for the manuals themselves.

The publication of these manuals is only a part of the campaign of education. As was the case in the

gardening campaign, the Commission is conducting a national school in coöperation with newspapers all over the country. Daily lessons in canning and drying are furnished these newspapers and are being printed in nearly two thousand publications.

As a result of this splendidly organized educational work, no household will have an excuse for failure to do its share in the conservation of the nation's food supply. All information needed to make expert canners and driers of the people of America is available through the medium of the manuals and the daily lessons published in the newspapers. The intention of the Commission is that no household shall be overlooked.

Everybody is

needed in the army of canners and driers. Every request for a booklet will be cordially welcomed and every possible encouragement afforded those who are ready to do their share in the great fight against the waste of food.

From every part of the country and through countless channels comes proof that America is already deeply stirred over the food question. Prices for everything that enters into the daily diet of a hundred million people are abnormally high. With this condition prevailing during the season of production, it is evident that the winter months will bring widespread hardship unless due heed is given the imperative demand for thrift in the use and saving of Food.

The battle cry of Food Thrift is directed to every household in America. Its urgency should be impressed on every good citizen, regardless of age, sex, or condition. Those who have done canning and drying in the past should this year engage in these activities on a larger scale than ever before. For those who have not done these things in the past, wartime is the time to begin. Never again will the American Home have the same opportunity to serve the American Nation.

To become a canner or drier of vegetables and fruits it is not necessary that one should be a home gardener. For those who have their own gardens, of course, the



COMFORT AND UTILITY

By the use of the electric fan it is possible to achieve excellent results in drying vegetables and fruits. The picture shows trays stacked in front of the fan, with the air current directed lengthwise in relation to the trays. The method is extremely simple.

matter of summer preparation for winter food supply is already partly solved. With an abundant supply of green stuffs of their own raising, they are independent from the very outset. To non-producers, however, the call for canning and drying is in no measure less urgent. Even though they must buy their vegetables and fruits for canning, they will find that the money saving will be very large, for the reason that the buying



AT HOME WITH A ROTARY SLICER

The housewife in this picture is preparing sweet potatoes for the drier, with the aid of a rotary slicer. She has already cut the potatoes into slices and is now cutting these slices into strips, with the same machine.

Various causes contribute to this increased cost. Not the least of these is that the winter supply of storage goods and canned products lacks competition with the fresh products. With all merchandise the markets are ruled by the laws of supply and demand. In the growing season the supply is so great as to keep prices at the lowest level. During the winter, when production is stopped, the canned goods and the storage goods have the market to themselves. That prices should then be much higher is one of the plainest truths of economics. For this reason the individual household must provide its



POTATOES THAT APPEAL

Note these potato strings and imagine how you would like them stored away for immediate use at any time during the winter. They have been cooked, passed through a grinder and then dried. By elimination of the moisture they are reduced to size that takes little storage room.

own means of furnishing competition. The one way in which this can be done is by canning and drying while the supply is plentiful. To do this is helpful in two directions. It utilizes the vast surplus that would otherwise go to waste, and it makes the household independent of the high prices of the winter season.

Another factor making for higher prices during the winter is that divers intermediate charges and profits are added to the price before they reach the consumer. The cost includes the charges for cold storage, for warehousing, for transportation, for distribution, and for many

other phases of commercial necessity, to say nothing of the interest and dividends which must be earned on the invested capital of every agency concerned in preparation, distributing and selling. With vegetables and fruits canned at home even the non-producers are freed from the tax properly placed on winter purchases. They pay for no handling except that connected with the market operations of the fresh supply. From the various charges and profits connected with goods bought during the winter they are entirely immune. In this they are on even terms with the home gardeners after the first cost of the green stuffs.

Of similar importance is the national need for reducing the strain on the transportation facilities of the country. With the vast shipments of munitions and countless other forms of war merchandise now taking place, the railroads are already strained beyond their powers. With the approach of winter this strain will be tremendously increased. Authorities agree that next winter will see freight congestion throughout America on a more appalling scale than has ever been experienced. The importance of this in its relation to food supply can not be overemphasized. If the homes of America permit themselves to face the winter with their usual dependence on the corner grocery and the storage warehouse for their foodstuffs they will be inviting tragedy in the form of high prices and



AN ARGUMENT IN FAVOR OF DRYING

Nothing could be more inviting than this plate of foodstuffs prepared for drying. This shows the results to be achieved, as to uniformity and appearance, by using a mechanical device for preparing shreds or strips of vegetables.

shortage. If they engage in a drying and canning campaign of preparedness they will be inviting independence, and at the same time they will be relieving the traffic situation. If twenty million families, or even ten million, are able to draw on their own storerooms for canned goods and dried products the relief to the traffic situation will be tremendous. So vital is the need for this relief that even if there were no question of preventing waste the urgent need for canning and drying would be enough to justify the stress now being placed upon them. With the double reason the requirement is such as to be the patriotic duty of every household. No family can afford to ignore this duty. No family can afford to be a food-slacker in this time of war.

Recognizing the tremendous need for canning and drying, the National Emergency Food Garden Commission, in its manuals on Home Canning and Home Drying, has laid great emphasis on the importance of these activities. This advice is fundamentally sound and is based on the knowledge and counsel of the nation's leading students of food conservation and the serious problems involved in the present situation. In its treatment of the subject the Commission has undertaken to drive home to every household and every good citizen the duty of the individual in connection with the food supply of the nation and its European allies. So tersely expressed are these arguments, and so irrefutable, that they are reproduced herewith.

"To save vegetables and fruits by Canning this year is a patriotic duty," says the Commission in its Manual on Canning. "The war makes the need for Food Conservation more imperative than at any time in history. America

is responsible for the food supply of her European Allies. The American family can do nothing more helpful in this emergency than to Can All Food that Can be Canned. In this way the Abundance of the Summer may be made to supply the Needs of the Winter.

"To do this means the practical application of the principles of Food Thrift. It means the elimination of Waste. The situation demands that every American should do his share toward increasing the Food Supply of the World. It is time to begin starving the American Garbage Pail. It is time for every woman to enlist in the Army of Canners. It is time for the conservation of food."

In its introduction to the Manual on Drying, the Commission says:

"Drying vegetables and fruits for winter



EVAPORATOR FOR USE ON COOKSTOVE

The fair Conservationist in this picture is placing a tempting array of apple rings on an evaporator which she bought for \$6.00. This drying outfit rests on the kitchen stove and is supported at one end by a metal leg reaching the floor.

use is one of the vital national needs of wartime. As a national need it becomes a patriotic duty. As a patriotic duty it should be done in every family.

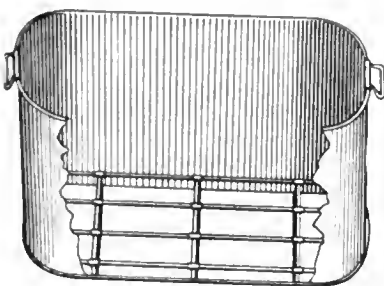
"Failure to prepare vegetables and fruits for winter use by drying is one of the worst examples of American

extravagance. During the summer nature provides an over-abundance. This year, with the planting of 2,000,000 home food gardens, stimulated by the National Emergency Food Garden Commission, this abundance will be especially large. The excess supply is not meant to go to waste. The over-abundance of the summer should be made the normal supply of the winter. The individual family

### THE BATTLE AGAINST WASTE

**WAR-TIME** Food Gardens have already given us an abundance of vegetables "F. O. B. the Kitchen Door." None of these must be wasted. Every household must enlist in the useful army of Food Canners and Food Driers. The Can is as much needed as the Cannon; the Drier is as important as the Dreadnaught or the Submarine. Their importance must not be overlooked. If we use them as we should our immediate food abundance "F. O. B. the Kitchen Door" will be transformed into a winter food supply "F. O. B. the Pantry Shelf."—CHARLES LATHROP PACK.

should conduct drying on a liberal scale. In no other way can there be assurance that America's food supply will meet our own needs. In no other way, surely, can we answer the enormous demands made upon us for furnishing food for our European Allies.

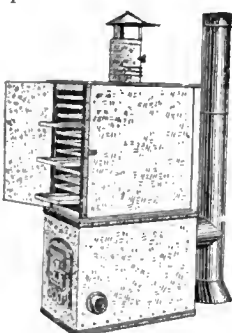


**WHAT EVERY HOME HAS**

This is an everyday family wash-boiler. By inserting a rack of light wooden strips, an inch from the bottom, its owner has made it into a perfect hot-water bath for home canning by the cold-pack method. The jars are subjected to heat in this boiler and the contents require no cooking.

The needs of to-morrow and next winter are left to take care of themselves. This results in heavy loss of food products during the growing season, when they are plentiful, and high prices during the winter when production is stopped. Winter buying of vegetables and fruits is costly. It means that you pay transportation, cold-storage and commission merchants' charges and profits. Summer is the time of lowest prices. Summer, therefore, is the time to buy for winter use.

"Every pound of food products grown this year will be needed to combat Food Famine. The loss that can be prevented, the money saving that can be effected and the transportation relief that can be brought about make it essential that every American household should make vegetable and fruit drying a part of its program of Food Thrift. The results can be gained in no other way. Vegetable and fruit drying has been little practiced for a generation or more. Its revival on a general scale is the purpose of this manual. There is no desire to detract from the importance of canning operations. Drying must not be regarded as taking the place of the preservation of vegetables and fruits in tins and glass jars. It must be viewed as an important adjunct thereto. Drying is important and economical in every home, whether on the farm, in the village, in the town, or in the city. For city dwellers it has the special advantage that little storage space is required for the dried food. One hundred pounds of some fresh vegetables will reduce to 10 pounds in drying without loss of flavor or food value.

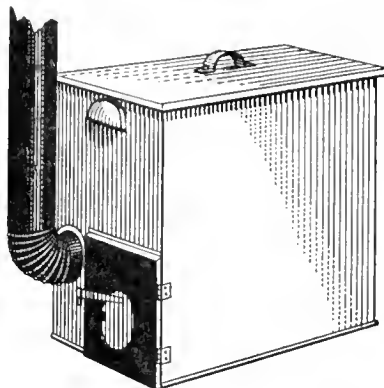


**FOR HOME DRYING**

This is a type of drier manufactured for home use. It may be bought either with or without its furnace, and used on top of the ordinary kitchen stove.

"This year's need for vegetable and fruit drying is given added emphasis by the shortage of tin for the manufacture of cans. This condition has created an unusual demand for glass jars. For this year, therefore, drying is of more than normal importance.

"The reckless extravagance of living from hand to mouth has become a national trait. Too frequently to-day's order from the grocer is for to-day's needs. The needs of to-morrow and next winter are left to take care of themselves. This results in heavy loss of food products during

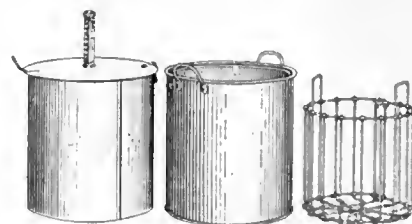


**A CANNER FROM THE STORE**

The canner here pictured is for use in the cold-pack method of canning. It has its own furnace, a vat for holding jars, a smoke pipe and a cover. There are several makes of this type of canner and they are efficient and not expensive.

Dried products can be stored in receptacles that could not be used for canning."

The storage of vegetables in their natural condition is treated by the Commission as an important adjunct to canning and drying. Potatoes, beets, carrots, parsnips, salsify, turnips, cabbage, celery, onions, sweet potatoes, dry beans, and dry lima beans may be so stored.



**CANNING MADE EASY**

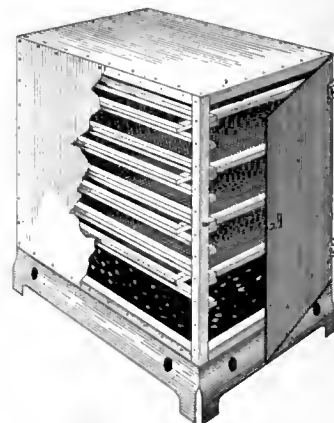
A simple type of canner for use in the cold-pack method. This is known as a water-seal outfit and consists of cover, with thermometer, a holder for jars or cans and a basket-crate for ease in handling the containers. It is used on the top of a kitchen stove.

In a house heated by a cellar furnace, partition off a small room. It is best to have in it at least one outside window for temperature regulation. An earth floor is desirable. In this room may be stored potatoes, beets, carrots, parsnips, turnips, and salsify. Put them in bins or in boxes, baskets or barrels. The vegetables should be harvested when the ground is dry and should lie out-doors until any moisture on them has evaporated. Remove the tops from beets, turnips, carrots, and salsify.

For out-door storage make a pit 6 or 8 inches deep and as large as needed, in a well-drained place. Line this with straw, leaves, or similar material, and place the vegetables on this lining in a conical pile. Cover the vegetables with straw, leaves or something similar and cover this with enough earth to prevent freezing. It is well to make several small pits rather than one large one, for the reason that when a pit has been once opened the entire contents should

be removed. This form of storage is used for potatoes, beets, carrots, turnips, parsnips, cabbage, and salsify. It is well to store several varieties of vegetable in one pit, for convenience in winter use.

For cabbage the pit should be long and narrow. The cabbages are placed in rows with heads down and covered with dirt. The removal of a portion of this supply does not disturb the remainder. Cabbages may be stored in the cellar in boxes or barrels of earth or sand.

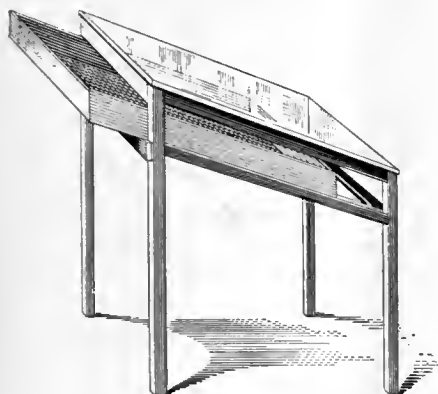


**USEFUL COOKSTOVE DRIER**

The type here pictured is made at home or may be bought already made. It has galvanized iron sides, a series of trays and a swinging door. It is used on top of the kitchen stove and is highly efficient in drying vegetables and fruits.

Briefly summarized, America is now in the midst of its year of greatest plenty in the production of garden truck. Emergency food gardens have changed the entire

face of the national landscape. Complete transformation has been wrought in the American backyard and vacant lot. In the past these areas were waste places whereon the chief fruitfulness was dilapidated tinware. Discarded tins from the corner grocery were a standard crop, perennial, un failing, and in perpetual bloom. To-day the waste places flourish with the abundance of nature. Instead of tomato cans the backyard



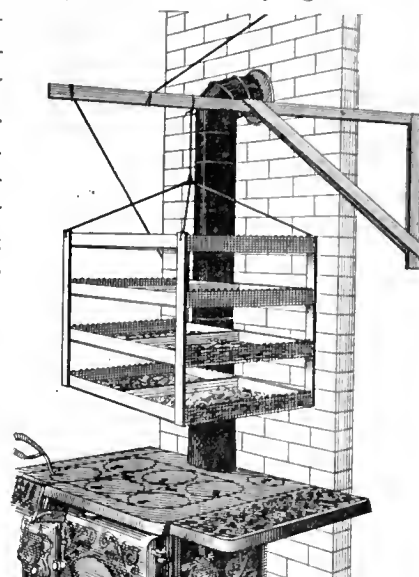
HOMEMADE SUN DRIER

A simple form of construction is used in this drier and the ease with which it may be made is out of all proportion to its great value. The sloping glass top exposes the contents to the sun. The tray for holding vegetables or fruits is made of strips of wood with galvanized wire mesh bottom.

has its crop of tomatoes. For unnumbered tins we have substituted foodstuffs in unmeasured tons. With the advent of the season for canning and drying we must carry the transformation one step further. For the discarded tins we must now substitute cans and jars filled with an abundance of our own making. Now that we have taken the cans from the backyards we

must place their brethren on the pantry shelf as component parts of a company of holders carrying our food supply for the winter. The food garden has already given us food "F. O. B. the Kitchen Door." Our canning and drying operations must give us winter abundance "F. O. B. the Pantry Shelf."

In this campaign F. O. B. has a double meaning. To the student of economics it means delivered free of charge. To those who realize the need for an abundant food supply for the allied armies its meaning is "Feed Our Boys." That this meaning will be met with indifference and neglect is not to be believed.



ONE FORM OF DRIER MADE AT HOME

This drier makes possible highly effective vegetable and fruit drying and its simplicity is such that it may be made at home with little trouble. It consists of a series of trays supported by light framework. The bottoms of the trays are of galvanized wire mesh. It is to be used over a stove.

## A WATCHFULLY WAITING RODENT

By Lewis Edwin Theiss

**W**E were trout fishing. Noon came and with it the call of Nature. We looked about for a suitable place to eat. Near the stream was an opening in the forest. A giant tree had fallen, making a great hole in the leafy canopy. Through this hole in the forest roof, the sun streamed down warm and grateful, for it was a chilly day in early spring. The tree lay prone in the center of the patch of sunlight. We put our lunch on its trunk and seated ourselves astride the tree, facing each other, the lunch between us.

Twenty-five feet distant rose a tuft of tall grass, near some underbrush. The grass was a vivid, fresh green. All about it were the sere, brown leaves. This splash of bright color caught and held the eye. And as we looked at it, one of the graceful stalks of grass trembled, waved fitfully, and disappeared. The remainder of the grass stalks were as motionless as the painted ship of poetic fame. We watched. Presently a second stalk quivered, shook, and fell. In due season another vanished. Yet not another thing stirred.

Intently we watched. One after one the grass stalks disappeared; and when the clump was sufficiently thinned, we saw the cause of it all. A sleek, little woodmouse

was cutting these grass blades one by one and dragging them into her nest to line it.

The entrance to the nest was the familiar little opening under the brown leaves. So unsubstantial was this leaf roof that we could even trace the mouse's movements underground, by the slight motion of the leaf-mold.

For perhaps fifteen minutes we watched this little creature in silence. Blade after blade of grass disappeared. Then no more fell for a time. Then the harvesting was resumed, only to be interrupted again. What was the mouse doing in these hiatuses? We watched intently.

Suddenly, near at hand, two button-bright eyes and a brown nose popped out from under the leaves, regarded us a moment, and disappeared. The grass cutting was resumed. Presently it stopped. We watched closely. Many feet away the same brown head suddenly appeared above the forest floor. It watched us for a moment, then withdrew. And again the haying continued. So it went on throughout our entire lunch period—which we purposely prolonged. A dozen tunnels led to the grass-lined nest, and at every one the little mouse took a squint at us, then went on with her work. Presently we withdrew quietly. We had learned how the mouse kept watch of us. We went away wondering how the trout managed it—for our creels were empty.

**N**EVER backfire against a forest fire from the bottom of a mountain. You may burn up some of your own party if you do. Go to the top and work down the hill.

**I**F you are burning resinous wood, such as pine, and your chimney becomes clogged with soot, throw a few pieces of sheet zinc on the fire.

## FOREST REGIMENT OFF FOR FRANCE

THE roster of commissioned officers in the "forest regiment," or, as the War Department designates it, the Tenth Reserve Engineers (Forest), has just been announced and includes two regular army officers, 15 foresters from the U. S. Forest Service and two from the Forest Branch of British Columbia, one lumberman from the Indian Forest Service, and 13 foresters and lumbermen taken from private or institutional work.

The War Department has designated Lieutenant Colonel James A. Woodruff of the Engineer Corps to organize and command the regiment, and Beverly C. Dunn, Captain of Engineers, as Adjutant. W. B. Greeley, now Assistant Forester in charge of the branches of silviculture and research, U. S. Forest Service, and formerly district forester in charge of the National Forests of Montana and Northern Idaho, has been selected to serve as Major on the regimental staff and to aid in the organization and equipment of the regiment. The remaining officers will be as follows:

Majors in command of battalions: R. E. Benedict, assistant forester in the Forest Branch of British Columbia, and C. S. Chapman, manager of the private timber protective associations of Western Oregon.

Captains: Edward S. Bryant, forest inspector, U. S. Forest Service, stationed at Washington, D. C.; Inman F. Eldredge, forest supervisor of the Florida National Forest, stationed at Pensacola, Florida; J. D. Guthrie, forest supervisor of the Coconino National Forest, stationed at Flagstaff, Arizona; Evan W. Kelly, forest examiner, U. S. Forest Service, stationed at San Francisco; John Lafon, assistant forester in charge of timber operations, Forest Branch of British Columbia; David T. Mason, professor of forestry at the University of California; W. N. Millar, professor of forestry at the University of Toronto; Barrington Moore, a private forester from New York City; Arthur C. Ringland, forest inspector, U. S. Forest Service, stationed at Washington, D. C.; Dorr Skeels, logging engineer and professor of forestry at the University of Montana. The three captains taken from university professorships are, it is stated, chosen because of their extensive past experience in practical lumbering and other woods work.

First Lieutenants: Risdan T. Allen of the Allen-Medley Lumber Company, Devereux, Georgia; M. S. Benedict, forest supervisor of the Sawtooth National Forest, stationed at Hailey, Idaho; Robert L. Deering, forest examiner, U. S. Forest Service, stationed at Albuquerque, N. M.; Clarence R. Dunston, lumberman, U. S. Indian Service, stationed at Dixon, Montana; D. P. Godwin, forest examiner, U. S. Forest Service, stationed at San Francisco; J. G. Kelly, lumberman, of Portland, Oregon; Eugene L. Lindsay, forest examiner, U. S. Forest Service, stationed at Washington, D. C.; E. C. Sanford, forest supervisor of the Idaho National Forest, stationed at McCale, Idaho; H. C. Williams, who recently resigned from the supervisorship of the same forest; Stanley L. Wolfe, forest examiner, U. S. Forest Service, stationed at Washington, D. C.; J. B. Woods of the Arkansas Land and Lumber Company, Malvern, Arkansas; Herman Work, deputy forest supervisor of the Caribou National Forest, stationed at Montpelier, Idaho.

Second Lieutenants: H. R. Condon, forester with the Pennsylvania Railroad, Philadelphia; S. H. Hodgman, logging camp foreman with the Potlatch Timber Company, Potlatch, Idaho; W. H. Gallaher, forest examiner, U. S. Forest Service, stationed at San Francisco; J. W. Seltzer,

forester with the New Jersey Zinc Company, Franklin, New Jersey; H. B. Shepard, forester with the Lincoln Pulp Company, Bangor, Maine; E. F. Wohlenberg, forest examiner, U. S. Forest Service, stationed at Flagstaff, Arizona.

Recruiting for the rank and file of the regiment is actively under way. The enlisted men will be picked woodsman. With only two thousand men needed out of the vast number of woods workers which the lumber industry of the United States employs, and with rapid recruiting necessary, a special machinery has been developed to handle the preliminary stages of enlistment. Local representatives of the Forest Service in various parts of the country and a number of State forestry officials have been designated as "listing officers" to secure applications from men in their neighborhood who are known to be of the right type. By this "still hunt" method it is believed that an efficient force can be gathered much more successfully than by encouraging a large number of miscellaneous applications which could not be thoroughly sifted without a great deal of effort. Great care will be used to secure men proficient in woods work.

The regiment will convert available timber behind the battle lines in France into railroad ties, trench timbers, mine props, bridge timbers, lumber, and cordwood needed in the military operations of the British Army. The work may, it is stated, fall within the danger zone and will be done largely in sprout forests of oak, beech, hornbeam, and other hardwoods, with some stands of pine. The timber is small in comparison with most American forests, much of it from 8 to 12 inches in diameter. These forests resemble the woodlots of southern New England, and the operations will be similar to portable sawmill logging and tie cutting in Massachusetts, Connecticut, Maryland, and Virginia. The larger logs will be sawn into boards and dimension material, while the smaller trees will be cut into hewn ties, poles, props, etc. The closest possible use of timber will be required.

The French forests have for many years been managed with great care and skill. It is the view of the Government's forestry officials that if the American forest regiment is to do creditable work, it must be able not only to cut and manufacture the timber with high efficiency, but also to avoid waste and leave the forests in good shape for future production. This is the reason for selecting mainly trained foresters as officers.

The regiment will be made up of six companies of 164 men each, aside from battalion and regimental staffs, drivers, and commissioned officers. It will be sent overseas as soon as organized, trained and equipped. It will first be assembled at two training camps, the regimental headquarters, and one battalion at the American University, Washington, D. C., and one battalion at Fort Leavenworth, Kansas.

Enlistment is for the period of the war. Recruits must be between the ages of 18 and 40 and must be citizens of the United States or have declared their intention to become such. They are subject to the same physical examination as that required for other military service.

While designed to serve primarily as a mobile logging and milling crew, the regiment will be organized on military lines and its members will be uniformed and armed like other units in the United States Army. The first duty of its officers and men will be to learn military discipline and teamwork through thorough-going drill at training camps.

For the logging crews skilled axemen, sawyers, tie hewers, skidders, teamsters, and blacksmiths are being enlisted. Millwrights, sawyers, and engineers are to man portable sawmills which will form part of the equipment, while suitable helpers for the various activities connected

with woods operations and the maintenance of large camps will be picked up.

The prompt recruiting of this regiment will, it is expected, enable it to be among the first to carry the flag of the United States abroad.

## FORESTER GRAVES IN FRANCE

**A** NNOUNCEMENT of the arrival of Henry S. Graves, Chief of the U. S. Forest Service in Paris, has led the Department of Agriculture to explain that Mr. Graves has gone abroad to make arrangements for the forest work which the American army engineers will undertake in France in connection with the military operations of the Allied forces.

Because of the opportunity for service by this country in woods work incidental to the war which the request of the British Government for the sending of a forest regiment was believed to present, Mr. Graves has been granted leave of absence from his position as head of the Forest Service and has received a commission as Major in the Reserve Engineer Corps. He has not been assigned to any command, but is acting under instruc-

tions, it is stated, to proceed to France in order to learn on the ground in advance just what conditions will need to be met, what equipment will be called for, and how extensively the services of American lumbermen can be utilized to advantage. Meanwhile the recruiting of the regiment which has already been asked for is being pushed by the Forest Service and is said to be advancing rapidly.

One of the staff officers of the regiment, Captain Barrington Moore, is with Mr. Graves for the purpose of arranging for its prompt assumption of the specific duties to which it will be assigned when it is landed in France. While organized on military lines, the work of the regiment will be industrial, not combatant. It will operate in the woods behind the armies, getting out timbers, ties, and lumber required for military purposes.

## LUMBER FOR WAR-TIME USES

**T** HE lumber committee of the advisory commission, Council of National Defense, estimates that 2,000,000,000 feet of lumber may be used for purposes directly connected with the war in the next twelve months.

The committee now is given to understand that provision will be made at each camp for anywhere up to 40,000 men, instead of the 25,000 originally planned. This may be due to the decision to call for 125,000 men to serve as a reserve for the first 500,000 men drafted for the new national army.

Second in quantity of lumber required comes the wooden shipbuilding program, which the committee estimates will require about 400,000,000 feet of lumber.

In a statement the committee says:

"The best estimate that can be made of the total amount of lumber required for purposes of national defense within the next twelve months is 2,000,000,000 feet. This sounds like a colossal figure, and it is a big figure, but should give no apprehension that it will disturb the markets or cause a shortage of lumber. Actually this will not exceed 5 per cent of one year's lumber production of this country."

Here are some more lumber requirements seen by the committee: Structures for training camp purposes for the navy, 200,000,000 feet; aviation school cantonments, 120,000,000 feet; erection of 200 buildings at army and navy training camps by the war work council of the

Young Men's Christian Association, 6,400,000 feet; packing boxes and crates for the army and navy, at least 200,000,000 feet; army wagons, 25,000,000 feet; gunstocks, 10,000,000 feet; material for 3,500 aeroplanes, 3,500,000 feet.

Army cots, tent poles, automobiles, artillery, cooerage, furniture, docks and piers, trench lining, saddles, mine timbers, tools, railroad construction, and the lumber necessary in building factories will go to largely swell the total.

The special committee representing the Southern Pine Association here has issued this formal statement:

"The committee representing the Southern Pine Association, acting for the Southern Pine Emergency Bureau, announced to-day that an order for 100 ships to be sawed by the southern mills has been placed by Gen. George W. Goethals, general manager of the United States Shipping Board Emergency Fleet Corporation, at an average price of \$35 a thousand feet at the mills. The Southern Pine Association has asked those mills which can do so to manufacture the timbers required for wooden ships, and a large number of them have bound themselves to furnish complete schedules at the price named for delivery at such shipyards as may be designated by the Government.

"General Goethals has accepted this proposition, to the extent of 100 units (ships), comprising approximately 140,000,000 feet of lumber."

**I** NSTEAD of planting a horse-chestnut, why not plant a real nut tree? Pecans, hickories, or English walnuts cost very little more than horse-chestnuts, make less litter and produce a valuable crop.

**M** APLE sugar season is over. It ended when the first leaves unfurled, the sap then becoming less sweet. Seventy drops of sap per minute flow from good trees, and twenty-five gallons of sap make about five pounds of sugar.

## LUMBER FOR AN ARMY CANTONMENT

**T**HIS is the story of the use of lumber in an army cantonment, and of the manner in which the American Logging Camp has been copied for regular army uses, in the building of quarters for the Reserve Officers' Training Camps. When the letters R.O.T.C. are seen, this is the interpretation. There are two camps at Fort Sheridan, each of 2500 men, roughly, one camp for Illinois and one for Wisconsin and Michigan combined. Each camp is organized in fifteen companies of about 160 men. Wisconsin and Michigan are in permanent barracks except for four companies which, with the Illinois regiment, are quartered in cantonments on the south side of the reservation. There are quarters for two emergency companies with the four Wisconsin-Michigan companies, making a total of twenty-one companies quartered in the newly-erected wooden cantonments.

The quarters for each company are four buildings, placed end to end with a twenty-foot space between each. On the south is the mess hall, with a kitchen and two tables the length of the building, *à la* lumber camp, bench seats on each side of each table. The next two buildings are the quarters, with cots in each, for eighty men. North of these two is a bathhouse.

The speed of construction of the camp was notable, and a most striking evidence of the ability of the typical American business man to meet emergencies. The contract for the construction of the buildings was awarded to the Sumner Sollitt Company, Chicago, on Saturday evening, April 28. About noon on Sunday, April 29, the Edward Hines Lumber Company, of Chicago, received the order for the material, amounting to a total of some 1,400,000 feet. During the afternoon 5 auto-truck loads of lumber were dispatched to Fort Sheridan to provide quarters for the working force engaged on the job. At 5 o'clock in the evening a train of 50 empty cars was on track in the yards of the lumber company. The entire train was loaded with the 1,400,000 feet on April 30 out of the stock of Northern, Southern and Western lumber carried on hand. The contract called for all dressed lumber. The most remarkable part of the operation, therefore, was that some 400,000 feet of the shipment was run through the planing mills of the lumber company, as well as being loaded on the cars in the same day.

The Chicago and North Western Railroad delivered the trainload of lumber at Fort Sheridan on Tuesday morning, May 1. The Sumner Sollitt Company had its construction force on the ground equipped with gasoline saws and all other devices for quick work. Ohio National Guard Engineers staked out the company streets and buildings. The job was finished on May 10, in just ten working days, using only one shift of men per day. The largest number of men employed on the job at one time was 785. Here is what they built complete, ready for occupancy:

42 barracks, 20 x 126 feet each.

21 mess buildings, 20 x 110 feet each, equipped with tables and benches built in regular logging camp style.

21 lavatory buildings, 16 x 63 feet, equipped with toilets, shower baths, etc.

1 postal exchange building, 20 x 30 feet.

1 telephone exchange building, 20 x 33 feet.

This is the story of one of the camps where officers will be trained for the new army and is duplicated in many other camps throughout the country, as there are fifteen reserve officer training camps in the country, requiring quarters for 35,000 prospective officers. The regular permanent barracks do not begin to provide room for all these men. This story of the Fort Sheridan camp is that of all other camps where cantonments are being built, and will be duplicated on a larger scale to provide quarters for the new army of 500,000 men called out September 1.

### OAK TREE FOUNTAIN

By H. E. Zimmerman

**F**ROM the picture one would judge that this drinking fountain at Mount Lowe, California, has its source of

supply in the heart of an oak tree. Some years ago there was a cavity in the heart of the tree. A hole was bored through to the cavity and a water pipe from the mountain stream connected, as shown in the illustration. Later, modern tree doctors filled the cavity, and now the bark has grown over, completely hiding all traces of the operation. Moving-picture companies have used the fountain in films, depicting the quack doctor and his wonderful health restorer, "The elixir of life, or the blood of the oak."



**R**EPORTS compiled by the paving block bureau of the Southern Pine Association show that the wooden block, properly creosoted, is rapidly becoming the vogue all over the country, and popular wherever it has been tried.

The statistics of production by the redwood manufacturers of California show a material increase for 1916, as compared with 1915, but considerably smaller than several recent years.



# THE EXTENSION OF NATIONAL FORESTS IN COLORADO

By HERMAN H. CHAPMAN

TEN years ago opposition to the National Forest policy in Colorado reached such proportions that the State demanded and secured from Congress a law which took from the President of the United States the power, given him in 1891, to proclaim new National Forests within the State. Five other States were also included in this measure, namely, Wyoming, Idaho, Oregon, Washington, and Montana.

To-day the people of northern Colorado have petitioned and secured from Congress a law permitting the President to increase these same National Forest areas by the addition of over half a million acres of land. No incident in the entire history of the struggle between nationalism and States rights as applied to our western public lands so emphasizes the growing understanding and approval with which the National Forest adminis-

tration is regarded as this complete reversal of attitude on the part of a State which has been conspicuous in the past for the violence of its opposition and the broad and sweeping character of its attacks on the Forest Service policies. In fact, the insistence of the actual residents of the great agricultural district bordering the foothills of the Medicine Bow Mountains for an extension of the National Forests placed certain Colorado politicians in an embarrassing position, leaving them, so to speak, high and dry, and nullifying much fiery oratory and indignant declamation.

The opposition to National Forests in Colorado centered about the development of the publicly owned water-powers, and these interests are by no means converted to the idea of retention of government ownership and regulation to-day. From this group it spread to the

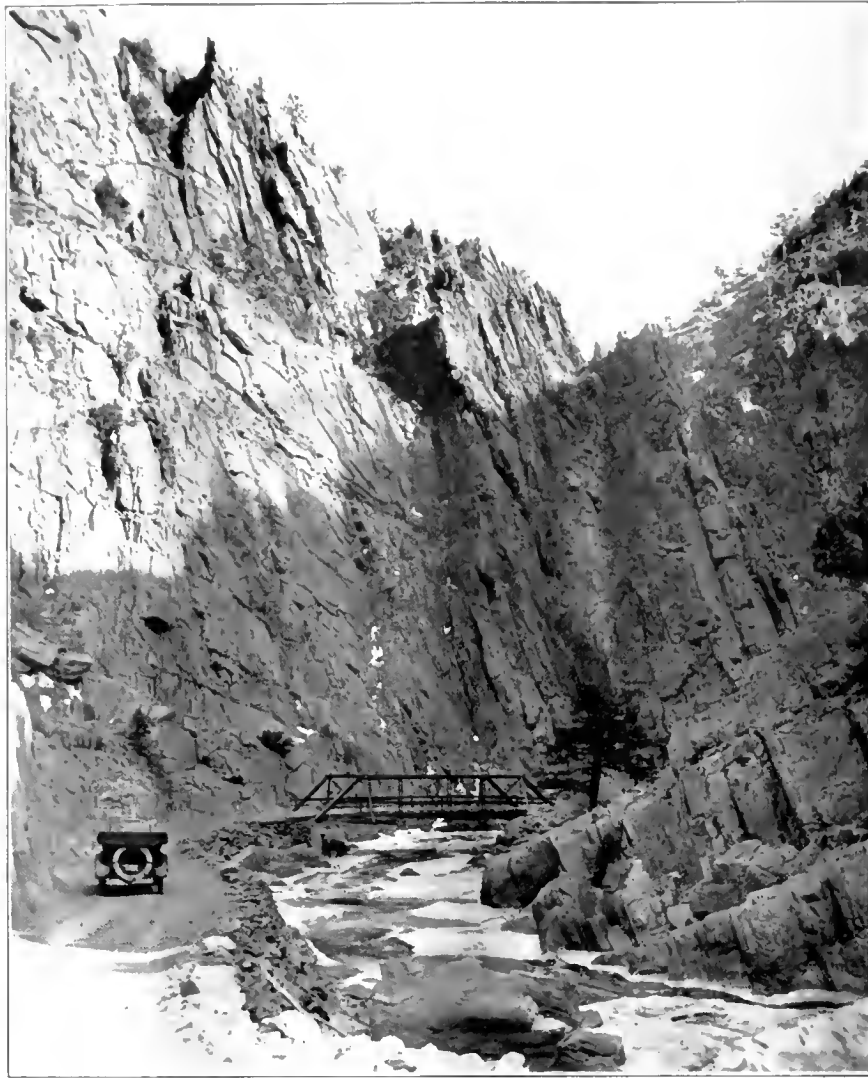


A BEAUTIFUL VIEW OF THE CANYON

Along the Estes Park road—a beautiful stretch typical of the scenery of the section which it is desired to include within the Colorado National Forest.

mining interests, who were persuaded to believe that the National Forests would in some way or other act as a drawback to the development of this industry. Since the location and working of the mines themselves is unobstructed, and has been permitted within the Forests since 1896, the miners were forced to concentrate their opposition on the timber policy of the National Forests. But here again they disagreed as to what constituted the real objections. Under the existing regulations, timber could be purchased from the Forests for the development of mines to any required amount. So one group of objectors claimed that timber lands included within National Forests were at once opened to wholesale and unrestricted exploitation by lumbermen and pole hunters, to the injury of mining and other local industries; while a second group still blindly insisted that the National Forests locked up all resources, including the timber, from any kind of development.

Meanwhile, the agricultural interests, dependent upon watershed



CANYON OF BIG THOMPSON RIVER AND LOVELAND  
On the Estes Park auto road—a midwinter scene showing the Canyon and bridge.



GOOD UTILIZATION OF NATIONAL FOREST RESOURCES  
These lambs from New Mexico, on the Henry Fejt Ranch, are fattening on alfalfa raised locally by the use of irrigation water from the Colorado National Forest, and corn from Nebraska.

protection for the maintenance of irrigation on many thousands of acres of the richest lands of Colorado, discovered that the ruthless denudation of the foothills of the Medicine Bow range was diminishing the flow of water and causing great damage to irrigation. These foothills had not been included in the original withdrawals for National Forests—because at the time areas containing 15 per cent or more of patented or private land were not considered suitable for National Forest use, and this stretch of territory was honeycombed with mining and timber locations. In the very year 1907, in which the opposition succeeded in prohibiting the creation of any further National Forests by the President, petitions went to Congress from this region asking for this extension of the Forest area. During the last decade this demand has grown constantly stronger and better organized, until it embraced not only the commercial bodies of the foothills towns, the local livestock associations, and the representative agricultural organizations, but included

such bodies as the Boulder County Metal Mining Association, thus bringing the mining interests back into line for a measure formerly bitterly opposed.

And no wonder that pressure was brought to bear for this legislation. The region affected, which consti-



NEAR THE COLORADO NATIONAL FOREST

This is taken on the Estes Park auto road, and shows part of the proposed addition to the Colorado National Forest. The forest and cliffs may be seen in the distance.

tutes the level plains bordering the foothills, is one of the richest orchard and farming communities in the State. Sugar beets, alfalfa, apples, and many grains are produced in abundance, provided only that the land receives water for irrigation. Boulder Creek, Left Hand, the St. Vrain, the Big and Little Thompson, and the Cache La Poudre are all utilized to the last bucketful in fostering the great agricultural wealth of the region. Many thriving towns are located on the plains close to the foothills, among which are Boulder, Ward, Estes Park, Longmont, Berthoud, Loveland, Lyons, Fort Collins, and Greeley, all of which get their domestic water supply from the streams flowing east from the Continental Divide across this foothills region. The sugar factories alone produced in 1916 an output of 319 million pounds of sugar from 86,000 acres of sugar beets, and the by-products, or refuse, from these factories fattened 25,000 cattle and over 1,000,000 sheep. More than half

a million acres are irrigated from the streams heading in the Medicine Bow Mountains, and the crops produced are worth over \$10,000,000. Municipal water plants already represent over \$3,000,000 invested, with 20,000 horsepower developed and several additional plants under construction.

These are the communities whose insistent demand finally overcame the bitter opposition of States rights advocates and champions of unrestrained private exploitation. In 1916 a bill was introduced, which became a law in September of that year, by which the President was



OLD MAN RANGER STATION

This is one of the most picturesque stations in District 2. It is near Estes Park and on the proposed addition to the Colorado National Forest.

authorized by Congress to proclaim as National Forest land any portion of an area of 524,478 acres adjoining the Colorado and Pike National Forests.

This was promptly followed by the withdrawal of these lands from all forms of private entry, through an order of the Secretary of the Interior. The lands have been since examined and classified, and the addition of this area to the adjoining National Forests now awaits the President's action.

Although on the entire area 252,840 acres are alienated lands belonging or claimed by private parties, or nearly 50 per cent of the total, yet these claims represent an almost negligible area of cultivated or cultivatable

lands. On the Colorado extension but 162 acres are listed by the assessors as agricultural, while but 6402 acres are meadow land. The remainder is assessed as pasture land and valued at \$2 to \$3.50 per acre. Roughly speaking, 25,000 acres of this is owned by the State, 50,000 acres by railroads, 125,000 acres by individuals, and the remainder represents claims pending. So thoroughly have private interests searched this area for possible values that, although a period of over eight months elapsed from the date of introduction of the bill—January 27, 1916—to the date of its passage—October 2, 1916—during which time petitions to secure the withdrawal of the lands from entry were unavailing, yet in that whole period but 14,260 acres of additional claims were filed, leaving a quarter of a million acres of Government land which no one could be tempted to claim.

The sharp contrast between the fertile plains, of which practically every acre capable of irrigation is in cultivation, and the foothills immediately adjoining, covered by this withdrawal, where the only land capable of being cultivated lies in a few narrow ribbons along portions of the larger streams, is an excellent illustration of the natural classification of land into agricultural and non-agricultural areas. Many false statements have been made in the past about the inclusion of lands valuable for agriculture within National Forests in Colorado. The history of this foothills region shows conclusively that at least in this locality the National Forests failed to include an immense area of land so poor that no one would have it after many years of opportunity.



ALONG LITTLE THOMPSON RIVER  
A beautiful bit of road in the proposed addition to the Colorado National Forest.

These lands either have been or will be placed under the permanent care and management of the Forest Service following the Presidential proclamation. In spite of their poverty for agriculture, they will produce timber crops of great value, and their protection from fire and retrogression will have an immediate effect in regulating the stream flow and supplying additional water during the dry months when it is most needed.

The accompanying photographs show the character of lands to be added to the National Forests, and reveal both their possibilities for the production of timber and their absolute unfitness for agriculture.

The National Forest policy has come to stay. It has won on its own merits in Colorado, in the face of bitter and prejudiced opposition. The solid citizens of the West, whose interests lie in creating and maintaining conditions mak-

ing for stability and permanent prosperity, are behind the broad constructive policies of the Forest Service, and their influence is becoming increasingly important in overcoming the harmful activities of the elements whose principal aims are exploitation and speculation. The difference between mushroom prosperity incident to the rapid exhaustion of natural resources, and the slow but far more lasting and beneficial development resulting from the protection and renewal of the timber and forage by regulated use, is beginning to be recognized throughout the entire West, and, with this changing viewpoint, hostility to the National Forest policies has given way to a cordial and intelligent support and cooperation.

**D**URING the present summer the Extension work of the New York State College of Forestry will be developed along the line of woodlot improvement demonstrations. Calls for advice along this line have become so frequent that trips will probably be arranged in the fall to take in a number of woodlots in given localities. A trained Forester from the College will demonstrate methods of improving the stand by taking out unprofitable trees and planting rapidly growing species in large openings, and in simple methods of estimating the volume and value of woodlot stands.

**A**TREE census has recently been taken by the school children of Binghamton, New York. The work was done in cooperation with The New York State College of Forestry at Syracuse University, and the information resulting will give the number of trees by streets, the species, condition, and other points valuable in working out a definite Shade Tree Program for the City. This work is done in accordance with the agreement of The State College of Forestry to cooperate in village improvement work along Landscape Engineering lines. Professor Henry R. Francis represented the College at Binghamton.

# MIDSUMMER FLOWERS

BY DR. R. W. SHUFELDT, C.M.Z.S.

AS common a plant as the Dandelion is, with its great golden flowers (Fig. 1), how rarely do we see reproductions of artistic photographs of it, presenting it in all its splendor as we find it in nature! There is a very good reason for this. As a rule we find it growing close to the ground, and it generally requires a high order of patience to so place the camera that what we see of it is reproduced on the camera's ground-glass. Then, its brilliant yellow flowers require the use of a special plate, in that they may not photograph nearly black; and finally, if one attempts to dig up a plant in order to photograph it indoors, its big and long root

acts as a deterrent to its proper transplanting. If the root be cut in two an inch or more below the surface of the ground, the leaves and flowers wilt in a few moments, rendering them unfit subjects to pose before the camera in the botanist's studio. Neltje Blanchan refers especially to this latter character when she described that part of the Dandelion plant; she says: "Deep, very deep, the stocky, bitter root penetrates, where heat and drought affect it not, nor nibbling rabbits, moles, grubs or insects, and other burrowers break through and steal."

Where the climate is mild, or where mild winters occur from time to time, one may expect to see Dandelions from day to day throughout the entire year; this is often the case in Washington, D. C., where it is no uncommon thing to observe a flower of this species peeping above the snow in January; a layer of snow on the ground there may by no means be long lasting. Then, in this city, when spring comes around, these very Dandelions may appear in magnificent abundance. There was at least one marvelous outcropping of them on the broad

lawns of "Oak Lawn" of the Dean estate on Connecticut Avenue, in the very heart of the city. The million or more of flowers formed a close carpet of gorgeous, golden yellow that spread over several acres of ground, forming a wild-flower exhibit not easily forgotten.



FEW WILD FLOWERS POSSESS GREATER BEAUTY THAN THE COMMON DANDELION

FIG. 1.—One of the most abundant of all the *Compositae* is this golden beauty of the pastures, lawns, and waysides. Scientifically, it has been named *Taraxacum officinale* for the reason that its root has been employed for medicinal purposes; there are several other species of dandelions more or less nearly related to it. Originally, it was introduced from Europe; but at the present time it has spread over a large part of the world. The Dandelion has everything in its favor to spread its kind to all quarters of the globe; and it would seem that, in certain sections or even regions, it is becoming more and more abundant each year that goes by.

There are several species of Dandelions in this country, belonging to different genera, as the Dwarf Dandelion and the Tall Dandelion, which will be figured and described later on, should good examples come to hand.

In midsummer, throughout the eastern parts of our country and elsewhere, there is such a bewildering blossoming-out of flowers, of so many descriptions and in every conceivable

sort of place in nature, that it is no easy matter to make a choice at this season, in that the flora may be fully, or even fairly, represented. However, there are some flowers that must not upon any account be overlooked; and, abundant as the chosen flower may be, one can generally manage to find out something about it which is not very generally known. This holds true, for example, in the case of such a plant as the Pink Knotweed, of which a spray or two is here shown in Figure 2. Masses of its gorgeous pink flowers are to be seen along the roadsides, in the corners of pastures and fields and in many so-called waste places. Not one in a hundred who daily passes them even knows the common name of the plant, to say not a word as to its scientific name. Its rosy flowers are bundled together on erect spikes an inch or more in length, and they open in the most unmethodical manner here and there along the spike. Many insects are attracted to them, especially the smaller bees of the genus *Andrena*, fertilization taking place much as we find it in the common Buckwheat, to which group the Pink Jointweed belongs.

A little while after fertilization the seeds begin to form inside the calyx, which is likewise pink and persistent. They are almost black when ripe—flat, small, and sub-circular or cordate in outline. So deliberate is the blos-

their seeing "beauty" in the pink flowers of a "Smartweed," it is quite safe to say that, as a rule, they most emphatically do not; should they, perchance, see it and appreciate it, it is much to be doubted that it would even be admitted by any one of them. This should not cause us any surprise, for "weeds are weeds" to all cultivators of the soil, and in thousands of cases they are the chief menace to the annual success of their labors.

These Smartweeds, Jointweeds, Pink Knotweeds, or whatever we may choose to call them, of the Buckwheat family (*Polygonaceæ*) are a most puzzling group



PINK KNOTWEED IS A CONSPICUOUS JULY FLOWER

FIG. 2.—This plant has several common names besides the one given above, it being known in some sections as Common Persicaria, while to others it is familiar as Jointweed or Smartweed. Botanically, it has been relegated to the Buckwheat family (*Polygonaceæ*), where, according to Gray, it belongs in the genus *Persicaria*, it being *P. pennsylvanicum*; other botanists, while giving it the same specific name, retain it in the genus *Polygonum*. Its flowers, which are of a rose-pink color, sometimes tinged with greenish, are well shown in the cut, as are also its lanceolate leaves. The plant flourishes best in moist soil, though it is abundant everywhere on its range from July until late autumn, adding masses of color along the roadsides and in waste places in the rural districts. Single plants are sometimes very extensive or spreading, and may grow to be at least a yard in height. One of its chief characters is the stipitate glands found on the upper branches and on the peduncles. Jointweed flourishes from northern Maine to the Gulf, and westward to Texas and Minnesota. The butterfly in the picture is the Black Swallow-tail (*Papilio troilus*).

soming of this Jointweed that we can always find more buds and seeds than we can find flowers on any spike. *Polygonum*, which is the generic name for this plant and its allies, is composed of two Greek words, meaning *many knees*, which refers to the numerous joints seen to compose the stems of the plant.

In our country no plant has been more generally relegated to the order of "weeds" by farmers and other tillers of the soil than has this much-despised one. As to



THESE LITTLE WHITE BEAUTIES DECEIVED THE OLD BOTANISTS

FIG. 3.—Flowering Spurge (*Euphorbia corollata*); natural size. This is a specimen from southern Maryland; and, while the plant is found in rich and sandy soil from New York southward and westward, it has, of recent years only, been naturalized in New England. We generally meet with it in open fields from midsummer to October; and, when abundant, it is quite conspicuous, especially when it attains a height of thirty-six inches or more, as it often does. It can easily be seen at quite a distance. The true flowers, both staminate and pistillate, are surrounded, as we see in the picture, by a five-lobed corolla-like involucre. The early botanists mistook this latter for the petals of the true flower; but we know better now. Note that the branches are forked, and that the flowerheads are borne upon five-forked umbels. The leaves are not very large; they may be either lanceolate or ovate in outline, and always smooth. The Spurge family (*Euphorbiaceæ*) contains many species, some of which are very beautiful plants.

to study; there are dry land species, climbing species, amphibious species, and so on. Several of them present varieties, and this still further complicates their study. For example, Neltje Blanchan says: "When the amphibious *Persicaria* (*P. amphibium*) lifts its short, dense,

rose-colored ovoid or oblong club of bloom above ponds and lakes, it is sufficiently protected from crawling pilferers, of course, by the water in which it grows. But suppose the pond dries up and the plant is left on dry ground, what then? Now, a remarkable thing happens; protective glandular, sticky hairs appear on the epidermis of the leaves and stems, which were perfectly smooth when the flowers grew in the water. Such small wingless insects as might pilfer nectar, without bringing to their hostess any pollen from other blossoms, are held as fast as on bird-lime. The stem, which sometimes floats, sometimes is immersed, may attain a length of twenty feet; the rounded, elliptic, petioled leaves may be four inches long or only half that size."

There appear to be several subspecies—or varieties, as the botanists designate them—of this species, as *P. a. terrestre* and *P. a. hartwrightii*.

When we come to study the Spurge family (*Euphorbiaceæ*), we run into all sorts of curious plants, with still more curious flowers. Not a few of these are represented in the flora of our Atlantic States, from Massachusetts to Florida, inclusive, while in warmer parts of the world the array of the members of this family is simply enormous. If we chance to be crossing some barren and sandy field along in July and August, anywhere throughout the middle of its range, we are very likely to run into some of the Spurges of the genus *Euphorbia*, and most likely the Flowering Spurge (*E. corollata*), of which there is a fine specimen shown in Figure 3, collected in southern Maryland. Formerly this plant was found no farther north than New York, but of recent years it has become naturalized in New England, as far north as southern Massachusetts. East of the Mississippi Valley there are



THE GREEN TREE FROG (*Hyla cinerea*)

FIG. 4.—Should one be hunting for the flowers of some of the broad-leaved aquatic plants that flourish on the margins of ponds in any one of the southern states, the searcher is more than apt to meet with a big, green tree frog, which the herpetologists will tell you is one of the most conspicuous and interesting of its genus. This is *Hyla cinerea*. It has a near relative in *Hyla evitata*, which has thus far only been found near Washington, D. C.; we have but meagre knowledge of its habits. The Green Tree Frog, as its name would suggest, is of a brilliant pea green, verging upon a bright pale yellow. Upon either side it has an elegant stripe of white or pale golden yellow, the legs being similarly striped, the former being emarginated with black. It is one of our largest tree frogs, and certainly one of the most handsome. It thrives well in captivity, living upon flies and other insects; it is a noisy but not an especially active species. The specimens shown in the cut were taken near New Orleans, and were in the possession of the writer several days for the purpose of photography.

upwards of thirty species of *Euphorbia*, as the Sea-side Spurge, Milk Purslane, Snow-on-the-mountain, Painted Leaf, Wartweed, and the rest, while in this same family with our pretty little Flowering Spurge we find the famous Castor Oil plant (*Ricinus communis*), and several species of Mercury of the genera *Mercurialis* and *Acalypha*.

The flowers of the Flowering Spurge are both staminate and pistillate kinds, and, strange to say, the plant is rather closely related to the elegant Poinsettia, with its gorgeous scarlet or vermilion flowers—a plant we not rarely have the opportunity to admire in the show windows of the establishments of first-class florists. Flies of various species are the insects most often responsible for the fertilization of the Flowering Spurge, and they carry the pollen from its staminate flowers to the pistillate ones—minute and delicate little structures situated in the centre of the showy, though small, white involucre. Some of the *Euphorbia* are poisonous plants, and, according to Alice Lounsberry, "the medicinal properties of spurges are said to have been discovered long ago by King Juba of Mauritania, in Africa, and to be equally well known to our own Indians; they have not altogether the sanction of many for such use. It is certainly true that, aside from its powers of purging, the plant possesses little

virtue." However this may be, it is very important that we know these interesting plants in our fields when we meet with them.

In Figure 5 we have a very pretty specimen of Bouncing Bet (*Saponaria officinalis*), a flower that has been saddled with many names, most of them as inappropriate as the vernacular one just given, as Soapwort, Hedge Pink, Bruisewort, Old Maid's Pink, and Fuller's Herb.

Originally the plant came from Europe, introduced into our gardens, from whence it has escaped to establish itself along the highways in the country districts throughout a very wide range of our country. In many localities it is very abundant and flourishes luxuriantly. In old days it was supposed to possess medicinal properties, the idea having gained ground from the fact that its leaves, when bruised, will form a soap-like lather when agitated in water. Many moths and other insects help to fertilize its flowers, and the plant also propagates through its underground runners. This latter means often accounts for our finding the plant growing in colonies in some waste fence corner along the roadside. A popular writer at hand says: "It was always a mystery to Dickens that a door nail should have been considered so much more dead than any other inanimate object, and it seems also strange that this plant should have suggested the idea of bouncing more than other plants. Dear Bettie does not bounce, nor could she if she would. She sits most firmly on her stem, and her characteristics seem to be home-loving and simple. We are sure to find her peeping through the garden fences, or on the roadside, where the children nod to her as they pass by. She is one of the best loved of our waste-ground flora."

It would appear that the common double variety of this plant is the original cultivated species, and the single variety is its more simple and wild form derived from it—the plant that usually occurs along roadside, far from any country garden patch. The flowers of Bouncing Bet are sometimes of a bright pink color, and as a rule they possess a certain spicy fragrance, which some writers speak of as "an old-fashioned odor," whatever may be meant by that term. In typical flowers, the distal ends of the petals are scalloped, a fact that lends to them a still nearer resemblance to a Pink, though, as a matter of fact, this resemblance is never very close.

The leaves of Bouncing Bet are smooth and from three to five-ribbed, and have an ovate or even oval-lanceolate outline. The most interesting relatives of the *Saponaria* are the Campion or Catchflies—curious plants with very interesting histories. Their generic name is from a Greek word meaning *saliva*, which refers to the viscid juice found in the calyx and stems of some of the species; in this small insects are frequently entangled.

Some of the wild carnations also belong to this Pink family, and some of these have been domesticated for ornamental purposes.

#### EASTERN FOREST RESERVES BOUGHT

**T**HE National Forest Reservation Commission has approved the purchase of 51,916 acres of land in the White Mountains and Southern Appalachians for inclusion in the National Forests of those regions. The two largest and most important tracts whose purchase was authorized are one of 11,000 acres on the White Top National Forest in Smyth County, Va., and another of 10,000 acres on the Savannah National Forest on the Tallulah River in Rabun and Habersham Counties, Ga. The purchase of three additional tracts, with a total of 1203 acres, was authorized on the Savannah National Forest.

On the White Mountain National Forest 11,270 acres, chiefly in Carroll and Grafton Counties, N. H., were approved for purchase. By the acquisition of this land the purchases which have heretofore been made in the White Mountains are connected and rounded out.

The purchase of 40 different tracts comprising approximately 7750 acres on the Alabama National Forest in Lawrence County, Ala., was ordered. This will raise the total Government holdings on this forest to about 30,000 acres. In Rockbridge, Amherst, and Botetourt Counties, Va., 7454 acres were approved for purchase.



BOUNCING BET, THE FLOWER OF THE DUSTY ROADSIDES

FIG. 5.—This well-known flower is also called "Soapwort," hence its scientific name *Saponaria (sapa, soap)*, it being *Saponaria officinalis* of the pink family (*Caryophyllaceae*); the "Cowherb" is the only other representative of the same genus (*S. vaccaria*). Both plants came originally from Europe, and, as Gray remarks, they are "coarse annuals or perennials, with large flowers," having in their stems a "mucilaginous juice forming a lather with water." In the Pink family, in this country, also occur several species of Carnation plants (*Dianthus*); the Campions and Chickweeds, of which there are many kinds; the Spurrey, Pearlworts, and a number of species of Sandworts; finally the Corn Cockle, which has already been described and figured in *AMERICAN FORESTRY* (May, 1917). The insect shown on the flower below the crowning bunch is one of the Damsel-flies of the Dragon-fly group (genus *Calopteryx*); it is the black species of feeble flight, so frequently seen about the small streams that find their way through the shady forests of Eastern United States. Dr. L. O. Howard says that their "large pop-eyes which seem almost stalked like those of a crab" are distinctive of them.





TREE PLANTED BY PRESIDENT LI YUAN-HUNG OF CHINA

A group of high Chinese officials taken just after the ceremonial observance of Arbor Day at Peking, China, on April 5th. President Li Yuan-hung is seen in the centre of the picture, behind and slightly to the right of the tree he has just planted. The stone tablet bears the inscription in Chinese "Planted by the hands of President Li." The Premier, General Juan Chi-rui, is seen in uniform at the extreme right. Between him and the President are Mr. Jao Chang-shang, Chief of the Department of Agriculture and Forestry (on the left), and Mr. Ngan Han, well-known to American foresters and to whose influence the adoption of a national Arbor Day in China was largely due. Behind the tree at the left is Dr. Chen Chin-tao, Minister of Finance.

## FORESTRY PROGRESSING IN CHINA

**F**ORESTRY propaganda in China is making steady progress and producing results increasingly important. Indications of the growth of interest in reforestation are manifested throughout the nation and from various sources AMERICAN FORESTRY is in receipt of information, proving that this long neglected subject is now receiving the attention it deserves. In official circles and elsewhere the republic is awakening to the necessity of making up for the laxity that has caused China to be looked upon as the horrible example of indifference to the importance of forest development and conservation.

Not the least significant incident along this line was the personal participation of President Li Yuan-hung in the Arbor Day exercises in the Temple of Heaven at Peking, April 5. Information concerning this celebration comes in a letter from Mr. W. F. Sherfese, an American, who is now Adviser in Forestry to the Chinese Government. Mr. Sherfese writes that this was the first time a ruler of China had taken part in exercises of this nature and adds that it was unquestionably the President's intention thus to invite national attention to the importance of forestry in the republic. The day was observed as a national holiday, and similar exercises took place in all of the provincial capitals and in most of the cities of lesser importance.

"President Li is an ardent friend of forestry," adds Mr. Sherfese, "as indeed he is of whatever promises to promote the economic and social welfare of the people, and never misses an opportunity to express his interest

in, and to exert his influence in favor of, the work. Especially at this time of crisis in international affairs, when the president is overwhelmed with pressing important matters of all kinds, it was no slight sacrifice on his part to devote the time and effort to making the occasion one of national prominence; and to him is due the gratitude of all friends of Chinese forest conservation."

Clippings from Chinese papers, enclosed with Mr. Sherfese's letter, describe the Arbor Day ceremonies in detail and make it clear that the event was regarded as of great national importance. The *Peking Gazette* speaks of the celebration as one that should go down in history as marking another milestone in the progress of the first republic in the Far East. "Until yesterday," says this paper, "the prayers offered by the rulers of China, imperial and republican, had been in the form of words and burnt offerings. Yesterday it took the form of a practical demonstration. The occasion records in actual deed the fact that China no longer dreams of prosperity pouring down from heaven without the people lifting a finger, but believes that prosperity must come with work—actual work of the hand. The most remarkable fact is that it was the President, the chief executive and representative of the country, who made this demonstration. Nor was it a perfunctory act that was gone through to show the people that their ruler was not idle. The example set by the president was immediately followed, eagerly and sincerely followed, by hundreds of others who were privileged to take part in the ceremony. The rush for



THE CENTRE OF LAI-AN

The Kuli hsing ting gate marks the centre of the town where Dr. Bailie's colony is established.



NORTH GATE OF LAI-AN

Showing character of the houses and the streets in the village whose people have started a forest nursery.



LU TI MIAO SHRINE

An old shrine near the village which is but little shaded by a feeble tree which cannot live much longer.



FAMINE REFUGEES

These people are entering the village from the famine stricken country. The family property is all on the wheelbarrow.



PU SHU SHRINE

A small shrine along the roadside a short distance outside the gates of the village of Lai-an.



SOUTH GATE OF LAI-AN

Showing the old town walls and the moat which constitute the town's chief defences against an enemy.



MAIN STREET OF LAI-AN

Dr. Bailie speaks feelingly of the filth and destitution of this walled village which is called a city.

VIEWS OF LAI-AN COLONY, CHINA, WHERE A FOREST NURSERY HAS BEEN ESTABLISHED



STOCK FOR THE LAI-AN NURSERY

This stock sent from the University of Nanking, the magistrate paying half and the colony half the cost.



THE LAI-AN FOREST NURSERY

Magistrate Wan, in black and white, directing the work of establishing the nursery near the village.



REFUGEES IN A HUT

These people fleeing from the country took refuge in a hut under a ginkgo tree on the nursery plantation near Lai-an.



THE MEN RESPONSIBLE

Magistrate Wan of Lai-an, Dr. Bailie and Mr. Best, the men whose efforts resulted in the forest nursery being established.



CHURCH AND PAGODA

These places are some fifteen miles from Lai-an, but on the road to it, and are very well attended by the villagers and others.



THE NURSERY GROUND

After a conference the plot of ground here shown was selected for the location of the forest nursery.



A LAI-AN BACK YARD

The donkeys so much used in China are kept so close to the kitchen door that they are the chief back yard ornaments.

seedling plants was so great that many went away disappointed because they were unable to plant trees with their own hands."

Small cypresses were planted by the President and by all the members of his cabinet with the exception of Minister Wu Ting-fang. Other high officials of the government followed his example. After the ceremonies citizens and school children planted all the trees that had been provided for the occasion.

Since Mr. Sherfese's letter was written internal troubles have arisen in China. Imperialists have overthrown the government and have been in turn assailed by the Republicans.

One of the most important examples of the Chinese interest in forestry matters is afforded by the success of the Colonization Association in its work on Purple Mountain. This association was the outgrowth of relief work undertaken in 1911 by Dr. Joseph Bailie, Instructor in Forestry at the University of Nanking. The organization owns 1000 acres of land on the north-west slope of the mountain, and this property enables it to carry out its plan of providing work for

the poor and at the same time give the workers the benefit of the fruits of their industry. The men have been employed in digging canals, removing stones, making roads, levelling uneven places and converting a waste area into an orchard and plantation of mulberries. Much opposition was experienced during the early stages of the work, but this has been replaced by complete confidence and coöperation. Undertaken as a means of giving succor to sufferers from famine, the association has proved the soundness of its plans and has put to profitable use large areas hitherto idle. It has given temporary employment to thousands, and many families now gain a permanent and comfortable livelihood on land which otherwise would have remained indefinitely unproductive. It has resulted in the establishment of a comprehensive course in forestry at the University of Nanking and has served to arouse interest in other and possibly larger projects of reforestation throughout the republic. Under date of May 20, Dr. Bailie writes from the University:

"I made a trip to Lai-an Colony, where we have over 80 families, numbering over 400 people, now independent. The object of my visit was to establish a nursery for our

Colony to enable the colonists to plant trees on those lands that are too steep or too stony for cultivation. I had also hopes to be able to extend the Colony. In this latter object I was foiled. When we took the 80 families—refugees—from the farmers for whom they were working in 1914 and put them on the mountain, wages for the next harvest doubled, and have never gone down

below a living wage. The farmers contended that if we open another mountain wages will go up again. We have proved that if the lands are thrown open the poor can maintain themselves even if the lands are second or third rate.

"We were successful in opening our nursery. The official had heard that I was going up to start it, and he requested me to bring some trees and seeds along for him as he also wanted to open a nursery. In two of the pictures which I send along the bundles of nursery stock are seen outside of Mr. Best's gate. We sent up from our University nursery robinias, melia azederach, maple, pines, thunbergii, sophora japonica, pistachio chinensis, gleditsia and ginkgo biloba, besides a few of the other species.

"The official after some conferences arranged to

have a meeting at Lo-an temple, which is the administrative centre for our Colony and is distant from Lai-an about eight miles. Though the temple belongs to the association, he invited us all as his guests, and provided a horse for Mr. Best and a chair for me. He himself went ahead in a chair. After some deliberation on the spot it was decided that the official coöperate with our association and that he give half of the expense and the association give half. Mr. Yu, who is the caretaker at Lo-an temple, and the manager among the colonists under Mr. Best, has done such good work that he is made the head of the nursery, and the official has been much pleased by his management for over two years.

"A photographer took a number of pictures on this trip and I send you several of them. You will see how squalid a place Lai-an is and the self-denial involved for Mr. and Mrs. Best in making it their home instead of remaining in civilization. It is simply like going into heaven to get into Mr. Best's mission compound after being out in the filth and destitution of this walled village called a city."

Acknowledging a copy of the constitution and by-laws



ARBOR DAY IN CHINA

President Li Yuan-hung (indicated by a cross at the foot of the steps towards the right) and his party leaving the Chai Kung on his way to perform the tree-planting ceremony on Arbor Day in China. This temple is situated within the enclosure of the Temple of Heaven, Peking, and it was here that the Chinese Emperors used to fast before proceeding to the Altar of Heaven to offer sacrifice.



TEMPLE GIVEN TO LAI-AN COLONY

If the presentation had been delayed a few days all the trees surrounding this Ta an Temple would have been cut down.



SHRINE OF THE GOD OF FARMING

Note how religiously the trees surrounding this temple have been preserved despite great need of firewood.



INTERIOR OF TA AN TEMPLE

The tree banked up with stones is a knei hua and over 500 years old. When in bloom its fragrance is perceived three miles away.



BRIDGE NEAR CHU CHI

Owing to deforestation the floods in this region are so great that in flood times this bridge is impassable.



EN ROUTE TO TA AN TEMPLE

Dr. Baillie in a chair and Mr. Best on horseback on the way to the Temple presented to the Lai-an Colony.

of the American Forestry Association, Mr. D. Y. Lin, Executive Secretary of the Conservation Division of the Young Men's Christian Association of China, writes from Shanghai:

"I am sure this booklet will be of great help to me in my attempt to get a Chinese forestry association firmly established. I shall be very glad to tell you later, in detail, how I have been working to interest prominent men in this country in such a movement.

"After my lecture campaign in Nanchang, I went to Wuchang, where altogether nine lectures were given. The total attendance was 3580. Military Governor Wang Jen-Yoen, who is also civil governor for Hupeh, presided at the first meeting, and his interest certainly gave a good start to the campaign in Wuchang. Results of the Wuchang campaign may be briefly stated as follows:

"1. The governor issued circulars to different districts urging local magistrates to do a certain amount of planting every year and asking the different taoyin to supervise the work.

"2. An appropriation for extension work to be done by some government agricultural students during the summer time has been granted.

"3. A bureau for the promotion of forestry in Hupeh will be inaugurated in the Agricultural Society.

"Leaving Wuchang I went direct to Changsha, Hunan. It was in this province that preparations for a forestry lecture campaign were most complete. The governor gave \$150 to defray expenses for running a local campaign in Changsha. The Hsien officials were notified. Arrangements for a trip through the province were made. Altogether 15 lectures were given in Changsha and as many as 5912 people attended these lectures. The gover-

nor was so pleased with the results in Changsha that he appointed one of his secretaries to escort me through the province and urged me to lecture in as many of the interior cities as possible. Four cities were visited and I lectured in three of them. Coming back to Changsha I was asked to inspect Yaloshan, where the famous generals, Huang Hsing and Tsia Oa, are buried, to see what could be done to reforest, or, rather to beautify, the mountain.

"Perhaps the most important lecture in Changsha was the one before the provincial assembly. The lecture was arranged by the governor and the Commissioner of Industries, who wished to see that the assemblymen would take a greater interest in agriculture and forestry and would appropriate more money for the work for the entire province. The lecture was a success and it was followed by some most interesting discussions as to what ought to be done at once on Yaloshan and throughout the Hsien cities. There is every reason to believe that forestry work in Hunan will have a good start this year. The results of the Hunan forestry campaign may be summarized as follows:

"1. Five cities were visited, 19 lectures given, and 7912 people reached.

"2. A forestry association for Hunan was started.

"3. A forestry essay contest will be conducted to encourage the study of forestry among Hunan students.

"4. Two men have volunteered to carry on lecture work in the country towns, and three sets of my lecture outfit have been ordered.

"The results of such forestry lecture campaigns in Kiangsi, Hupeh and Hunan during the last two months are indeed encouraging."

## FORMS OF LEAVES

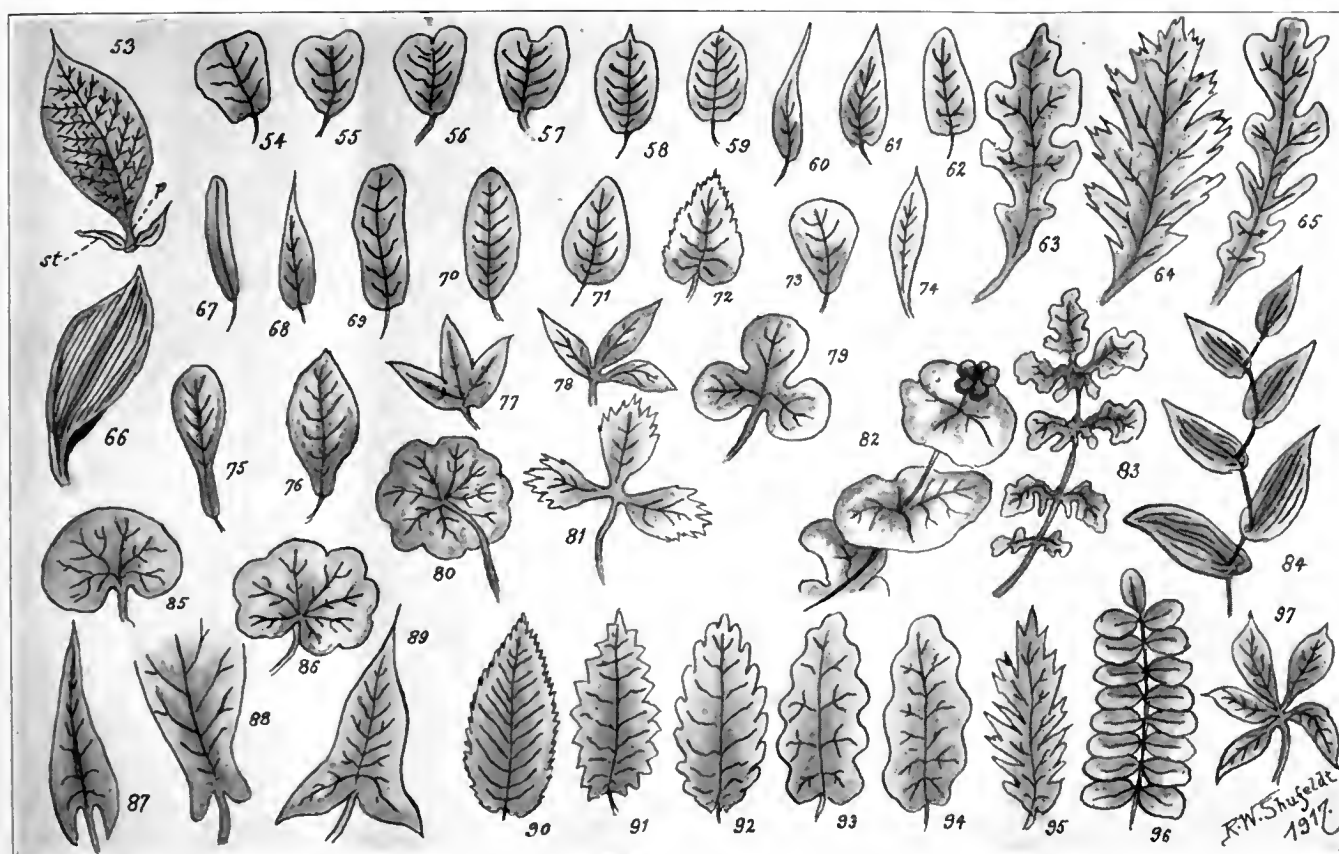
A PERFECT and typical leaf (Figure 53) consists of its expanded part called the *blade*, which frequently has a foot or leaf-stalk termed the *petiole* (*p*), and a pair of *stipules* (*st*); sometimes the blade is called the *lamina*. In Figure 53 the midrib, veins, and veinlets are well shown. There are two principal types of this veining: the netted-veined and the parallel-veined (Figure 66). The significance of this is extremely important; moreover, it has much to do with the form assumed by leaves in general.

Leaf-forms are well-nigh infinite; but they may be so classified as to be referred to specific kinds, for which a terminology is highly necessary. This terminology is also applied to other parts, as the petals of flowers, and so on. Most all leaves have a base and an apex with respect to the stem, and these vary in general contour as well as in their margins. As to the apex, it may be *truncate* or square across (Figure 54), *retuse* or indented (Figure 55), *notched* or emarginate (Figure 56), *obcordate* or deeply notched at the apex, causing it to be inversely heart-shaped (Figure 57). Then they may be *cuspidate*, where the apex is rigidly

spined (Figure 58), or *macronate*, where this spine is small, perhaps a mere extension of the midrib (Figure 59).

As to the general form of the leaf, it may be *linear*, that is long and narrow (Figure 67), *lanceolate* or lance-shaped (Figure 68), *oblong* (Figure 69) and *elliptical* (Figure 70), as well as *ovate* or egg-shaped (Figure 71), and *cordate* or heart-shaped (Figure 72). When the leaf tapers to an acute angle at the base, being broad above (Figure 73), it is said to be *cuneate* or *cuneiform*, and when it is inversely ovate, it is said to be *obovate*, as in Figure 76. Then the outline may be *spatulate* (Figure 75), also *oblanceolate* (Figure 74), which is lance-shaped, with the small end at the base—the reverse of Figure 60.

Passing to the form of the base, it may be *reniform* or kidney-shaped (Figure 85), or *peltate*, shield-shaped (Figure 86), as in the white Water Lily. If the margins at the base of this leaf are brought together, we have another shield-form (Figure 80), which is the Marsh Pennywort. A leaf may be arrow-shaped or *sagittate* (Figure 87), *auriculate* or eared (Figure 88), as well as *hastate* or halberd-shaped (Figure 89).



Then we may have simple or compound leaves, all in one piece in the first instance, or divided up into two or more pieces springing from a single stalk, when they are termed *compound* leaves; an enormous number of patterns represent these two divisions. With respect to other outlines, the leaf may be *entire*, that is with unbroken margin; but when this margin is saw-toothed, it is said to be *serrate* (Figure 90). When the teeth point outwards, it is *dentate* (Figure 91); if the margin be scalloped it is said to be *crenate* (Figure 92), and if wavy it is *undulate* (Figure 93). If markedly wavy it is *sinuate* (Figure 94). Finally, the margin may be *incised* or *jagged* (Figure 95).

Sometimes leaves are more deeply cut than this, when they are said to be *lobed*—the projections being called lobes—and they may thus be 2-lobed, 3-lobed, many-lobed, etc. Simple lobed leaves are shown in Figures 63 and 79; when sharply lobed it is *cleft* (Figures 64 and 77), and such leaves may be *bifid*, *trifid*, *quadrifid*, etc., even *multifid*, giving rise to segments to correspond. If not cleft, the leaf may be parted by deeper incisions extending almost to the midrib (Figures 65 and 78); so we have them 2-parted, 3-parted, multiparted, etc. Should the incisions reach the midrib, the leaf is said to be *divided*, that is *bisected*, *trisected*, and so on (Figures 81 and 83). Figure 97 shows a *palmate* leaf, or five leaflets (Sweet Buckeye).

To describe the degree as well as the mode of division, other terms are employed, as feather-veined, that is *pinnately-veined* and *radiate-veined* or *palmately-veined* leaves. Figures 63, 64, 65 and 83 are examples of the first, and 77, 78, 79 and 81 examples of the second. Such terms as *palmately lobed* (Figure 79), *palmately cleft* (Figure 77),

*palmately parted* (Figure 78), and *palmately divided* (Figure 81) are self-evident.

Compound leaves exhibit leaflets as in Figure 96 which are said to be *pinnate*; there are also palmate compound leaves, sometimes called *digitate* (Figure 97). Compound leaves like in Figure 96 may have one or two leaves at the distal end of the stem, or terminate in a tendril as in the common garden pea. A variety of other terms are employed to describe the compounding of leaves; for example, the foliage of the Meadow Rue is said to be *ternately-decompounded*. But space will not admit of giving more of them here.

*Perfoliate* leaves is where the stem seems to run through or perforate the leaf near its base (Fig. 84, Bellwort); this is definitely so in the lower leaves, and less so as we ascend toward the end of the stem, where the last leaf is *sessile*. Sometimes the perfoliation is due to two leaves amalgamating (*connate-perfoliate*), as in true honeysuckle vines (Figure 82), and here the perforations disappear as the main stem is approached.

**A** SIGNIFICANT indication of the interest taken in forestry in California is the popularity of a course in Elementary Forestry at the University of California. This course is designed, not for the professional forestry student, but to supply information on forestry matters and methods for its general educational value. Seven colleges of the University are represented in the enrollment—Letters and Science, Agriculture, Commerce, Chemistry, Civil Engineering, Mechanical Engineering, Mining. Statistics recently compiled show that during the past year 382 different students have been under instruction by the Forestry Division, including both those in professional and in non-professional courses.

# ORNAMENTAL SHADE TREES AND THEIR CARE

BY HOMER D. HOUSE  
STATE BOTANIST, NEW YORK

IT cannot be said with any degree of propriety that trees are really at home along city streets. They belong in the forest, and when planted for shade or ornamental purposes are confronted with a new set of conditions, which make life anything but a simple proposition for them. It is not unlike the problems which confront the citizen of a forested, rural community who for the first time finds himself obliged to cope with the confused life of a big city.

In this brief discussion of trees I must confine myself largely to the subject of the proper selection and care of trees best fitted for shade and ornament along the streets of cities and towns. The particular species of trees most suitable for this purpose varies considerably with the climate of the various portions of the United States and Canada, but certain general principles regarding their selection and care apply everywhere. In the use of trees for street shade there are certain requirements and conditions which do not permit of very great diversity of kinds, as compared with the number of trees which can be used for shade and ornament in parks and private estates. Allowing for certain minor differences in soil, exposure, and drainage, conditions to which trees along streets are subjected are apt to be generally uniform in any one section of the country, and experience has demonstrated the supreme fitness of certain trees and undesirability of others.

The proper use of a few hardy and desirable shade trees is preferable from every point of view to the indiscriminate and improper use of a great variety of trees, some or many of which are entirely out of place as street trees. So much has been written about the good points of our native and introduced trees that it seems like needless repetition to point out the characters which make them most desirable for street trees.

It is useless to plant trees which are not hardy or not adapted to the soil or able to withstand wind, snow, and ice, and these latter conditions may vary consider-

ably in different portions of the East and North. The most desirable are those trees which suffer least under city conditions from insect and fungous attacks. Some trees, like the basswood and maple, suffer from leaf-burn when over a light-colored pavement. Some trees do better in clay than in sandy soil. These factors must be taken into careful consideration in the selection of trees for any particular street.

Trees which do not harmonize with the width of the street and the character of the buildings do not accomplish

the purpose of beautifying the street, which is about as important as the shade which they may give. Tall, overtopping elms are not beautiful on a narrow street where houses are close to the street. For such situations trees of moderate height, growth and with slender crowns are appropriate and beautifying to an otherwise unsightly street.

Our city streets are often too full of trees like the Carolina Poplar, Box Elder, Silver Maple, and Aspens, planted by well-meaning but thoughtless people to secure quick shade in places where with a little care a Norway Maple, Sycamore, Red Oak, or Elm would have attained almost as quickly a shade-giving size and a permanency of many years. The fast-growing trees are apt to be short-lived. They are also usually the cheapest, and many people plant them for that reason. This emphasizes the importance of having all street

tree planting under the charge of a city forester, who will set out the proper kinds of trees as soon as the street is laid out and paved.

If the houses are close to the street and close together, dense shade is not desirable. Lawns, walks, and buildings need sunshine. Under such conditions, trees like the Norway Maple if planted close together give too much shade and prevents grass from growing. A tree with thin foliage, like the Ash, White Birch, or Locust, is most desirable for such streets, although local conditions may permit Norway Maple planted at greater



THE BEAUTY OF THE MAGNOLIA

This tree, most artistically placed near one of the entrances to Franklin Park, Washington, D. C., illustrates the perfect adaptability of the magnolia for such use.



distances and occasionally pruned, or the use of Sycamore, which will stand a lot of pruning.

Several trees, otherwise very attractive, are often a nuisance along streets because they litter the walks and pavements with bloom or fruit, send up suckers, or attract insects. The Silver Maple has a bad and well-deserved reputation for breaking up pavements and walks. The Honey Locust litters the pavement with slippery pods, and the fruit of the Mulberry and Shadtree are objectionable for the same reason. The fruit and foliage of the Horsechestnut cause quite a litter, and often the foliage is diseased in summer, causing it to turn brown and fall prematurely. With proper care, such a condition may be obviated and the litter of the fruit tolerated for the sake of the beauty of the flowers, foliage, and shape of the crown, since few trees surpass the Horsechestnut in these respects.

To obtain beauty in street planting there must be harmony between the trees and their surroundings. This is best obtained by using, as far as possible, trees of one kind upon a single street or block, and trees of a character that are best adapted to the width of the street and other conditions. Since the city street is not the native home of the trees, we cannot expect absolute perfection, but, excluding evergreens, it is possible to select and plant those trees most suitable for the conditions presented.

For wide avenues or boulevards, there is probably no one tree that is so satisfactory both as to size and beauty as the American Elm. On wide avenues or boulevards with a central parkway, two rows of elms may often be used, and flanking them on either side and planted on the curbing a very good effect can be obtained by rows of Sycamore, Norway Maple, Pin Oak, Green Ash, or Basswood, if the houses are comparatively close to the street. If the houses are well back from the street,

larger growing trees may be used, such as Red Oak, Scarlet Oak, Sugar Maple, Tulip Poplar, in addition to the row or rows of elms in the central parkway.

For avenues without parkways, but with broad curbing and at least 100 feet between the building lines, there is a wide range of appropriate trees, leading off, of course, with the Elm, Sugar Maple, White Oak, Red Oak, Tulip Poplar, Scarlet Oak, Red Gum, American Basswood, Cucumber-tree, and others.



*Courtesy of N. Y. State Conservation Commission.*

LOMBARDY POPLAR, ROCHESTER, N. Y.

Entirely too stiff and formal, and not at all suitable for street tree planting, save perhaps under most unusual conditions.

For the ordinary street, which is 70 to 90 feet wide between the building lines, trees which do not attain the largest and most majestic growth of crown are most beautiful. For such streets there is no more appropriate tree than the Norway Maple, although circumstances and taste may with equal propriety dictate one of the following: Sycamore, Sycamore Maple, Basswood, White Ash, Ginkgo, Horsechestnut, Red Gum, Pin Oak, Red Maple, Honey Locust, or Hackberry.

For narrow streets, 70 feet or less between the building lines, the number of suitable trees is very limited, and even some of them will require skilful pruning as they attain their growth to keep them in harmony with their surroundings. The best trees for this class of street are the European Linden, Red Maple, Green

Ash, Hackberry, Japanese Maple, Ginkgo, Red Bud, and Shadtree. The use of Norway Maple and Sycamore on narrow streets is very often productive of good results where they are kept trimmed.

The above paragraphs contain scarcely any mention of several trees common on city streets. For one reason or another they should not be used where it is possible to use one of the trees which experience has shown to be the best. Beech is not desirable because of its dense shade and slow growth. The Chestnut is susceptible to the chestnut blight disease, for which no control has

been found, and along with all large nut-bearing trees, like the Walnut, Butternut and Hickory, are not desirable along streets. The Black Locust (*Robinia pseudo-acacia*) suffers so severely from the attacks of the Locust borer and consequent decay that it is poor policy to make any but a very limited use of it. The Willow is not adapted either by its form or durability as a street tree.

I can well imagine that there are conditions which demand the use of trees of rapid growth, trees which ordinarily should not be used along streets. I have seen many factory streets, railroad grades through cities, and other con-

ditions where I would not hesitate to use the most rapid-growing tree available, to act both as a screen and to give shade. There are conditions where the necessity for a screen of foliage and for shade takes



Courtesy of the N. Y. Conservation Commission.

A TREELESS STREET

This is difficult to treat, but sycamore or Norway maple, if planted and kept carefully trimmed, would do much to destroy the ugly vista.



Courtesy of the N. Y. Conservation Commission.

A STREET PLANTED WITH WHITE BIRCH

Could anything be more inviting, restful, or pleasing to the artistic sense than this tree planting? Contrast this cut with the one above.

precedence over beauty and length of life. The Ailanthus, Carolina Poplar, Black Poplar, Lombardy Poplar, Horsechestnut, Box Elder, and several other rapidly growing but comparatively short-lived species are eminently fitted for such purposes. Sometimes it is possible to alternate these trees with slower-growing but longer-lived trees which when they attain sufficient size may be left,

complications which frequently make them very easy victims to a wide range of injuries. Many, if not most, of the injuries which lead to the death of street trees can be prevented. They can only be prevented, however, by proper municipal control of the causes or agencies which produce the injury and a more extensive public-spirited effort to aid such protection.

It would be almost impossible in a short space to enumerate the kinds of mechanical injuries to which street trees are subjected. Trees close to the curbing are subject to abrasion by passing vehicles, or abrasion may be caused by the piling of flagstones or paving blocks against the trees. I have seen this sort of injury in cities with most efficient city foresters and park superintendents. If they are powerless to prevent such injury, or overlook the matter, such cities still have some progress to make in the care of their trees. Horses when hitched to a tree close to the curbing will almost invariably gnaw the bark. All of these injuries, while more or less preventable, indicate that absolute prevention may only be secured perhaps by the use of iron palings around all trees upon the curbing.

Careless telephone men, in spite of the definite orders



*Courtesy of N. Y. State Conservation Commission.*

**AN ATTRACTIVE ROW OF NORWAY MAPLES**

This exemplifies the practical value of the Norway Maple, than which it would be hard to find a better tree for roadway or street planting.

of all telephone companies to the contrary, frequently use their climbing spurs in ascending trees. Important roots are often cut off and destroyed by the laying of curbs, gas and water pipes.

All injuries of these kinds, as well as a wide variety of other mechanical injuries to either trunks or roots, result in the formation of decayed spots, which if neglected will sooner or later shorten the life of the tree.

Escaping gas causes the death of many city trees, especially where the gas mains are laid under or close to the sidewalks as they are in some cities. Even when the main is under the pavement, the connecting extensions to the dwellings on either side often become defective and the gas escaping into the soil frequently causes the death of surrounding trees before the leak is discovered and repaired. Greater care in the use of better pipes and better joints seems to be the only solution of this sort of damage, which probably kills more city trees than any other one agency.

In wet weather or during storms, lighting wires, carrying an alternating current, will cause serious damage to trees, when the loss or abrasion of insulation makes direct contact possible. This trouble is easily detected and easily remedied, and in cities where any degree of care is taken of the lighting installation serious injury to trees from this cause is rare. High-tension, direct-current-bearing wires, if brought into contact with trees, will kill them the same as by a lightning bolt striking the tree. Hence such wires should be most carefully insulated when near trees, and, what is safer for both trees and human beings, placed under ground.

It seems absurd to class pruning among the injurious agencies of trees, but a casual inspection of the trees in almost any city appears to indicate that careless and improper pruning has accomplished great damage. There is a right and a wrong way to prune trees, and a saw, an ax and a little muscle are not all the requirements for correct pruning of trees. When cut



*Courtesy of N. Y. State Conservation Commission.*

**A MAGNIFICENT SPECIMEN OF THE AMERICAN ELM**  
Most beautiful of all shade trees, in the opinion of many, and undoubtedly ideal for planting of broad streets and avenues.

close to the trunk and not supported, a heavy limb will split down the side of the trunk before it is completely severed from the tree. This split of exposed wood is difficult to prevent from starting to decay. If the branch is cut too far out, a stub is left which will decay and extend its decay into the heart of the tree. Proper pruning demands that the limb be supported by ropes until severed from the trunk, by a cut made some distance out from the base of the limb, and that the stub thus left be cut off close to the trunk and painted or treated with some preparation which will prevent the start of decay before it heals over.

The use of cement fillings for decayed spots in street trees is doubtless too expensive, if well done, to be practicable on a large scale, however desirable it may be as a treatment for privately owned trees. For certain city-owned trees of exceptional size and beauty, it is worth all that it costs. For the ordinary street tree, it is probably best, in the long run, to merely remove the decay, giving the interior sufficient ventilation to check to some degree the progress of decay. In many cases, where the tree is badly decayed, it is best to remove the tree and plant a good-sized healthy young tree to take its place. That such trees need care is obvious. What care they will receive depends much upon the funds available and the tastes and desires of those in charge.

Space need not be taken here to diagnose the numerous insect and fungus attacks upon trees. The more serious of them have received careful study in many quarters. The fact that with all of our knowledge of shade-tree insects and fungi, the trees continue to languish and die in many towns and cities, points to a more important



THE CATALPA IN BLOOM

Largely used for ornamental purposes on lawns and in parks because of its fragrance, showy flowers and heavy foliage.

of every city should interest themselves more in the matter of shade tree improvements to be obtained by trained and well-paid men. It is an investment for the future which no city will ever regret, and its results are almost immediately evident in the improved appearance of the trees and the systematic planting of the right kinds of trees along new streets.

I believe that we should be optimistic enough to expect that results will speak for themselves, and that every city will rapidly come to realize the importance of placing its planting plans and care of trees in the hands of a competent and well-trained forester, giving him funds and authority, not merely to give advice, but to accomplish results, which, measured by beauty, will have a value in the future unrivalled by any other form of civic improvement.

**T**HE California lumber manufacturers have taken up the campaign for food production on their available land and Secretary E. A. Blocklinger, of the White and Sugar Pine Manufacturers, has sent out a detailed letter urging the production of food as a patriotic duty and opportunity.

**A** TREE forester and landscape engineer are desired by the city of Trenton, N. J., and applications blank for the places should be in not later than August 3. All information regarding the requirements may be had from the Civil Service Commission, Trenton, N. J.

# THE WRENS

(Family Troglodytidae)

BY A. A. ALLEN, PH. D.

ASSISTANT PROFESSOR OF ORNITHOLOGY, CORNELL UNIVERSITY

**A**GES ago there dwelt in northern Africa and along the Red Sea certain tribes of men known as the Troglodytes. They were herdsmen, living entirely upon flesh, and they made their homes in caverns which the ancient sea had gnawed into the rocks. They were hole-dwellers. This alone could have prompted the name of *Troglodytidae* for the great family of wrens, for surely there is no other comparison between these prehistoric, carnivorous shepherds and the little energetic brown birds which compose the wren family. But *Troglodytidae* they were christened, because of their hole-nesting habits, and by that name shall they always be known.

There are about 260 different kinds of wrens, the majority being found in the tropics of South and Central America. Between thirty and forty are found in the Old World and only fourteen in the United States and Canada.



PETULANT, INQUISITIVE, MISCHIEVOUS—BUT A GOOD FRIEND  
JUST THE SAME

The house wren—the commonest and most widespread of all the wrens—is fond of human habitations and quick to avail himself of nesting boxes or crannies about the porch.

In spite of their numbers, they are remarkably uniform in plumage, wearing browns and grays in very inconspicuous patterns. They are, with few exceptions, very small birds, seldom exceeding five or six inches in length, with rounded wings and short tails, which they characteristically hold erect or even tilt forward over the back. Their small, plump, brown bodies and their habit of haunting brush piles or sneaking along the ground

give them an exceedingly mouse-like appearance. In fact, were it not for their inquisitive ways and their petulant voices, wrens would seldom be seen; but as it is, one cannot pass their retreats without being surveyed



GUARDING THE MARSHES

Short-billed marsh wrens would seldom be seen if they were content to creep around the tangled sedges, as is their usual habit—but at anyone's approach they climb the tallest reed in the vicinity and rebuke him for venturing into the marsh.

from every side and without being the target for their loud, fretful calls.

When not alarmed, the male seeks some exposed perch, where, with drooping tail, he gives vent to his exuberance in a voice of surprising volume and sweetness, for, with the exception of the cactus wrens, the whole wren family is famous for the brilliancy of its songs. Even the familiar loud, bubbling, gurgling song of the house wren sinks into insignificance when compared with the bold, ringing songs of the Carolina and canyon wrens or the roundelay of the winter wren. As with most birds, the song is usually confined to the male, but certain tropical species have the delightful habit of singing in duet. L. A. Fuertes, the well-known bird artist, in some pleasing essays entitled "Impressions of the Voices of Tropical Birds," gives us a vivid picture of these birds in action:

"This counter-singing by the female, so far as I am aware, is not generally known among birds, but it is cer-

tainly practised by this species (*Helodytes bicolor*), as well as by all forms I know of, *Phengopedius*, *Henicorhina*, and *Donacobius*. In all these cases the birds sit close together, the male a little above the female, and his song is usually louder and more brilliant than hers. *Helodytes bicolor* gurgles a loud, clear, oriole-like 'Keep your feet wet.' The female, three inches below and a little to one side, parallels this advice with an evenly timed 'What d'you care?' in perfect unison usually with the reiterated phrases of her mate. *Donacobius* does it somewhat differently, as the female only says 'wank, wank, wank,' while the male sits just above and sings almost exactly like a cardinal, or a boy whistling loudly to his dog, 'hui, hui, hui.' If the male gives only three phrases, so with the female; if, however, the male repeats his whistle a dozen times, the female begins and ends in exact time with him."

As suggested in the first paragraph, the nests of most wrens are placed in holes, either in hollow limbs, in crev-



A HOME DESPOILED

A bumble bee has here utilized the nest of a marsh wren instead of that of a meadow mouse, as is his custom. A broken eggshell tells of the former occupant—a cell of honey possibilities for the future. The bee constructed an inner roof over the chamber containing the honey cell.

ices in the rocks, in cran- nies about buildings, or in nesting boxes erected for them. Some species, how- ever, like the marsh wrens, build globular structures suspended in the reeds of the marshes, while the cac- tus wren makes an enor- mous structure of thorny twigs, placing it well within the heart of a Spanish bayonet or branching cactus.

The energy and indus- try of wrens find expres- sion for itself in the build- ing of duplicate nests. Not content with having com- pleted one nest, many spe- cies, if not all, continue to carry material until half a dozen nests may be con- structed. If they are hole- nesting species, every cranny in the vicinity will be stuffed full of sticks. If they are marsh wrens, they will place their globular structures usually within a

short radius, although in late summer and early fall, with their energy not yet failing even after rearing two broods of young, they may scatter their nests wherever the spirit seems to move them. The reason for building these dupli- cate nests, as suggested in AMERICAN FORESTRY for De- cember, 1916, probably had its origin in the effort of the male to secure more than one mate, and indicates that the



A MARSH WREN AT ITS NEST

A long-billed marsh wren at its globular nest hung in the cat-tails of the marsh. The opening is in one side.



THE BEAUTIFUL LITTLE SHORT-BILLED MARSH WREN

The bird at its nest in the sedges. This species does not frequent the deep-water marshes, but prefers the sedgy borders or even wet meadows.

wren progenitors were normally polygamous. That house wrens, and possibly others, still are polygamous when opportunity affords we now have considerable proof (*Ibid.*).

The irrepressible energy of the wrens likewise shows itself in the size of their families, for the eggs usually number six to eight instead of the three or four of most birds. They vary in color, with the different species, from the pure white ones of the short-billed marsh wren to those of the long-billed species which are so thickly speckled as to appear almost brown.

Wrens are almost entirely insectivorous birds, showing but little selection in the "bugs" they eat so long as they are sufficiently abundant to satisfy their insatiable appetites and those of their numerous young. How plen-



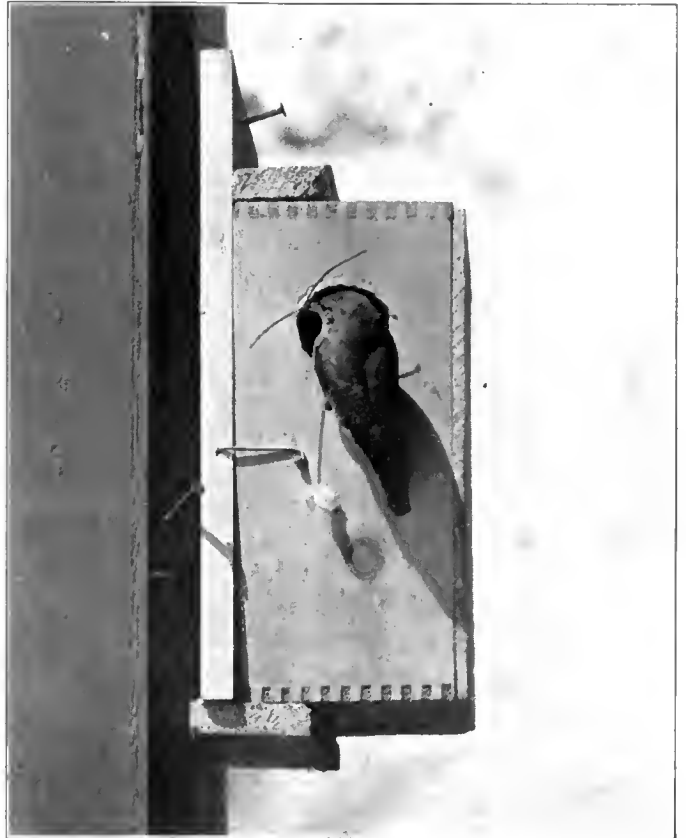
CHIPS FROM THE OLD BLOCK

Impatient and fretful—young wrens insist on being fed over 500 times a day, and one case is on record of a family which was fed 1217 times in one day.

tiful insects must be in order to maintain a wren family and how many pests are destroyed by these birds, one is better able to judge after watching the parent birds feed their young. It is by no means exceptional for them to feed their young from 500 to 700 times a day, while one instance is on record (see *The Auk*, January, 1917) of a single male wren (the female having been killed) which fed its young 1217 times during the fifteen hours and forty-five minutes of daylight.

There is but one blot on the name of the wren family: they are exceedingly mischievous. This sometimes results in disaster to their neighbors. I have seen a long-billed marsh wren, for example, perch on the edge of a red-

winged blackbird's nest and deliberately peck holes in the eggs. I have found the eggs of Virginia and Sora rails with similar holes punched in them, and Dr. Chapman, in his charming book, "Bird Studies with a Camera," tells of watching a marsh wren, in a similar way, destroying the eggs of a least bittern. The familiar little



GETTING READY FOR SUMMER

Much skill and ingenuity are often required to get some of the larger sticks into the box, yet the house wrens persist in using just such materials.

house wren, likewise, sometimes indulges this egg-destroying habit. I once watched a male house wren go from the box where he was nesting to one occupied by a house sparrow, disappear for a moment, and then come out with a sparrow's egg in his bill. This he dropped and watched it fall until it broke on a porch roof below. He then dodged back into the nest and repeated the performance until all five eggs lay in fragments, when he flew to the nearest branch and burst into a triumphant song.

If the wrens practised this habit on house sparrows alone, we could only praise them, but, unfortunately, almost any other birds, particularly hole-nesting species, nesting in the near vicinity are likely to be treated in the same way. It is almost useless to try to attract other birds or to put up bird houses within fifty feet of a box occupied by wrens. Wrens and bluebirds seem bitterest enemies, and where they do nest fairly close together the bluebird is ever on the alert to chase the wren.

The *house wren* is the commonest and most widely distributed of all the wrens, some form of it being found throughout North and South America from Quebec to Argentina. It is uniform dark brown above, faintly

barred with black, and brownish gray below. It is smaller than the Carolina wren, which is more rufous and has a light line over its eye; it is larger than the winter wren, which is more heavily barred and has much darker underparts, but it is very similar to the Bewick's wren. This bird, however, has a light line over its eye, as has the Carolina wren, and light spots on the corners



THE DUMMY NEST—A PECULIARITY OF THE WREN

A dummy nest of a long-billed marsh wren. All of the wrens build duplicate nests—possibly an indication of a former polygamous habit.

of its tail. So similar are all wrens to one another in size and color that it is much easier to identify them by their songs, which are distinctly different.

Both the house wren and the Bewick wren are fond of the habitations of mankind and are quick to avail themselves of nesting boxes put up for them, the house wren from Quebec to Virginia, the Bewick's wren from central Pennsylvania to South Carolina. They can be attracted even to the heart of large cities more successfully than any other birds because the opening in the nesting box need not be larger than an inch in diameter, and this will not admit sparrows or starlings, which, by usurping all available nesting sites, have done so much toward driving the hole-nesting species away from the cities. It is best to place the boxes on poles in the sun or light shade, although the wrens are not so particular in this respect as the other "nesting-box birds," and will take with equal readiness a box on the porch or in the centre of a tree.

The *winter wren* and the *Carolina wren* are both woodland species, but their breeding ranges do not over-

lap except in the Alleghenies, for the winter wren is a Canadian species, while the Carolina wren is a southern bird occurring only occasionally as far north as New York and New England. In the fall, however, the winter wren migrates southward, some as far as Texas and northern Florida, and at this season all four kinds, as well as the two species of marsh wrens, may be found in the Southern States.

The *long-billed marsh wren* is the commoner of the two latter, frequenting the cat-tails and sedges of marshes bordering lakes, creeks, or sloughs, where its incessant song is always heard. Even during the hours of darkness, when most birds are quiet, the marshes will often resound with a chorus of marsh wrens. At such times it sounds as if Dame Nature were keeping late hours and had brought out innumerable tiny, ill-working



EGGS OF THE LONG-BILLED MARSH WREN

A section of a long-billed marsh wren's nest, showing the heavily spotted eggs. Those of the short-billed species are pure white and other species show all gradations in between.

sewing machines. Often the wrens seem to be carried away by the exuberance of their song, and, springing from the flags, they seem actually to explode upward. With their feathers shaken out, their short wings vibrating, their cocky tails tilted far forward over their plump little bodies, they look like animated cotton bolls.

The *short-billed marsh wren* is much yellower in general appearance than his dark, long-billed brother, and is seldom found in the deep-water marshes, for it prefers the sedge borders of such or even wet meadows. It is ordinarily very mouse-like in its habits, running about among the tangled sedges, and would seldom be seen were it not for the fact that whenever any one approaches it climbs at once the highest reed in the vicinity to scold him for venturing so far from sidewalks and pavements. Its song is little more than a repetition of its call, like the



sound produced by striking two pebbles rapidly together, ending with more of a grating sound.

In the arid regions of the West dwells the largest and most unwren-like of all the wrens, the *cactus wren*. It is a gray bird with a white spotted breast whose large, retort-shaped nests are one of the most characteristic sights of the cactus country. Its song is the least musical of any member of the family, although it is given in characteristic wren fashion, with the tail drooping and the head thrown back.

In the dry, rock-bound regions of the West, where most bird life is scarce, lives the *rock wren*, whose curious tinkling song is one of the few redeeming

features of the desolate rock slides of the mountains.

In the canyons it is the song of the *canyon wren* that so frequently causes the rocks to reverberate with wild ringing notes. The bugler, it is sometimes called, but a tiny bugler indeed, less than six inches in length and so inconspicuous that were it not for its white throat it would escape unseen.

The *Parkman wren* and the *Vigors wren* of the Pacific coast region are the western representatives of the eastern house wren and the Bewick's wren. The common wren of Europe and the British Islands, or Jenny wren, as it is often called, is a species very similar to our winter wren in color, song, and habits.

## THE DEADLY MANZANILLO

BY FRANK COYNE

LITERATURE on the tropics abounds with stories of poisonous plants and trees, and to this beautiful tree, arching many a roadway with its glossy green leaves and rose-tinted flowers, has been ascribed

tree have, however, been greatly exaggerated, and as for the actual poisonous effect of the leaves and shade considerable diversity of opinion still exists, as is the case with the poison ivy of the States.

The small, apple-shaped fruits have tempted many a stranger to a much-regretted meal. As recently as the summer of 1916 an officer of a Dutch steamer had a narrow escape from serious poisoning, emetics and stomach pumps alone saving his life. Some 32 years ago 54 members of the crew of a German ship were taken to the local hospital, all very sick from having eaten the fruit of the Manzanillo. Five of this number died and the rest after serious illness for several weeks recovered.

As is the case with the question of the leaves and shade, there are many accounts of the effect of the fruit. To quote from one writer, "A fish which eats the fruit becomes infected, the gills becoming yellow and black, and one who eats the fish in this state is said to fall into a profound lethargy, with a general relaxation of all the limbs, according to the amount eaten."

The tree when cut exudes a quantity of white, milky juice, in the same manner as the common rubber-tree, and to most persons this juice has the same effect as our poison-ivy. However, if this acrid milky juice reaches the delicate membranes of the eye temporary and often permanent blindness is sure to follow.

The Manzanillo is a native of the West Indian Islands and is usually found in moist situations. The accompanying picture shows a pure stand of the Manzanillo, fringing the banks of a small stream on the Island of Curaçao.

**I**N response to an inquiry from the National Wool Growers' Association, the Forest Service announced that stock growers having National Forest grazing preferences will be permitted, if they enlist in the army or navy, to retain their preferences without use of the range during the period of enlistment. Those wishing to avail themselves of this privilege will file a statement similar to that now required of State and Federal employees who wish to discontinue use of the range during their term of service without losing their preferences.



MANZANILLO GROVE, CURACAO, DUTCH WEST INDIES

This beautiful little grove belies the deadly reputation which tradition has attached to the manzanillo—that he who partakes of the fruit, or sleeps under the trees, is likely to sleep forever.

the deadly poisonous properties of the far-famed Upas tree of the East.

To the fruit of this tree, more than to the effect of its foliage, is due its evil name. Manzanillo in Spanish means "little apple," and in the Papiamento tongue of the blacks of Curaçao, Dutch West Indies, living in their little thatched huts, the name Manzanillo is pronounced but slightly differently from the Spanish.

It has been stated by Spanish writers that if one remains under its shade for a few hours or sleeps there death is likely to follow, or that even if the unfortunate escapes death the body will become a mass of running sores. The deleterious properties of the shade of this

# WINDOW GARDEN ATTRACTIVEIONS

By C. W. H. DOUGLASS

**T**HE window box, as a means of relieving and beautifying the stern face of the modern office building, is becoming more and more popular as people realize that not only is it an inspiration and pleasure, but also has a practical value. Numerous observations have shown that the use of plants in this way makes an excellent advertisement, and the effect upon employees within whose range of vision the plants are placed is wholesome and conducive to better work.

Developing a system of parks, beautify-



*Courtesy of the Missouri Botanical Garden.*

### AN INFORMAL ARRANGEMENT OF FLOWERS IN A BARK-COVERED BOX

This window box, covered with bark and filled with Boston fern, anthericum, boxwood, rubber plant, vinca major, Kentia palm, geranium and hibiscus, makes a very attractive window garden.



*Courtesy of the Missouri Botanical Garden.*

### A MORE FORMAL ARRANGEMENT, IN A BOX WITH SEVERER LINES

This box is arranged to give a slightly more formal effect than that above. The plants are pandanus veitchii, caladium, canna, English ivy and vinca major.

ing the grounds in close proximity to public buildings, encouraging the decoration of the home grounds, and adding a touch of softening decoration to the buildings in the business section are all factors in the problem of beautifying a city. The last one is the least developed, due no doubt to a lack of proper appreciation of the results that can be attained as well as to the inherent difficulties presented by this type of building. There is no possibility, except in rare cases, of planting trees to grace the view because of lack of space. Likewise, the use of shrubbery is impossible, and climbing vines, which have such a softening effect, have no place to take root. The only means remaining for decorating the office building are the tubbed ornamen-

tal trees or shrubs at the entrances and the window boxes.

Because the windows far outnumber the entrances, the window box is the more important of the two. At the same time it offers a much greater opportunity for variety in decoration. It may be a riot of color or a dignified and unobtrusive bit of decoration. And with the changes of season an endless variety of plants may be used in their most beautiful stages of development and bloom.

Good taste must of course be exercised in selecting the type and size of box to be used. Boxes made of wood are most popular because of their light weight and relative cheapness as compared with those made of concrete, terra cotta, or vitrified clay. Cypress, redwood, cedar, chestnut,



*Courtesy of the Missouri Botanical Garden.*

### AN ARTISTIC GROUPING IN A BOX COVERED WITH BIRCH BARK

Vinca major, asparagus sprengeri, petunia, vinca rosea, coleus and Boston fern in a window box made of wood and covered with birch bark. This gives a good idea of the effect obtained by placing the plants close together in the box.



*Courtesy of the Missouri Botanical Garden.*

**A BEAUTIFUL PLANTING IN A METAL WINDOW BOX**

A metal box containing hibiscus, crotons, vinca major, dracena terminalis and pandanus veitchii. The trailing vines help to soften the hard, abruptly-angled lines of the building, yet not so profuse as to give a "weepy" effect.

and several other woods are durable in contact with air or soil, and a box made of any one of them, thoroughly painted both inside and outside, will last a long time. Bark of the birch, hemlock, or cedar may be used with very good effect to cover the box. The depth of the receptacle should be at least six inches, and better results will be obtained if it is eight to ten inches deep. The width of the window ledge determines the width of the box, although from six to nine inches is considered best. Length is entirely dependent on convenience of handling. If the ledges are long, it is easier to handle the boxes if they are made up in short sections. Most ledges are built with an outward and downward slope, which makes it necessary to put strips under the outside edges of the box to keep

it level. It should also be anchored to the building by wires running to the window sills, or some other means, which will prevent it from slipping gradually or being blown off in a storm. Boxes in upper-story windows should be equipped with drip-pans to prevent leakage of water and consequent staining of the building by the minerals dissolved in the water during its passage through the earth in the box.

For the best growth of the plants a fibrous loam soil is best. Too much clay or too much sand will be detrimental.

The soil will need enriching, and for this purpose thoroughly rotted stable manure is best. It should be dried and crumbled into powder and then mixed with the soil in the proportion of one part of manure



*Courtesy of the Missouri Botanical Garden.*

**A MOST EFFECTIVE WINDOW GARDEN**

This beautiful window garden makes a very attractive decoration for the high-class apartment hotel. The English ivy, completely covering the box, makes a background against which the flowers of the geranium show to best advantage. The date palms add a desirable touch of formality.

to from two to six parts of soil. This fining of the manure by drying and powdering, and thoroughly mixing with the soil, is considered very important in securing the most luxurious plant growth.

The drainage of the box is very important, although it will be more likely to suffer because of too little moisture rather than too much; nevertheless, if no means is provided for getting rid of surplus water, except evaporation, the plants will suffer. The bottom of the box should be perforated with a number of half-inch holes about six inches apart, and these partly covered with pieces of crock placed curved side up. Some people get best results by filling the box an inch or an inch and a half deep with pieces of broken crock, then throwing the soil in on top, taking care not to pack it.

The success or failure of the box very often depends on the watering or lack of it.



*Courtesy of the Missouri Botanical Garden.*

**ANOTHER PLAN FOR A WINDOW GARDEN**

The architecture of this building prevents the use of a long window box. Hydrangeas and English ivy here combine splendidly in an attractive bit of decoration, using the short but comparatively deep space available to the best advantage.

The frequency of watering can only be determined by actual practice, being dependent on atmospheric conditions, soil, sunlight, wind, etc. During average summer weather the plants should be watered once a day, and this should be done after sunset if possible to prevent scalding of the plants. The foliage should be washed in the process of watering to keep the leaves clear of dust, which clogs the air pores, to the detriment of the plants.

The red spider and the green aphids are the chief insect enemies that are liable to attack plants. A thorough syringing of the foliage on both sides will eliminate the red spider, and spraying with a tobacco solution eradicates the aphids.

In selecting the plants to be used in the window boxes, special attention must be given to the amount of sunshine they receive. All plants require plenty of light, but some make lesser demands for it than others. Plants which do not demand the maximum amount can be used on the north side of

buildings or in shaded situations. It is easy to overdo the use of certain conspicuous plants of trailing habit, which give an undesirable "weepy" effect, due to the great profusion of hanging vines. Color combinations are important, of course, and the colors of blossoms must be considered in selecting the plants. Against light stone or stucco, red, purple, or scarlet will look well, and blues, yellows, and whites with as much green as possible as a background make a pretty contrast with the red brick building. Flowering plants should possess the qualities of rapid development and profuse-

ness and continuity of bloom. The succession of bloom may be carried out by filling the boxes in the spring with pansies and English daisies, and following these with foliage and flowering plants lasting throughout the summer.

The following varieties of annual flowering plants

are specially suitable for window gardens: Ageratum, a compact-growing, hardy plant, about one foot in height and producing a constant succession of white, light blue, or purple flowers; Asters, although more easily grown in the open ground than in boxes, and having a short season of bloom, will thrive in the window garden; Calceolarias, a slender, graceful plant, blooming persistently, growing about sixteen inches high and bearing tassel-shaped, bright orange-colored flowers; Calendula or Marigold, a rather coarse plant from ten to fourteen inches tall and producing large yellow flowers; Candytuft, a hardy, easily grown plant six to sixteen inches high and bearing abundant clusters of white or purple



*Courtesy of the Missouri Botanical Garden.*

#### EFFECTIVE ARRANGEMENT FOR AN ENTRANCE

The fresh, rich green of the English ivy and geraniums in the boxes, and the bay tree in the tub, makes an attractive contrast with hot pavements and the severe architectural design of the modern office building. The tired business man has a springier step and a keener light in his eye when working in such an atmosphere—such is the subtle, scarcely to be observed effect of nature's living plants.

flowers; California poppy, an open trailer and a persistent though not abundant bloomer; Chinese pink, a persistent bloomer with flowers of brilliant color; Dianthus, a brilliant-hued garden pink which is not easily grown, but is so attractive as to warrant the effort; Cobelia, a slender-stemmed, delicately graceful plant bearing small, beautiful blue flowers, and very desirable for the window box because of its graceful habit of growth and constant bloom; Mignonette, one of the most fragrant of our common flowers, and one that does well in the window box; Nasturtium, an excel-

lent plant for the window box, as its graceful habit of growth and brilliant flowers are very effective; no manure should be added to the soil for nasturtiums; Petunia, a plant which produces a succession of bright-colored, broad, trumpet-shaped flowers which give brilliancy to any collection; Snapdragon, a rather slow plant to bloom, but one that is attractive while growing and makes a good background for the other plants of the collection and is very brilliant and showy when it does bloom; Sweet Allysum, a low-growing, spreading plant, with small, white, sweet-scented flowers, produced in abundance; Verbena, a trailer which covers two to six square feet and is an abundant and persistent bloomer; Zinnia, a strong, rather coarse-growing plant, but very hardy and a persistent bloomer.

There are many other plants which are suitable for window-box use. With any combination, certain foliage plants should be used to furnish a sufficient filler or background for the flowers. Among these asparagus, red and green dracena, English ivy, sword fern, Whitmani fern, pandanus, vinca, and wandering Jew are most adaptable.

The great range of available plants makes it impossible to indicate exactly what the arrangement and combinations should be, but the following examples are suggested:

SUNNY LOCATION

SHADY LOCATION

- 1. Vinca major—front.
- Petunia—filler.
- Ageratum—filler.
- Vinca Rosea—points.

- 1. Asparagus Sprengeri—front.
- Dracena terminalis—points.
- Boston fern—filler.

- 2. English ivy—front.
- Asparagus Sprengeri—front.
- Geranium—filler.
- Lantana—filler.
- Hibiscus—points.

- 2. English ivy—front.
- Coleus—filler.
- Boston fern—filler.
- Pandanus Veitchii—points.

- 3. Wandering Jew—front.
- Asparagus Sprengeri—front.
- Verbena—filler.
- Petunia—filler.
- Marigold—filler.
- Croton—filler.

- 3. German ivy—front.
- Asparagus Sprengeri—front.
- Hibiscus—points.
- Whitmani fern—filler.
- Croton—filler.

A FORESTRY CONFERENCE

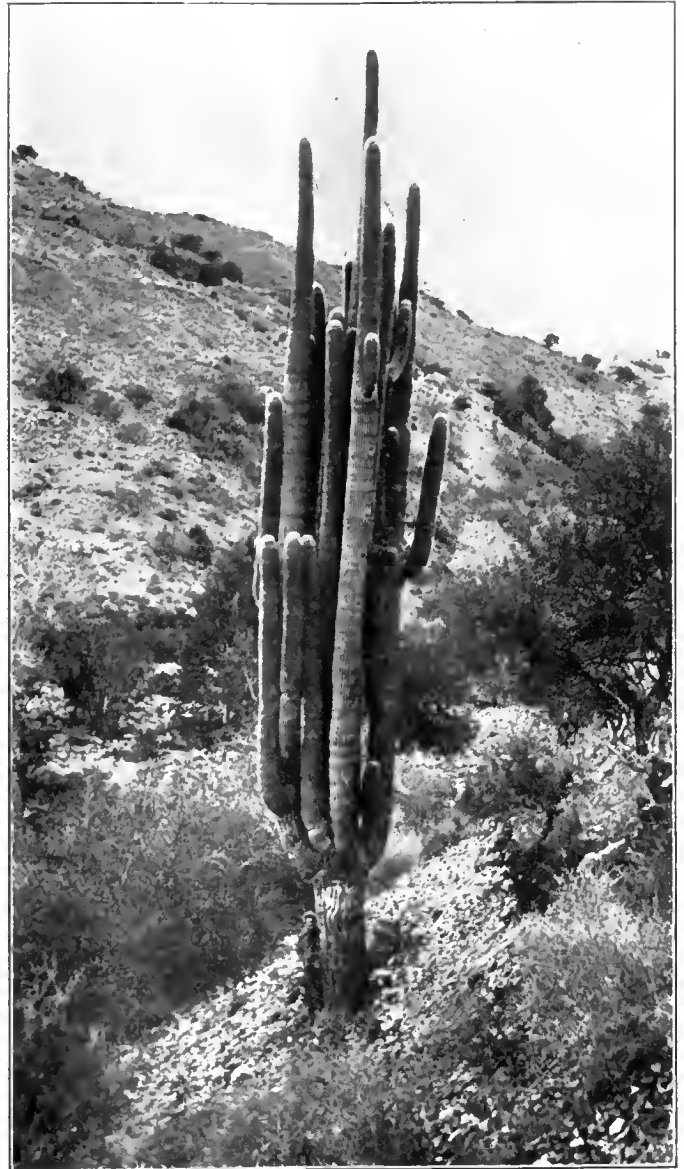
A FORESTRY conference held at Pittsburgh, June 21, 22 and 23, was well attended by members of the American Forestry Association, Pennsylvania State Forestry Association, Canadian Forestry Association and other organizations interested in forest conservation. Three full and profitable days were spent in hearing addresses, in viewing municipal plantings, nurseries and examining forested lands in various sections of the state near Pittsburgh. Dr. Henry S. Drinker, president of the Pennsylvania Forestry Association and a director of the American Forestry Association, presided at the sessions. Owing to illness Mr. Charles Lathrop Pack, president of the American Forestry Association and also president of the National Emergency Food Garden Commission, was unable to be present, but sent an address on food conservation to be read.

A GIANT CACTUS

By Stanley F. Wilson

THIS giant cactus (*Cereus giganteus*) was found at an elevation of 3600 feet twenty-five miles northeast of Tucson at the border of the Santa Catalina Division of the Coronado National Forest.

Its height is forty-five feet; its diameter breast-high, twenty-six inches. There are more than fifty branches.



ARIZONA'S GIANT CACTUS

This great plant, weighing five tons, is forty-five feet high and has a diameter of twenty-six inches.

It is estimated that the weight of the plant is more than five tons. Its age is unknown, but must be very great. The dots are woodpecker holes. These birds delight in the giant cactus. It furnishes a fortified residence for birds of many species.

Most people see only the desert country in travelling through Arizona. This is because the railroads follow the lower levels. How many people would believe that on the summit of the Catalina Mountains, only nine miles from this cactus, are to be found giant firs and pines, Alpine wild flowers, a well-stocked trout stream, an ideal summer climate, and a rapidly growing summer colony where people take refuge from the heat of the desert?

# Forestry for Boys and Girls

by Bristow Adams

## SOME OF THE WOODSIDE FOODS



WE are all trying to do our bit in one way or another. Our best way seems to be in the food campaign. Mother tries wheatless meals on

us and we are even going a step further and eating dinners that are both meatless and wheatless. It is something of a game with us and we make jokes about it; but we have the grimmest sort of humor in the thought that war is not only making wheatless and meatless dinners but also in many parts of Europe is making "eatless" meals. Mother was much cast down over the first trial at a meal without wheat or meat when she served us macaroni and cheese and corn muffins. It was a special "company" dinner, with green peas, fruit salad, ice-cream and macaroons. Good enough for Mr. Hoover or anybody! But when our Lady of the Home realized that macaroni is made of wheat it most broke her heart. However, it was a start, and from that start we have had many another such meal, equally as good and without the wheat that the Allies need.

FEW of us know how much food the woods hold for us: Wild strawberries, blackberries, dewberries, raspberries, huckleberries. The so-called weeds are good; and there must have been a time when man first tried to eat rhubarb and asparagus. Lettuce is undoubtedly developed from a plant pretty close to the dandelion. We have eaten with relish the young shoots of the poke-berry, or "poke-root." Burdock, wild mustard, purslane and a lot of others are worth trying, though it is unwise to eat strange roots or plants with which one is not familiar. The deadly water-hemlock, or

cicuta, is not uncommon and it looks just as good to eat as many another herb.

For myself, I cannot raise any very great stir of enthusiasm for most of these "wild greens." One "mess" of dandelions will do me for a long time, and two are about all I can stand for each season. At least, that is the way I feel now; they say hunger may make a man do anything.

THERE is a lot of fun, as well as thrift, in going to the woods for berries, or rather to the pastures at the edge of the woods. A day in the blackberries is one of adventure. We are supposed to bring in our cups of berries as the cups are filled, mother being in charge of the central station, and of the lunch. Always there is a clamor for that lunch long before lunch time.

Toto comes in with a cup that is not very full and a wail that he is on the edge of starvation. Yet he is smeared from ear to ear with the rich juice of blackberries.

"I only ate one," he declares in reply to an accusing finger.

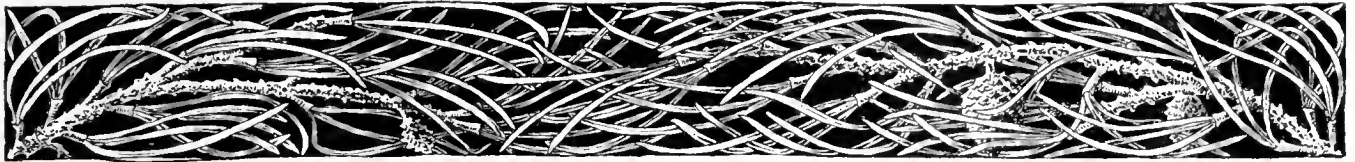
"That sounds like bad grammar," says father, butting in from the heights of great wisdom; "but it may be all right. He 'only ate one' and the rest were used for a facial massage."

Toto rolls his big eyes, as he always does, when puzzled.

"Maybe I did eat more than one," he admits, "but a fellow's got to do something when he's hungry and they won't give him anything to eat."

This appeal is too much. So the baskets are opened and the feast is spread; then a munching in silent contentment, and afterwards a rest in the shade with every one of us too full to move with comfort; afterwards more berry-picking; the finding of a song-sparrow's nest with young in it. When the little birds stretch their necks and open their mouths that look almost as big





as the nest itself, Toto wants to feed them each a ripe blackberry. We tell him that they much prefer the insects which the mother bird brings. We see her hovering near, and stand back to watch how she does it. Just as soon as they hear her come, up pop the heads and wide-open fly the mouths; in goes the bug and away flies the parent bird in the task that does not stop while daylight lasts. Everywhere the search for food, life's great need!

Trudging home toward supper-time as the day begins to grow cooler, we are tired but happy. Fresh berries and cream with bread and butter for the evening meal; early good-nights, and then comes wholesome rest. Next day appetizing odors of the cooking fruit, for jellies, for preserves, or for canned berries to go in next winter's pies. Mother takes us in to show her proud rows of neatly labeled jars.

**O**UT in the yard are trays of fruit and vegetables drying. This drying is worth more than most folks realize. It is so easy to do! An electric fan and some shallow trays make as good a drier as one could wish. Yet the fan is not necessary. The heat of the sun is enough, and is better than artificial heat, which makes the food lose color and flavor and even some of its food value.

Here are some of the things that our Home-maker has found out:

Strawberries and asparagus are no good dried; the strawberries make a pasty mush, and the asparagus goes into tough strings that furnish a good fiber but mighty little food.

All the small fruits, including rhubarb, can be dried with success. Raspberries, blackberries, loganberries, huckleberries seem to go away to a dry mass of seeds and skins, but they cook back to their original color, and flavor, and volume. Drying is a good method this year because it does not have to depend on a supply of cans.

Vegetables should be sliced before drying, and this is true, of course, of the larger fruits, such as apples or peaches. If there is no root-cellar or root-pit, potatoes, carrots, and turnips may be sliced and dried. Onions, string beans, lima

beans, peas, spinach, cauliflower, cabbage, Brussels sprouts and okra dry perfectly.

Sweet corn, white potatoes and sweet potatoes need to be cooked before drying, though the cooking does not have to be thorough. A short plunging into boiling water seems to be enough. If they are not cooked they lose their color and may not keep.

**D**RYING is not without its fun, even for the children. They like to see the orderly trays under their mosquito-nettings out in the sun. There is excitement in the scurry to get the trays under cover when a sudden summer shower comes. In spite of the mosquito-net, many insects that like sweets come to the drying trays, and Everett has added some rare kinds to his sets of butterflies.

Once he had a trying result when his joking uncle told him that he could catch them easily if he could put salt on their tails. Everett has a most serious mind and an earnest nature. He got the big salt box out of the kitchen; then, when the butterflies were rather thickly gathered over the netting, he let fly with a broadcast deluge of salt that ought to have caught them all. Mother was riled for a time; but it was her own brother who was to blame, so we told them to fight it out in their own family, and they soon saw the joke, even though it was on them.

**A**S I said in the beginning, we have fun over the food situation. It is best that we should while we can; but in the meantime we must see its serious side. It is very serious for our friends across the water now; it is going to be serious for us. The best of it all is that each one can do his part—man, woman and child. In our own house we are eating less, and we are just as well as we were before, or even have better health. The plates that go to the kitchen go there empty. No more crusts and bits of food for the garbage can; no half-inch of milk left in the bottom of the glass.

"That would feed a Belgian kiddie!" cry all the other children if one of ours leaves a scrap of good food; and the morsel is eaten—or saved, by and for the same child—out of very shame.



## SOME INTERESTING TREES OF SINGULAR GROWTH



NATURAL GRAFT OF BEECH



"SIAMESE TWIN" SYCAMORE



NATURAL AFFINITIES



GRAFT OF A BEAUTIFUL BEECH

**T**HE first picture, of natural graft of beech, was sent to *AMERICAN FORESTRY* by Mr. J. G. Brown, and was taken by him during the summer of 1916 about a mile southeast of Palisade Park, a summer resort near South Haven, Michigan, in a grove of soft maples bordering an old oxbow of Brandywine Creek, while he was studying the physiographic ecology of the region in a class of the University of Chicago.

Near West Milford, in West Virginia, on the banks of the West Fork River, is found growing the remarkable specimen of sycamore which we have dubbed the "Siamese Twin." A close examination of the photograph will show that the trunks are joined at three different

points. The gentleman is standing on the middle connecting limb, or what might be called the "second floor."

There seems to be no reason for the white oaks in the next picture to have grown together—they just did.

The last photograph is another instance of natural graft of beech, and quite a striking example of peculiar growth. The tree started out to be a twin, and then changed its mind and grew together again, its health and beauty unimpaired by its freaky growth.

This photograph, and the ones of the sycamore and the white oaks, were all taken within a mile of each other, and were sent to *AMERICAN FORESTRY* by Mr. J. Franklin McConkey.

**T**HE largest number of sheep grazed on any single National Forest is 315,740, finding pasturage on the Humboldt in Nevada, while the largest number of cattle—75,818 head—is found on the Tonto in Arizona. The value of the average annual meat product of these two National Forests is estimated at \$2,000,000.

**O**F the 22,000,000 trees planted on the Pennsylvania State Forests to January 1, 1917, over 15,000,000, or about seventy-two per cent., are now living, according to a

statement made by the Commissioner of Forestry. Figures are not available on the present status of the private plantations, but up to the end of 1916 about 3,000,000 seedlings were planted by corporations and individuals, and at least 2,000,000 should be in good condition now.

**T**HE work of classifying and opening to homestead entry such lands in the National Forests as are chiefly valuable for agriculture is progressing rapidly. More than seventy million acres have been covered by field examinations and the final reports acted upon.



# PAPER-MAKING IN THE INSECT WORLD

BY DR. R. W. SHUFELDT, C.M.Z.S.

**A** MOST interesting volume might be written devoted exclusively to the achievements of many insects in the arts and trades, and the treatise would, in the matter of size, by no means be a booklet. When I say this, I do not refer to such structures as the cocoons spun by many caterpillars and the like; for the material used in their construction—that is the silk—is secreted by a special organ forming a part of the economy

Wonderful as many of these are, none are more so or more interesting than the various forms of paper nests constructed by certain species of hornets and wasps. Some of them are familiar to us as occurring in the insect fauna of the Atlantic seaboard states, and to these the present article will be confined, though there is a great temptation to refer to other examples found in various parts of the world, which are most extraordinary with respect to their nesting-habits.

We are all familiar with the common brown wasp, for there is hardly one who has not, at one time or another, been stung by one of them. It is the female of this species that constructs the paper nest, which contains the young wasps until the time has arrived for them to fly. When they are ready to build, they resort to places where they can find fibres of old-wood; this they gnaw and knead until a grayish mass is manufactured which closely resembles *papier-maché* in color, consistency, and other properties. While this mass is being prepared, its adhesive quality is



THE NEST MOST OFTEN SEEN

FIG. 1.—Here we have several wasps of the common species in the eastern part of the United States, resting upon a small paper nest they have completed, in the cells of which the eggs of the insect have been deposited. The back of this nest, that is, the opposite side of the view given in the cut, is made fast to the twig of the bush selected by the builders by means of a strong little pedicle, made of the same material as the nest, only denser and darker. This is the only paper now being made in this country not costing more for production, claimed by the manufacturers, and not affected by the war in Europe.

of the animal. But, upon the other hand, the instances in the book could be confined to the work of such a remarkable insect mechanic as the carpenter bee—a species that cuts a tunnel for its home in solid wood, the entrance to which is almost a true circle half an inch in diameter, and the rest a tube several inches in length, of about the same diameter and quite cylindrical. With a brace and bit one can make a similar excavation; but should the tunnel made by the bee alter its direction, even for the eighth of an inch or less—as happens in some species—there is no tool that can accomplish what this insect does in its particular piece of carpentry. Then there are the remarkable cells of the mud-wasps, which one would have considerable difficulty in imitating with accuracy, to say nothing of the wax-combs of the honey bee, and an almost endless number of other structures made by representatives of various orders of the insect world.



THE NEST OF THE BLACK HORNET

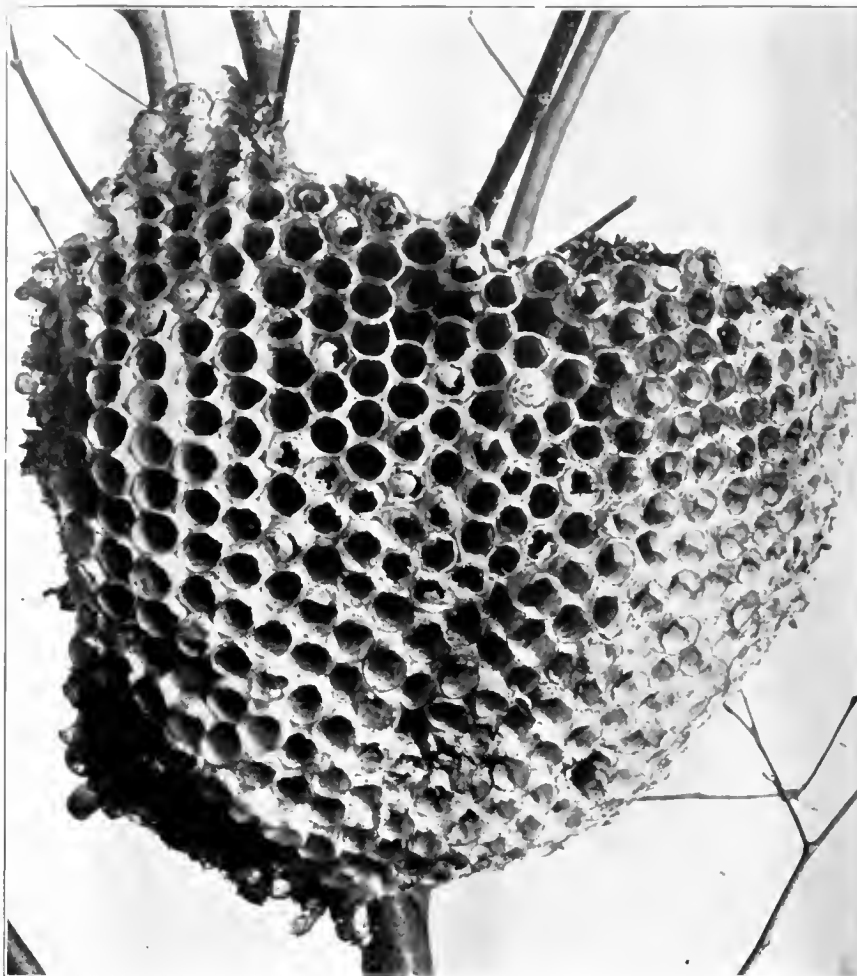
FIG. 2.—The nest shown in this illustration is made by the common black hornet of the Atlantic States; it is more or less fully described in the text of this article. These nests, or nests of this form, are often of great size—in fact, big enough to fill a bushel basket, or even larger. They contain a series, or tier, of nests, quite similar to the ones shown in Fig. 1, only of greater size with respect to the diameter. Eventually, this series of nests, fastened together by a central pedicle in horizontal planes, is completely surrounded or housed in by a top-shaped structure, similar to the one shown in the illustration. These insects, upon being disturbed, fiercely resent it, and frequently their combined attacks are quite serious.

ensured by there being incorporated into it the secretion of the salivary glands of the insect.

It is with this material that the common brown wasp builds such a nest as shown in Figure 1. I photographed this specimen in the woods near Cabin John Bridge in Maryland, a few miles from Washington. Only three or four wasps were the proprietors here, and this structure was selected because it was small and showed so well the hexagonal paper cells for the young. Moreover, the nest was in a vertical position, which is by no means usual; as a rule they lie in the horizontal plane when finished. Along the old Georgetown Canal I saw recently, far up in a dogwood tree, one of the

largest—indeed the very largest—specimen of the paper wasps' nest that I had ever seen. It certainly was a foot and a half in diameter, and covered with a very large colony of the insects. At this time they were busy depositing the single egg the female lays at the bottom of each cell. Then the aperture of each is sealed over with a paper, which I have always noticed is some four or five shades paler than that of which the nest is made. Several attempts to collect this fine specimen were failures, as the wasps were then in a very combative frame of mind. It is firmly attached to the twigs by its usual single, strong pedicle, far up in the top of the tree. Unlike the nest shown in Figure 1, it is tipped at an angle of forty-five degrees. In New England these brown wasps often build in the stone walls surrounding farm fields, or under fence-rails, and elsewhere.

The form of the nest is more or less circular in outline, though I have collected those which were oval, or even a bit triangular or oblong in shape. I have never met with one in which the openings of the cells faced upwards; if they were so built, the rain might get into the cells, and



A TYPICAL WASPS' NEST

FIG. 3.—Another species of these brown wasps build a large nest, of a form shown in this cut; they are abundant in many sections of the Middle Atlantic States, but are not usually seen until the leaves are all off the trees in early winter, at which time both young and old have all departed. In form, they are roughly circular or subcircular in outline; unhooused, and made up of a large number of cylindrical paper tubes, closely packed together and united in such a manner as to successfully resist tearing apart. This nest in its posterior aspect, which is concave, is united to a twig or shrub by a single, tough, paper pedicle, usually situated above the middle of the nest. This cut is a reduced reproduction of one of these structures which I photographed natural size, having collected it on the 5th of December, 1916, in southern Maryland. It was in a tree about thirty feet above the ground; it measured about 6×6 inches, and was made of over two hundred cells. Sometimes these nests are built in the tallest trees in the forest, and sometimes in a vine or shrub not five feet above the ground. Occasionally we find two or more in the same tree.

destroy the young as well as the nest. A far more elaborate nest than the one just described is constructed by the paper hornet, an insect also very abundant in the eastern United States; these are frequently large enough to fill a bushel basket. Such a nest is shown in Figure 2, and I have cut out with a knife the near side of it, in order to expose the three tiers of nests inside, each of which is built precisely as the brown wasps build theirs. They are arranged one above the other, the whole having a paper structure built around it, usually top-shaped in outline, with a hole below and to one side, for the insects to go in and out of as occasion requires. This species often construct their nests under the eaves of various buildings, in the country or well within the city limits. In the forests they build in trees or shrubs, sometimes so close to the ground as to be in contact with it, while at other times as high up as fifty feet or more. The smallest nest of this hornet that I ever met with was no bigger than a boy's peg-top.

All of these paper nests, of both hornets and wasps, are composed of the same material, and constructed in the same manner. The paper, being manufactured from wood pulp, is quite durable, tough, and strong. If a nest be kept in a dry place indoors, it will last for ages and exhibit no sign of breaking down; one that I collected many years ago is still on the shelf of one of my bookcases. Brown wasps built that one; and the most interesting feature it presents is that it is a half circle in form, the cells on the long diameter being the deepest and largest, while those around the periphery are so very small and shallow as to be entirely useless, beyond finishing off the marginal curvature of the structure. Quite a few other insects also construct interesting forms of paper nests.

## PINE BLISTER DISEASE WORK PROGRESSES

**T**HE organization of the campaign against the white pine blister disease has gone forward steadily. Many of the state appropriations were delayed six weeks or two months beyond their ordinary course on account of the pressure of National Defence measures. Fortunately the season was much later than normally is the case. A few fruiting pine specimens were found early in May, but it was the middle of May before the pines in the heavily infected localities of New England showed an abundance of blisters. The first stage of the disease on currants and gooseberries was discovered on June 5, the same date on which it appeared last season. The second stage of the currant rust was found on June 13, ten days earlier than last year.

The results of scouting to date have shown conditions to be just what was feared last year as a result of the wide distribution of the blister disease on currants and gooseberries throughout New England. At all of the points where diseased native pines existed last year the disease was found to make steady progress. For instance, one tree in the Kittery Point infection area, 38 feet high, was being girdled on the main stem at a point 20 feet above ground where the circumference of the trunk was 23 inches. All of the side branches on this tree—more than 100—were infected with the blister rust, as the bright colored blisters plainly proved. In addition to the increased size of the infection areas at Kittery Point, Swansea, Massachusetts; Stratham, New Hampshire; Lyndonville and Woodstock, Vermont; Essex County, New York, and Norfolk, Connecticut, many new areas of infected pines, both planted and native, were found in these states. One of the most serious is at Intervale, New Hampshire, near the Cathedral Pines. On a pine hedge near the Cathedral Pines, 1021 infected branches were removed and about 90 infections taken from a single tree. On another property where there were a dozen heavily infected black currant bushes in a garden there were a number of infected pine trees about 40 feet distant. One of these trees, 6 feet high, had 26 separate blister rust infections and showed indications that many more infected branches were developing. Infected pines were found on other nearby properties and the pines of the whole region are apparently in the greatest immediate danger if not already hopelessly diseased.

Currants and gooseberries, both wild and cultivated, at this early date, are already heavily infected in regions where pine infection is plentiful. Currants and gooseberries in Maine are about as heavily infected now as they were last year in August and September. Between Brunswick and Bath, Maine, they are generally infected; that is, careful observation shows that it is safe to estimate that 90 per cent of all these plants are infected now. Many plants already have infection on practically every leaf. This condition existing so early in the season (the latter part of June) indicates that these plants must have been directly exposed to spores from pines. Infection is especially heavy on skunk currants.

Pine infection is well scattered between Brunswick and Bath. At Bath there exists a comparatively large area which contains at least 90 per cent of infected white pine trees. Many of these have fruited during the past season. On one young tree 35 infected branches were noted. The oldest infection found in the Bath area appears to have taken place about eight years ago, probably less.

The wild currant and gooseberry bushes along one side of the highway between the villages of Warren and Wentworth, Grafton County, New Hampshire, were examined; 91 per cent of the plants proved to be infected. In New York State pine infections were found scattered over a number of square miles of fine native pine growth in Essex County and infected currants have been found in Clinton and Niagara Counties. Only one new infection has been found in Pennsylvania, and Michigan has also been added to the list of infected states through diseased pine stock found in a nursery. In Minnesota five new points of infection have been found at Afton, Marine Mills, Pine Hollow (opposite Osceola, Wisconsin), at Franconia, and on the water supply reservation at Lake Vadnis.

Until recently considerable effort was expended in scouting localities where infection was known to exist last year and diseased pines were destroyed. The efforts during the balance of the summer will be confined principally to controlling the disease by destroying currants and gooseberries. The work of eradication is being pushed as rapidly as possible. In each of the New England States one or more areas of heavy pine growth have been selected for the destruction of all currants and gooseberries. These areas will serve to demonstrate the feasibility of controlling the disease and the boundaries of the areas will be extended as rapidly as possible. In New York the heavily infected pine area in Essex County is being isolated by pulling currants and gooseberries from a strip two miles wide which, when finished, will extend through the Ausable Valley, from the Canadian border to Lake George. Last year a strip of this character was made through Columbia County, New York, to stay the advance of the disease from Massachusetts. Later in the season this line probably will be extended northward through Rensselaer and Washington Counties to Lake George. A similar strip a mile wide is being cleared of currants and gooseberries from Lake Ontario to Niagara Falls and the southern extremity of Grant Island. This strip was cleared on the suggestion of the Canadian authorities, who are now completing the eradication of currants and gooseberries from a mile-wide strip along the Niagara River from Niagara-on-the-Lake to Fort Erie. A large force of scouts is engaged searching for the disease in all of the eastern states where the disease was not found last year, including the Southern, Rocky Mountain and Pacific Coast States where five-leaved pines are native, but special attention is being given outside of New England and New York to the Lake States.

# EDITORIAL

## ARKANSAS SUPPORTS THE NATIONAL FORESTS

**T**HE recent Legislature of Arkansas passed an Act authorizing the Federal Government to acquire by purchase lands within the State for National Forest purposes. This is simply another indication of the changing attitude towards National Forests in the West. Two National Forests were established in Arkansas several years ago, and ever since have been the butt of fierce attacks on the part of various congressmen from that State who sought to have them abolished and thrown open

to settlement and timber exploitation. Congress did not yield to this pressure, and examinations showed that the lands were not fitted for agriculture. Where any doubt existed as to this classification, the areas were eliminated.

By this recent action the people of Arkansas have at last placed the stamp of approval on the Forest administration. The law will enable the government to acquire much-needed areas within the forest boundaries and consolidate them for fire protection and the production of timber.

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## A VISITATION AND A MORAL

**T**HE memory of the terrors of the Hinckley and Bandetti fires did more to prevent the passage of the Public Domain bill in the Minnesota Legislature, with its proposed disruption of the State Forest Service, than all other factors combined. As this is written, the State is again in the grip of the fire fiend. The dangers of these violent conflagrations, driven by the wind through the tops of trees, is extreme, wherever the country is comparatively flat and densely covered with timber or slash. They resemble the disastrous fires which at intervals destroy large districts in our big cities, in spite of the most thorough preparation and the high efficiency of the fire departments in those communities.

Perhaps this series of conflagrations will serve to impress still more firmly upon the public mind that the State Forester's Department must be kept as it is, absolutely free from politics, and furnished with the necessary funds and support to maintain at least the skeleton of an organization for controlling fire in the vast timber areas of northern Minnesota. Where short-sighted policy per-

mits this department to become the prey of spoilsmen, in that day the efficiency of the service ceases, and citizens of the north country are left to their own devices to cope, without direction or plan, with this monstrous enemy.

The State Legislature, through the action of the Senate, refused to sanction the restoration of the appropriations of the Forestry Department to the sum of \$75,000 from which they were reduced two years ago to half that amount. The overburdened state rangers, each one with over a million acres of territory to supervise, cannot possibly cope with the extreme danger of a dry season without more help. Yet recently the work and responsibilities of these men were greatly increased by imposing upon them duties formerly exercised by the surveyor generals of logs and lumber in order to save the State money.

If the State of Minnesota ever expects to be freed from the recurring blight of forest fires, it must be through the strengthening and upbuilding of her State Forestry Department, as at present constituted.

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## COLORADO REDEEMS HERSELF

**A** POLICY so utterly opposed to the pioneer spirit of individualism as that set forth in the reservation and development of the National Forests was certain to arouse bitter opposition in the West. New ideas are not received cordially when they threaten to interfere with cherished personal privileges and business opportunities. Here was a plan apparently worthy to be classed as a product of the brain of some utterly impractical theorist. The Government actually proposed, in all seriousness, to set aside immense areas of public land as "Forest Reserves," for purposes but dimly comprehended, except that it was evident that no more timber claims could be located, nor "homesteads" filed on for the purpose of acquiring title to timber. For a while, even mining claims were prohibited, and grazing was prevented as being injurious to the forest.

Western people, imbued with the spirit of liberty and optimism, and impatient of restraint, accustomed to regard public lands as the great field for exploitation and development upon which the further progress of the states depended, instinctively protested against this policy, and this opposition was especially strong and bitter in Colorado.

But the founders of the National Forest policy were more far-seeing than the representatives of the pioneer area—which was already passing. They realized the evils of unrestricted private ownership, especially its effect upon the forests. They considered the effect of the forest cover upon the flow of water for irrigation, and the necessity for regulating the grazing upon these lands. Theirs was a new vision, of a future era when coöperation and the recognition of the rights of all classes of citizens would

supersede the somewhat brutal and blind policy of *laissez faire*—the old idea that by permitting the strongest, most able, and also the most unscrupulous and cunning to have their own way, the best results would be obtained.

Since this new doctrine did not contemplate depriving the public of the resources of these forest reservations, but rather strove to make them available, the public soon learned that under the rules and regulations worked out by the government, they could secure timber, graze their stock, prospect for and develop mines, and harness the national water powers, while at the same time the great farming interests observed that fire protection and the restoration of the forest cover on the watersheds controlling their supply of water for irrigation, was for the first time becoming efficient.

The crest of the opposition was reached in 1907, but two years after the transfer of the National Forests to the Department of Agriculture—and was due largely to the fear and wrath occasioned amongst the advocates of the old school by the rapid extension of National Forest areas in the two years preceding. In this year six states, Colorado leading, secured congressional action which put an end to the creation of further National Forests, except by specific authority of congress in the future.

For several years thereafter, the area of National Forests in these six states either remained stationary or diminished by elimination of areas unsuited to the purposes of the forests. Meanwhile, the real purposes behind the forest policies became more and more clearly comprehended by western people, and the great benefits

of intelligent and efficient administration spoke more forcibly than arguments.

In 1916 bills began to appear in congress authorizing the President to make additions to existing National Forests. For the most part these dealt with small areas, and were significant only as indicating the tremendous revolution in public attitude which has taken place in this decade toward the *ideas* embodied in the National Forest policy.

But it remained for Colorado to give expression to this current of opinion in a way that no one can mistake. In spite of opposition of a particularly virulent and vindictive character, the people of the agricultural districts, dependent upon the watersheds for their very existence, demanded and secured authority from congress for the addition of over half a million acres of public land to the Colorado and Pike National Forests. And in this they had the support of mining associations, county commissioners and every commercial interest in the district affected.

This country will never tolerate the substitution of an autocratic bureaucracy for the liberty of thought and action to which we are accustomed—but we are fast learning that our rights and our prosperity are best secured through an efficient public administration by trained experts, whose duty it is to carry out policies formulated to secure the greatest good to the greatest number. This new Service is responsive to popular demand, but is able to distinguish between the selfish desires of the few and the permanent benefits for the many. Its true spirit is coöperation—and coöperation will win.

## THE DIPLOMATIC FOREST RANGER

BY W. G. MORISON

THE work of a Forest Ranger or Guard during the fire season is, of course, taken up very largely in preventing fires. Since the greatest danger is from campers, hunters, and fishermen, who through carelessness or ignorance throw down lighted matches, cigarettes, etc., or build camp fires where they should not or go away leaving them burning, it is essential that they be warned, and it is equally important that they be warned in such a way that they will not take offence. I have known campers who have been left in a very antagonistic frame of mind by being told in a tactless way to be sure and not start a fire, and how not to start one, the law for such offence, etc., and consequently did not care much if one did start, and certainly would not have helped fight one unless forced into service by reciting the law to them, which is worse than not having them at all.

It is very easy to get the coöperation of most of the people who come into the woods for recreation (the natives of the woods usually are as anxious as the Forest officers to prevent fires) by several little ways without even letting them know that you are trying to do so, for instance: a Ranger or Guard sees a fisherman; he goes down towards him, and when he sees that he is seen, he

incidentally tells the fisherman thereby who he is, and probably has him thinking unconsciously of fire already. Having done this, he goes up and says, "Hello, had much luck?" and then engages in a conversation as to the pros and cons of fishing (no better way to please a man than by talking about the thing he is interested in at that particular moment). During the conversation he glances around as if looking for smoke (remember the idea is to get the fisherman's mind centred on smoke, and smoke means fire). After a while he says, "Well, I guess I will have to be getting on, pretty bad time for fire." The fisherman then probably says something such as "Had many this year?" or "Has there been much damage done around here?" This gives the Forest officer the opening he is looking for, and he says, "No, not so far. Have been mighty lucky in having 'old timers' around who realize the damage done by fires and are careful. You can spot them every time. Now, I can see you are far from a green one in the woods from the way you handle your rod and line," or anything like that to flatter him. If he is an "old timer" he will admire your powers of observation; if he is not, he will be tickled to death to think that a Ranger, who is supposed to be the best of woodsmen,

could not spot him, and his chest will bulge out considerably. In either case the Ranger has pleased him, and the chances are one hundred to one he will have no trouble with that man starting a fire. On the other hand, suppose the fisherman does not give him an opening: in that case, the Ranger stops and says, "By the way, did you see any camp fires coming down the river?" The fisherman says "No." Then the Ranger, "I certainly would appreciate it if you would put out any you see burning. We have some people who come up here who are not used to the woods, and naturally do not realize the importance of putting out their fires or that a little spark from a cigarette or match is very dangerous." The Ranger has now warned the fisherman by pretending to be worried about others, and at the same time pleased him by pretending to think the chances of his being so careless are so remote that it is unnecessary to warn him. The same mode of procedure applies to hunters and campers. The Ranger can always bring the conversation around to his work, and, by a little tact and politeness, go away resting assured of the fisherman's, hunter's, or camper's cooperation.

Suppose he has come onto some campers: he walks in, not forgetting to be looking for smoke, and after the usual day's salutation sits down. After talking about things in general, he gradually brings the conversation around to cooking in the open. Most of them will have some opinion as to the best way. Of course, he will be supposed to give his ideas on the subject. He might say something like this: "Personally, I think a stone fireplace is the best. It makes a cracking place to cook on (all the time he is showing them how to make one), and if you bring along a piece of sheet iron to lay on the stones you will have a regular stove, or should you forget the sheet iron (the chances are they have none with them this time), you can easily make the fireplace narrow enough to rest your frying pans on the stones, and then, too, a fire of this kind is not so apt to start a forest fire." Then he has the conversation started on forest fires, having told them of the fireplaces, which is important. He now has them in a good state of mind, and their attention his, and he can tell them lots which ordinarily would go in one ear and out the other. I personally have tried these ways of inciting the interest of the users of the National Forests, and found they never failed to bring good results.

### JACK LONDON'S OAK

**J**ACK LONDON'S memory is kept fresh in the minds of the people of his native city, Oakland, California, in a fitting manner. A sturdy oak tree, personifying the character of the famous author, has been planted on the plaza before the city hall. Here, surrounded by a fine lawn and with a beautiful building for a background, it occupies alone the most conspicuous place in the city. The dedicatory resolution of the City Council of Oakland expresses in words the esteem for the author, which the planting of the oak exemplifies.

*"A resolution of the Oakland city council, calling.*

*memory of Oakland's author and dedicating the city's standard-bearing oak to his name—Jack London.*

*Proud his city that there came a lad who lived and grew to world's renown by striking chords that until his time had been unsung.*

*Sad our city that life for him, a narrow vale wherein he spoke and gave a radiance for all mankind; and that his life was short, a sacrifice for experiences that remain aglow for you and me.*



HOW OAKLAND'S OAK WAS TRANSPORTED

Having been excavated with the large ball of earth about its roots, this seventeen-year-old tree was carted from one section of Oakland to another and was successfully replanted.

*Glad that we can confer this mite of honor by dedicating Oakland's standard-bearing oak to him who grew with this city, that this sturdy sentinel may stand in memory and to honor Jack London."*

The moving of this seventeen-year-old tree from its birthplace in Mosswood Park to its new location was one of those feats of engineering which were considered impossible a few years ago. The transplanting of a tree is always difficult because the root system must be protected from drying-out and excessive cutting-back, if the tree is to live. One drying gust of wind on the small living root hairs may kill the tree. When a tree reaches a height of twenty-four feet and is thirteen inches through at the base, the magnitude of the task is easily imagined. A circular trench six feet deep and fifteen feet in diameter was dug around the base of the tree and the ball of earth about the roots was carefully boxed to prevent breaking and exposure of the roots. A big truck transported the tree to its new home, where it was successfully transplanted. The fact that the young tree withstood one of the heaviest windstorms the city has experienced in years, after being in its new home only two months, shows how well-chosen it is to typify the sturdy, rugged man, Jack London.

## NATIONAL PARK SERVICE ORGANIZED

**T**HE National Park Service, which was created by act of Congress in August, 1916, to administer the National Parks under one correlated system, has been organized under appropriations made in April. Secretary Lane has appointed as Director Mr. Stephen T. Mather,



STEPHEN T. MATHER

Director of the National Park Service who has done remarkable work in developing the parks.

who, to accept the place, resigned the office of Assistant to the Secretary of the Interior. Horace M. Albright becomes Assistant Director, and Frank W. Griffith, Chief Clerk of the new bureau.

Secretary Lane began the work of National Parks development, the success of which is insured by the organization of this new bureau, two and a half years ago. During this preliminary period much has been accomplished of importance to the cause. All National Parks have been opened to automobiles. New roads have been projected, of which many have been built and many improved. Cooperation in the public interest has been promoted between railroads and the Government, between concessioners and park managements, and between parks. Large private capital has been induced to enter several

National Parks for the enlargement and improvement of hotel and transportation service. Prices to the public have been decreased wherever possible.

New concessions have been made on a basis destined to make National Parks self-supporting under conditions of increased patronage, and several parks already have become self-supporting. Larger appropriations have been secured from Congress for road building and the perfecting of sanitary and other conditions. An extensive educational campaign has been inaugurated for the information of the people concerning the hitherto unknown quality and extent of their scenic and recreational possessions, under which public interest in our National Parks is growing with unanticipated speed; and public realization, interest and practical use is the condition as well as the object of National Parks development. Public patronage of the parks has increased rapidly and steadily.

These and many other beginnings point the way toward the system which it will be the object of the new Service to build and perfect.

Stephen T. Mather, the head of the Service, was formerly assistant to the secretary, in which office he had supervision of the National Parks, and, in addition, other Departmental work. He resigned that position to become Director of the National Park Service, in order that he might devote his entire time to the park work. He was born in California in 1867, and educated at the University of California. He then removed to New York and engaged in newspaper work. Later he entered the business of manufacturing borax and boracic acid as a member of the Thorkildsen-Mather Company, with offices in Chicago. He has devoted time, energy and his own money to National Park work and has been a remarkably successful official.

## E. A. STERLING'S NEW WORK

Mr. E. A. Sterling, a well-known forest engineer, who for the past two years has been manager of the Trade Extension Department of the National Lumber Manufacturers' Association, at Chicago, has resigned to become manager of the new eastern office of James B. Lacey & Co. This office, which will be in the Forty-second Street Building, New York City, will be opened about August 1. In connection with his new work Mr. Sterling will also take up some of his former consulting practice as part of the activities of the office of the Lacey Company. Mr. Sterling was for several years in the United States Forest Service, and later was a partner in the forest engineering firm of Clark, Lyford & Sterling, which has headquarters at Vancouver, B. C. Mr. Sterling had charge of the eastern section of the United States, with offices in Philadelphia. For several years Mr. Sterling has been a director and member of the executive committee of the American Forestry Association.

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*Public Domain Commission,  
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"It would be hard to tell you how much we enjoy and profit by your publication. Yesterday a girl who is now in the Normal School said she read it each month. With the boys it is as popular as a magazine on Electricity, Autos or Mechanics, and one girl gave her report in an English Class on White Pine Blister Rust."

"The articles by Mark Daniels are a joy to any one who has visited the National Parks and a lure to any one who has not."

"I wish I could send the magazine to more of my friends as a Christmas gift, but in the meantime it is giving to many boys and girls a taste for the best and most worth while things. We take it in our school library."

NAOMI ACHENBACH,  
*Everett, Washington.*

"I am greatly pleased with the work of your Association the past few years. It has been sound and wholesome and no one has used it as a political football."

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"The magazine in its new form certainly deserves great praise."

ROBERT S. STOCKTON,  
*Strathmore, Alberta, Canada.*

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CHARLES H. SHINN,  
*Northfork, California.*

"After carefully going through your February number of AMERICAN FORESTRY, I cannot refrain from expressing my appreciation of its excellence. You have succeeded in building up an exceptional magazine and I trust that its success may continue."

THOMAS B. WYMAN, *Director,  
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"I read AMERICAN FORESTRY each month. It is doing such great good for our trees and forests and is always full of wonderful and beautiful scenes."

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L. F. ALLBACH,  
*Peabody High School,  
Pittsburg, Pennsylvania.*

"I am greatly pleased with your magazine and with the work you are doing, am recommending it to my friends and a number of them have subscribed and are in turn furthering the cause."

GEORGE W. FISS,  
*Philadelphia, Pennsylvania.*

"I wish to compliment you on the attractiveness of the magazine, and the manner in which it is being improved."

CHARLES A. HOAG,  
*Lockport, New York.*

"Your magazine has been coming regularly to this office for more than six months, and I look on it as one of the most informative and valuable magazines of the day."

M. G. CHAMPION,  
*Public Parks Board,  
Winnipeg, Canada.*

"I have received my certificate and magazine and am more than pleased and delighted to know of the great good you are doing."

F. J. DIXON,  
*Hackensack, New Jersey.*

"May I thank you for the pleasure derived from reading the splendid articles in AMERICAN FORESTRY about Wild Flowers?"

JULIA A. THORNS,  
*Ashboro, North Carolina.*

"How well you do things in America! Your Forestry Magazine is a fine one, and your work most interesting and valuable."

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"A friend sent me a subscription to your magazine and I haven't had a present in years that has already given me as much pleasure, and just think of all the numbers still to come."

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*Memphis, Tennessee.*

"Permit me to make use of this opportunity to commend very highly the official publication of the American Forestry Association. It is worthy of all praise."

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"I am deeply interested in the conservation of our forests and it gives me a great deal of pleasure to be identified with an Association which is accomplishing such excellent results in this direction."

JOHN W. WEEKS,  
*Washington, D. C.*

"I have recently become a member of the American Forestry Association and I am reading your magazine with keen interest. It is very well gotten up and most excellently printed."

LEWIS EDWIN THEISS,  
*Lewisburg, Pennsylvania.*

## CANADIAN DEPARTMENT

### ELLWOOD WILSON, SECRETARY, CANADIAN SOCIETY OF FOREST ENGINEERS

The Report of the Forest Branch of British Columbia for 1916 is just out and is very interesting and shows what such work, properly conducted, can do for a country. Trade extension in wood products has been carefully studied and efforts made to increase the markets for and the consumption of timber. Heretofore southern pine has held the eastern Canadian market, but Douglas fir has been brought to the attention of architects, city building departments and other wood users and much very creditable advertising has been done. Exhibitions have also been held in many eastern cities. Mills are also put into touch with enquirers and possible customers. The Prairie Provinces have also been carefully canvassed and the same methods used to induce their people to use British Columbia timber as in the East. Foreign trade has also been carefully studied, but the difficulty of obtaining ships has greatly hampered the export trade. The British War Office has done considerable buying of boxes in British Columbia. The estimated value of the total lumber production for 1916 is \$35,528,000 and the total timber scaled amounted to 1,280,000,000 feet. B. M. logging operations increased and were carefully inspected; 1648 inspections were reported. Land classification work was carried on, 144 examinations being made. Manufacturing and export statistics were also collected and these showed that the pulp and paper industry has obtained a foothold, 65,229 tons of paper and 14,389 tons of sulfite wood-pulp being manufactured. Reconnaissance work had to be



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abandoned altogether as so many of the field force are absent at the front. Forest protection was carried on as in the past, but owing to shortage of men a less number were employed. The total damage estimated amounted to \$49,913.00, as against \$108,873.00 for 1915 and \$72,057.00 for 1914. The people are beginning to realize from the Forest Branch's campaign of education the necessity of care and are beginning to cooperate heartily. The report shows that the work is being kept up to the same high standard which was set when the work was started and with a strong personnel and good *esprit de corps* this will be continued.

The Manager of Eastern Lands of the Canadian Northern Railway has just returned from a trip through Northern Ontario and says that he believes that there are tributary to the present railways and waterways leading to them, 250,000,000 cords of spruce pulpwood in Ontario and 350,000,000 cords in Quebec. He says that it is useless to consider timber north of the Transcontinental Railway, as the rivers run north, and only a small portion could be brought upstream by building dams which would enable the wood to be towed back.

The campaign against the white pine blister rust is progressing under the Dominion and Provincial Governments. Subject to the general supervision of Dr. J. H. Grisdale, Acting Dominion Botanist, the field work is in charge of

W. A. McCubbin, of the Field Laboratory of Plant Pathology at St. Catherines, Ontario. A senior and two junior assistants are provided who will specialize in research work calculated to determine the best methods of control of the disease. The actual work of scouting for the disease and eradicating it will be done by men provided by the Forest Services of Ontario and Quebec, respectively. The salaries of these men will be paid by the Provinces and their traveling expenses by the Dominion. There will be twenty in Ontario and the same number in Quebec. Until June 10 the work of location and eradication will be confined to white pine; after that date similar work will be done on currants and gooseberries, the alternate hosts of the blister rust. Work is now under way of clearing both wild and cultivated currants and gooseberries from a strip a mile wide along the bank of the Niagara River, from Niagara-on-the-Lake to Fort Erie, to form a safety belt which will prevent the disease from passing over the river into New York State. On the New York side of the river, similar work will be done by the state for the protection of Ontario. Pine in this territory on both sides of the river will be dealt with later, if necessary. In connection with the location of the disease on currants and gooseberries, it is proposed to utilize the services of school children. The stage of the dis-

ease on these plants is easily recognized and the pupils will be able to render a valuable public service by reporting any outbreaks found. Literature and colored illustrations will be furnished and instructions given through the teachers.

The necessity for uniform statistics of forest fires and the damage caused by them is a subject of great importance and likewise of considerable difficulty. It would seem to be necessary to have, whenever a fire occurs, the date, location, cause, area burned over, stand before the fire occurred, timber which can be salvaged, and timber burned. Value of timber or other resource destroyed is also important. The last three items are very difficult to ascertain. Protective agencies cannot be expected in the nature of the case to cruise and accurately determine the amount of timber on areas under their care. The ordinary fire ranger is certainly not qualified nor has he the time to make a careful estimate of the amount of timber which can be salvaged, nor the value of the trees destroyed. At best the most he can say is: green timber destroyed, or old burn, or logging slash or some such general description, and he can say timber scorched but fit to cut, timber all burnt, etc., and none of these designations are of any real value for statistical purposes. In fact, the determination of areas is really often beyond the capacity of the ranger, and again the difficulty of leaving

his patrol to measure burnt areas crops up. Then when the question of valuing such damaged areas is encountered, further difficulties enter. Only an expert in local values is competent to say what timber is worth. The question of the value of young growth, of scorched timber and of areas which have just started to reproduce is a trying one and no two owners will agree as to the value placed on such areas. Much preliminary work is necessary, especially in country which has not even been carefully mapped, such as all of the Canadian Coöperative Associations are operating in. It might be possible for these Associations to undertake such mapping and estimating work. This would give winter work for rangers and inspectors, a very important matter indeed.

Forest fires are said to be raging in the organized and unorganized districts around Fort William and Port Arthur in Ontario, destroying large areas of timber and uncut pulpwood. Bush fires have been raging in fully a hundred sections west of Fort William since last week and much territory near Commee and beyond has been burnt.

Professor W. N. Millar, of the University of Toronto, has gone to the United States to help organize a Forestry Corps for work in England. This leaves only Drs. Fernow and Howe on the teaching staff of the Forestry School.

Dr. Howe, who is making studies of cut-over lands and the reproduction of pulpwood on them for the Commission of Conservation, has returned from a two weeks' reconnaissance trip north of Grand Mere, which he took in order to plan out his summer's work.

The Minister of Lands and Forests has sent out a circular letter to all licensees of timber lands in the Province of Quebec urging them to join the coöperative fire protective associations and warning them that if they do not he will enforce to the limit the requirements and penalties of the forest-fire laws. Practically all of the limit holders have joined. The notable exceptions are owners who from their standing and prominence should be more public spirited and should know better where their interest lies.

The summer meeting of the Technical Section of the Pulp and Paper Association will consist of a trip to the industrial centres of the St. Maurice Valley, where the large paper mills, water power installations, carbide and aluminum works will be visited. The members will leave Montreal on a special train of two sleepers and a diner and will be the guests of the Laurentide, Belgo-Canadian and St. Maurice Paper Companies.

The inquiry being held by the Canadian Government into the cost of producing newsprint paper is progressing slowly, and meanwhile the price fixed by the Government is still being charged by the producers. The prices of wood, wages and supplies are still rising.

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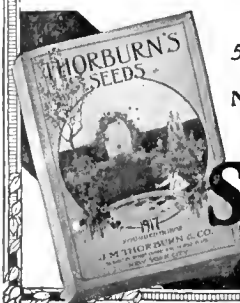
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ELZ.-MIVILLE DECHENE,  
Deputy-Minister,  
Department of Lands and Forests.

Engineering news-record, June 7, 1917.—Timber structures in Hawaii menaced by marine borer, p. 489; Build wood training camp city for 5,000 officers in three weeks, p. 506-8.

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St. Louis lumberman, June 1, 1917.—The problem of reforestation, by M. L.

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to yellow pine timber by steam logging, by O. F. Ericson, p. 507-8; Changes proposed in Louisiana taxation, p. 508-9; The work of the United States Forest products laboratory, p. 509-12.

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"THE WOOD ETERNAL"

The following editorial item is from the May 10th, 1917, issue of the LUMBER WORLD REVIEW. (It is worth reading because it is true—and worth reproducing here because you probably don't read lumber trade papers.) We submit it without further comment.

## Note the Emphasis it puts on the *Relative Value of Genuine* "Tide-water" Cypress

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(From the "Lumber World  
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"And then followed what usually follows any marked success in merchandising in these days of intensive buying and selling. Inferior, or upland, cypress (and some carelessly manufactured cypress) began to share unduly in the results of public faith, and it became necessary to protect the lay consumer and at the same time protect the conscientious manufacturer and the honorable and up-to-date preponderance of retailers.

"The general public was not aware that there was a considerable difference between 'tide-water' cypress and the cypress that grew too far inland—but experience began to teach them that while one was 'eternal' the other was more or less temporal and 'fleeting.' One was truly rot-resisting

while the other failed to justify the confidence of the user in its rot-defying character.

"So the already famous cypress arrow trade-mark was devised as an insurance policy for both seller and user. The value of a trade-mark need not be dwelt upon. The manufacturer who won't sign his product will never get very far with it, in these days. The quality must be maintained if the product is to survive the fierce battle of business.

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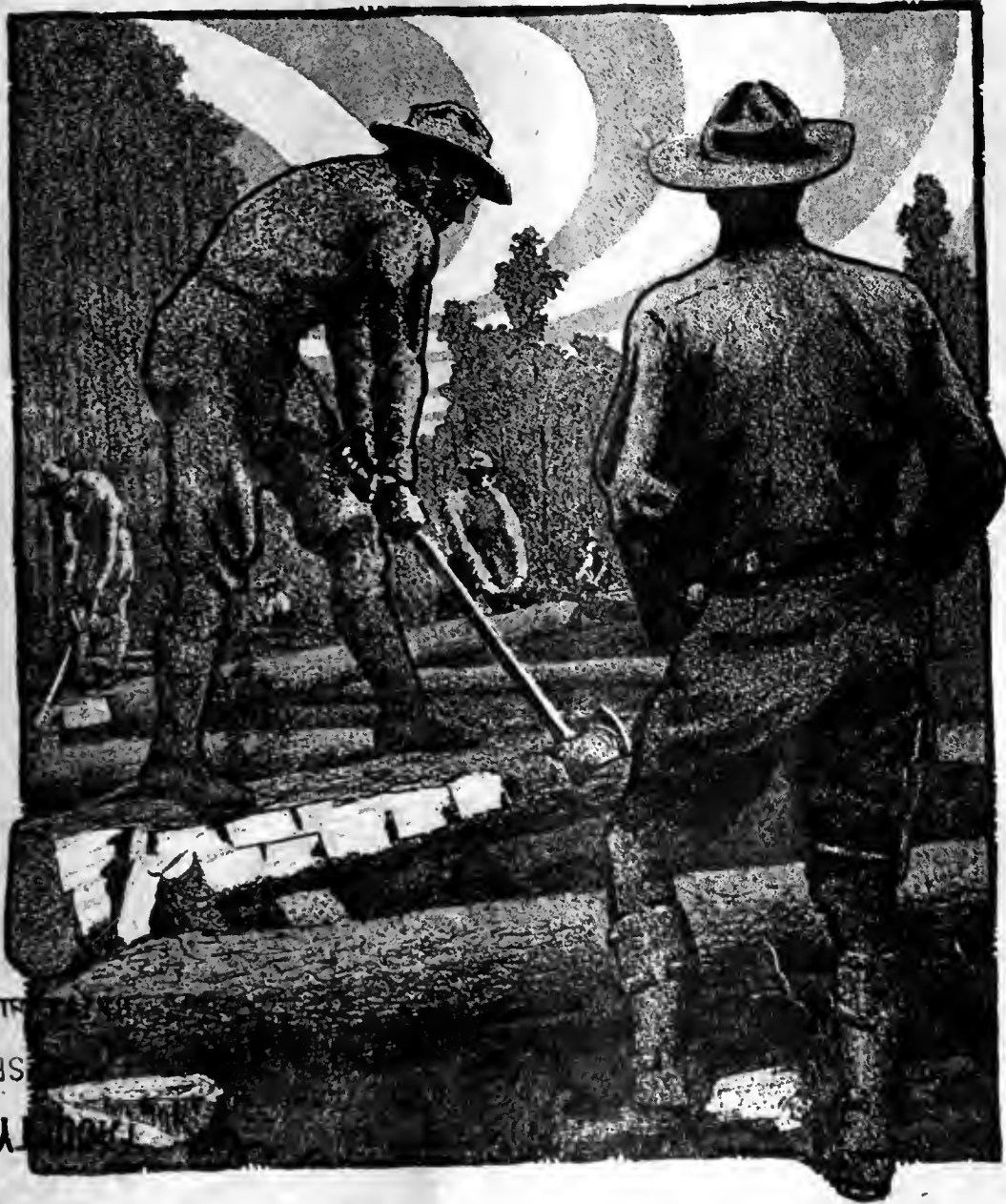
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# American Forestry



SEP 1917  
OF FORESTRY

An Illustrated Magazine about Forestry and Kindred Subjects Published Each Month by the American Forestry Association Washington, D.C.



Permanent plant erected by copper mining company; constructed of wood consisting of two tanks, one for "hot bath" and other for "cold bath." Used for creosoting timber and lumber used in surface-structures and mills.



Temporary treating-plant constructed of wood and lined with galvanized sheet iron. Used for creosoting over 250,000 feet B. M. of timber for floor-framing of industrial plant.



Permanent plant for creosoting of refrigerator-car sills and roof-boards.



Permanent portable plant built by large paper-mill for creosoting roof-boards and miscellaneous lumber. (A) Tank for hot treatment. (B) Tank for cold treatment. (C) Tank for catching drippings.

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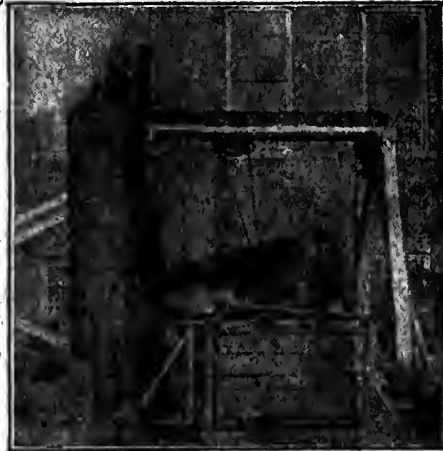
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Permanent plant erected by large iron mining company consisting of two steel treating-tanks and one 10,000-gallon storage-tank. Used for creosoting miscellaneous timber and lumber.



Temporary plant constructed of wood lined with galvanized sheet iron, equipped with steam-pipes for heating creosote. Used for creosoting roof-timber and -boards for roof over machine-room of paper-mill.



Modern Open-Tank Pole-Treating Plant. (Photo. courtesy Lindley Bros. Co., Minneapolis.)

# AMERICAN FORESTRY

THE MAGAZINE OF THE AMERICAN FORESTRY ASSOCIATION

PERCIVAL SHELDON RIDSDALE, Editor

AUGUST 1917 VOL. 23

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# REAL ESTATE AND TIMBER

## SALE OF TIMBER RED LAKE INDIAN RESERVATION.

SEALED BIDS, MARKED OUTSIDE "BID, Red Lake Timber," and addressed to Superintendent of the Red Lake Indian School, Red Lake, Minn., will be received until 12 o'clock noon, Central Time, September 26, 1917, for the purchase of timber upon about 51,300 acres within Township 150 N., Ranges 32, 33, 34, and 35 west; Township 151 N., Ranges 32, 33, and 34 west. The sale embraces approximately 72,000,000 feet, of which about 65 per cent. is white pine, about 27 per cent. Norway Pine and the remainder Jack Pine, Spruce, Balsam, Cedar and Tamarack. Each bid must state for each species the amount per thousand feet Seebner decimal C log scale that will be paid. The minimum prices per M feet, B. M., which will be accepted are as follows: White Pine \$10, Norway Pine \$8, Spruce \$5, Tamarack \$3, Jack Pine \$2, Cedar \$3, Balsam \$2.50, Cedar and Tamarack ties \$0.08, Spruce and Balsam pulp \$1 per cord. Cedar posts, 7 feet long, 3 and 4 inch tops, \$0.01; 7 feet long, 5 to 7 inch tops, \$0.015; 8 feet long, 4 to 7 inch tops, \$0.02; 8 feet long, 8 and 9 inch tops, \$0.05; 10 feet long, 4 to 7 inch tops, \$0.025; 10 feet long, 8 to 10 inch tops, \$0.08; 12 feet long, 4 to 7 inch tops, \$0.03; 14 feet long, 4 to 7 inch tops, \$0.035; 16 feet long, 4 to 7 inch tops, \$0.04; 18 feet long, 4 to 7 inch tops, \$0.06. Cedar poles, 20 feet long, 4 to 8 inch tops, \$0.08; 25 feet long, 5 to 8 inch tops, \$0.12; 30 feet long, 6 to 8 inch tops, \$0.30; 35 feet long, 6 to 8 inch tops, \$0.60; 40 feet long, 7 to 9 inch tops, \$1.25; 45 feet long, 7 to 9 inch tops, \$1.50; 50 feet long, 7 to 10 inch tops, \$2.25; 55 feet long, 7 to 10 inch tops, \$3; 60 feet long, 7 to 10 inch tops, \$4.50. Each bid must be submitted in triplicate and be accompanied by a certified check on a solvent National Bank in favor of the Superintendent of the Red Lake Indian School in the amount of \$2,500. The deposit will be returned if the bid is rejected, but retained if the bid is accepted, and the required contract and bond are not executed and presented for approval within thirty days from such acceptance. The right to reject any and all bids is reserved. For copies of the bid and contract forms and for other information, application should be made to the Indian Superintendent, Red Lake, Minnesota.

Washington, D. C., July 13, 1917. CATO SELLS, Commissioner of Indian Affairs.

## SALE OF TIMBER FLATHEAD INDIAN RESERVATION.

SEALED BIDS MARKED OUTSIDE "BID, Flathead Timber, Roman Unit" and addressed to Superintendent of the Flathead Indian School, Dixon, Montana, will be received until twelve o'clock noon, Mountain time, Tuesday, September 11, 1917, for the purchase of the merchantable timber upon tribal and allotted lands situated within Sections 4 and 5 T. 19 N., R. 19 W.; Sections 5, 6, 7, 8, 9, 10, 15, 16, 17, 18, 19, 20, 21, 22, 27, 28, 29, 32, 33, and 34 T. 20 N., R. 19 W.; Section 21, 22, 27, 32, 33, and 34, T. 21 N., R. 19 W.; Section 1 and Section 12 T. 20 N., R. 20 W. M. P. M. containing approximately 57,000,000 feet of timber, over 80 per cent. Western Yellow Pine. Each bid shall state the amount per thousand feet B. M. offered for Yellow Pine (including "ball pine") and the amount per thousand feet offered for Fir, Larch and other species. Each bid must be submitted in triplicate, and be accompanied by a certified check on a solvent National bank, drawn in favor of the Superintendent of the Flathead Indian School, in the amount of \$2,500. The deposit will be returned if the bid is rejected, and retained as a forfeit if the bid is accepted and the bond agreements required by the regulations are not furnished within 60 days from the date when the bid is accepted. No bid of less than \$3 per thousand feet for Yellow Pine and \$1.25 per thousand feet for Douglas Fir, Larch, and other species will be accepted. The right to reject any and all bids is reserved. Copies of regulations and other information regarding the proposed sale including specific description of the sale area may be obtained from the Superintendent of the Flathead Indian School, Dixon, Montana.

Washington, D. C., May 4, 1917. CATO SELLS, Commissioner of Indian Affairs.

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## PROVINCE OF QUEBEC Department of Lands and Forests

Quebec, 2nd June, 1917.

Public notice is hereby given that, in conformity with the law, on the 21st August next, at 11 o'clock a. m., at the office of the Minister of Lands and Forests Dept., Quebec, there will be offered permits to cut timber on lands belonging to the Crown in the Upper-Ottawa, Lower-Ottawa, St. Maurice, Lake St. John, East and West, Saguenay, Rimouski West and Bonaventure West agencies, comprising several large blocks in the Abitibi, Upper-Ottawa and headquarters of the St. Maurice and Gatineau and on River Chamouchouan.

Permits will be adjudged to the highest bidder.

The price of adjudication is payable in three equal instalments.

The permit to cut will be subject to the ordinary conditions of the Law and Regulation and the grantees of any of the aforesaid territory must, within a delay of three years, manufacture, in the Province of Quebec, with the timber cut in said territory, either pulp or paper in the proportion of ten tons per day, or sawn lumber in the proportion of ten thousand feet board measure per day, per hundred square miles.

Further information may be had by applying to the Department of Lands and Forests.

ELZ.-MIVILLE DECHENE,

Deputy-Minister,

Department of Lands and Forests.

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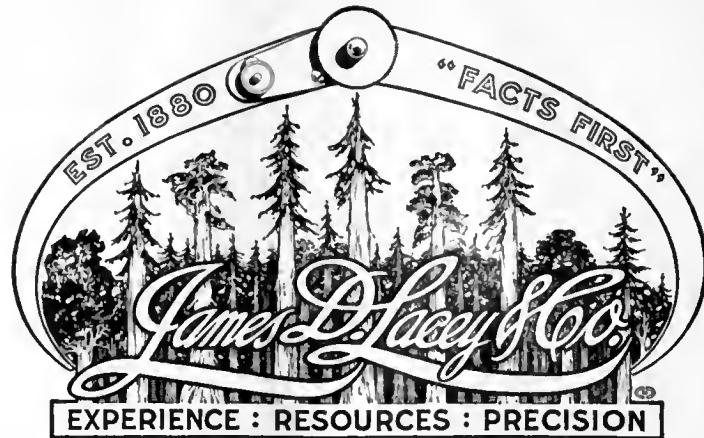
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# AMERICAN FORESTRY

VOL. XXIII

AUGUST 1917

NO. 284

## FORESTERS TO THE FRONT

BY BRISTOW ADAMS

Far from Floridian sands and pines,  
From Maine's dark-mantled, spruce-clad hills  
From Klamath firs in serried lines,  
From Coconino's lumber mills,

We see them come with saw and ax,  
With wedge and peavy, hook and chain,  
With hardened hands and sturdy backs  
To hack and hew for trench and train.

CAPTAIN INMAN F. ELDREDGE, of the Tenth Reserve Engineers (Forest) was peering through the eyepiece of a transit and directing the civilian contractor as to where the corner stakes should be driven for the barracks for housing the regiment to which he had been assigned. The time was late afternoon, and the place was the engineers' camp on the grounds of the American University, somewhere in the northwest quarter of the District of Columbia. If he had not been to the west of the structure, he could have been literally within the shadow of a white marble building, upon the face of which were deep-chiseled words "College of History."

Eldredge's deeds of the day were helping to make the history of tomorrow, but he did not feel like a historical personage—far from it. In getting the ground cleared of sassafras brush and blackberry bushes, he had become the host of a small army of chiggers, and although chiggers can get under them readily, one cannot scratch chigger-bites through leather puttee leggings. Moreover, his mess had partaken of some tinned food a day or so before and there had

been something wrong with that food. The field hospital was taking no chances, so it used up all of a barrel-and-a-quarter of perfectly good castor oil in dosing the Captain and his mess-mates. It was the first castor oil he had ever taken in his life without a preliminary licking and it was a man's-size dose. Military discipline counted for something after all!

Not that he had any objection to military discipline; he took to it like a hound to a rabbit track. As Supervisor of the Florida National Forest he had required uniforms and insignia of rank for all his Forest officers. He knew the value of inspections and of strict lines of accountability. He had wanted to get into the war from the day it was seen to be inevitable, and on another day shortly after had passed the examination for a captaincy in the Engineer Corps. Small wonder that he was assigned to the popularly so-called Forest Regiment in May, as soon as its formation was assured.

It must not be thought that Eldredge had no ideas about history. Even the chiggers could not get his mind off the fact that he was demolishing a Yankee fort which was one of the defenses of Washington



LIEUTENANT COLONEL JAMES A. WOODRUFF

A regular who has been designated by the War Department to organize and command the first of the Forest Regiments.

during the Civil War. He was from South Carolina; his father had tried to do, in a different way, what he was accomplishing with ease and a plow and scraper



MAJOR HENRY S. GRAVES

Chief of the United States Forest Service, who has received a commission as Major in the Reserve Engineer Corps but has not been assigned to any command. For the past two months he has been in France preparing for the work which the Forest Regiments are to do when they arrive. Major Graves is a vice president of the American Forestry Association.

in the hands of two sweating negroes. This ground, tortured into earth-works and riflepits for Fort Gaines in 1861, was here being leveled off for the barracks of a new army made up of the sons of those who had fought against one another. The easy careless cadences of southern speech here met the tight twang of the northerner, and also the words of the westerner, which were of neither variety. Only a short distance away the earth was torn up anew, however, where engineer forces were putting into effect the lessons learned in the present war.

So here he was getting the barracks ready.

Here, too, was Captain E. S. Bryant, helping to lay out the company streets. Captain Arthur Ringland, who had formerly watched over the destinies of the National Forests of the Southwest, known to the Service as District 3, was quartered in Number 4 barracks nearby. Others were gathering from all over the continent; Benedict from British Columbia, Chapman from Oregon, Guthrie from Arizona, Mason from

California, Skeels from Montana. Some from the Forest service, some from forest schools, some from lumber companies. The head of the Forest Service, now Major Henry S. Graves, was on this day already in France, with Captain Barrington Moore, looking over the ground to make plans for the actual work at the front. Major Greeley, with some fourteen others, went over early in August.

Why a forest regiment? Any three of a number of reasons will suffice. In the first place, the War Department asked for such a regiment, being prompted to make the request by a suggestion from the British Commission, which visited this country soon after hostilities between Germany and the United States were officially recognized. In the second place it could be readily seen that the work would be of great use, not only to the United States and its Allies generally, but mainly to the French, whose forests were being terribly devastated. This devastation was bad enough in the zones of actual warfare, but it might



MAJOR W. B. GREELEY

Assistant Forester in charge of the branches of silviculture and research, U. S. Forest Service, who has been active in the organization of the Forest Regiment and who led the party of fourteen officers which sailed for Europe early in August. Major Greeley is a director of the American Forestry Association.

be lessened if the forests back of the line, which were furnishing timber imperatively needed for war purposes, could be cut with the least of permanent dam-



MEMBERS OF THE FOREST REGIMENT

These men, many of whom are newly arrived, lined up for inspection at the camp on the grounds of the American University, Washington, D. C. They come from all parts of the United States and are keen, efficient and skilled in forestry and lumbering.

age. In the third place, the field force of the Forest Service wanted to go.

The last-named reason furnished a considerable problem. At first it was understood that Mr. Graves didn't care to have members of the Service leave their work on the National Forests. They represented a fundamental need at home. The organization so ably started by Gifford Pinchot, upon whose broad foundations Henry S. Graves had continued to build, had become a permanent structure which had withstood a good many storms. It was strong and no one who had anxiously watched its growth wanted to see it

weakened. To put its best men overseas threatened just this weakness.

It may be said, therefore, that Mr. Graves desired to hold it intact. He had had a chance, during the very earliest stages of the trouble with Mexico three years before, to see what would happen. Then the Forest field force, almost to a man, wanted to organize itself into cavalry to sweep across the border. A roster of available men with the records of the special service for which each was fitted was in the hands of the authorities at Washington. Only a word was needed to put into the field a well-mounted, hard-



MAJOR C. S. CHAPMAN  
Manager of the Private Lumber  
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Oregon.



CAPTAIN DORR SKEELS  
Logging Engineer and Professor of  
Forestry at the University of Mont-  
tana.



FIRST LT. JOHN B. WOODS  
Of the Arkansas Land and Lumber  
Company of Malvern, Arkansas.



FIRST LT. ROBERT L. DEERING  
Forest Examiner, United States  
Forest Service, stationed at Albu-  
querque, New Mexico.

riding, straight-shooting lot of men, not only familiar with hardship and the life of the open, but particularly capable of looking out for themselves, by themselves,



CAPTAIN ELDRIDGE AT WORK

Laying out the camp of the Tenth Reserve Engineers (Forest) on the grounds of the American University, Washington, D. C.

a long way from civilization. It was difficult to dissuade them from jumping into the fracas anyhow. The Mexican crisis passed, but then a bigger thing came along. District foresters wanted to get into it and said so; forest supervisors likewise, deputy supervisors the same, forest examiners and inspectors, ditto. Some did get into it, via the Officers Reserve,—witness Eldredge.

Foresters, from the very needs of their work, are red-blooded; they are used to doing things; they are accustomed to be where there are hard tasks to perform; naturally they are patriotic because their job is to look out for the "rocks and rills, the woods and templed hills." But counting only what may be called the least of their impulses, they have usually been where a good deal is going on; they didn't want to be out of the crowd where the most stupendous upheaval of the world was taking place. This may be no nobler spring of action than the one which prompts a man to go across the street to see a dog-fight, but to

those who have felt the urge, it was enough. Philosophers say fighting is a primal impulse.

With all these motives, plus the call for the defense of Democracy, the best way to hold the men of the Forest Service together, even though it be in France, was to organize a military unit of foresters. Mr. Graves became a willing convert to the call from the War Department; the organization of the Forest Regiment was undertaken forthwith, and Graves himself was prevailed upon to accept service with it.

One may ask, what are the foresters to do?

This can best be answered by a simple enumeration of some of the uses for timber, down to the smallest sticks, demanded by present-day warfare. Out in front of the very front line trenches are the barb wire entanglements stretched on wooden stakes driven into the ground. Three to five-inch round stuff with the bark on will do for these supports. Immediately in front of the trenches themselves, within arms' reach from the firing step, there are other stakes, projecting only a few inches above the ground. In the wall of the trench below them, footholds are cut and the short stakes provide a hand-hold to give ease and speed in climbing out when the order comes to "cross the top" and go forward on a charge.

A trench is not a simple, deep ditch. It has bastions and embrasures. It has advanced areas and recesses, all needing supporting timbers. What is apparently a slight mound in advance and to one side, is in reality a machine-gun dugout, with the gun so placed as to fire down a line directly in front of the trench itself, and all along the barbed wire. There is a cunningly built porthole, not high from top to bottom, but wide, at least at the outer opening, and narrow at the back or inner opening. Here a machine-gun spurts death fan-wise into the ranks of an attack. The frame work of this opening is made of logs.

Poles are in great demand, for field telephone service and for derricks and cranes in handling heavy loads. Bridge timbers are especially necessary, railroad ties are wanted, wood material for roads, repair lumber for transports, for field buildings and other construction work, all to be got out with the least possible waste and with the minimum damage to the forests. It will all represent a closer utilization of timber than most Americans have ever seen, even the smallest stuff going into fuel, and the tops into leafy screens for batteries. Eldredge and Bryant and the rest of them are getting pretty good practice in the camp construction itself. They have placed the barrack buildings at the American University grounds somewhat following the contours down the two sides of a slope or slight spur, upon the crest of which the main street lies, with the buildings running back on either side. On one watershed, divided by the spur, are the latrines; on the other watershed are the cook camps and mess buildings.

Most of the supervisors have directed similar con-



FIRST LT. RISOEN T. ALLEN  
He is a member of the Allen-Medley Lumber Company, of Devereaux, Georgia.

SECOND LT. H. R. CONDON  
Who was employed in the forestry department of the Pennsylvania Railroad.

SECOND LT. STANLEY H. HODGMAN  
Logging camp foreman of the Pottlatch Lumber Company of Pottlatch, Idaho.

SECOND LT. JOHN W. SELTZER  
Forester of the New Jersey Zinc Company of Franklin, New Jersey.

struction on their own forests, with bridges, lookout towers, ranger stations, and telephone lines. The materials of construction for these were taken right out of the woods on the ground.

The French timber will be taken out of forests of oak, beech, hornbeam, with some stands of pine; most of it is small—not over a foot in diameter. Since the forests are more nearly equivalent to the woodlot type of the Eastern states, it has been the aim of the recruiting officer to get the forces from the East rather than from the West, where woods workers are accustomed to handling larger stuff.

The men who will work this timber will be woodsmen. The officers are trained in forestry and lumbering and their task will be to see that the timber is efficiently manufactured and utilized. At the same time they are to make sure that there shall be no unnecessary destruction so that the forests will be left in the best possible shape for the future. The French forests have been painstakingly cared for, over many years, and French forestry has been an example to American foresters. Gifford Pinchot himself got part of his forestry training at Nancy, where the forest school has actually been under fire.

The men for the ranks are coming fast. Everard, back from New Orleans, his old home, reports plenty of applicants for positions as interpreters from the French population of that city. John Cobbs has been in the mountains of North Carolina; Kiefer in the big lumber camps of Michigan and Wisconsin; Reynolds is up in the Adirondacks, where he studied the fires of 1903, getting the plans explained to the lumberjacks there. Clifford Pettis, New York's state forester and one of the listing officers for the regiment, has been surprised and delighted with the type of men who

have applied for the rank and file—successful small mill operators and woods foremen,—men of ability in their fields of work and of standing in their communities.

Thus the enlisted men are picked woodsmen, and especial care has been exercised to get those needed for specific tasks. Ax-men, sawyers, tie-backs, skidders, teamsters, and blacksmiths have come in; millwrights, sawmill operators, engineers, filers, farriers, cooks and carpenters.

Reports now are that there will be six additional forestry regiments. This will give men like Coert DuBois and Redington, who have all along wanted to come in, the chance they have been looking for. All of the regiments, including this first one, will be under the direction of regular engineer officers, the "tie-hacking tenth," or the "fighting foresters," being organized and commanded by Colonel James A. Woodruff, Engineer Corps, U. S. A.

The foregoing, then, is a discursive sketch of the beginnings of the forest regiment. It does not give much in detail, and it leaves out many things that might go in. It mainly explains why Captain Eldredge, chigger-infested but cheerful, spent hot July days getting ready for a big undertaking and a most serious and necessary job, which will be attended with real risks, and will have its share of fire. The regiment is organized on military lines for military service, to be much in the thick of things, for that is where it is needed. Some of the fellows known to that great fellowship of foresters will not come back; but that is a hazard of war. At least, says Captain Eldredge, who claims to have read up on the subject, there are no chiggers in France,—which is his cheerful way of looking at the future.

We see them go where barricades  
Are builded of the trees they fell;  
Leaf-screens against the air-craft raids  
And log redoubts 'gainst screaming shell.

Where France's forests bleed for France  
They toil with hand and heart and brain  
To help the Starry Flag advance,—  
God send them safely back again!



## THE MONARCH PINE

By LEON T. CHAMBERLAIN

Straight, and gaunt, and grim,  
 He stands on the canyon's rim,  
 And lifts his knotted arms  
 To the winter's mighty storms,  
 And roars as they rail at him.

As he mounted to the stars  
 Through a century of wars  
 With the winds—those bitter foes  
 Left the story of their blows  
 In a thousand ragged scars.

Thus the Titan reigns alone  
 O'er a monarchy of stone,  
 And his paeans never cease;  
 Martial airs or notes of peace  
 Pour eternal round his throne.

When the summer sun smiles down  
 On his royal, pinioned crown  
 His myriad needles sing  
 The love songs of a king,  
 And he smooths his battle frown.

In the warm, impassioned night,  
 With a thrill of keen delight,  
 His softest tassels sigh  
 To the nightbirds flitting by,  
 And the breezes' aimless flight.

## RECREATION IN THE FEDERAL FOREST RESERVES

BY IDA AGNES BAKER

OUR vacation was a ten days' tramp among the foot hills of Mt. Baker, in the Washington National Forest Reserve; and "we" means two women who enjoy the woods and the out-doors and wished to begin a nearer acquaintance with old Koma Kulshan. We had no ambitions for dashing straight to his summit, as so many try to do. We wished to climb to a few of the outer courts, greet him afresh on each rise, see him in many moods and reckon with our own moods as well. We didn't care to join a big mountain climbing party. We hoped to be able to go alone. A crowd overwhelms sylvan life with its human chatter, but two people can quietly blend into the shadows and stillness of the forest life. This was as near as we came to having a plan when we started. Of course the fact that there is no recreation in tramping with a heavy pack on your back was a deciding condition in planning our trip.

On the twenty-fourth of July we went to Glacier with a party of thirteen students from the Normal Summer School, ready to climb Heliotrope Ridge. Glacier is a village at one of the gates of entrance to this Reserve. It is forty miles, by train or auto, from Bellingham and Puget Sound and nine hundred feet above the level of the sea. It exists just because

of the mountain. From it trails radiate to coal mines, gold mines, Forestry Lookout stations and mountain climbing stations. It lodges miners and mountaineers and summer guests, and it furnishes packhorses, packers and mountain guides. It sells food and post cards. Has a tennis court with a hotel, one street, a side walk that you risk your life walking upon, several pretty little homes and is a Forest Ranger's Station. It is surrounded by boiling grey-green glacial rivers, virgin forests and mountains and enveloped in air that is exhilarating.

From here the party had planned to climb Heliotrope Ridge on Saturday and return on Sunday. We were going with them, but we had as yet no definite plans as to when we would return to either Glacier or Bellingham. Heliotrope Ridge is one of the stations for the Marathon runners who raced from Bellingham to Mt. Baker's summit and back. It is ten and one-half miles from Glacier and fifty-three hundred feet elevation and four miles from the summit.

The first nine miles of the trail is easy tramping, in the deep forest by beautiful waterfalls, over old burns and one treacherous slide. It was so surprisingly easy that my friends protested "there will surely be a day of reckoning." There was. The last mile



THE SNOW FIELD ON THE APPROACH TO MT. BAKER

The author and a friend spent ten days tramping in the foot hills around this fine mountain which is in the Washington National Forest Reserve.



NOOKSACK FALLS NEAR MT. BAKER

A big water power plant utilizes the water of these falls to furnish transportation and light for Bellingham, fifty miles away.

and a half made us gasp, perspire and ache, and every few rods drop upon the ground—to enjoy the landscape. In the first mile the crowd broke up into twos and threes according to the pace they wished to take. Some of them made the trip in four hours, but we didn't. We took eight.

As we all started at 5:15 a. m. we slow ones had the last mile and a half in the heat of the day. Most of the women were dressed in the usual mountain suit. While I expected to be at the tail of the procession, I looked the crowd over at the start and decided that I, even I, would pass two of those girls laid out by the trail, for they had on long heavy woolen dresses. When, tired and hot, the last of the crowd, we reached the camp, there by the fire, as fresh as a daisy, sat the young lady of the heaviest skirt, tatting. On the threshold of old Koma Kulshan, to sit and tat! I was shocked. But I couldn't afford to be for she had already been in camp four hours. Time enough to meet the mountain, the glaciers, the flowers and get around to her tatting!

Heliotrope Ridge is probably a medial moraine in the great Roosevelt glacier. It is too close to the summit to give the most beautiful view of Mt. Baker,

but is an intimate view. From here the long precipitous snow wall, one hundred and fifty feet high can be seen very clearly. Our camp, under alpine firs and mountain hemlock, was on a bluff about fifty feet high that drops steeply down into glacial crevasses. We could see the blue ice of their depths, but the surface of the glacier here was brown with the boulders and soil that had fallen on it from the bluff. When night came we wrapped our blankets about us and lay down beneath the hemlock trees to rest and slumber. Those of us slumbered who had remembered hoods and extra hose, but the breeze from those vast snow fields drove the "foolish virgins" to the camp fire. The young people left the next morning. A packer had brought up the blankets and food for the party on two pack horses. As he was willing to carry our blankets back when he brought up another party we too decided to stay another day. On the ridge there were masses of blue lupines, white heliotrope, pink evening primroses and pink minulus and about twenty varieties of other flowers.

We slept another night upon the ridge, as comfortable and safe as the trees and blossoms among their snow fields. Nine o'clock in the morning, with a tin bucket of flowers to analyse and our lunch in our packs, we started back to Glacier. We dawdled on the trail, enjoyed every place of beauty to our fill, falls, outlooks upon the mountain, trees and flowers and reached the Glacier hotel in time for a hot bath and six o'clock dinner. The next day we analysed our flowers and made further plans. We decided to go to Twin Lakes, twenty-one miles distant, and five thousand and two hundred feet elevation, and after our return to climb Sky-line ridge. We didn't realize



LOWRY'S CABIN AT HERMAN

The comfortable home of a miner at which the trampers stopped for a night on their way to Mt. Baker.



then that we were planning anything unique, but they told us afterward that we are the first women who ever tramped in this region alone. I know that in the southern foot-hills of Mt. Baker another friend and I have tramped to homesteads alone for thirteen years. There may have been early women homesteaders in this region, but we are the first women to start out from Glacier into the Reserve alone and just for the pleasure of it.

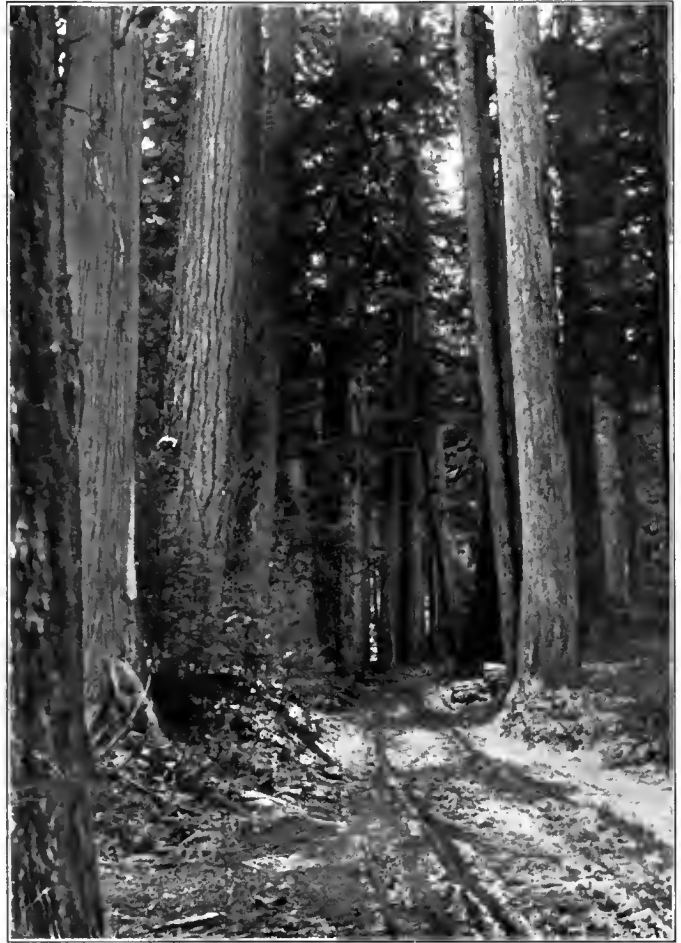
At 5:15 p. m., with packs containing face cream and powder, soap, towels, comb, tooth-brushes, one five-cent can of milk, one glass of dried beef, one loaf bread, some malted milk tablets, nut-meats, raisins, sweet chocolate, five sticks candy and three oranges we started on a three days' tramp; the first station to be at Excelsior, seven miles up the Nooksack river. I wore my khaki mountain suit and my friend a blue flannel blouse and bloomers. We both wore winter underclothes, woolen stockings, mountain shoes and carried our sweaters. My sweater was my only mistake—it was too heavy. At six we stopped by the river, a roaring mountain river, and ate our supper in the rosy afterglow of the sun sinking behind the black mountain ridges. We had phoned ahead and made arrangements to stay the night with the Dickson family at Excelsior. Mr. Dickson is manager of an electric power plant located at Nooksack falls. They and three other families that work for them are the only people living in this romantic place. The Nooksack river boils past their back porch and at high water rises up to the porch. A huge hill, a mountain, rises across the road from their front door. Everywhere there were great clumps of the red berried elderberry loaded with scarlet fruit.

It is an ideal place to live for with all this wildness and grandeur they had the comforts of civilization;



ALONG THE BERRY BORDERED TRAIL

Miss Baker and her friend in their mountaineering costume on one of the trails on the approach to Mt. Baker.



FROM GLACIER TO EXCELSIOR

The road winds through magnificent forests from the gate of the Reserve at Glacier, many miles along a plateau nine hundred feet above sea level.

lights in abundance, electric cookers, hot and cold water, bath, piano, graphophone, books, magazines and lovely rooms. I can't remember when I have had such refreshing sleep as I enjoyed this night. After breakfast Mr. Dickson took us over the plant where they make the force that furnishes transportation and light for Bellingham fifty miles away. The plant in no way destroys the picturesqueness of this spot. The walls of the valley are really mountains and the vast dimensions dwarf the buildings of the plant until they give just the evidence of human interest the valley needs. There are innumerable cascades and waterfalls in the Washington forests, but the Nooksack falls are not ordinary falls. The plant only uses one-third of their power. By a bend in the rock bed and wall the falls are half encircled and the sound of the falling waters in this huge bowl reverberates like the tones of a pipe organ. Far out on the rocky walls, in the mist, is a bunch of blue hare-bells and they will never be disturbed by men for until the water stops flowing no human hand can reach them.

It was nine when we started for our next stopping place, Herman, seven miles farther into the mountain. There are several shacks here, but only one is occupied. This is owned by a bachelor, a miner, who keeps a road house when he isn't off to his mine. The

forest ranger also uses it as a station, and since the owner was off to the mines, the ranger told us where to find the key and to help ourselves to anything we needed in food and pay when we came back.

We were in by three. We had loitered by the way, lounged by the river, cooked our dinner, picked berries, measured trees and estimated their board feet in our heads. We had neither paper, pencil nor tape measure with us and we wanted to estimate the lumber in one of the large trees among the cedars. I have tested and know that I can depend upon my nose to measure a yard. So, by relaying our two shawl straps, on which we carried the field glasses and marking stations we succeeded in measuring the circumference breast high. I have been estimat-

ing the height of the lowest branches of our firs and cedars for ten years so felt safe in saying it was one hundred feet to the lowest branches. While we stretched ourselves on the moss by the river, with these two dimensions, our arithmetic and forestry formulae, we mentally did our reckoning, proving our mental computations by comparing results. We found the tree to be a little over ten feet in diameter breast high and to contain over 65,000 board feet of lumber. A real school-ma'am-y amusement. It occurred to us to reckon how many homes could be built out of the tree, but we lacked data and it began to seem like work. However, I know that from such trees often only half of one cutting of shakes at the butt is needed to build a woodman's cabin.

The cabin at Herman is decidedly superior to the ordinary bachelor's cabin in the woods, and only a woods trumper knows how to appreciate these little homes in the woods. From the front porch we looked over the Nooksack river to the mountains. Ruth mountain, jagged, precipitous and yet snow covered, flushed in the light of the setting sun, was the center of the picture. I made hot biscuits for supper and since I could find neither lard nor bacon I made them

of carnation cream. They were fairly good, but extravagant for the woods. We cooked our last eggs, that is what was left in the shells, for I had dropped the bucket once. When Mr. Lowry is gone his cats keep house. There is a cat hole in the door. I love

a cat and was delighted to see them at first, but between the heat of the little room — we couldn't leave the door open because of the mosquitoes — and the racket of the cats, we slept so little that we made a late start in the morning. When we came back I closed the cat hole and the cats slept in the open for once in their lives.

I have lived for weeks in the woods fourteen miles from a road, and the freedom from noises of civilization, — the silence of the forest broken only by the musical



MT. BAKER FROM HELIOTROPE RIDGE

The snow wall that appears to be about three feet high is more than one hundred and fifty feet high. A wonderful view of the mountain is to be had from the Heliotrope trail.

sound of rippling water or falling twigs, is very familiar and fascinating. Into this the ring of a telephone bell was as startling as a team of horses. But it was a very friendly sound when we heard the voice of Forest Ranger McGuire at Glacier asking how we had made the trip. The installation of the telephone is a long step in forestry towards closer protection of the forest. Trails, telephones and lookout stations are an absolute necessity in the control of fires.

After breakfast we started for Twin Lakes, six and one-half miles farther on and 3,000 feet farther up. It is the way to many gold mines and the forestry trail building crew of seven men were just completing a trail to the Lakes. They are far up among the peaks, two mountain lakes of exquisite blue shading from indigo to emerald, floating tiny ice-burges, in places bordered by banks of icy snow, surrounded by slopes of snow and clumps of alpine flowers and trees and by huge buttes that framed the distant peaks of Red mountain and a magnificent view of Koma Kulshan.

The water from one lake empties into the other by little resounding falls and from this lake the water cascades down the mountain sides as Swamp creek. Even creeks have an individuality. This one is inter-

laced with moss covered logs and stumps in place of boulders until it seems to be trickling through a swamp of greenery. It is a fine trail and the climb on easy grade until you reach the last two miles. Nothing could make that easy—owing to our late start we made it between eleven and one, and the day was hot. Only climbers know all that means. Then is when you grieve over every ounce of avoirdupois you have permitted yourself to acquire in the last ten years.

Fortunately we had left our packs and sweaters and had only our field glasses, pail and lunch to carry. We were thoroughly weary when we reached the summit, but the view was worth our pains over and over again. All my life it will

“Flash upon that inward eye,

Which is the bliss of solitude.”

Our only grief was that we had no blankets and could not stay all night and then climb the buttes. I think we could have seen the world from their summit. We rested and explored for two hours and then started back. The trail building crew were within ten rods of the end when we met them. As they eagerly asked how near they were to the top it was a delight to cry, “The next turn will show you the lakes.” It is sort of dramatic to be in at the finish of any thing, especially when that thing is a trail to cloud-land. When we returned to the camp for our packs the cook gave us some bread just from the oven to take with us and a slice of hot bread and butter, the best I ever ate.

Picture a bit of meadow land, a white tent and a fly; under the fly a table, stove, little cook stand and cupboard, benches, a rollicking baby of eight months on a blanket on the ground, and a bright faced young lady in overalls, and you have our cook and camp. Her husband is foreman. The Ranger sent out horses the next day to move their camp to the Hannigan Trail. On one of them she took her baby and rode to the next station thoroughly enjoying the primitive life. These people understand trail building. There is all the difference in the world between trails. After you have felt of eighty miles of trail with your feet and packed and panted over them you know that you are capable of having opinions concerning trails. His trails make the most elevation with the lowest grade of any I have ever trod.

On Heliotrope Ridge trail, which was not built by the Forest Service, you do so much going down when you are going up the mountain and so much going up when you are going down to Glacier that my friend suggested that perchance we had lost the mountain and were going back. Unless he reaches some special point of beauty by the down grade, the provident climber groans over every loss in elevation. We reached Herman at seven p. m. and spent another night in the cabin. Rising at half past four we had breakfasted, put the cabin to rights and were on the trail by half past five, too early for the flies.

I never saw so much wild fruit as there is on this trail. We counted thirteen kinds of edible berries, quantities of blue and red huckleberries, salmon berries, thimble berries, red, yellow and black raspberries, blackberries, red elderberries, Oregon grape, silal and two kinds of wild currants. For miles it is one vast berry patch. We picked and ate. I thought for once I would have all the thimble berries I wanted and one can hardly resist the red huckleberries because they are so pretty. We reached the Dickson's by eleven, had dinner and visited until three, then started to Glacier. It was a warm day and we had enough left in our packs for supper so we planned to reach the hotel about eight. It is the easiest thing to loiter in the Washington woods by a mountain stream. While it was still warm we took a nap on a bluff that was deeply cushioned with moss and embroidered with twin flower vine and bunch berries. It was more comfortable than most beds. We were screened from the road by red huckleberry bushes loaded with their coral colored fruit. A hundred feet above us the firs, hemlocks and cedars held a canopy of green over us, their trunks like great pillars. At one side the grey-green river boiled below us and on the other the mountain rose steeply out of sight. The haze from forest fires had filled the air, the sun was red in the sky and the yellow light gave the effect of seeing the world through colored glass. While we rested and lounged we saw two men go down the road with packs on their backs, prospectors probably, coming out of one of the mines.

On a tramp like this you meet few people and every one has a personal interest. On the Twin Lakes trail, besides the trail makers, we met a jolly old assayer going to one of the mines. He had a charming German inflection, and his stories as we rested and chatted were delightful. One story told was how one winter they worked a mine all winter and there was so much snow that every morning they had to climb on the roof and put on another joint of pipe. In the spring their pipe was “up in the air,” and somehow his chuckle gave you the impression that the pipe wasn't all that was up in the air.

The first day on the Shukson trail we met the Ranger and received kindly directions. These, with the packer I mentioned before, and the Excelsior folks were all the people we saw on that three days' tramp. The loneliness is what we enjoy. Sometimes we walk long distances in Indian file and Indian silence through those still forests thoroughly happy. Every forest incident is an event on the trail, a familiar or a new bird song, a change in the trees or the flowers, a dip in the trail, a break in the woods that frames a mountain peak or a ridge, a miner's shack, a sign board and trails, those composite imprints of living feet, turning off among the tree shadows, a bit of meadow, a burn, a slide, the deep breath of exhilarat-

ing air, the joy of a weary climb accomplished, a seat on a log and renewed study of the map, lunch by the brook.

There is no use in describing it to those who enjoy it for they know already and there is no use for those who are puzzled over it for they never can know. We reached the hotel by half past eight, dusty and footsore and luxuriated in the hiker's delight, a hot bath and clean cotton sheets and night clothes. If summer outings do nothing more they make one realize the luxury of ordinary comforts of civilization. We rested and analysed flowers a whole day, then climbed Sky-line Ridge, one of the forestry lookout stations. The forestry crew built this trail the spring of 1914, and whenever there is a lightning storm the Ranger sends a man up to look for lightning fires. The outlook is vast and wonderful, but the thickening haze hid most of it from us. There is hardly a foot of lost elevation on this trail and yet it is a stiff climb. It rises 5,500 feet in five miles.

We started too early for hotel meals and prepared our three meals ourselves. We had breakfast down by the brook on hot coffee, boiled eggs and hot toast and were on the trail by half past five. Nevertheless, noon found us on the snow meadows, whence all the snow was gone, and the only signs of the trail far apart blazings. By having one of us stay near a blazing until the other had found the next one we plodded up over the slippery, grassy, flower-bedecked, hot meadows until we reached the lookout's tent. The springs on the trail are not perennial and there was only one place where we found water. When we reached the ridge above the tent the world was veiled in a smoky haze. Only the bare outlines of ridges and mountain peaks hinted at what we would see on a more auspicious day. The ridge is a succession of meadows outlined by alpine firs and hemlocks, brilliant with blue lupine, white heliotrope and buttercups, but so much alike that we soon realized that, surrounded by this haze like a fog, it would be very easy to lose the tent and so the trail. This checked our exploration of the ridge. We missed what we came for, but nevertheless it was worth while, the trail itself, the meadows and flowers, the lookout station, the geography of the ridge were all interesting enough to balance the fact that it was a hot, weary, dry and resultless climb.

We had lunch without water on the meadows. These lunches are always simple on the summit for obvious reasons. We had dinner down by the river again about a mile out of our way. We started to Heliotrope Ridge, taking a plate, knife, spoon, cup and bucket, the simplest of culinary outfits. We had this last meal with hot coffee, the one utensil, a cup apiece. We left our plates and knives with our bedding at Heliotrope Ridge. We had lost the penknife on the trail so we broke our bread. As there were no new flowers on the summit I left the bucket at the Outlook tent, forgetting about supper. We built a

tiny fire and made coffee in our tin cups. We spread butter on our broken bread with flat pebbles, stirred the sugar in our coffee with dry twigs, divided the orange, and nutmeats, raisins and candy and with our hot coffee and toast, by the boiling river under the fir trees in the afterglow of a dusky twilight, ate our last luxurious meal. Thus you can simplify the simplified.

We reached the hotel long after dark, after our longest one-day trip, seventeen miles, and in the morning, after eight miles of tramping we took the auto stage for a forty-mile ride out of the foothills to Bellingham.

### SCRAPPIN' FIRE ON TH' CHEROKEE

By H. L. Johnson

**I** RECKON she's swiped th' whole durned thing,  
From Oswald's Dome down to Clemmer's  
Spring."

"Naw, 'tain't that bad," says a little feller,  
"Our gang stuck to 'er an' never showed yeller.  
We cut her off twixt the' prongs er th' crick,  
An' saved th' south end,—Lord but I'm sick.  
Let's stop here an' drink, who's got a chaw?  
An' who's ever heerd of th' eight-hour law?  
Here, take yer blamed ol' busted hoe,  
I've toted hit round 'till I dunno  
Ef I'm able ter git back home 'fore day.  
Wonder when we'll git our pay?  
No grub sense mornin', sucked water like a bee  
Now fire's jes played H—— on th' Cherokee.

"Jeff, you take the lead an' the rest'll foller,  
COURSE I KNOW THESE WOODS, ev'ry lead  
an' holler;

But I'm fair to admit, I'm a leetle mixed,  
LORD a' mighty, now I'm fixed.

Huh? Oh nothin' tall, keep peggin' ahead,  
Stumped my toe, an' was dreamin' uv bed.  
This looks a heap like makin' a crop,  
Us scrappin' fire, an' it ain't rained a drop  
Sense week 'fore last when they cut th' still,  
Back er Fate's house and busted his mill.  
A fool that'll grind malt in a coffee machine,  
Is sure ter git ketched ez soon ez it's seen.  
Huh? Naw, thet FOREST FELLER can't hear,  
or SEE,  
All he knows is scrappin' fire on th' Cherokee.

"Whoa, hol' on, ain't that a light,  
A man gits blind in a fire fight?  
Yep, thank the' Lord it's Greasy Crick,  
Git up ol' woman, my skull's too thick  
Ter figger how we made it back,  
SURE it's me, git up an' cook a snack  
Er grub, (come in men), for these fellers  
Ter eat as they go, that boy bellers,  
Jes' as soon as he hears his Pap,  
Here SON, set up here, on yer ol' Dad's lap,  
An' keep out fum under yer Maw's feet,  
Till she gits suthin' fixed fer the men ter eat.  
Now men, set right up an' EAT, it ain't no spree,  
This scrappin' fire on th' Ol' Cherokee."

# THE NEW FREEDOM-OF FOOD

BY NORMAN C. McLOUD

**A** COMPOSITE photograph of the homes of America at the present moment would show the national family busy with Food Conservation in its most practical and most profitable form. The work of providing a food supply for winter is under way in every part of the land. The Canner and the Drier have taken a place of new importance in the household. They have become the symbols of the new domestic freedom—the American citizen's Declaration of Independence against the high prices and food shortage of winter which must inevitably result from food waste in summer.

More than three million home gardens are reported by the National Emergency Food Garden Commission. This is triple the number the Commission undertook to inspire through the campaign of education and stimulation conducted throughout the early spring in conjunction with the Conservation Department of the American Forestry Association. If but one million gardens had been planted the Commission would have felt that its work had been well done and its reward complete. With three million and more of these gardens flourishing within the borders of the United States the Commission feels profoundly gratified and at the same time recognizes new responsibility. In discharge of this obligation it is devoting its energies and machinery to a campaign of Home Canning and Home Drying. All reports indicate that this movement is meeting with the same overwhelming success that attended the campaign for home gardening.

Food Thrift is the watchword of the undertaking. Through every agency at its command the Commission is urging upon the people of America that the utilization of 100 per cent. of the nation's food supply is the patriotic duty of the individual citizenship. As the basis of this gospel of thrift Home Canning and Home Drying



THE END OF A CANNER'S DAY

If you should ask this girl's mother you would probably find that it was the end of a perfect day as well, for sunset found the young lady surrounded by the cans which she had filled since morning, without help. Why not take this home and try it on your canner?

## WILL THIS JAR CAN MASON

**F**ROM our constant daily reading we can see the thing we're needing is the stuff for fully feeding folks at home and folks afar. For the daily papers tell us facts and figures that compel us to be wide-awake and jealous of the waste we should debar. Bread and butter, beans and berries, kraut and cabbage, cheese and cherries and the eggs of Tom and Jerries should be saved throughout the land so that ours, the fruitful nation, may prevent the quick starvation of the balance of creation in the troublous times at hand. Though it seems inconsequential each small slice of bread's essential to keep famine pestilential from ourselves and our Allies; waste of food is unpropitious, un-American, pernicious, and has consequence as vicious as a swarm of German spies. All our logic and our reason prove it's nothing short of treason if we let the growing season find us idly looking on, not considering nor caring for the famine which is staring in our faces, nor preparing for the days when summer's gone. Let us then do what we ought to, by devoting all our thought to saving food-stuffs as we're taught to by the manuals complete which the National Commission has prepared in large edition for improving the condition of our stock of things to eat. This is something worth your trying, for by canning and by drying all the things that you've been buying you'll not merely feed yourselves, but you'll find, from the beginning, that you've helped our troops in winning by the drying and the tinning which have stocked your pantry shelves.

Manuals are being distributed by hundreds of thousands. These booklets embody the wisdom and counsel of the foremost research workers of the United States. Men and women who have devoted years to the improvement of methods for home canning and drying have contributed to their compilation. In simple terms and plain language, devoid of technical complications, the manuals make it possible for everybody to can and dry vegetables and fruits at the lowest possible expense and with the greatest possible measure of satisfaction.

In addition to these publications the Commission has the co-operation of nearly two thousand newspapers from coast to coast. These papers are publishing daily lessons in canning and

drying prepared by the Commission's experts. In this way the instructions given in the booklets are supplemented by continuous suggestions and helpful hints which keep the homes of America constantly reminded of the importance of food saving and intimately informed as to every possible detail of the canning and drying pro-



RADISH HARVESTERS AT WORK

Suppose you were one of these boys and had found more fun in planting and weeding your radish patch than in stealing away to go fishing; and suppose when harvest time arrived you found that you had bushel after bushel of radishes five inches in length; and suppose the market was eager to buy such vegetable treasures. Wouldn't you feel proud of your summer?

cesses. Co-operation of similar force is being given by magazines and other periodicals of national influence which are making liberal contributions of their space and the talents of their staffs in spreading the propaganda of food thrift.

That such thoroughly organized work should be reflected in the nation's food situation is inevitable. The people of America are aroused as never before to the importance of Food Thrift and Food Conservation. Interesting measure of this interest is afforded by the vast demand for the canning and drying manuals issued by the Commission. Since early in June this demand has been growing in volume. Beginning with a few thousand a day the requests for the booklets increased at such rate that July brought the average up to 25,000 or 30,000 daily. These requests have come from every state in the nation and from every part of every state. They have come through every possible channel—from hundreds of thousands of individuals ranging from the day worker to the wife of the railroad president; from local canning and drying clubs, from organizations of all kinds, from schools, colleges and universities, from libraries, from state educational departments and from city, county, state and federal official sources. Members of Congress and United States Senators have been procuring the booklets in large quantities to distribute to their constituents. The employees of the Treasury Department have received official notice on the department bulletin board, advising them to avail themselves of the Commission's offer to

supply the booklets upon request. Some branches of the Federal Government have placed the seal of approval on the work of the Commission by adopting the manuals as standard. In the department of the Interior Indian Commissioner Cato Sells requested and received enough manuals to supply the Indian schools throughout the country. The Public Health Service provided the booklets for all of its marine hospitals which have gardens and the Department of Commerce supplied them to its lighthouse service. In short, the manuals have been given recognition by the most important private, social and official agencies and have gained currency that has afforded profound satisfaction to the public-spirited men who have made this a part of their contribution to the national emergency.

As was the case in the home gardening campaign of the spring and early summer, the headquarters of the Commission have come to be looked upon as a national center for activities along the line of Food Thrift. The daily mail at the offices in Washington requires the maintenance of a large staff in addition to the employees whose time is devoted to the work of complying with requests for manuals. Thousands of questions are submitted for expert attention. These are met with the same ready response given the applications for the booklets. The Commission has made itself a clearing house for information on various lines of food saving and food utilization. Through these activities the nation has received constructive and practical counsel on every phase of food production, food canning and drying, the storage of vegetables and fruits in their natural state, the economical use of all food products and the urgent need for preventing the waste that has played such an important and grievous part in American practices.

The new importance attached to canning and drying this year has two fundamentals. Primarily it was never so essential as now that no foodstuffs should be allowed to go to waste. The world needs everything that can be produced. Closely related to this underlying truth is the tremendous harvest of the home garden area. Even when the production is no more than normal the growing season creates a supply far greater than the immediate demand. For proof of this one need consult no statistics. All of us are familiar with the waste that takes place in garden and orchard. It does not require a large garden to produce more foodstuffs than the family of average size can possibly consume. As a result much of the crop is wasted. It is all too common to see tomatoes going to decay on the vines because the supply is beyond the household appetite. This is similarly true of various vegetables grown at home. At least 20 per cent. of the sweet potato crop of the Southern States goes to waste for lack of demand. Millions of bushels of apples are allowed to spoil in the orchards because a glutted market will not take them at prices that will pay for harvesting and transportation.

This overplus of the growing season must be viewed in one of two ways. It is obvious that we must look on it either as a mistake of nature or as the manifestation of

a deliberate purpose on the part of an all-wise Providence. No alternative is possible. There is no middle ground. If we choose to regard it as nature's miscalculation it is logical that we should be willing to sit by complacently and make no effort to correct the apparent

home drying furnish the inevitable answer. Through these activities only can we obviate the prodigious waste with which an abnormal garden crop threatens us. In no other way can the abundance of summer be made to supply the needs of winter. In no other way can we insure ourselves the full worth of our food supply. If we fail we cannot comfort ourselves with the thought that nature was in error and that no responsibility attaches to ourselves. The burden is on us. We can but feel that the mistake was our own and that we have only ourselves to blame for the food shortage, and high prices of the winter.



DID YOU EVER SEE SUCH A TURNIP PATCH?

What better argument could be offered in favor of Home Gardening than this picture of a prosperous turnip patch at the time of harvest? These boys knew what they were about when they undertook the job of making a garden, and they stuck to it like a shoemaker to his last. The result speaks for itself, but in this case virtue has a reward in money as well as in itself.

Food thrift, therefore, has a double meaning. In its larger sense it is a duty of patriotism. To the individual it is a means of providing a winter food supply at a minimum cost. As a patriotic measure it is a vital factor in enabling the United States to fulfil its obligation in the matter of overcoming the food shortage of its allies in the great European conflict. Every pound of vegetables and fruits stored away on the pantry shelf will be a factor in solving this problem. By decreasing the need for winter purchases these home stores will augment the amount available for the feeding of our own soldiers in

error. On the other hand if we use our reason we know the trenches and for supplying the needs of the domestic and military population of the countries which are

we are brought to the conclusion that the forces of creation wrought wisely and well in giving mankind of their abundance. We are brought to the realization that it was no part of nature's plan that any of these products should go to waste. Nature is the true Conservationist. The most elemental observer knows that she never miscalculates and never wastes, as witness the transformation of prehistoric forests into today's coal supply. The materials she cannot use in one form go through her laboratory to be transmuted into another. With this example of thrift constantly before us we cannot fail to recognize our own responsibility as to the food wealth of the summer. Our duty is clear. This wealth was given us for a distinct purpose. To achieve this purpose we must practice food thrift on a national scale. Home canning and



SUFFRAGE NOTE: BOYS EARNING THE VOTE

The man is teaching the boys how to utilize fruit products by home canning. That they were apt pupils is shown by the statement that on the day the picture was taken these lads put up an even thousand cans of fruit by the cold-pack process. Mothers and sisters please give credit.

helping us in our fight for world-wide Democracy. In this way canning and drying are vital to victory. By

thus providing for our own food needs we are making possible an adequate provision for preventing starvation in Europe. In no other way can we be so helpful in the great war. Our armed forces will do valiant service, and our money and munitions will be of tremendous worth in crushing the foes of freedom; but in the final analysis it is in the matter of food that we can be of greatest use.

As an individual benefit the saving of food by canning and drying has direct appeal for every household in America. Experience has shown us what it means to go into the winter with nothing laid by for the table. An empty pantry or storeroom means that the household must look to the grocer for its supplies. Each day's eating becomes a problem in finance. The can of tomatoes purchased in February involves the payment of tribute to the various agencies concerned in its production and handling. The consumer pays cost and profit on every stage of the process, from the time the vegetable leaves the vine until it has passed through the hands of the dealer, the canning factory, the transportation companies, the warehouse, the wholesaler,

grower. In view of this common prudence demands that the individual do away with the chain of middlemen and absorb the various costs and profits for himself. If you



WHAT A COMMUNITY CAN ACCOMPLISH

There is no better way to engage in canning and drying operations than by forming community clubs, to conduct the work at a common center, such as a school house. This picture shows a gathering at a rural school, making a business of providing vegetables and fruits for the winter. Every family within three miles is represented.

have raised your own garden truck your problem is all the more simple. By Canning or Drying all the vegetables and fruits that can be spared you reap the benefits which otherwise would accrue to everybody from grower

to retailer. You pay tribute to none of the agencies concerned in winter preparedness, but go into the months of non-production with a sense of profit and independence obtainable in no other way. If you have no home garden your duty to yourself is no less imperative. By Canning and Drying you avail yourself of purchases at the time of greatest plenty and with prices at their lowest ebb. By failing to take advantage of this opportunity you will be forced to buy when there is none of the competition of the growing season and when prices are at their highest level. The conclusion is so apparent as to require no argument.

The need for Food Thrift neither begins nor ends with canning and drying. It must be made the every-day of household routine. The essence of it is that nothing should be allowed to go to waste. The food that is left over from one meal should be prepared for the next.



TEACHING THE CANNING AND DRYING TEACHERS

Stimulation of canning and drying activities always follows the formation of clubs. These people are club leaders who have gathered at the county seat to receive instructions from experts. From this meeting the leaders return to their own localities and instruct their neighbors at club gatherings where the actual canning and drying is done.

the jobber and the retailer. All of these agencies must exact their share of the selling price and by the time the can reaches your kitchen it represents an investment that bears no relation to the sum originally realized by the

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MODEL FOOD GARDENS AT SOUTH BEND, INDIANA

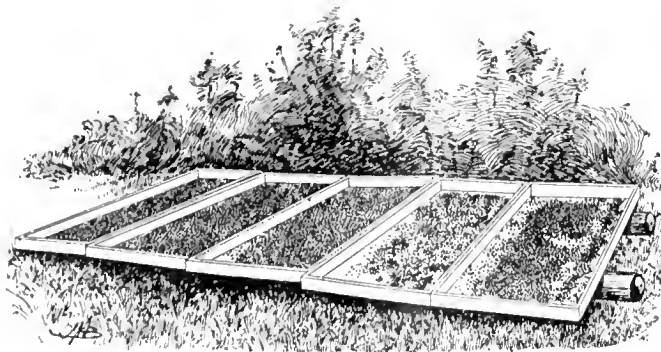
These gardens are planted and cultivated by the employees of the Oliver Chilled Plow Co., which provides the land for them and aids them to make the garden successful. Similar co-operation between employer and employees in many sections of the country has resulted in thousands of acres being planted and many thousands of dollars worth of vegetables being raised.

In this way we should follow the example set for us by nature in her unwillingness to allow waste to enter into her scheme of operation. Every American home should become a laboratory for the transmutation of food surplus into food values. In this undertaking we have a distinct advantage over nature, in that no loss of time is involved. To change forests into coal takes generations. Even the conversion of vegetable matter into enriched soil is a slow process. Food saving, however, is a matter of the moment and involves no loss of time in waiting for results. It can be accomplished so quickly and so easily and its benefits are so definite that one wonders why a world war was needed to bring us to realization of its advantages.

This country has been notoriously extravagant in the use of its food supply. The British army in France and a large portion of the French army as well could live comfortably on the food which has been allowed to go to waste in America from year to year. This annual waste is estimated at \$700,000,000 and this figure is believed to be too low. Be the amount what it may it is appalling and inexcusable. Translated from dollars into concrete and definite possibilities it means that sheer recklessness in the matter of food destruction might easily

wipe out all hope of success for America and her allies in the European war. To win the great conflict we must defeat the domestic enemy—the wanton waste of our foodstuffs.

Much of this waste may be prevented in the home. The natural thrift of the housewife must be given enthusiastic support by the entire family. We must overcome the idle prejudice against warmed-over dishes. If the ruler of the kitchen takes the trouble to prepare in tasty form something left from a previous meal we should marvel at her skill and show our appreciation of her resourcefulness. Sarcastic comments on the re-appearance of yesterday's dinner should be punishable by fine and imprisonment for grown-up offenders, and by adequate application of the corrective slipper to those of more tender years and anatomies. In short, we must all do our share to encourage the housewife in the practice of thrift in the use of her food supply. Each of us has a responsibility along the line of making certain that nothing edible is thrown away. With military authorities agreed that the outcome of the war is a matter of food supply, every food saving, trivial and unimportant as it may seem of itself, adds to the aggregate of the supply which must be available if victory is to be made cer-



LETTING THE SUNSHINE DO YOUR WORK

The simplest form of vegetable and fruit drying is to spread the slices in the sunshine. The trays here pictured are made of light wooden framework with galvanized wire netting. By having the trays raised two or three inches above the ground air circulation is provided.

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YOUTHFUL CANNERS SEE IT THROUGH

The woman at the right is an instructor in home canning operations. She is teaching a group of future housewives the cold-pack method. The various steps are pictured. With vegetables or fruits in a piece of cheesecloth the instructor dips them into hot water, for bleaching. The first girl removes the skins and cores. The second girl puts the vegetables or fruits in jars. The third adds syrup or water, as required, and puts rubbers and tops in place. The fourth places the jars in sterilizer and watches the time.

tain. As an example of the appalling figures reached by seemingly slight waste a single slice of bread affords a startling total when multiplied by the aggregate of American homes. Considered individually a slice of bread does not amount to much. In many households it is no uncommon occurrence for a quarter or even a half a loaf of stale bread to be thrown away as having outlived its usefulness. Let this take place in every home in America and the loss is prodigious. A fair-sized slice of bread weighs an ounce. To produce it has required the use of three-quarters of an ounce of flour. If each of the 20,000,000 homes in America should waste an average of a single slice a day it means that in the aggregate the country is throwing away daily over 14,000,000 ounces of flour—more than 875,000 pounds. This is enough flour to produce over a million one-pound loaves. In a year it means the throwing away of over a million and a half barrels of flour. Figuring flour even at \$15.00 a barrel this involves an annual loss of \$22,500,000, all of which arises from the waste of one slice of bread a day in every household in the land.

The worst of it is that no one can deny that these figures are an underestimate rather than an exaggeration of the bread wasted in American homes. Can anyone claim that the loss is justifiable? The cure is simple and is in the hands of every household. The number of ways in which stale bread may be worked over into appetizing dishes is so great as to make it possible to prevent this loss without sacrifice of the family's enjoyment of its daily bill of fare. The same reasoning applies to a thousand and one varieties of leftovers. Cereals uneaten at the morning meal may be combined with meats, fruits or vegetables to make appetizing side dishes for luncheon or dinner. Even so small a quantity as a spoonful of cooked cereal is worth saving as a thickener for soup or gravy. Even the water used for cooking rice and many vegetables may be used to advantage in the preparation of appetizing and nourishing dishes. Skim milk contains all the nourishing qualities of milk except fat; sour milk may be used to advantage in baking and in other forms of cooking; meat and fish scraps add flavor and nourishment to made-over dishes and fat can be tried out



SOME LUSCIOUS TOMATOES

These are now grown by experts who advocate six foot poles for the vine so that the fruit will be exposed as much as possible to the sun.



#### BOYS CAN MAKE THEMSELVES JUST AS USEFUL AS GIRLS

Just because a boy is a good baseball player or a mighty fisherman there is no reason why he should let his sister have the advantage of him in this time of Food Thrift. These boys have developed themselves into expert canners of vegetables and fruits. Their interest arose from the success of their home gardening work. After raising a thrifty crop they saw that in order to get the most good out of it they must prepare a large part for winter uses. Manly pride made them unwilling to call for feminine help so they did the canning themselves. This gives them the satisfaction of knowing that the food-stuffs are of their own creation from seed to jar.

and used as a substitute for butter and lard in cooking.

Nor is the use of leftovers the only duty of the household. There is probably as much waste through spoilage as through throwing away. To prevent this food supplies should be carefully guarded against exposure to heat, germs, dirt and flies. Mice and insects should be treated as alien enemies and kept away from the restricted zones in which the household larder is located. Vegetables threatened with decay should be put to use immediately. If the use is not apparent it should be found. Fruits on the verge of spoiling should be stew-

#### THE HOME GUARD IS WORKING

**T**HERE'S something doing in the land. You'll find the signs on every hand. There's something in the air. The folks have formed a kitchen guard and everybody's working hard; they're busy everywhere. And what I like about the bunch is that they've got the proper hunch about the things we'll eat. They're canning corn and peas and beans, they're drying pumpkin, squash and greens, they've got the food game beat. They're canning everything they can, to please and feed the inner man and keep the wolf away. They're drying stuff in wholesale lots and taking steps to knock the spots from winter's rainy day. They've viewed the mammoth garden crop and vowed that they will put a stop to all the waste of food that's taken place from year to year and made the winter living dear for every household brood. No more we'll see tomatoes fine decaying on the fruitful vine, nor apples on the trees; no more we'll see things lie and rot within a fertile garden spot while mother's out at teas. For every woman in the town has dressed herself in kitchen gown and works with all her might to can and dry the things she'll need her hungry family to feed, with winter days in sight. The girls have taken Mother's cue, and Dad and all the brothers too have set themselves to work, because they know that war-time thrift must be the patriotic gift which none of us may shirk. They know the nation must provide the food that's either canned or dried to fill the household stores in order that the stuff we've raised may make our country's name be praised on European shores; they know that we must feed the troops in many million numbered groups that they may win the fight; that they may win their battle brave, the Democratic flag to save, and thus maintain the Right.

ed and held for future use. Of similar importance is the necessity for cooking appetizingly. Even patriotic duty is subjected to a strain when oatmeal is scorched, potatoes improperly seasoned or soggy, vegetables poorly flavored or meats and fish overcooked. The cook who uses care to make dishes palatable is rendering a national service this year, just as truly as the soldier in the trenches.

One of the most gratifying phases of the war-spirit is the enthusiasm with which the people of America are responding to the need for food thrift. This response is general, genuine and unstinted. Its influence on the food problem of the nation will be tremendous. By canning or drying everything that can be canned or dried and by practicing food thrift in every-day living the individual household will be making available a vast food supply that will prevent starvation in Europe. Every pound kept from

going to waste augments the amount of food that can be spared for export. By providing its own winter stores through canning or drying the household reduces the demands which it must make on the open market. Everything stored on the pantry shelf or saved from waste is a factor in releasing other edibles for transmission to war-ridden Europe. Conservation thus becomes a distinct service to the nation and to those who are engaged with us in the fight for Democracy. Its practice is a patriotic duty and in this time of war no true American can afford to do less than his full share in bringing about 100 per cent efficiency in the use of the foodstuffs with which nature has rewarded the labors of the Soldiers of the Soil.

To encourage, stimulate and render easy the practice of food thrift through Home Canning and Home Drying the National Emergency Food Garden Commission is bending its every energy and resource. In the various ramifications of the undertaking the Commission has had in mind the one vital fact that a nation at war is a nation with a food problem. This problem is fundamental. Its solution is essential to success at arms. With all Europe aflame, her fields devastated and fruitless and her population engaged in the pursuits of war, America is confronted not merely with the obligation to feed itself, but to feed its allies as well. The world supply of food is abnormally short. If victory is to be achieved in the battle for democracy America's food wealth must be thriftily and intelligently utilized. Armies cannot fight unless well fed. Countries at war cannot give their armies adequate support if the home population is weakened by hunger and want. America is the one country among the allied nations which this year will produce foodstuffs in excess of her own needs. The measure of this excess will be the extent to which Food Thrift is practiced by every American citizen. If we permit waste to go on as in the past the surplus will be reduced to zero. If we engage in Food Conservation on a national scale it will become an abundance with which we may prevent starvation in Europe. Food Thrift, therefore, is the one true secret of success in the great war. With it we can win the conflict. Without it the most brilliant achievements of our armed forces will be of no avail and America must face her first defeat. The choice must be of our own making.

**T**HE lumber industry is doing its share in providing material for national defense," said John W. Blodgett, Chairman of the Trade Extension Committee of the National Lumber Manufacturers Association today. "Reports to the National Association office by 691 mills just tabulated, show that during the month of June these mills cut 1,499,000,000 feet of lumber and shipped 1,581,000,000 feet, the largest volume of shipments ever reported to this office during any one month. Moreover, telegraphic reports from 300 representative Southern and Western mills show that during the last four weeks these mills have cut 655,000,000 feet of lumber and shipped 784,000,000 feet, of 20 per cent. more than they produced.

## A GIANT SASSAFRAS TREE

**F**OLLOWING the publication in AMERICAN FORESTRY for January of the photograph of a veteran sassafras of unusual size at Horsham, Pennsylvania, Mr. Beirne Lay, of Keswick, Virginia, sends the following interesting account of a sassafras on the farm of Mr. Frank M. Randolph, near Keswick: "I enclose the photograph of the big sassafras. The measurements—20 feet 6 inches, at six inches above the ground, and 18 feet 4 inches, at five feet above the ground,—show this to be a good deal bigger than the Pennsylvania tree, and probably the largest in this country. Some years back this tree was a hollow trunk, broken off at the top and languishing. Someone built a fire in the interior which

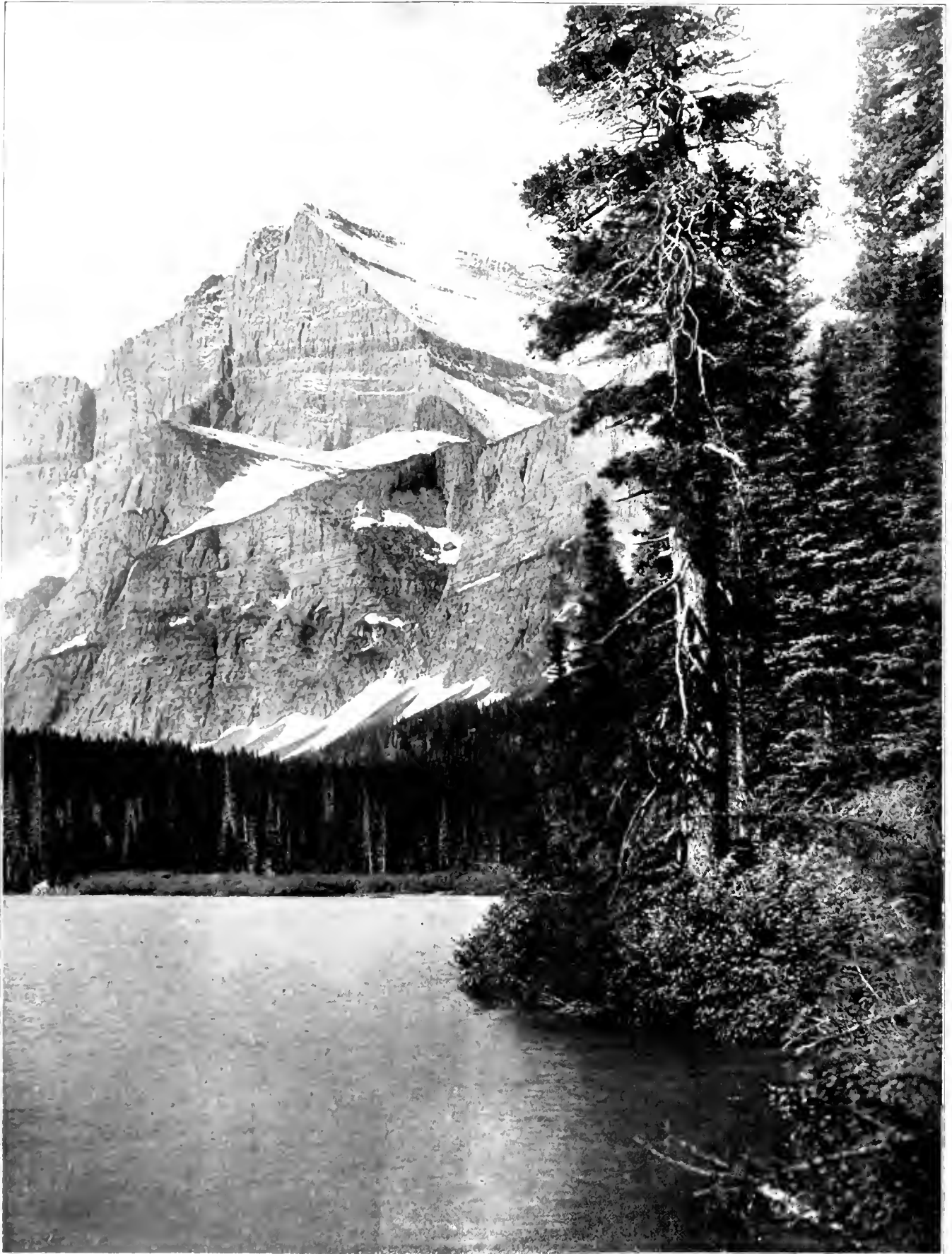


SASSAFRAS TREE ON VIRGINIA FARM

The rival of the Horsham Sassafras, which only measured 13 feet in circumference 16 inches from the ground, while this rejuvenated—as the story proves—specimen measures 20 feet only 6 inches from the ground.

was quenched with difficulty. It was thought that the fire would finish the tree. Instead, it killed the bugs and hardened the interior surface and the old tree stump branched out, like a dressy old woman, in a new Easter bonnet, with the crown of strong, healthy boughs that you see in the photograph."

**S**AID the late Simon B. Elliott, one of the pioneer foresters of America: "I can come to no other conclusion than that of the 10,000,000 acres of non-agricultural land in Pennsylvania at least sixty per cent. is now, or soon will be so devoid of uninjured trees of valuable species that it must be planted to justify the payment of taxes."



A WONDERFUL SPOT IN GLACIER NATIONAL PARK

This shows the cliffs of Mount Gould, in that Alpine Paradise known as Glacier National Park, and typically illustrates one of the greatest charms of the region—the sharp contrast between the magnitude and grandeur of its mountain masses, and the quiet stillness of the waters of its beautiful lakes.

# WILD FLOWERS THAT BOYS AND GIRLS SHOULD KNOW

BY R. W. SHUFELDT, C.M.Z.S.

**M**ANY a girl and many a boy in this country delight in spending a good share of their time in the woods and fields at nearly all times of the year. If the country they get into possesses a certain degree of wildness, with lakes, and ponds, and marshes here

botanists; they can often correctly name a comparatively long list of the local species, and possess a fair smattering of the elements of the science. These require no pressing to be induced to take to the open with the view of gathering specimens new to them, and adding to their



THE RED CARDINAL FLOWERS

FIG. 1.—When these are in bloom in the midsummer time, or in the early autumn farther north, you will find them growing along streams, or in marshy places. Often you can notice them quite a long ways off,

and there, and with their natural outlets of streams, so much the better. Among these young rambles there are generally a fair number who take a certain amount of interest in the wild flowers they come across, and who probably know the names of a good many of the dandelion, clover, or buttercup class; but, unless something arouses a deeper interest, they never get along any further than this. A fewer number have mastered the English names of a longer list of species, and are fond of taking flowers home to be kept a few days in receptacles containing water. Finally, the exceptional few, both girls and boys, are essentially young

store of knowledge in other ways; they are the very ones to help the others along, and are, under proper guidance, more than eager to do so.

Now it should be the pride of every American girl and every American boy to be able to name all of the flowers which are met with while out on trips through the country; such an accomplishment has no end of advantages, and in more ways than one thinks.

What we have before us this fine August day is to all get together, and start out for a long ramble over the fields, through the woods, along the edges of streams and marshes, and see just how many wild flowers we can find out something about—where they grow, what they look like, and what their



WHAT IS THIS BUSH?

FIG. 2.—It is not often that we meet with a girl or a boy that cannot give the name of the bush that bears the flowers shown in this picture. It is one of the most beautiful flowers in our country, and it has been named the Mountain Laurel.

names are. This is lots of fun, and you may be sure it is not the last time you will want to try it. On this first scout we will get after only the most abundant and easy ones to examine and name. As you know, in the right kind of country, wild flowers grow nearly everywhere, and there are hundreds of different species or kinds of them. This must not discourage you, however; for you will soon find out that, after you have studied one big, showy flower and named it, what you have learned about it will make it much easier to study the next one you bring home for the purpose.

The chief help you will have



THESE ARE EASY TO IDENTIFY

FIG. 3.—Surely you all remember the bright yellow flowers, like these, which you found in big patches in the marshy places and by the creeks, when you first visited the woods very, very early last spring. They are called Dog-tooth Violets or Yellow Adder's Tongue.

when you first commence will be good pictures of flowers, to compare with those you gather in the woods. So you see we have given you a whole lot of pictures here "to go by," as they say; surely you will find out the names of some of the flowers in the woods and fields where you have been by comparing them with these.

Always remember that you have not *the color* in the picture to help you; but this does not apply to *white* flowers, or those that photograph white, as many do. All the flowers here shown were collected within a few miles of Washington; but then



A FUNNY-LOOKING PLANT

FIG. 4.—These have prickly, very thick, paddle-shaped joints, with sharp, needle-like points scattered over them. It is a true cactus, and the only one found in the Eastern States. The joints correspond to the stems of other plants, and the spines to the leaves. In the summer it has handsome yellow flowers on it.



TWO ONIONS? NO

FIG. 5.—Some boys might think that we have two onions here; but they will have to guess again. Really, it is a couple of Grape Hyacinths, and some people call it Baby's Breath, because it smells so sweet! Its flowers look like a little bunch of purple grapes.

that does not matter, for they are to be found over nearly all the eastern parts of the United States, and some of them far to the westward.

If you have been scouting lately, that is, during this month, down through the wet places in the meadows, where it is a little shady, or along some of the streams, you may have noticed flowers having the form of the one here shown in Figure 1.

They are usually of a very red color, and you can see them at quite a distance, for the straight stems that bear them may be nearly five feet high, and the flowers well above the tall grass where they grow. Sometimes you will find this bright red Cardinal flower, or Red Lobelia, as it is sometimes called, growing all by itself in some shady place in the middle of a swamp or marsh. You must not pick any more of these than you can help, as there are not many of them left; for, for many years, their lovely red color has attracted all beholders, and they have been gathered so mercilessly that now, in our time, they are hard to find, as nearly all are gone. Indeed, this should guide you with re-



THIS HAS A PECULIAR NAME

FIG. 6.—Sometimes, down in the moist places, but more often in the woods or in sandy soil, you will find this curious-looking plant, with its yellow flowers. It is the Four-leaved Loosetrife; but where the leaves start there may be as many as six leaves, as in the picture, just below the Dragon-fly.



THE CORN MUSTARD PLANT

FIG. 7.—Here is a plant that has very showy bright yellow flowers. They come out very early in the spring, but may last well into the fall. Sometimes hundreds of them grow in the meadow, and not very far apart, so you cannot mistake them.

spect to all flowers. Leave all you can in the woods, so other girls and boys can see them when they come out next year! This particularly applies to the beautiful flowers of the Laurel (Fig. 2); you have often seen careless



THE CARRION FLOWER

FIG. 8.—As you go along the edge of the woods, you cannot possibly mistake this plant if you come across one. It grows up much higher than your head, and has many flower-bunches on it like the one seen here. The top is also shown. In the fall the big berries are purple, and it has a very bad smell. That is how it got its name.



NEARLY ALL KNOW THIS

FIG. 9.—There is hardly any use in telling you boys and girls what this beautiful flower is. It is of a lovely pink color, and some may be almost white. It is the Pink Azalea of the hill-sides in the woods. See what dark leaves it has.

boys, some of whom did not even know the name of this very beautiful flower, break off whole branches of its stems with the blossoms on, to throw them away long before they got home to make any use of them. When you first went out to the marshes in the spring, you may have seen the flower that looks like a small yellow lily (Fig. 3). Sometimes it grows all over the damp or even muddy places to a height of six or seven inches, or even less. The pale green leaves are often beautifully mottled with brown; and when the seed-pods come, they are shaped like the one you see to the left in the picture. Maybe you will find one of these plants growing all by itself up on a bank by the stream; it is the Dogtooth Violet, and some people call it the Yellow Adder's Tongue. It has a number of other names. Anyway, you will know it by taking a good look at it here, remembering its curiously marked leaves, and its pretty yellow petals or leaves of the flower itself. It is not in any way a violet, and most of you will know better than that, surely.

In sandy fields, on dry rocks, and in the pine woods, you will meet with fine specimens of the Common Cactus in some places. The one here shown (Fig. 4) was growing on the rocks in the pine timber on top of the high cliffs on the Maryland side of the Potomac River, at Great Falls. There is plenty of it at Piney Point below. Nearly everybody knows what it is, and to this boys and girls are no exception.

Some plants you will have to hunt pretty hard for before you come across one. This is the case with the Grape Hyacinth (Fig. 5). The picture shows the whole plant, for the roots look like onions; and, by the way, whenever you can, it is a good plan to study the different kinds of roots of most plants. You will be surprised when you pull some of them up.

There is another wild flower that you certainly ought to know, for it is very pretty and very abundant, especially so this year. Loosetrife it is called, and some people call it Crosswort (Fig. 6). Some of you boys may know how this name of loosetrife came to be applied to this interesting little plant?

We next have a flower that blooms early in the spring, and



WHAT LILY IS THIS?

FIG. 10.—Sometimes this beautiful lily grows down by the streams, but more often you will see it in big bunches along the country road-sides; it is a deep, yellowish red. Nearly everybody calls it the Day Lily, because it blooms for one day only. See what a lot of buds it has of more flowers coming.



keeps on blooming all summer into the early autumn; this is the Field or Corn Mustard (Fig. 7), and its yellow flowers are so striking that, with the aid of the picture here given, you can hardly make a mistake about it. Near the city it may be seen growing on the waste heaps or in unoccupied lots. Birds are very fond of its pale, peppery seeds as winter comes on; this is especially true of tame pigeons, and they will eat quantities of them if they get the chance.

Sometime, when you get along a little further in your studies, you must read up about the Carrion Flower shown in Figure 8. It smells just like a piece of meat that has been kept too long in a warm place. This is for a very important purpose to the flower, and it is quite as important that in the fall its leaves should turn a brilliant red and green, for these colors attract many small birds on their way southward; as the seeds in the berries are then ripe, the birds come after them, and help scatter them, in one way or another, far and wide. The Carrion Flower is but another species of the Smilax or Catbrier, and every boy who goes into the woods knows what the Catbrier or Green-

brier is, with its smooth, glossy, and bright green leaves.

Our wild Pink Azalea (Fig 9), which we all know so well, and love as one of the most beautiful of America's flowers, is the shrub from which the fine azaleas we see in the flower-stores came. About two hundred years ago, the Belgian florists received the wild one from the colonists here, and by cross-breeding produced the superb plant that you now see ornamenting our homes almost everywhere. Unhappy Belgium! She is not thinking much about azaleas now, with her lovely lands all devastated and ruined.

You must remember that many

flowers have, as the years have gone by, escaped from gardens, and are now found growing wild in all sorts of places. This is the case with a very large number of our eastern wild flowers, and it is true of the Day Lily shown in Figure 10. Through one way or another, a whole lot of our wild flowers have spread from Europe, and not a few from Asia and Africa. Naturally, as you will know from your geography, we find these first in eastern United States, but then, too, many of them have already spread far toward our Western States. Ages ago, when people were so superstitious—and only too many are so yet—it was



COLORED LIKE LEMONS

FIG. 12.—That is a Black Swallow-tail Butterfly which has just lit on the side of the bunch of buds of the Evening Primrose. Note the one in full flower down to the right. Those flowers are bright lemon yellow and very handsome.



THIS HAS MANY NAMES

FIG. 11.—Some plants have very beautiful leaves, and this is one of them. Like most of its kind, it has a whole lot of names, as the Rattlesnake-weed, Early or Vein-leaf Hawkweed, Snake Plantain, and so on.



HERE IS A QUESTION

FIG. 13.—Why they call these Common Burdock burrs "Beggars' Buttons" it is hard to tell; but that is one of their names—surely they would make very sticky old buttons.



EVIDENCE OF A TRAGEDY

FIG. 14.—That strange-looking little thing up on the leaf there is a poor little Saddle-back caterpillar, killed by a parasite—a story you will hear some day. There is no missing this Bittersweet Bush, for you can see its beautiful deep coral red berries at some distance away.

generally believed that all plants and flowers had some mark upon them to show what they were good for, and what they would do for sick or injured people. The rattlesnake-weed (Fig. 11) was one of these, and the "herbists" or old herb doctors, believed that since its curiously marked leaves looked like a snake's back, it was surely created to cure snake-bite—particularly rattlesnake bite. Did you ever hear of anything so stupid?

Evering Primrose (Fig. 12) you will find all the way from June to October in the dry fields and thickets—especially in the fence-corners and along the dusty roadsides, where so many other interesting flowers and plants are to be found.

The moth you see on these Burdock-burrs is the I-O, so called for the reason that either of its hinder wings, which are buffish-yellow like the fore pair, have a round, black O on them, with a purple bar to the inner side of it,

the whole bearing a fancied resemblance to the capital letters I O (Fig. 13). The leaves of the Burdock are among the largest you will find—scout where you may. No horse or cow will eat these because they are so very bitter and rank, and you know how common they are in many of our fields. Their burrs contain the seeds, and it is easy to see how people and cattle often carry them long distances by these very burrs, sticking fast to clothing or to the hair of the farm animals. There are all kinds of ways in which seeds of plants are spread over the world, so that the plants from which they come spring up in the most unexpected places.

The Bittersweet (Fig. 14) is not an easy plant to get a photograph of, for the



THESE NOT HARD TO FIND

FIG. 16.—These elegant flowers, of a brilliant purple color, are Starworts or New England Asters. The plant begins flowering in August, and you cannot very well miss it, for it not only grows in swamps and fields, but all along the roadside where you start out for your walk.



OLD MAN'S BEARD

FIG. 15.—In a little while after this month has passed you will see the Virginia Clematis gone to seed, and looking like it does here. Boys and girls call it "Old Man's Beard." At the same time the Horse Nettle is sporting its big, round, yellow balls, as you see them below.

beautiful, deep reddish orange berry-like fruit easily tumble out on the way home; then the empty capsules all look like the lower-most one in the picture. The leaves are very dark, but you will also find variegated ones, and others almost white. When this is the case, take pains to study the stems closely; you will find most curious little "tree-hoppers" there in crowds, with their heads all pointing one way. They weaken the plant terribly, so that sometimes it has no seeds even.

Virginia Clematis or Virgin's bower (Fig. 15) is usually found growing in very rich earth near something upon which it may readily climb, as an old fence or wall, or over other vines, and on wayside thickets. It is a most interesting plant for you to study; and Darwin, the great British naturalist and philosopher, frequently used it in his experiments, when working out the wonderful climbing power of some vines. The Clematis hooks

on to everything in its reach as it grows, and sometimes almost seems to be guided by a certain kind of intelligence.

In Figure 16 we have a grand bunch of New England Asters; but why they are called so it is hard to tell, for they are to be found growing from Canada over the entire eastern United States, down as far as the Gulf of Mexico. There are a great many different kinds of asters; but you should have no trouble in naming this one, for its large, purple flowers are very striking, and then the stem is hairy and the leaves lance-shaped. After the first week in August, clear up to the middle of



she is very fond of butter. Most boys are fond of butter, too, as this flower will surely tell you.

When next spring, or early summer, comes round, you will meet with the bellworts thickly growing in the thickets and wet places, in the rich, shady woods. There are several species or kinds of them, but in all of them the beautiful light green flowers bend over or droop as you see them in the picture (Fig. 17). Some

A CURIOUS FLOWER, THIS

Fig. 18.—Around the thickets in the open woods, or sometimes up on the sides of dry, rocky hills, this strange-looking flower is met with. Its curious tops may run all the way from white to a deep magenta. You will not easily forget the only name it has, for from Maine to Mexico it is known as Wild Bergamot.



DIFFERENT KINDS OF BUTTERCUPS

Fig. 17.—When you come to study our Buttercups or Crowfoots, you will find that there are a whole lot of different kinds of them. The one here shown is the Early Buttercup or Crowfoot; note the hairy stems. The drooping flower is the Bellwort; it is pale green, and you can tell it by the long stem passing through the leaves.

October, you will find them, and of course, in the South, much later. Generally they grow where it is wet or moist, although sometimes we may find them doing beautifully right along the road somewhere. Later on you will find the Late Purple Aster; but the purple is of a lighter

shade, the flower-centers are smaller, and there are other differences which you may study up some day.

Many kinds of Buttercups (Fig. 17) grow in our country, and we meet with them at all times of the year. In some cases they are pretty hard to tell apart; but this hairy one, which is one of the earliest, should give you no trouble. If you want to find out whether that little girl standing over there loves butter, just pick a big buttercup and hold it under her chin—about an inch away—and if her chin turns bright yellow, you may be sure that



THIS GROWS IN WET PLACES

Fig. 19.—Here is one of the handsomest flowers we have, and you may find it in wetish places along streams and ditches, all the way from July to October. It is known as the Great Lobelia or Blue Cardinal flower, as its flowers really are of a bright blue color.

day it will interest you to know how all these plants get their hard scientific names, which frighten so many people away from a more serious study of them; this bellwort will give you some idea of it. All the different kinds of bellwort have *drooping* flowers like the one you see here, so we must have a group-name (genus) for them. It has been called *Uvularia*. Now if you will look down your throat in a glass you will note a soft little thing, hanging loosely from the roof at the back and directly in the middle of it; this is called the *uvula*; and, as a bellwort flower *droops* like a *uvula*, the group has been called *Uvularia*. That is not hard? Now we call this particular bellwort *Uvularia perfoliata*,—that is, it comes from the words meaning a leaf that is *pierced*; and, if you will take a good look at how the leaves (as they are shown in Figure 17), appear to be pierced by the stem (they really clasp the stem), you will understand why we so name this flower, and thus distinguish the *species* from all the other bellworts. You will come across Wild Bergamot in August, and there is a splendid specimen of it here given in Figure 18. The flowers run through a series of shades, all the way from white to a deep magenta. Scarlet Oswego Tea, with its deep red flowers, has a general look like this Bergamot, but you cannot very well confuse them.

Strange to say, the Great Lobelia or Blue Cardinal flower, is not so distantly related to the Red Cardinal flower seen in Figure 1; but why this is so is a long story, and too long a one to tell here. Sometimes its heads have a very different form as shown in Figure 19; but departures of this kind are seen in many flowers in nature, and you should always give them your attention. There is nothing present on the part of any flower which is not worthy of your most careful study. This big, blue Lobelia, with its wealth of bright blue flowers, sometimes grows to be fully a yard high; so you will have



MANY DISCOVERIES AWAIT HERE

FIG. 20.—A good place to look for water plants. The surface is covered with bright green scum, but this does not prevent your seeing the big plants above it, as the Cat-tails, the purplish Pickerel-weed and other things. Hear that big bull-frog croaking?

no trouble in finding plenty of it growing down by the marshes, and along the soft, swampy shores of sluggish streams. After you once know the plant, you will never forget it or its name. So, when you come to places where it grows, and meet with a dozen or more specimens standing up amidst the rank sedges and undergrowth, where you have been trying to force yourself through, it is a great satisfaction to say to yourself: "Oh, I know that thing; that's the Blue or Great Lobelia." Ten to one, you will meet with the red one or Cardinal flower as you go a bit further.

When the stream broadens and becomes still more sluggish, and reaches the pond in the woods (Fig. 20), you will surely have your hands full to gather all the lovely flowers you will find there. But then, Pickerel Weed, Skunk Cabbage, Jack-in-the-Pulpit, Water Arum, Cow Lily, Burr Reed, Arrow Head, and the rest of them, are all big and conspicuous flowers, and it is easy to find out the names of them. Be sure not to

forget to take your flower collecting-case, when you go out on a good, long tramp; you can buy a nice one at the store where they sell supplies for naturalists, and two dollars and a half is plenty to pay for it. You may find one for something less than that, say about one dollar and a half. Then you should take along some newspapers; some string; a few dozen common pins, and a small, strong trowel, or, what is better, a big table-knife to dig plants up with entire, when you want to study them at home. A good butterfly-net is another thing that comes in very handy; for the time will surely come when you will want to study insects as well as the flowers you find.

ONE of the very few towns where no taxes are assessed is Freudenstadt, Germany. This town of 7,000 has an annual governmental expense of \$25,000, and pays it all from the revenue of 6,000 acres of town forest.

# HAS THE BLACK FOREST GONE?

BY JOHN B. WOODS

FIRST LIEUTENANT FOREST REGIMENT (10TH RESERVE ENGINEERS)

**H**AS Germany's famous Black Forest been destroyed? Have the wartime demands for timber been so great that, with her imports cut off, Germany has been compelled to cut down most of the Black Forest? Various reports received in the United States say a great amount of the timber has been cut, but these reports can not now be verified.

A million acres of woodland, divided about equally between the states of Baden and Wurttemberg, with relatively poor soil and fifty inches of rainfall yearly, the Black Forest is a splendid

example of natural woodland which could never be anything else half so successfully. The hills are bold and their summits windswept, while tiny settlements nestle down in sheltered ravines beside foaming creeks. Hardwood species are few in number, although the beech abounds to the extent of forming nearly a third of the timber wealth. But chiefly there are conifers, fir, pine, spruce and larch, of which the first named is by far most plentiful, the intertwining tops spreading a cover through which daylight scarcely can penetrate to the neatly carpeted earth. Even in modern times these black aisles have been peopled with all sorts of fearsome beings by superstitious people, tourists as well as peasants.

In the early days there were no sightseers wandering through the woods. In the first place there were no roads over which they might wander and then the region was infested with robbers, some operating upon their own accounts and others employed by the numerous petty barons who owned the land. Lumbering was an occupation beset with murder and thieving so that it is no wonder that the workmen were rough in every sense of the word. Before the time of using wood for building purposes to the extent that it possessed a commercial value the Black Forest was given

over to pasture and only fuel wood taken therefrom, but as time went on the petty lords took steps to increase the timber production. Throughout the Seventeenth Century they squabbled over plans of operation and agreed finally that cutting for market should be permitted.

So during the first half of the Eighteenth Century they worked upon the river Murg, improving it to the end that logs might be driven down to the broad expanse of the Rhine and thence to cities of the lowlands. And then for fifty years a timber firm was given free rein to

exploit the tree wealth, paying the owner the vast sum of six cents, or rather its equivalent, for each log taken away. Even then no roads had been constructed, for the streams furnished motive power for commerce, and land traveling was accomplished upon foot along narrow paths. As late as 1858 a stone splash dam was constructed at great expense to serve as reservoir for flood waters, and the builders stated plainly in their plans that it was to be for "Eternal Use."

All this activity meant the development of a fixed population within the limits of the forest, so logging villages grew up in sheltered and convenient locations where the loggers might find home comforts after the day's work. And in the winter months when woods work was at a standstill the menfolk toiled at home industries, weaving baskets, carving knick-knacks of one kind and another, and busying themselves generally, while the children hung about listening to the fearsome stories of creatures who leaped from their Daddies' imaginations to people the woods.

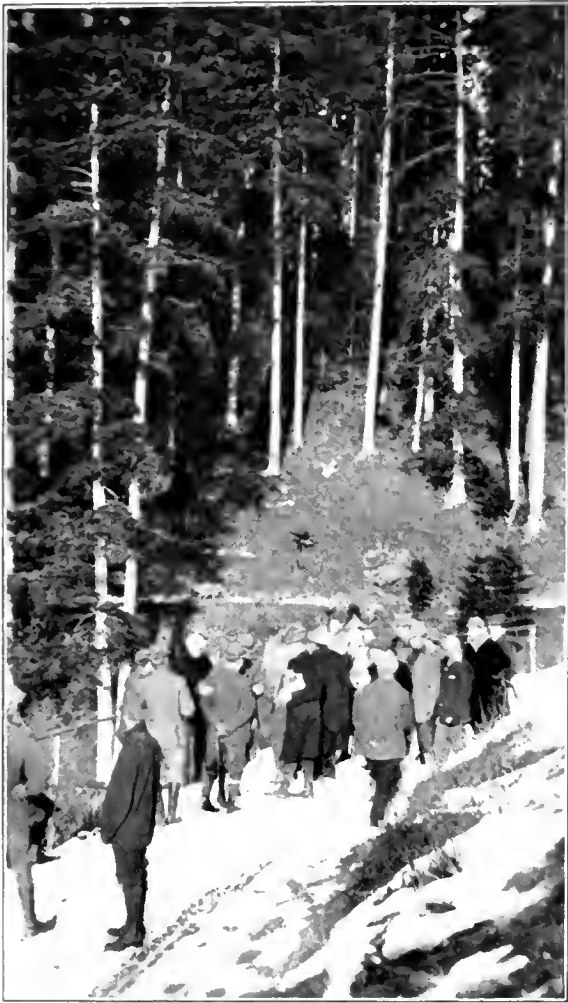
And then came the awakening of the German commercial giant. The states which had been evolved from scores of woodland principalities came to realize that they were vitally concerned in the progress of the Federation, so Baden and Wurttemberg set about



Photograph by C. W. Armstrong

## BLACK FOREST KURHAUS

One of the many sanatoria and hotels which are in close proximity to heavy timber and the roads to which wind through dense forests.



Photograph by C. W. Armstrong

#### BLACK FOREST SHADOWS

A typical bit of the famous Schwartzwald showing a group of German foresters and a number of visiting American foresters.

realizing upon their natural and human resources. The Black Forest became a living business enterprise, representing several hundred million dollars of invested capital from which a life-giving revenue was required. Plans of cutting and regeneration were introduced and followed to the letter, and an era of constructive forestry was brought into co-ordination with the long practiced lumbering operations.

But great as the timber wealth was, another asset was soon to be developed in the warm medicinal springs which flowed from the northern margins of the hill areas. In fact the name of Baden suggests the kingdom's chief attraction from a commercial standpoint. Baden-Baden, Baden-Oos, Baden-This and That, all have become famous watering places

for the wealthy and afflicted of every nation. And in order that these visitors should not tire of the confinements of health resorts the wise authorities opened ways for them back into the hills by constructing highways of rock into every beautiful ravine and over each wind-swept summit. This made the timber readily accessible and did away with the need for drivable streams with their burden of upkeep, so that it became quite the thing for nimble pleasure automobiles to dash along the roads, honking in derision as they passed the more dignified log-laden motor trucks.

#### German foresters



Photograph by C. W. Armstrong

#### WATERFALLS IN BLACK FOREST

One of the numerous waterfalls which were such an attraction to the thousands of tourists who before the war were yearly visitors to the Schwartzwald.



Photograph by C. W. Armstrong

#### OLDEN TIME METHOD OF LOGGING

This photograph illustrates the method of logging during the first half of the eighteenth century in the Black Forest of Germany.

handle their operations on the basis of yield and cost per acre, or rather per hectare, which is not the same except in principle, thereby distributing the outgo and income of a given area over the thousands of unit areas of which it consists.

Thus we find that during a certain year they cut an average of fifty-four cubic feet per hectare, yielding in net-revenue about five dollars. Considering the combined land and stumpage value this spells a profit of one per cent per annum, which is not staggering when compared with our own industrial stocks.

But there is the great value which these forests lend to the country's tourist business, an asset beyond calculation in terms of money, for the hills are dotted with Kurhäuser where visitors before the war spent their wealth for the privilege of roaming among the fir trees. Moreover, out of the gross revenue the foresters spend a dollar per hectare upon the highways, which takes a heavy burden from the state. All in all it is a fine system, this co-operation of lumbering and health resort interests probably impossible where a weaker form of government would hesitate to dictate, but they are partly owned and wholly controlled by the powers of State.

And now we are told that the great catastrophe

has strained Germany's timber resources beyond the breaking point, in fact she could not supply her own needs in peace time, depending largely upon imports. And the Black Forest has perhaps gone down

before the ax and saw! Just what this really means we do not know, probably the chief attraction for future visitors has been removed, and the Germans are no better off than we in made woodlands and far worse so far as primeval growth is concerned, having little if any. Of course they

will grow another Schwartzwald, but the task will require half a century or more. Maybe the flood of daylight will kill those mythical creatures of story, and the logging villages will rot down because their former occupants are dead in foreign fields or out of

work in their old home places. But for all this there are many lessons contained in the story of this area, some of them applicable to our own American conditions, and they are responsible for this brief and inadequate sketch. We also have watering places, and cities of summer tourists,

not to mention those year-around hives of industry and commerce. Woodlands are nature's finest gift for man's recreation and the noblest setting for his every day toil.



Photograph by C. W. Armstrong

THE BADENER SCHWARTZWALD

Note the orderly ranks of spruce and fir thriving under intensive forest management directed by Germany's best foresters.



Photograph by C. W. Armstrong

SECOND GROWTH IN THE BLACK FOREST

The development of a spruce plantation on rock soil. Here the steep hillsides are so well covered that erosion is reduced to the minimum by a thriving forest.

# MAKING FRIENDS WITH THE BIRDS

BY A. A. ALLEN, PH.D.

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**T**H**ERE** is a common belief, nurtured by the time-honored fables of Aesop and La Fontaine, that, somewhere, there lies hidden the key to the animal world; that there is a secret or mysterious language which, when discovered, will permit one to penetrate the woods and have

## MAKING FRIENDS WITH A PHEASANT

But the friendship is all on one side, for the bird is held only by its unusually developed instinct to keep its eggs warm.



the birds and beasts come from their retreats to greet one. The disappointment felt by the child when the birds flit from sight or when the squirrels scamper into their holes is shared by all of us, and whether we believe in the mysterious language or not, we all wish that there were some way by which we could individually



BEFORE FEAR DEVELOPS.

Young Redwinged blackbirds responding at the approach of an intruder as eagerly as at the approach of their parents. The altricial young of most birds do not know fear until their wing feathers grow out and they are able to answer to the calls of their parents.

make friends with the birds and the wild animals.

A small boy, when told by his teacher to study the habits of birds instead of stoning them, replied, "But birds don't have habits when I watch them." This thought occurs to most of us and so when we read some of the modern animal stories with their strong appeal we are led to believe, either that the authors have used their imaginations, or that they have some secret power or control over the animals they watch that permits them to penetrate so intimately into their lives. Some of the stories are avowedly fiction, but others are based on actual experiences with animals that have permitted the closest acquaintance.

This intimate knowledge, naturalists tell us, we may gain for ourselves, and, if we will but devote the time and patience to it, we can make friends with any bird or beast without having discovered a secret language. Pos-



ANOTHER FEARLESS (?) WARBLER

A chestnut-sided warbler, whose desire to feed its young has destroyed fear.

sibly this is so, if we do not expect too much. In my experience the number of wild birds or wild animals that have entirely lost their fear of man and become real friends has been very small. If one will remain absolutely quiet or if one will conceal himself or disguise himself so that he no longer appears like a human being, many animals may come close to him and appear fearless. But when the disguise is thrown off, fear immediately gains the upper hand. There are some birds which no amount of time or patience could bring to friendly terms, and there are others, even of the same species, which are more approachable than a self-conscious human being. Animal fear is the great stumbling block to one's becoming better acquainted with his wild neighbors. Birds are creatures



of instinct and fear is the predominant one. Without it "natural selection" would be of no avail and there would be no evolution.

Fear of man is as strong in birds as is fear of hawks or fear of predacious animals, developed not alone through the experience of the individual, but through that of the species and that of all birds. It is less strongly developed in those birds which have never seen man, but it is always present. Added to it, is the fear of everything that is unusual. Birds hatched in the far north and seeing man for the first time on their migrations southward, are less timid than their more experienced fellows, but their innate fear of anything unusual makes them somewhat wary and thus preserves them. Immature shore-birds, for example, and the young of many warblers, when they first arrive in the fall are surprisingly tame but, as soon as they have absorbed the timidity of their associates, there is no way of making friends with them. Once in a great while there comes a bird which is very slow in learning from its associates and



A FEARLESS CHICKADEE

But it is the lure of food and an insatiable appetite that have tamed him.

whose fear instinct seems undeveloped so that it hops about apparently unconscious of the proximity of man. Unfortunately for our pleasure, these birds are usually deficient in other ways, as well, and do not survive long. If these birds could be preserved or if the immature shore-birds and warblers could be segregated from the rest of the bird world, we might develop a strain of birds actually fearless of man but, until that happens, we must be content with birds as they are, and take solace in the knowledge that their fear of man helps them to escape their other enemies as well.

The fear instinct appears in young birds with the development of the feathers and the power to escape or to



A COURAGEOUS LEAST BITTERN DEFENDING ITS NEST

No love is wasted upon intruding human beings, but its abnormally developed instinct to incubate gives it courage.

respond to the calls of their parents. The precocial young of such birds as grouse, ducks, grebes, rails, plovers and sandpipers, which are covered with down when hatched and able to run about, instinctively crouch and hide from



CLOSE OBSERVATION OF A BLUE-HEADED VIREO

The incubation instinct in birds is often more powerful than the fear instinct, and they lose their timidity of man.

the beginning, while the altricial young of other birds stretch their necks and open their mouths at the approach of an enemy as eagerly as at the approach of their parents. It is not until their wing feathers grow out or until they are able to respond to the calls of the old birds, that

though long continued kindness will help to dispel it.

The tenacity of the instinct varies with different species and with individuals of the same species. During the past winter, for example, we trapped for experimental purposes, a number of wild ducks of several species, canvasbacks, scaup ducks, black ducks, and mallards. Within a few days some of the canvasbacks became accustomed to our presence and dove and fed in the artificial pond with but little show of fear. The scaup ducks were slower to adapt themselves, and the mallards and black ducks remain sullen to this



BETTY FEEDING THE GEESE

they crouch and hide or flutter from the nest upon one's intrusion. The fear is apparently instilled into them or acquired by absorption from their parents, for if they are taken from the nest before it appears and raised by hand, it never develops. Thus, the wary crow, when taken from the nest before it acquires the fear instinct, becomes so tame as to be almost obnoxious. On the other hand, if young birds are taken after it appears, they may never lose it, al-



WHEN HUNGER DOMINATES FEAR

Part of a flock of wild geese owned by J. D. Showell, at Ocean City, Maryland. They are valuable as decoys during the hunting season, and are very tame, coming to his call and even permitting discriminate petting.

day. Even among the canvasbacks, however, there is a difference and some are much tamer than others. An-



CAN YOU SEE THEM?

Young Killdeers, just hatched, crouching in the nest. In precocial birds such as the plovers, sandpipers, ducks, and grouse, fear develops immediately upon hatching and they hide upon the approach of an enemy.



THE SHELTERING HAND OF AN ORNITHOLOGIST

The little Blackburnian warbler does not appreciate the protection and submits to it only because of the precious eggs beneath her and her abnormally developed instinct to protect them.

other matter of interest, as showing how fear is transmitted, was that the few domestic ducks which were placed with the wild ones and which previously fed from our hands, immediately became wild, and even the pet Indian runners skulked in the corners like the freshly caught black ducks. Thus, in nature, individuals that might otherwise be tame, absorb fear from their more timid brothers.

It has been said previously that it is only abnormal birds in which fear is lacking and that their number is exceedingly small. In an experience with thousands of birds, I have found a few chickadees, one wood pewee, and one Blackburnian warbler which without the



NO FRIENDSHIP HERE

Apparently this black-throated blue warbler has no fear of man but in reality its timidity is merely overwhelmed by its instinct to feed its young. It was necessary to remain absolutely quiet or fear remained uppermost--note the mosquitoes on the hand.

lure of food or anything else would allow one to touch them or would alight on one's person with absolutely no show of fear. One could walk up to the pewee, for example, as it sat on a low branch and touch its tail while it watched with a merely inquisitive look. I have found quite a number, however, in which the instinct to incubate or to defend the nest was greater than the instinct of fear. These birds would allow themselves to be handled on the nest but, away from it, they were quite timid. I have met with a number of others which, through the stress of cold or hunger, would allow themselves to be touched or



FEEDING "JIMMIE"

Young birds, even of the wary crow, if taken from the nest before fear develops, become so tame as to be almost obnoxious. If taken later, they often remain wild.

would take food from the hand, but in all cases fear still persisted although dominated by other instincts. Thus in the accompanying photographs, the Blackburnian warbler, the blue-headed vireo and the ring-necked pheasant are held by the powerful instinct to incubate, although all three have the fear of man. The least bittern is actively defending its nest. The fear of the chestnut-sided and black-throated blue warblers is overcome by the instinct to feed their young, while the chickadee is lured by food and the wild ducks by actual starvation. None of them, however, with the possible exception of the chickadee, could be said to be without fear. We have not, then, made friends with them, but merely have taken advantage of a temporary abnormal condition and, as soon as the instinct to incubate or to feed the young passes or the hunger is appeased, the birds once more assume a more normal attitude toward man.

Bradford Torrey, in his charming essays, relates his delight at the discovery of an incubating vireo that would take food from his hand and permit itself to be stroked on the nest and tells of his disappointment when he learned that this was no special privilege permitted him, but that all people were treated alike. It was not a case of making friends with a bird, but

**PROTECT THE BIRDS AS A WAR MEASURE**

**T**HE food destroyed in America by insects and small rodents would feed the people of Belgium! Birds are the great natural enemies of these pests. The laws protect insect-eating birds, but many are being shot wantonly and for food. Every American has a direct, personal interest in seeing that these laws are properly enforced. Protection to birds means protection to the National Food Supply. Report to the nearest game warden all violations of the laws protecting the birds.

again of taking advantage of an abnormal condition. I have said that it is the unusual things which alarm birds. Birds may nest under bridges and become accustomed to the passage of teams six inches above their heads or on railroad trestles and not mind the roar of the trains above them, and yet the same birds may not allow a person to approach within ten feet. Birds have been known to nest on trolley cars and traveling cranes and to become accustomed to the transportation of their nests from place to place, when the same birds might have deserted their eggs for good if one approached the nest too suddenly or made a quick jump at the bird. Such things are possible only when they occur by degrees and so often that they become a part of the routine of a bird's life. Any bird will ordinarily allow one to approach within a certain distance of itself or its nest, varying with the individual, before taking alarm. If one moves slowly and uniformly, he can approach much closer, but if he makes sudden or jerky motions, pauses and starts, or attempts to sneak upon a bird, he usually alarms it at a much greater distance. Similarly the volume of a sound makes little difference to birds. The roar of a passing train does not usually alarm them when a little squeak will cause them to jump, because the sound of the train begins low and far away and gradually increases in violence, but at no time is the

added increase in sound sufficient to disturb the bird, though the whole volume of sound is hundreds of times more violent than that which would ordinarily alarm it. If the train should suddenly increase its speed or suddenly stop, the bird would become greatly alarmed, but as the sound dies gradually away it goes unnoticed.

If then we would make friends with birds or merely observe them without attempting to make friends, we must bear these things in mind. In the first place, fear is the predominant instinct and except in unusual instances or with abnormal birds dominates the bird's life. If one wishes to come on intimate terms with birds he must either seek out the unusual birds, take advantage of times of stress, or be content to conceal his identity, and like the branches of the trees become but a part of the bird's environment. If one will enter a woods quietly and then remain quiet and inconspicuous for an hour or more, the birds will resume their normal actions and he will see the woodland as it really is. If, on the other hand, he goes thrashing through the woods, he will cover more ground and scare up more birds, but they will "have no habits" except those of alarm. Select a spot near a bathing pool, a favorite feeding spot, or near the nest of some bird and there will be spread before him a panorama unknown to the rest of mankind.

## A TREE OF LOST IDENTITY

BY JOHN FOOTE, M. D.

THE wood of this tree of lost identity was so valuable that cups made from it were presented as gifts to kings and pontiffs; its physical properties were so remarkable that famous scientific men studied it and embodied their observations in classical works that are still authoritative; its medical properties were believed to be so marvelous that they exceeded in the cure of diseases of the kidneys what cinchona had accomplished in banishing swamp fever—it was a veritable king among trees in the seventeenth century—yet its very name had disappeared from modern works on botany and pharmacognosy and its botanical origin was worse than unknown. Such is the tale of the *lignum nephriticum*—the botanical source of which was discovered very recently by a brilliant economic botanist who found that the tree producing the "kidney wood" was really a twin or rather that it had two botanical sources.

This wood was celebrated throughout Europe in the seventeenth century. It came from the Old World, the land of mystery, out of which had come tobacco, cinchona and other remarkable products. Marvellous as were the reports circulated concerning cures it had accomplished, even greater things were expected of it. For chronic kidney disease had claimed many victims long before 1827, when Dr. Richard Bright published his description of the disease which bears his name, and it seems to have been unusually prevalent in the period of the renaissance.

The *lignum nephriticum*, or "kidney wood," when pulverized and steeped in water produced remarkable color effects of an opalescent type, which changed in sunlight and shadow in the most amazing manner. There is nothing to indicate that its medicinal reputation was well founded. In fact, it has absolutely no value as a remedy in kidney disease. It has been well said that "the therapeutics of every generation seems ridiculous to the succeeding one," so we cannot afford to be scornful of the Spanish physician Monardes, who was first to call attention to the wood. In 1565 he wrote the following account of it:

"They also bring from New Spain a wood resembling that of a pear tree, dense and without knots, which they have been using for many years in these parts for diseases of the kidneys and of the liver. The first person I saw use it was a pilot, 25 years ago, who was afflicted with urinary and kidney trouble, and who after using it recovered his health and was very well. Since then I have seen much of it brought from New Spain and used for these and kindred maladies. \* \* \* It is used in the following manner: They take the wood and make of it chips as thin as possible and not very large and put them into clear spring water, which must be very good and pure, and they leave them in the water all the time that it lasts for drinking. A half hour after the wood is put in, the water begins to assume a very pale blue color, and the longer it stays the bluer it turns, though

the wood is of a white color. Of this water they drink repeatedly and with it they dilute their wine, and it causes very wonderful and manifest effects without any alteration nor any other requisite than good order and regimen. The water has no more taste than if nothing had been put into it, for the wood does not change it at all. Its complexion is hot and dry in the first degree."

Francisco Hernandez, protomedico of Philip II, who returned to Spain in 1577 after having spent seven years in Mexico studying the resources and useful products of that country, added nothing to Monardes' description of the wood, but gave testimony as to its medicinal virtues, and for the first time described the plant producing the *Lignum nephriticum* of Mexico.

Interest in the question of the botanical source of this wood was revived by W. E. Safford, economic botanist, U. S. Department of Agriculture, and an article appeared in the Smithsonian Report for 1915 under the title "*Lignum Nephriticum*—Its History and an Account of the Remarkable Fluorescence of Its Infusion." Mr. Safford traced the printed records of the wood through many years and various languages, the whole constituting a remarkable piece of botanical detective work. Here are some of his conclusions:

"In 1646 Athanasius Kircher, a German Jesuit living in Rome, celebrated for his great learning and his contributions to science, published an account of *Lignum nephriticum* in his *Ars Magna Lucis et Umbrae*, under the heading 'On a certain wonderful wood, coloring water all kinds of colors.' (Op. cit., p. 77.) He calls attention to the fact that other writers before him had described the wood as coloring water only a blue color; yet in his experiments he had found that it transformed water into all kinds of colors. His description of the plant yielding the wood was not made from observation, but was undoubtedly taken from Ximenez's translation of Hernandez's work, published 31 years previously. He then goes on to say:

"The wood of the tree thus described, when made into a cup, tinges water when poured into it at first a deep blue, the color of a Bugloss flower; and the longer the water stands in it the deeper the color it assumes. If then the water is poured into a glass globe and held against the light, no vestige of the blue color will be seen, but it will appear to observers like pure clean spring water, limpid and clear. But if you move this glass phial toward a more shady place the liquid will assume a most delightful greenness, and if to a still more shady place, a reddish color; and thus it will change color in a marvelous way according to the nature of its background. In the dark, however, or in an opaque vase, it will once more assume its blue color."

"Kircher announces that he was the first to observe this chameleon-like color, as far as he knew, in a cup given to him as a present by the procurator of the Society of Jesus in Mexico. This cup he afterwards sent as a gift to his Sacred Majesty the Emperor, as something rare and little known. 'But,' he adds, 'as to the cause of the strange phenomenon which I observed, I

failed at first to understand it; for I saw that the color could be counted neither among the apparent nor the true colors; not among the former, because the true or real color comes from the nature of the wood and not from the light variously modified, as is usual with apparent colors; nor can it be considered a real color, since no color is seen in it when it is held up against the light; and it assumes different kinds of colors only when held against different objects.' The learned philosopher, true to his boast that there was no problem in nature that he could not solve, concludes with the statement: 'Taught, however, by various experiments, I have at last found the cause, which I shall publish hereafter.' This, however, he never did.

"Four years after the publication of Kircher's work Johan Bauhin, in his *Historia Plantarum* (1650), describes a second cup made of *Lignum nephriticum*, which he had received under the name of *Palum indianum* from a colleague, Dr. Schopffius, physician to the Duke of



CUP MADE FROM THE WOOD OF LOST IDENTITY

This cup is of *Lignum nephriticum* and with it is a flask containing water in which chips of the wood have been soaked. The water is thereby colored and the wood gives it a property which was supposed long years ago to make it medicinally valuable.

Württemberg. This ingeniously made cup, almost a span in diameter and of no common beauty, resulting from the variegated lines adorning it, was accompanied by sawdust or shavings. When water was poured in the cup 'a wonderful blue and yellow color' was produced 'resembling the opal' and 'wonderful to behold.'

"The color phenomena displayed by the extract of *Lignum nephriticum* were first investigated in a truly scientific manner by the Hon. Robert Boyle in 1663. The results of his studies were embodied in his *Experiments and Considerations Touching Colors*, page 203, 1664, a Latin translation of which (1667), and also a summary of the results of Boyle's studies in Richard Boulton's edition of Boyle's works (1700), are in the library of the Surgeon General of the Army at Washington."

Mr. Safford traces the cause of confusion regarding the identity of this wood which arose among botanical

writers from the beginning, and cites numerous authorities who had incorrectly placed its source. His solution, and a succinct summary of the facts he has ascertained are given:

"*Lignum nephriticum*, celebrated throughout Europe in the sixteenth and seventeenth centuries for its diuretic properties, but chiefly remarkable for the fluorescent properties of its infusion, comes from two distinct sources: (1) From a Mexican shrub or small tree, *Eysenhardtia polystachya*, the wood of which was used by the Hon. Robert Boyle (1663) in his well-known experiments on the fluorescence of light; (2) from a large tree of the Philippine Islands, *Pterocarpus indica* (*Pterocarpus pallida* Blanco), the wood of which, described by Kircher (1646) and Johan Bauhin (1650), was at one time commonly made into cups by the natives of southern Luzon. It is possible that cups were also made from allied species of *Pterocarpus* growing in Mexico, but there is no record of cups of known Mexican origin. That which Kircher received from the procurator of the Jesuits in Mexico had in all probability been brought as a curiosity to Mexico from the Philippines, for at that time the only trade route from the Philippines to Spain was by way of Mexico. It is also quite probable that Monardes's wood and the wood mentioned by Hernandez as being carried on shipboard in the form of large logs was Philippine *lignum nephriticum*.

"The source of *lignum nephriticum* has remained uncertain for so long a time owing to the following causes: (1) Neither the Mexican nor the Philippine wood is known in its native country by the name *lignum nephriticum*; (2) from the beginning of its history the two woods bearing this name among pharmacologists were confused; (3) pharmaceutical material and cups were unaccompanied by botanical material; (4) botanical material in herbaria was lacking in wood and was usually unaccompanied by economic notes; (5) the original botanical descriptions of the species yielding *lignum nephriticum* were unaccompanied by references to the phenomenon of fluorescence; (6) the source of the wood described by Monardes was sought in Mexico, but was in all probability of Philippine origin; (7) attempts were made to identify the Mexican plant described by Hernandez with the wood described by Monardes and the cups described by Kircher and Bauhin, which only led to confusion."



LIGNUM NEPHRITICUM LEAVES AND TRUNK

The specimen from which this photograph was made was grown on the island of Luzon in the Philippines.

**T**HE hickory bark beetle kills many thousands of trees every summer. Trees killed by it may be recognized by the very striking burrows made by the insects under the bark. These consist of a single gallery extending with the grain of the bark from which on each side extend numerous straight or slightly curved galleries two-thirds inches long. This is a very serious pest and a tree once attacked can seldom, if ever, be saved.



Courtesy of the New York Botanical Garden.

A STRUGGLE FOR SUPREMACY--WITH THE HONORS TO THE FIG

In a hammock on Roberts Island in the Everglades west of Little River, Florida. A strangling-fig, pale-barked tree, grappling a cocoa-plum, horizontal tree-trunk in front, and a swamp-bay, erect trunk behind. Note strongly buttressed trunk of strangling-fig.

## A DUEL TO THE DEATH

OF a very wonderful trip into Southern Florida, on a botanical exploration in 1916, Dr. John K. Small writes most interestingly in the Journal of the New York Botanical Garden. What he says regarding the immediate region surrounding Roberts' Island, where the unusual and striking photograph shown above was taken, is quoted:

"We went by automobile through the pinewoods to the edge of the Everglades. There afoot we took to the water and mud, and waded for a distance of three miles in a westerly direction in water mostly knee-deep and mud at the same time half as deep or of equal depth, until we reached the hammock. The trip requires strenuous wading, which must of necessity be made at a pace compared with which a funeral march would seem quite rapid; but the objective is worth the effort. This island is several miles long, standing north and south in the Everglades, and about a quarter of a mile wide. It is densely forested throughout. Much of its surface is so low that it is submerged during the rainy season. The soil of the low parts is mud and humus. This supports an almost impenetrable jungle made up mainly of pond-apple trees, cocoa-plum trees, and red-bay trees, and ferns. There are ferns by the square rod and ferns by the acre. The Boston fern and the sword-fern constitute the largest and most beautiful beds. Several kinds of epiphytic ferns and a few species of air-plants often cover the limbs of the trees. The higher ground of the island is sandy. There the live-oak is the dominating tree of the forest, and each tree constitutes a

hanging garden. Orchids, air-plants, and ferns completely clothe the limbs of the larger trees. However, plants do not have a monopoly of the trees. There are also epiphytic lizards and epiphytic snakes! There is everywhere present a beautiful green snake. It inhabits the hammocks and it is especially abundant in those of the Everglades. It lies outstretched on the branches of shrubs and trees and glides along the branches from one tree to another with surprising ease. One has usually to be careful to look before laying hold of the limb of a tree for support, or he may grasp something of quite different consistency from that of wood!

"The shrubs and herbs here represent more northern kinds than are met with in the hummocks of the nearby Everglade Keys. Among the more interesting discoveries on this island was a gigantic plant of the compositae, *Zamia pumila*, which had not previously been found south of Fort Lauderdale. The specimen mentioned had a very large branched underground stem, and an unusually fine cluster of leaves, each one over four feet tall. So striking was the plant that we dug it up, photographed it, and replanted it.

"After a profitable day on this island, we retraced our steps through the Everglades and found our automobile without special incident, except that one member of the party got his legs tangled in the coils of a large water moccasin, and in the excitement and confusion of trying to get away in a hurry he fell prone in the mixture of mud and water. Both snake and man were equally surprised at the sudden meeting and neither had time to harm the other."

# CHASMS OF EROSION AND FOREST DEFENSE

BY CHARLES A. WHITTLE

**N**O more striking exhibition of the results of erosion within the historic age is to be found than in parts of Georgia near the river basins along the dividing line of the Piedmont and coastal plain regions. Chasms two hundred feet deep, with tall trees growing from their bottoms, but with sides bare and gullied, have been resolutely gnawed deep into the plateaus by the forces of erosion. Farms have been riven, barns and houses have been engulfed and generations of men have looked with awe and helplessness upon the phenomena.

During geological ages of the long past, the now gashed and barren earth came down with the floods and found its present resting place. But now the police forces of nature are commanding it to "move on" and sturdy liquid minions are set to hustling it.

Only one staying hand has been lifted—the dark pine forests that grip the earth with strong fingers and resolutely confront the dragons of the caverns. Where the forest is weak the chasms have pulled it down. Where the forest is strong the caverns give up the struggle.

Man has taken cognizance of the combat and given his only aid to the struggle against erosion; he has learned to let the forest alone where the gorges encroach. To plant a forest athwart the line of approach has seemed futile to the farmer land owner. He realizes now long it takes to grow a forest and how formidable it has to be to withstand the under-cutting of the persistent force. So that once the gorge has invaded, the farmer abandons hope of ever again bringing the land under agricultural subjection, so forbidding are the rough steep slopes and



INVADING GOOD FARM LAND

Each day erosion nibbles more and more of the farm land and wood lot seen in the upper section of the picture and a great wedge is being driven into a valuable property.



NOT THE GRAND CANYON

This shows erosion of land in Stewart County, Georgia. Note the depth of the gully in which large trees are growing and how wooded land (left upper corner of picture) is threatened by the progress of the erosion.

so narrow and tortuous the bottoms of the gorges.

The sculpturing elements have left grotesque and often picturesque monuments along the courses of these chasms, as if to redeem their merciless work from utter sordidness. Behold the towers, the minarets, the miniature representations of the Alps, the Grand Canyon, the "Bad Lands"; see the carved animals and strange forms of no name—the grand and grotesque in these valleys of destruction!

If we pry into the secrets of this strange gallery there is an apparent reason for all of the sculpturing. Capping each upstanding figure is a protecting stone, often scarcely larger than a hand. From this stone slopes the earth forming a very pretentious peak. One





FANTASTIC SHAPES DUE TO EROSION

A scene in Stewart County, Georgia, where in a deep gully are strange shapes left as the water and weather eat away the soil.

stroke of a walking cane can dislodge this sentinel and last defender and leave the mass beneath a prey to the eroding elements.

The tree growth at the bottom of some of these gorges affords interesting data. Without doubt the trees have sprung from seed. The transfer of a tree or even a young sprout to this site is against all probabilities. A determination of the age of the trees would in a measure, afford data for determining the probable length of time the gorge has existed at its present depth, or the depth at which the tree found its footing.

Many trees of commercial size are found in these gorges, but so inaccessible are they as to be considered of little commercial value. The problem is one of lifting the cut timber out of the gorge to the level. To make a road out would be too expensive.

Some of the most striking exhibitions of this phase of erosion can be seen in Stewart county, Georgia, from which the accompanying illustrations were taken. In this region are the terrace lands characteristic of the deposits of soil brought down from the Piedmont to the coastal plain region. Along the river basins especially, the terraces almost attain the dignity of plateaus. In these redeposits of earth, and in a region of heavy rainfall, of course, erosion is to be felt with greatest severity and unusual problems for the conservationist are afforded.

**T**HE caterpillar of the Tussock moth is of a general gray color with its back ornamented with a series of four tufts of white hair. The head is bright red in color and has two pencils of black hair extending forward while a single similar pencil extends back from the end of the body. The very best way of fighting this voracious leaf eater is by collecting and destroying the egg masses during the winter or spring.

### DESTROYING TREE PESTS

**C**OMPETING for prizes offered by the Clinton County Agricultural Society, school children of Clinton County, New York, have prevented the ravages of more than two hundred and seventy million apple tree worms during the past three years, by destroying the egg masses before they hatched. In 1914, when the contest started, 175,965,250 worms were accounted for; the hatching of 95,000,000 was prevented in 1915; and 10,000,000 perished in the vigorous campaign of 1916.

The Society has made public comprehensive plans for continuing the work, with the object of completely exterminating the pest in the county. This year the different schools in a town will compete against each other, rather than one town trying to wrest the prize from another, and the increased number of prizes will mean added interest on the part of the children.

The figures above give a definite idea of the rapidity with which the number of worms is decreasing, as a result of the campaign, and leads to the belief that Clinton County will soon be entirely freed from the destructive activity of these pests.

### TREE BOWS ITS HEAD AT NIGHT

From Simla, India, comes this story:

"The educated public in Bengal is excited over the discovery of a palm tree which is exhibiting certain remarkable phenomena.

"This tree is on a plot of land owned by an inhabitant of Faridpur. In the morning it stands erect, with its leaves outspread; but after sunset it bows its head, the leaves touching the ground, as if prostrating. This is witnessed every day.

"Ignorant people have come to regard it as an abode of some god. Hundreds of men, women and children visit it daily and offer pujahs near it. It is even stated that many persons have been cured by offering pujah.

"Sir Jagadish Nunder Bose, the renowned botanist, sent some of his assistants, with a self-recording apparatus specially constructed for the purpose to discover the cause of the phenomenon. It has been found by dynamometric measurements that 'the internal forces, whose periodic fluctuation causes this remarkable movement, are very great, the pull necessary to bring the tree down to its position of prostration exceeding several hundred weights.'

"Notwithstanding the thoroughly scientific explanation that this phenomenon is entirely natural, the owner of the tree is still making a good income from the pujah offerings of pilgrims."

**T**HE heavier the fire wood, the more heat to the cord. Hickory, oak, beech, hard maple, locust, ash, and elm have high heat value, and one cord of seasoned wood has a value as fuel equal to one ton of coal.

# Forestry for Boys and Girls

by Bristow Adams

## WOOD FOR FUEL



**N**OW THAT the kiddies are enjoying the coolness of the swimming pool under the waterfall, it may not seem to be a good time to talk about wood for burning. Yet Mr.

Hoover and Mr. Pack are doing their best to make us look into the needs of the days to come; and some good persons we know are sitting in the draft of an electric fan this very minute making Christmas presents.

I am reminded that Everett took a dollar away from his father on the strength of having the courage and skill to swim all the way across the pool; and Toto is thinking up some way that he, also, can drag a dollar from the old man's jeans. All the rest have earned a whole dollar at once within the past six months, and they think that they are "putting it all over" their father. Eleanor got him to offer a dollar as a prize for making a good loaf of bread. She earned it fairly, but it must be confessed that she hasn't made another loaf since; and a dollar a loaf is a rather high price, even in war times. Gertrude arranged for a dollar reward when she was able to recite Lincoln's Gettysburg Address without an error. She made a great many attempts, but each time she left out a word or got some of them twisted, until at last she said:

"Father, I have just got to learn that speech and earn that dollar, because I have borrowed against it from Mother and the rest until there's only ten cents coming to me."

That night she was letter-perfect on the Address, and paid up all her debts. She could not help feeling that she had done a lot of work and had got only ten cents from it, after all. She wanted to eat her cake and have it too.

**T**HAT is what is the matter with the American people. We have eaten

our cake, in the form of forests, and gas wells, and oil wells, and the richness of our soils, until now we are beginning to find out that we can not use them and waste them, and still have them. Bismarck, the great man of the great nation which we are fighting, said in 1868, or a half-century ago, that the real test of the American form of government would come when we began to feel the pinch; that any nation could go forward and do big things as long as it was rich and there was plenty for all, but that it would fail when a good living no longer "came easy." Some folks say that we are beginning to feel the pinch already, and many there are who hope that the awful war will bring in its train at least the good idea that all must think and act to make it a kind and safe place where men may live, instead of a bitter place where men must die. It is already teaching us wise thoughts and good deeds that we had not thought worth the thinking or doing.

**O**NE of these thoughts and deeds is to save the waste. Looking forward to next winter, one of the wastes we can save is the waste of fuel, and particularly the waste of coal. And a way to save coal is to burn wood. Wood grows again and again; coal once gone is gone forever. More than that, wood is a good fuel, is a cheap fuel, and can be found almost anywhere.

**O**NLY a few days ago the whole family went fishing. Before we caught any fish we made a fire-place of stones and laid over that an old grill which we keep for just such uses. But no one was asked to gather any wood.

"I know," said one, "Father doesn't want to put any hoodoo on the fishing by getting so much ready beforehand that the fish won't bite. It's like carrying an umbrella to keep away the rain, or not cleaning up the house when you want company to come."

However, each one caught some fish, clear down to little Toto. After the





fish were cleaned and ready to be broiled, the children found a wonderful fire already made, with no smoke or flame, but with even, strong heat. It was made from charcoal, which had been bought from Caesar, our Italian neighbor down in the valley. He had learned to use it in Italy, and always made and kept a good supply on hand. Some of it he sold at a fair price, for it is a clean, cheap fuel. All we had needed for our fish had cost only a few cents—though Caesar had wanted to give it to us,—“you soocha gooda peop’,” he said. (The truth is, that Caesar and his folks are the such good people!) We had carried it to the fishing place in a light paper bag, and it served our purpose exactly.

**MOST** of us have forgotten the use of charcoal, and have begun to overlook the use of wood for making heat. Time was when all our best meat was smoked over smouldering hickory, which cured it through and through and gave it a delightful flavor. Nowadays, we look for short-cuts and paint our meat with creosote under the fancy name of Liquid Smoke, or some other fine-sounding phrase, invented by a city advertising man who never may have known what real smoked meat is.

In some places they still use quantities of chestnut wood in brass foundries because it makes just the right heat for melting the metal to make the castings. Many small bakeries still use wood, and claim that no other fuel is as good for baking bread; vessels put in Key West regularly to get the button-wood which grows on the Florida Keys and burns in the cooks' galleys with no smoke and little ash. One whole section of the Louisville and Nashville Railroad, in west Florida, is run by wood-burning locomotives, or was so run only a year or so ago. These locomotives used the resinous lightwood of longleaf pine, mainly from

the old roots, and the train stopped often at track-side wood-racks to refill the tender, stacking it high with the twisted and knotted stump wood. From the point of view of the traveler one can not wholly favor it. In the hot summer the car windows could not be kept closed, and the flakes of tarry soot came floating in to stick to everything they touched, like thick, greasy, black cobwebs. But every cord of wood saved a ton of coal.

**T**HAT is what we must all think of now. There are thousands of cords of good wood going to waste. The skeletons of blight-killed chestnut trees point accusing fingers to heaven, in all our north Atlantic states. They show so plainly that they seem almost to say, “Come take us away from here where we are so naked and ashamed. Let us burn for you, instead of standing here as records of man's carelessness.” It is so easy to persuade ourselves that the work will not pay for itself! When we try, we are likely to find that it does pay, and we are likely to learn more and more that it always pays to practice thrift.

**NOW** is the time to spot the dead-topped, and crooked, and diseased trees, and the time to mark the wild cherries that are not likely to furnish good timber, but are harbors for the tent caterpillars that do so much harm to orchard and woodlot. The removal of all these types of trees will make the woodlot better, and cordwood cut this summer will be well-seasoned for next winter's use, if it is split and piled. The work may be done on most farms, with the extra summer help, during the period between haying time and the early grains at the beginning of the season, and the final fall harvests. The poor trees make good enough wood for burning, and when they are gone the other trees have a chance to grow straight.

*(Continued on next page)*



**E**VEN if one cannot use the wood all on the farm, it is not hard to find a market. In nearby towns there are many persons who have open fire-places in their homes, and who would like to keep them burning on winter evenings, as household altars, but they have a real difficulty in getting the wood, even though it is only a few miles distant, at most, and going to waste from being allowed to decay. The money from the cordwood is not the only return; the trees that are left will take on increased girth because they are given more room and light.

**T**HEN, too, coming back to the war,—as we all do no matter what we start to talk about these days—the government is likely at any time to need all the coal it can get its hands on, for big manufacturing or for the navy. The use of wood will release coal for these purposes, and the trees will, in this respect, perform still another service in helping us to win.

To use our forests for firewood, provided they are used in the right way, is to save, and not to waste them. By being careful and thrifty we can “eat our cake and have it too,” with the trees, because, with wise use, they will return more and more. They are not used up as the coal will be, if we do not save it. Only when the trees again furnish a great deal of fuel, as they did in the days when men thought of coal only as a “black stone,” will we be practicing the thrift which must prove the words of Bismarck to be false.

#### NATIONAL FORESTS RECEIPTS INCREASE

**R**ECEIPTS from the National Forests in the fiscal year just closed exceeded those for 1916, the banner previous year, by more than \$600,000 and totaled over \$3,450,000. The cost of operating the Forests, about \$4,000,000, was virtually the same as in 1916.

The increase, according to the forestry officials, came chiefly from a more active timber business and from the higher fees charged for grazing, although practically every form of use of the Forests was greater than ever before and nearly every revenue-producing activity contributed to the gain. The only exception was that of sales of turpentine privileges, which fell off nearly one-half. Since these sales are made only on the Florida Forest the receipts from this source are relatively small.

The timber business realized for the Government over \$1,600,000 and live stock grazing over \$1,500,000. Permits for water-power development brought in over \$100,000 and other forms of land occupancy, including leases of land for summer homes, as much more. In this item the gain was 28 per cent.

It is pointed out by the Forest Service that many forms of use of the Forests bring in no revenue. Settlers in and near the Forests are allowed much free timber for domestic and farm use and are also allowed free grazing up to ten head of milch or work animals. As public recreation grounds the Forests are open to all without charge, while their almost inestimable value for

water conservation is maintained solely at the cost of the Government. Although their administration and protection as public utilities necessitate large expenditures which yield no money returns, the narrowing gap between expenditures and receipts holds out the prospect, those in charge of the work feel, that the revenues will in no great time exceed the operating cost.

With the demand for timber markedly stimulated by war conditions, the Government foresters anticipate a further increase in the National Forest cut and the receipts for timber during the current year. On the other hand, they point out that an increase in business will necessarily call for more work and increased costs. Congress provided for this by increasing the funds available this year for National Forest administration and protection by about \$80,000.

Of the grazing receipts cattle furnished approximately \$900,000 and sheep \$570,000. On account of the feed shortage faced by the live stock industry throughout a great part of the West last spring, and because of the needs of the nation for meat, wool and hide production, the stock were admitted early and up to the full limit of the carrying capacity of the ranges. As a result of regulated grazing the capacity of the ranges has been growing greater for some years, the Forest Service officials state, and the increase in grazing receipts is in part due to the fact that the herds on the Forests this summer are larger than in any previous season.

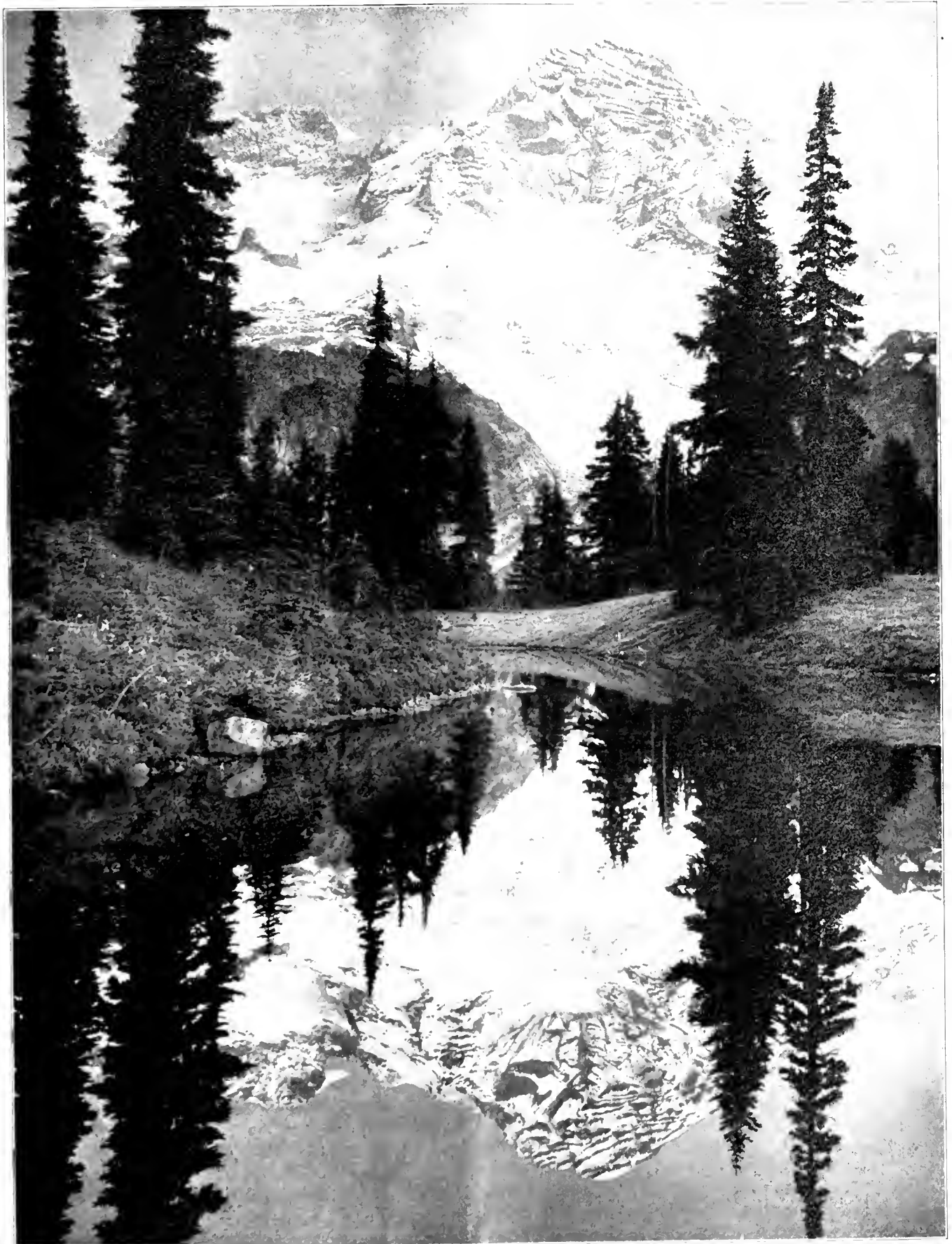
**A**PPROVED grazing allowances for the National Forests during the present season provide for the pasturing of 8,400,155 sheep, 2,120,145 cattle and horses, and 54,680 swine. These figures, compared with those of last year, represent an approximate increase of 111,000 cattle and horses and a decrease of about 200,000 sheep.

**D**O you know that many birds often eat their weight in insects each day? Do you know that but for these birds, insects would make the earth uninhabitable in seven years? Do you know that the game hog, the small boy with a 22 rifle and the domestic cat destroy untold millions of beneficial birds each year?

**D**O you know that there are over 100,000 kinds of insects in the United States, the majority of which are injurious? Do you know that these insects cause over a billion dollars worth of damage to our crops each year, and destroy forest trees sufficient to furnish lumber for thousands of homes?

**A**N interesting deposit of carbonized wood, principally Sitka spruce, was recently uncovered by a party of timber cruisers near Talolah, Washington. The coal was successfully burned for several days on the camp fires of the party.

**O**F the 30,000,000 trees planted in the United States last year, Pennsylvania planted almost one-fourth.



REFLECTION LAKE, IN INDIAN HENRY'S HUNTING GROUND, RAINIER NATIONAL PARK  
No better name could have been found for this clear, glass-like body of water—in this view mirroring "Rainier, the Beautiful"—rising in glistening splendor 14,408 feet above the sea, its white majesty vigilantly guarded by the dark forest of fir and cedar below.



A GROUP OF THE HUNTERS AND SOME OF THEIR SPOILS

Some of the school children of Dubuque, Iowa, whose good work, inspired by the Rotary Club of that city, resulted in the collection of sixty pounds of cocoons of the tussock moth. It was a competitive campaign, and the little girl whose collar is marked with a cross was the winner.

## THE VALIANT HUNTERS OF THE MOTH EGG COCOONS

THE following from the *Newark Evening News* is reproduced with congratulations to the Rotary Club of Dubuque for inspiring the work in that city and to the school children of Dubuque for the fine showing they made in collecting the cocoons:

"At first glance one might easily suppose the cut is illustrative of some phase of the food campaign which is now sweeping this country. In truth it is but several stages removed, for these school children are among those in Dubuque, Iowa, whose efforts were enlisted in fighting the tussock moth.

"When the Rotary Club of that city realized the danger that was threatening their trees because of the ravages of the tussock moth, a campaign was started to collect the egg cocoons before they had the opportunity to hatch out this spring. Members of the club visited the various schools and succeeded in interesting the teachers and pupils in the undertaking. The club offered prizes for the school children who would turn in the largest number of egg cocoons. Captains were appointed in each school and the work was soon organized.

The individual and school prizes approximated \$50.

"One hundred children brought in about five bushels of cocoons, weighing over sixty pounds, and the picture shows some of the boys and girls who were prize-winners. Little Barbara Alesch, aged twelve (whose picture bears a cross), was the winner, not only of the girls' first prize, but of the second general prize in competition with the boys. When asked how she did it, she replied, 'I just took all the boys overlooked.'

"The Rotary Club has decided, if next year another similar campaign is necessary, to give each pupil twenty-five cents for each pound of cocoons gathered, in addition to the special prizes. In this way every pupil participating will receive something for his or her work. By adopting this method the expenditure of \$75 or \$100 will accomplish wonders. This year publicity through the newspapers stimulated interest, and, aside from the egg cocoons gathered, scores of people cleared up their own trees and banded them. The ten days of energetic work certainly has proved a saving of countless trees to this wide-awake city."

## INSURING STANDING FORESTS

MUTUAL insurance of standing timber has recently been introduced in the United States with striking success. As with many other forms of forest development New Hampshire is the first state in which the practice has been applied. The results there have been such as to attract widespread attention among the owners of timberlands in other parts of the country and to warrant the belief that forest insurance on a mutual basis will soon become as popular here as abroad.

The Timberlands Mutual Fire Insurance Company was formed by leading lumbermen and men experienced in the handling of fire protection in the woodlands. Its operations are based on careful consideration of all available data as to the average loss over protected areas. This data came from widely scattered sources and represents the experience of successful insurance operations in foreign lands by both stock and mutual companies and by the stock companies of America. With this information as a foundation the company has been enabled to arrive at conclusions that eliminate much of the experimental work in a new enterprise of this nature and to give service at a minimum of cost and risk.

Besides giving policyholders their insurance at cost the mutual company is regarded as affording a valuable stimulus to planting and long time management of woodlands, for which adequate and continuous protection will be demanded. Of similar importance is that the insurance makes timberlands more satisfactory security for loans. Through these factors it is believed the new form of insurance will help establish a broader and more definite market for cut-over lands and plantations and thus create new values and a new source of wealth.

The New Hampshire company is now accepting applications and issuing policies covering loss or damage by fire on merchantable standing timber, young standing timber and plantations. Insurance is written on no tracts which are not adequately protected from fire by forest protective associations, the state or the owner. As another measure to minimize the hazard the company will not accept tracts which contain or adjoin recent slashings or which are exposed to undue danger from fire. The amount of insurance on any tract is governed by location and value and no line is given on any risk in excess of that warranted by the assets of the company. With this limitation timber may be insured for part or full value, as desired by the owner. Merchantable timber is insured on the basis of its stumpage value per thousand feet or per cord, while young growth and plantations are covered on an agreed value per acre.

As a mutual company the organization has for its aim the granting of insurance at actual cost, eliminating the agents' commissions and other items that must be added to the charges of companies operating for profit. For the current year the company has established a base rate of two per cent. premium deposit, with the announcement that this is several times the average annual percentage

of loss experienced over a number of years in standing timber under organized protection. Each premium paid is treated as a cash deposit. Such portion of this deposit as may not be absorbed by losses, expenses and necessary reserves will be returned to policyholders in the form of dividends. In this way it is claimed that the company places at the service of timber owners facilities for insuring standing timber at the lowest possible cost, hitherto unobtainable in this country.

Among the arguments set forth in behalf of this form of insurance are the following:

It guarantees owners the money value of their young growing timber which otherwise, if fire-killed before reaching merchantable size, becomes a total loss.

It makes standing timber a more acceptable security for money loans and thereby increases the owner's borrowing capacity on timber pledged as collateral.

It is a guarantee for money spent in making plantations and gives protection which warrants planting on a more extensive scale than has heretofore been practiced.

It is a stimulus to continued and adequate forest protection, as reduction of hazard will result in reduction of insurance cost.

The majority of the organizers and directors of the company are owners and operators of standing timber, who have been active for years in promoting forest protection. They believe that mutual insurance is now both safe and economical and that indemnity for fire losses by means of insurance is of importance next to fire protection itself. In the formation of the company there have been no expenses for promotion and organization. The only charges incurred were those for the charter and license fees.

Evidence of the high character of the organization is afforded by its personnel. As its president the company has W. R. Brown, president of the Berlin Mills Company, of Berlin, N. H., a director of the American Forestry Association and president of the New Hampshire Timberland Owners' Association, who conceived the idea and is chiefly responsible for its successful development. Other officers are: Vice president, E. E. Amey, of the American Realty Company, Portland, Me.; treasurer and manager, S. L. de Carteret, Portsmouth, N. H.; secretary, T. E. Sears, of Gilmour, Rothery & Company, Portsmouth, N. H. In addition to President Brown and Vice President Amey the directors are:

Martin A. Brown, Woodstock Lumber Company, Boston, Mass.; George B. Leighton, N. H. Forestry Commission, Dublin, N. H.; George Hewitt Myers, Washington, D. C.; H. G. Philbrook, Connecticut Valley Lumber Company, Boston, Mass.; E. Bertram Pike, Pike Manufacturing Company, Pike, N. H.; Weld A. Rollins, Lawyer, Boston, Mass.; L. S. Tainter, Publishers' Paper Company, Boston, Mass.; C. C. Wilson, Odell Manufacturing Company, Groveton, N. H.; F. J. Suloway, Lawyer, Concord, N. H.

# EDITORIAL

## HAWAIIAN FORESTS

HAWAII has a general system of publicly owned forest reservations, numbering 39, and covering 798,344 acres, of which 31½ per cent. is still private holdings. These forests are indispensable to the prosperity of the islands in protecting the slopes for the conservation of water for irrigation on the dryer lower slopes and flats. The Board of Commissioners of Agriculture and Forestry in 1915 appointed Charles S. Judd, a technical forester with eight years' experience in the National Forest Service, as superintendent of forestry to succeed Ralph Hosmer, also a trained forester, under whom the work had been organized, and who is now director of the College of Forestry at Cornell. Rules have been adopted protecting the reserves from illegal cutting or injury to timber, requiring permits for stock grazing and for hunting wild animals, prohibiting the pollution of streams and preventing the squatting upon government lands. The water supply of the city of Honolulu is given special protection, no one without a permit being allowed on this area. Extensive fencing projects have been undertaken against stock. A volunteer fire-warden system is well established and rendering efficient service, as the damage done by fire is very serious and universally recognized.

It is estimated that the algaroba, our native mesquite, now covers 80,000 acres of the dryer lands. Forest extension is being pushed by the introduction of other valuable trees, the maintenance of nurseries for tree seedlings, by planting on government lands and by giving advice on methods of tree cultivation. Eucalyptus species give great promise. Many Philippine species are being tested and others from India, New Zealand and Jamaica. An arbor day has been established since 1905. Within two years 1,803,728 trees have been planted on private lands, half of which were *eucalyptus robusta*, or swamp mahogany, which grows anywhere, withstands wind, produces good timber and fuel and is easily propagated from seed. In other words, this great undertaking is being conducted on a thoroughly efficient and progressive basis, free from politics, and if continued under its present form of organization by which a trained technical and business expert is given full charge of the activities of the department, with a board of directors to review his work and advise him, it is inevitable that the public will reap increasing benefits and that the economic objects of the administration will be fully attained.

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## THE NEW STANDARD OF PUBLIC SERVICE

THIS generation is witnessing not alone a gigantic struggle between the ancient superstition of autocracy and the young and vital principle of democracy and equality, but coupled with this in a manner most confusing to clear thinking is the question of harmonizing the apparently opposing tendencies of freedom and efficiency.

In a war which demands the concentration of every ounce of the nation's strength, and the rapid and complete organization of her entire economic structure, we have recognized, as have our allies, the need of surrendering our individual liberty of action to the directing genius of experts in every line. For perhaps the first time in our history the popular doctrine that the versatile American can turn his hand to anything at a moment's notice has, at least in military affairs, given way to the principle of thorough preparation by training for the duties ahead.

The Prussian State has for two hundred years recognized that national efficiency is based on thorough preparation, both in economic and military matters, but has held that such preparation could only be secured by an autocracy, in which the rulers and the ruling classes possessed the expert knowledge, combined with the su-

perior wisdom which enabled them to guide the obedient masses to the attainment of world domination. The grim and blighting success which has attended their aims has taught the world not merely the necessity for crushing once and for all a system of government which gives the soul and willpower of a great nation into the keeping of fiends devoid of human compassion, but it has brought out the fact that efficiency, serving the common good and directed by the combined will and intellect of democracy, is the only protection against brutal aggression.

How does this lesson strike home to us? National efficiency in private business has been maintained on a fairly high plane,—but, in public affairs we have frankly failed in a large measure. In the place of economy and skilled direction of vast public enterprises, we have endured conditions of unspeakable incompetency, waste and vicious graft. Why is there such a contrast? How long can we tolerate conditions which we now know to be not only unscientific, but suicidal?

The cause is not far to seek. We have applied the idea of freedom and equality to our management of public affairs in such a manner that the only qualifications for responsible positions were popularity and the ability to swing votes. Offices went as rewards to political ad-



herents, or as bribes for future favors, and the fitness of the appointee for the work was a secondary consideration. Even in the National Government, certain departments and bureaus were notoriously dominated by these standards, and the term "government official" was a synonym, in the popular mind, for laziness, incompetency, and even graft.

Very slowly, but with increasing momentum, our great and unwieldy democracy is coming to the realization and acceptance of a new and better standard of public service. This found its first feeble beginning in what was termed "Civil Service Reform", which sought to establish standards of efficiency, and to substitute merit and continuous tenure of office for subordinates, in place of the spoils system.

Soon there grew up in certain departments of the National Government standards of scientific attainment, requiring educational training of a high order, and attracting men to public work, not through the avenue of political preferment, but on the solid basis of a professional and business career. Engineers, both within and without the United States Army, geologists and topographers, agricultural experts and foresters—a great army of trained men has grown up almost over night in our National Service—and now, when we suddenly awake to our needs, it is these public servants of the new type who have taken the leadership in organizing not merely the army, but the food campaign and many other vital activities. Joined with them are the specialists drafted from private business.

The lesson which the National Government has so nearly learned, in the substitution and protection of a force of skilled men in place of the outgrown system of political appointees, is beginning to make headway also in state and municipal affairs. But here the powers of politics—the old, inefficient system of partisan government—is still strongly entrenched, and it will take much study and effort to establish practical systems under which the grip of the spoilsman can be shaken from the throat of the public, and at the same time the government of city or state be kept responsive to popular will.

It is significant that in cities, the form of government most successful to date is the commission plan, under which a body of several citizens is chosen by ballot, to serve as a governing board, with power to appoint all subordinates. A still greater improvement is

the authorization of employment by them of a city manager. This plan is identical with that followed by practically all large private business corporations—universally adopted by them because it has been found to secure the best results. Under its operation, experts are retained to manage each special department of work, and are paid adequate salaries.

But, when we come to state organization, we find no consistent policies developed as yet. The machinery is too complicated for the public to grasp and solve at once. The usual form of organization is the outgrowth of haphazard development, and combines appointment by the governor, for some positions, with the creation of boards of directors for other lines of work. The executives, in seeking light on this question, naturally gravitate towards enlargements of their own powers, the abolition of numerous boards, and the building up of centralized forms of government largely autocratic in character, and thoroughly dominated by the principle of political control. Can the various states find ways of solving this problem, which shall secure in state affairs the same efficiency and high standards of service that are now rapidly becoming established in National and Municipal Government?

If state forestry is taken as an example, the experience of numerous states is wholly in favor of the plan of retaining boards of directors over distinct departments of state work. But these boards must recognize that the executive work of the department must be placed by them on the shoulders of a trained official. It is the failure of boards to do this that has discredited them in many instances. Fortunately, forestry boards, with few exceptions, have followed correct principles, and the work of the trained men so selected speaks for itself in every state so managed. So conspicuous is the success of state foresters selected under this plan of organization, and so great is the contrast in states in which other plans have been followed, that in this time of self-examination and sincere effort the states cannot afford to overlook or neglect the lesson taught. Much remains to be learned, but the principle of a board of directors, properly chosen, must not be cast upon the scrap heap in favor of centralized control. Who knows but that in the board idea properly developed we may not have after all the solution of the problem of harmonizing popular liberty with highest efficiency in a democracy?

### OUR NATIONAL MEAT SUPPLY THREATENED

**I**N a recent issue, AMERICAN FORESTRY called attention to the probable effect of the new 640-acre stock grazing homestead law upon the grazing industry of the West. This law was based upon a fundamental economic error, in assuming that 640 acres of non-irrigable land was sufficient to support a family by its use for grazing. It is universally known in the West, and as freely admitted, that this cannot be done. The carrying capacity of the arid range to which this law applies is but one cow to from 20 to 40 acres. One hundred beef-

cattle yield only a fair living, yet this minimum requires at least 2,000 acres and more often twice that area.

The public officials charged with the administration of this law are as fully aware of this situation as are the local residents, but true to the ancient doctrine of *laissez-faire*, they shrug their shoulders and express the opinion that the success or failure of the homesteader is none of their concern, provided they live up to legal requirements in proving up.

In a recent article published in the Albuquerque, N. M.

*Morning Journal* the following summary appeared:

"The entrymen who will file on these lands consist of three classes: a small portion of them are looking for tillable soil on which to make a home; about one-third of them want to take up 640 acres *as a nucleus* for a small stock ranch, while the greater number are persons who hope to prove up on 640 acres and then sell at a good price." Continuing, this paper says: "The assassination of the late Thomas Lyons of Grant County is said to have been due to a feud he had with several 640-acre entrymen who had sent him word that he must buy them out if he wanted to keep his range intact."

The situation revealed by this frank statement brings out in clear relief the evils which will follow the application of this law. Not ten per cent of the applicants can actually support themselves from the grazing on 640 acres, hence the sole object of the filing will be to obtain private title to government land, in order to hold up some one who can make use of it, by "selling out at a high price."

The grazing business requires large units, and is the only possible use for most of this land. Once the land is fenced off by numerous 640-acre land speculators, whose sole hope of return lies in selling to these stockmen, the grazing business is immediately disrupted on an enormous scale, and cannot be resumed until after the three-year period required for the applicants to prove up, and the completion of negotiations for the purchase of the lands. But if these lands are held at speculative prices, either the overhead charges for capital and interest on the grazing business will be enormously increased, or the stockmen will be driven out at least temporarily. Ultimately, by the ruthless operation of economic laws, grazing units will be reassembled of sufficient size to permit the industry to resume its functions.

The worst effects of this speculative raid upon the arid public lands was postponed by the requirements that the officials of the Interior Department must first examine and classify the land as non-irrigable, non-timbered, and chiefly valuable for grazing, and the raising of forage crops. But the delays caused by this safeguarding of public interests are proving too irksome for the speculators, and by a recent amendment offered by a southwestern senator, all barriers are swept away and the applicant can file on any unreserved public land regardless of its character, whether timbered or otherwise. Should this amendment pass, the flood-gates are open and

the public lands will disappear over night in the worst scramble the West has ever seen.

We hold no brief for the cattle baron or sheep man, who in the past has monopolized the free range, fenced up the waterholes and driven out the homesteader by intimidation and violence. He should long ago have been made to pay into the public treasury the value of the grazing privileges on public lands, just as today he is paying for his grazing rights on both National Forests and Indian Reservations. But the stockmen fought this measure—and now find themselves facing ruin on the other horn of the dilemma.

In this contest for private gain, where does the public profit, and what thought is being devoted to the stimulation of the meat production on the western range? Whatever other effects the Fall amendment to the stock grazing bill will have, *it will at once and seriously decrease the production of meat, at the very moment when our national existence is threatened, and the triumph of human liberty and democracy depends directly upon increasing the food supply.* And to add a touch of satire to this vicious legislation, the amendment recently passed the Senate as a rider to the food bill.

How long will the nation continue to close its eyes to the fact that public welfare cannot always be best served by permitting the unrestricted operation of private greed? The new doctrine of public supervision and regulation for the good of the whole is winning its way slowly. The National Forests are the bulwarks of these principles. The history of the public range outside of the Forests may well be studied as an object lesson in the effects of unrestrained individual initiative.

This enormous and costly economic readjustment of the business of meat production on the Western ranges would probably have had to come some time, for the reason that the political pressure by states and localities seeking development and increased state revenue from taxation find no balancing or opposing force in the Department of the Interior, whose traditional policy is to dispose as rapidly as possible of public lands within its jurisdiction.

But that this movement should have been permitted to come to a head just when its disturbing effects upon meat production are most serious and keenly felt—and that the very bill passed to conserve the nation's food supply should be selected as the vehicle for its passage, betrays the utter disregard for public welfare and short-sighted selfishness inherent in the doctrine of individualism. Such measures will not aid us to win the war.

**T**HE College of Forestry of the University of Washington, one of the earliest of the forestry schools in the West, has been forced by the war emergency to entirely change its scholastic plan. The calendar for the coming year just issued, announces that all registrations have been postponed in this college until October 1, and that the university has elected for the period of the war to substitute the four quarter plan for the college year instead of the usual semester plan.

**A**S an interesting development in the wartime use for wood, it is stated by the authorities that the mobilization camp at the State Fair grounds, Syracuse, where 25,000 men are quartered, consumes more than 33 cords of wood a day for cooking purposes, or a total of 1,000 cords a month. This would represent the material obtained from necessary thinning and improvement cuttings in half a dozen good-sized New York farm woodlots.



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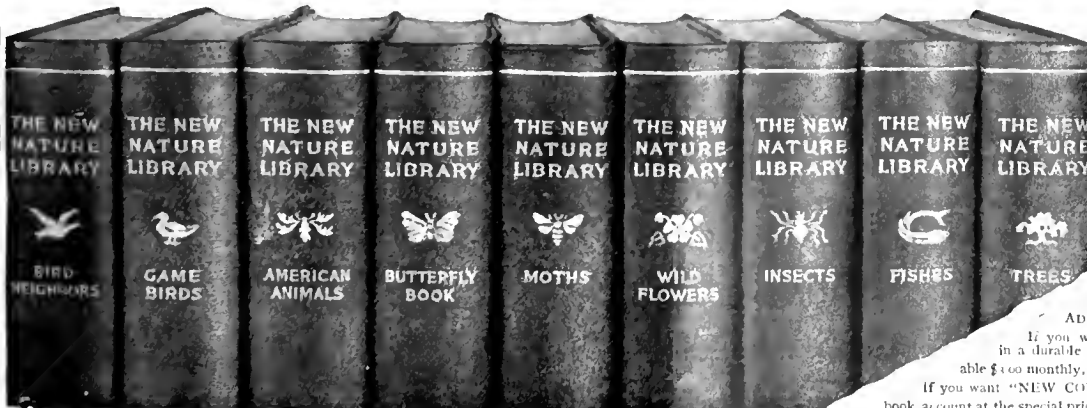
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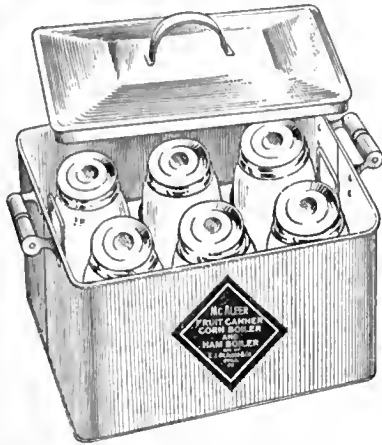
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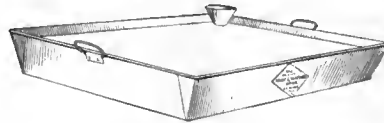
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French Forests and Forestry, by Theodore S. Woolsey, Jr. John Wiley & Sons, Inc., New York City. Price, \$2.50.

This work embodies the results of a study of the more important phases of forest practice in Corsica, Algeria and Tunisia. The author has not attempted to present a complete investigation of forestry in all its ramifications, but has rather aimed to set forth the essentials of French methods which might be applied directly in the United States, or would otherwise prove of value to English speaking foresters. His wide experience and studies abroad include not only Continental Europe and the French Dependencies described in the book, but also forest management in British India as well. Mr. Woolsey makes, in French Forests and Forestry, a most valuable contribution to the forest literature of the day.

1000 Hints on Flowers and Birds, by Mae Savell Croy. G. P. Putnam's Sons, New York City. Price, \$1.50.

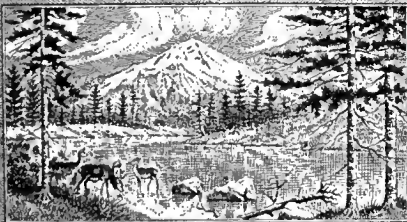
A very serviceable book, written for those who are interested in flower culture and in the establishment of wild life about the home, and so handled that it is of equal value to those who must live in cities and are limited in their efforts to a small back yard or a porch garden, and those more fortunate ones living in the country or the suburbs, who may spread themselves in planning and beautifying their gardens and grounds. The instructions for flower culture in Mrs. Croy's book are briefly and clearly given, and the information, classified under appropriate headings and exhaustively indexed, will prove invaluable to the flower lover and gardener.

The Bird Study Book, by T. Gilbert Pearson. Doubleday, Page & Company, Garden City, N. Y. Price, \$1.25.

To those who are interested in bird life and who desire to acquire a greater familiarity with the habits and activities of wild birds, this little book, charmingly illustrated, will prove a mine of pleasure and information. It is not intended so much for the advanced student of ornithology as for the beginner, taking up briefly the classification of birds, their form, color, distribution, migration, songs and foods, and it answers many questions which naturally occur to the student of bird lore. To know birds is to love them, and to be introduced to them through the medium of Mr. Pearson's book is to insure that love born of intimate knowledge.

An Introduction to Forestry for Young People, by Sir Andrew N. Agnew, Bart, Douglas & Foulis, Edinburgh.

This little book has been issued by the Royal Scottish Arboricultural Society, written by its president, with the object of



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arousing an interest among children in the important subject of forestry. The limited edition is being sent to masters of rural schools in Scotland as a means of broadening interest in this phase of education, and determining just how great a demand there may be for it. The Scotch Education Department has asked its inspec-

tors to bring the book to the notice of teachers or managers, and if this is done its purpose will have been accomplished, for it will surely inspire the intelligent interest hoped for by its eminent author.

(Books and periodicals indexed in the library of the United States Forest Service.)

## CANADIAN DEPARTMENT

ELLWOOD WILSON, SECRETARY, CANADIAN SOCIETY OF FOREST ENGINEERS

The resignation of Mr. P. Z. Caverhill as Forester in charge of timber surveys in New Brunswick, and his return to the British Columbia Forest Service are announced. New Brunswick is very unfortunate to lose so good a man and one who had made such good progress in his work. Mr. Caverhill's mapping and estimation of the forest resources of New Brunswick and the classification of its lands was making rapid progress and is of great value and the cost of the work was exceptionally low. It is to be hoped that a successor will soon be chosen and that the work will be brought to completion.

The Government of Newfoundland is expected to pass a bill permitting the export of pulpwood to the United States. Large quantities of wood were cut to be sent to England and France, but the difficulty in getting ships makes its transport impossible.

The Canadian Government some time ago took up the question of cheap wooden houses to replace temporarily the homes destroyed by the Germans. Some samples were made up and sent to Paris, where they were set up and attracted a good deal of attention. The French Government suggested several changes which will make the houses more expensive and Canada is ready to supply them. The long duration of the war has, however, side-tracked the matter for a time.

The British Columbia Forest Branch recently sent a carload of British Columbia timber as a present to the Toronto Technical School. This will serve to familiarize the young men being trained with that class of timber and when they later need to specify lumber in their work they will use western stock.

Prof. J. M. Swaine, Entomologist to the Dominion Entomological Department, has started on a trip through part of Quebec to study the cause of the dying of a great number of balsams. The trees turn brown and die. The same thing was noticed in France some 12 years ago and was described as a fungus disease and named *Phoma Abietina*. Mr. Lee, of the Forest Products Laboratory, will accompany Prof. Swaine, and they will commence their work in collaboration with the Forest Service of Quebec on the lands of the River Ouelle Lumber Company.

Dr. C. D. Howe, of the Commission of

Conservation, has finished his reconnaissance survey of the cut-over lands on which he is making an estimation of present stand, reproduction and probable rate of growth and yield. This is a very important matter, as the ideas of owners of timberlands are very vague if not altogether erroneous as to the future cut on their lumbered lands.

In this connection it is very interesting to note the increases in amounts of pulpwood being exported to the United States and the rapid increase in purchase of Canadian timber lands by American mills. The statement has been made that New York is practically at the end of her pulpwood supply and must look to Canada for the future. As the export of unmanufactured wood is prohibited and the amount of timber land held in fee simple is not very great proportionately, the New York mills had better begin to look out for the future. The consumption of pulpwood in Canada is rapidly increasing and owners who understand conditions are increasing their holdings and commencing to reforest. It is just as well to shut the stable door before the horse escapes.

The number of foresters in Canada going to the front continues to grow and the various services are getting short handed. The men who have gone are doing good work on the other side and the American units going over now will be very welcome.

Considerable work is being done this summer in the Alberta Inspection District of the Dominion Forest Service. Supervisor MacFayden has left to take charge of the Fort George District in British Columbia. A telephone line forty-two and one-half miles long has been commenced from the Headquarters at Entrance northward along the lower trail, the first twenty-one miles will be pole line and the balance will be a tree line. The poles are being treated with Carbosota. The line will connect several points where there are stations and also with two lookout stations. Inspector Manning, of the Brazeau Forest, met with an accident when his gasoline "speeder" telescoped a backing engine. The section foreman who was with him is laid up for repairs and only part of the "speeder" has so far been collected. In the Clearwater Forest a five-roomed house with barn and out buildings is being constructed at Nordegg Ranger Station. The bunkhouse has been nicknamed "The Ram

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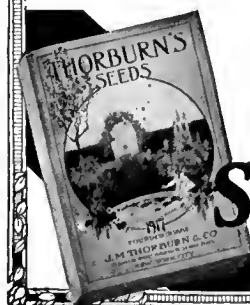
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AF 8-17

Pasture." A new trunk road is being built and this work will be done in the best manner possible so as to serve as a model both as to work and costs. In the Bow River Forest forty-five miles of telephone line have been built. A very successful ranger meeting was held at Morley when all sorts of problems were discussed and the men had an opportunity to get together. The Lesser Slave Forest is the only one which has been troubled by fire this summer. Assistant Director of Forestry T. W. Dwight has been making a tour of inspection.

Prof. W. B. Millar, of the University of Toronto, who resigned recently is in training at Fort Niagara, N. Y.

Messrs Benedict and Lafou, of the Brit-

ish Columbia Forest Service, have left to go overseas with U. S. Forestry Units.

Dr. Fernow and Clyde Leavitt, of the Commission of Conservation, are on a visit to Dr. C. D. Howe, at his camp on Lac Edward, Quebec, and will inspect the nurseries, plantations and experimental work of the Laurentide Company, near Grand Mere. In 1908 this company planted some Scotch Pine transplants, about three or four years old, received from Mr. E. J. Zavitz, Provincial Forester of Ontario. These trees have done well and average thirteen to fourteen feet in height. Last year some of them had cones, and the seed from one of these was planted this spring and has germinated nicely. Nearly all the trees in the plantation will have seed this year.

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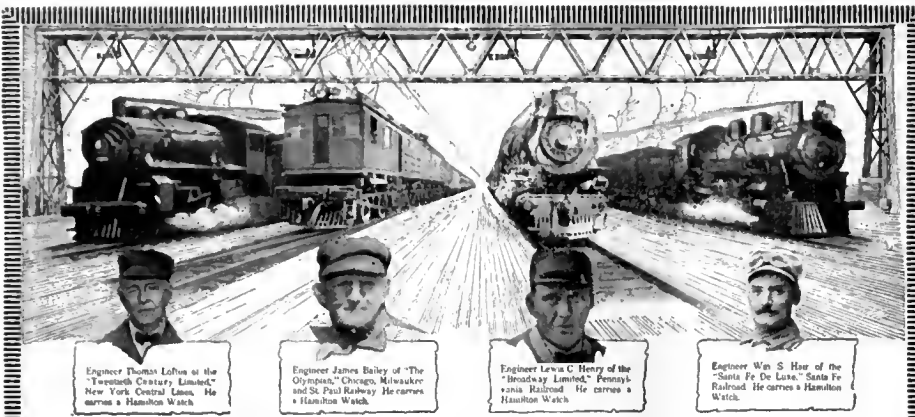
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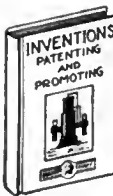
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- Southern lumber journal, June 16, 1917.—Lumber and the national defense, by R. S. Kellogg, p. 36.
- Timber trades journal, June 2, 1917.—Beech for bending, p. 996; Native timber trade of Ireland, p. 997-8.
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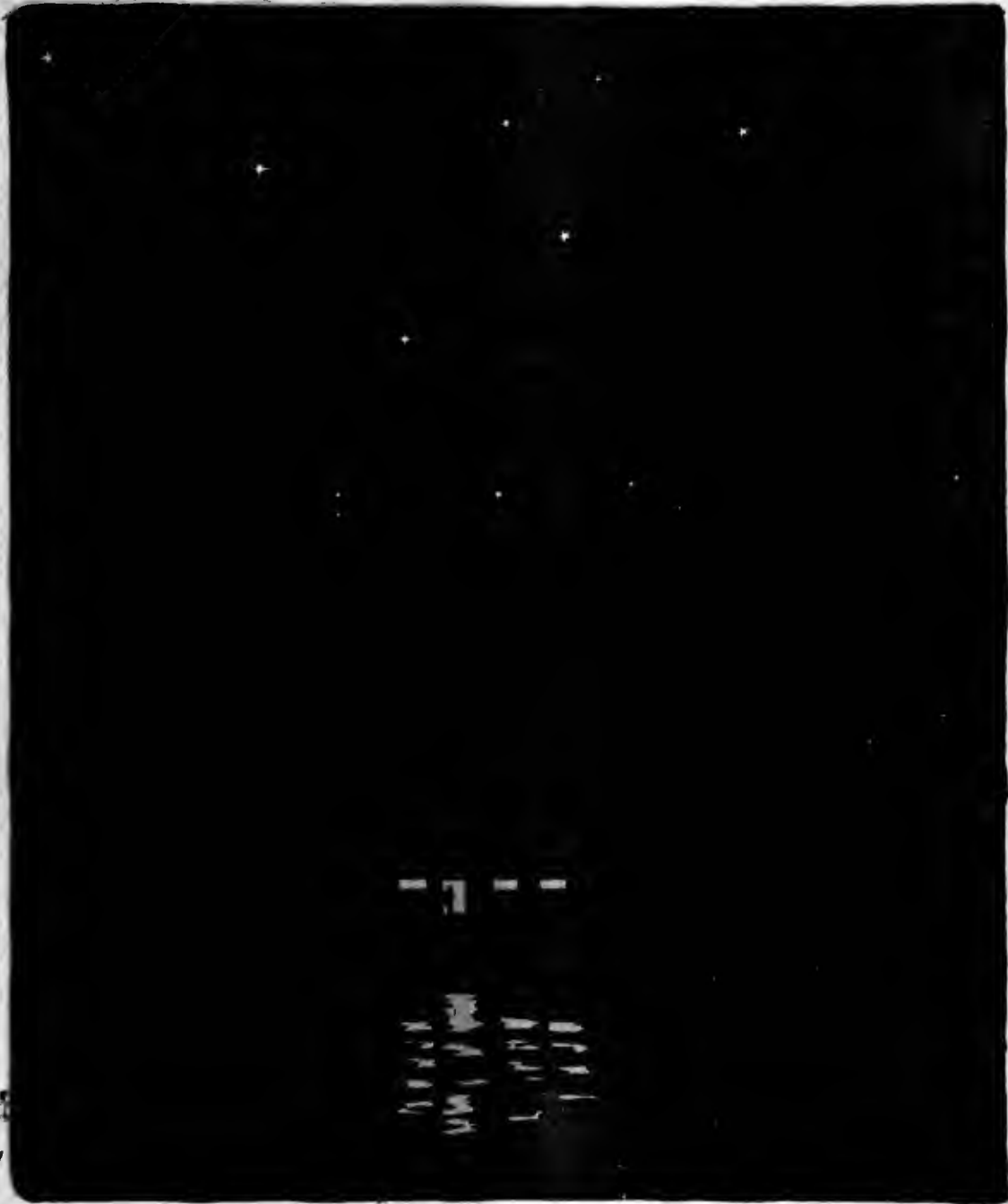
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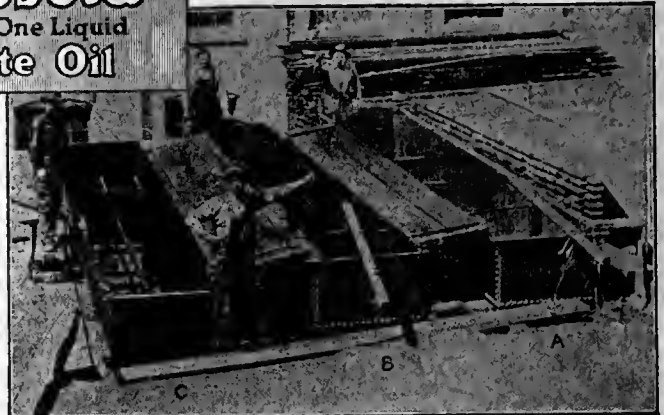


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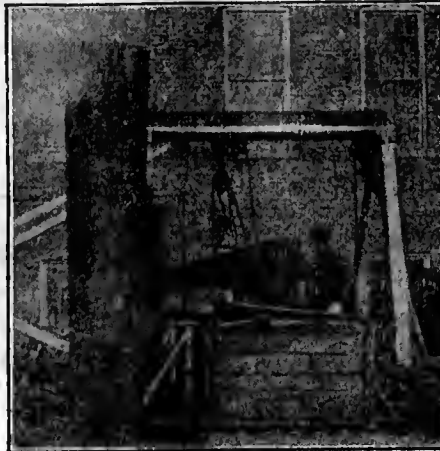
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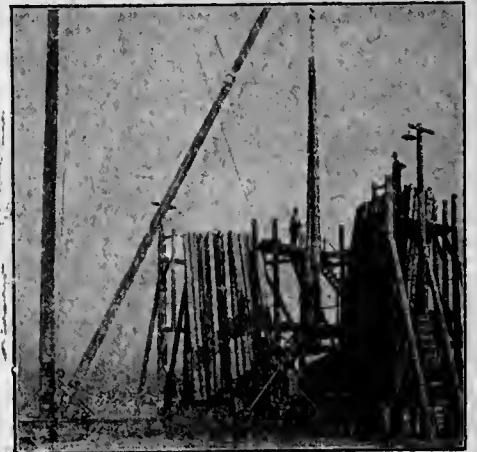
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# AMERICAN FORESTRY

THE MAGAZINE OF THE AMERICAN FORESTRY ASSOCIATION

PERCIVAL SHELDON RIDSDALE, Editor

SEPTEMBER 1917 VOL. 23

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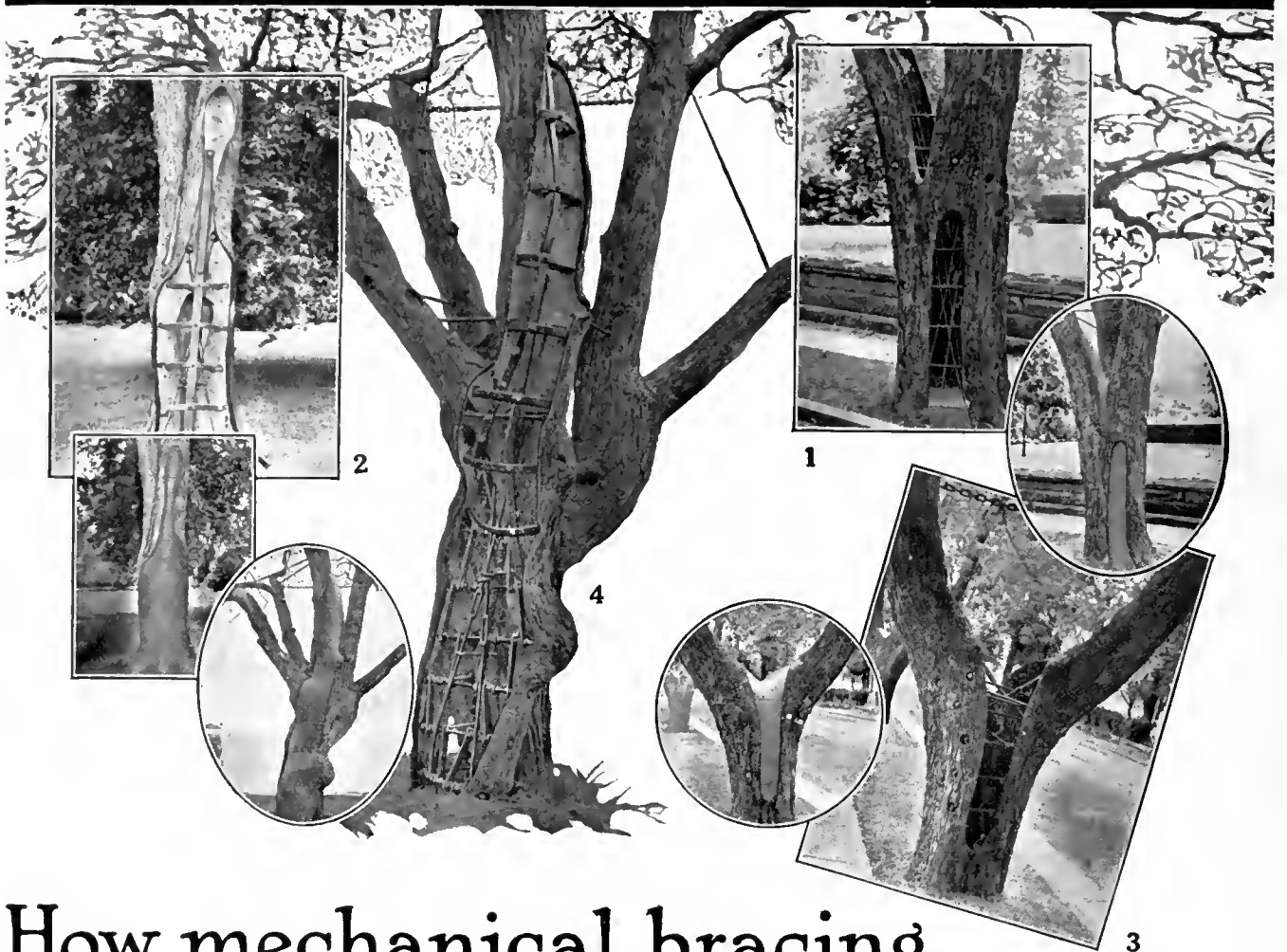
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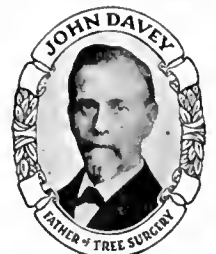
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SEALED BIDS, MARKED OUTSIDE "BID," White Mountain Apache Indian Reservation Timber" and addressed to "Commissioner of Indian Affairs, Washington, D. C.," will be received until 12:00 o'clock noon, Eastern Time, Wednesday, October 24, 1917, for the purchase of timber upon about 68,000 acres within Townships 8 and 8½ North, Ranges 23, 24, 25 and 26, and Townships 9 North, Ranges 24 and 25 East, G. & S. B. P. M., Arizona. The sale embraces approximately 400,000,000 feet of timber (about 35% Western Yellow Pine and 3 to 5% Douglas Fir and other species). Each bid must state the amount per thousand feet, Scribner decimal C. log scale, that will be paid for timber of all species cut prior to October 1, 1924. Prices subsequent to that date are to be fixed by the Commissioner of Indian Affairs by three year periods, in accordance with operating and market conditions. No bid of less than Three Dollars per thousand feet for all species within the sale area for the first period will be considered. Each bid must be submitted in triplicate and be accompanied by a certified check on a solvent National Bank, in favor of the Superintendent of the Fort Apache Indian School, in the amount of Fifteen Thousand Dollars. The deposit will be returned if the bid is rejected, but ten per cent. of it will be retained if the bid is accepted and the required contract and bond are not executed and presented for approval within thirty days from such acceptance. If the bid is accepted and the contract and bond executed, the deposit will be applied as an advance payment on the purchase price. The right to reject any and all bids is reserved. For copies of bid and contract forms and for other information regarding the offering, application should be made to the Commissioner of Indian Affairs.

The Department of Agriculture has advertised a tract adjacent to the Indian Reservation containing approximately 235,000,000 feet of timber. The Indian timber and same time with the understanding that the purchaser of these tracts may log them together. Information as to the National Forest Timber may be obtained from the District Forester, Albuquerque, New Mexico, Washington, D. C., August 27, 1917. CATO SELLS, Commissioner of Indian Affairs.

## 235,000,000 FEET

## NATIONAL FOREST TIMBER FOR SALE

**LOCATION AND AMOUNT.**—All the merchantable dead timber standing or down, and all the live timber marked or otherwise designated for cutting on an area embracing about 55,200 acres in T. 10 N., Rs. 23 and 24 E.; T. 9 N., Rs. 23, 24, and 25 E.; T. 8 N., R. 23 E.; and the unsurveyed land in approximately T. 8 N., R. 24 E., G. & S. R. P. M., within the Sitgreaves National Forest, Arizona, estimated to be 235,000,000 feet B.M., more or less, of western yellow pine, Douglas fir, Mexican white pine, cork bark fir, and Engelmann and Colorado blue spruce. Approximately 95% western yellow pine.

**STUMPAGE PRICES.**—Lowest rate considered \$2.25 per M feet for all species, rate to be readjusted October 1, 1924, and every three years thereafter until end of sale.

**DEPOSIT.**—With bid, \$10,000, to apply on purchase price if bid is accepted, or refunded if rejected. Ten per cent. may be retained as forfeit if the contract and bond are not executed within the required time.

**FINAL DATE FOR BIDS.**—Sealed bids will be received by the District Forester, Albuquerque, New Mexico, up to and including October 24, 1917.

The right to reject any and all bids is reserved.

Before bids are submitted full information concerning the character of the timber, conditions of sale, deposits, and the submission of bids should be obtained from the District Forester, Albuquerque, New Mexico, or the Forest Supervisor, Snowflake, Arizona.

The Commissioner of Indian Affairs is advertising a body of timber on the White Mountain Indian Reservation estimated at 400,000 feet more or less adjoining the above advertised area on the Sitgreaves National Forest. The conditions of contract and conditions on the ground permit the logging of both areas as one operation aggregating over 600,000 feet. Full information concerning the character of timber on the Indian Reservation, conditions of sale, deposits, and the submission of bids can be obtained from the Commissioner of Indian Affairs, Department of the Interior, Washington, D. C.



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# AMERICAN FORESTRY

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## THE FIRST FOREST REGIMENT GOES ACROSS

They've changed the Hun's ships names around;  
*Send us along, boys, send us along!*  
They didn't like Teutonic sound.  
*Send us along!*  
We're overdue beyond the seas,  
To hold us here is just a tease,  
So send us over, if you please,—  
*Send us along, along!*

*Chorus:*


As "Leviathan" the "Vaterland"  
Will gather no more moss;  
From "Hamburg" to the "Powhatan"  
Our gain is Prussia's loss,  
But we don't give a rip  
For the name of the ship,  
So long as we get across!

We itch to get there on the ground;  
*So send us along boys, send us along!*  
Right in the scrap we would be found;  
*Send us along!*  
We do not look for any ease,  
We'll work at first among the trees,  
Then we'll fight in the final squeeze,  
*So send us along, along!*

*Chorus:*

"Susquehanna" exchanged for "Rhein"  
In river names is fair;  
Our "Pocahontas" with "Irene"  
As a Princess doth compare;  
And the "Antigone"  
Is as "Neckar" to me,  
If she'll put us "over there!"

—*New Song.*

HESE were the sentiments expressed by members of the Tenth Engineers (Forest) in the early days of September, when each one of those days that passed in the camp at American University grounds seemed very late, rather than early. They lengthened out instead of growing shorter as all September days should do, and all because the regiment had not yet departed from a seaport on the Atlantic coast for somewhere in France.

In the latter days of August the regiment had passed in review before the Secretary of War and Assistant Secretary Vrooman of the Department of Agriculture. While the Tenth Regiment is a regularly organized military unit, and a part of the war forces, it remains true that in great measure the work of getting the regiment together had been done by the Forest Service, one of the bureaus of the Agricultural Department, so Mars and Ceres, figuratively speaking, together watched the regiment swing past.

And it did swing past, with the stride of a veteran organization; yet it had been given only a few weeks of drill. The men had real quality to begin with. Bystanders remarked how tall and broad they were, how bronzed and fit they looked. Why should they not appear to be what they were—men used to working outdoors, at jobs that required strength and alertness. Among the lot, also, was a very considerable sprinkling of college men, including not a few recent graduates and undergraduates from the forestry colleges, from California on the West to Yale in the East. "Eddie" Frey of Cornell was one of the intercollegiate champions in the two-mile run when he helped his Alma Mater clean up all four places in the event against the picked men of all the leading universities of the country. Another Cor-

nellian, and one of the smaller men, was George Kephart, coxwain of the Varsity eight-oar champions who had swept the Hudson at Poughkeepsie; and after that he was a member of Cornell's intercollegiate championship wrestling team. These men were typical of those who marched along with others who had achieved championships in "burling," cordwood-cutting, and the like.

After the final review, in which their fitness was everywhere apparent, they began to get impatient. They had men enough, and more than enough, for the unit which was to go across. Their equipment was complete, their personnel ready, chaplain and all.

The equipment included, besides sawmills and logging machinery and implements, a Red Cross ambulance and kitchen trailer, marked with the pine-tree badge of the Forest Service. These additional parts of the equipment were given by the members of the Forest Service, the funds being gathered in small contributions from office and field forces in Washington and on the National Forests, and in the various District headquarters in the West. Women clerks in the office and fire guards in the woods each gave her or his bit to these useful gifts, which were gladly accepted by the War Department and that department provided transportation for them along with the rest of the goods. Funds for an additional ambulance and trailer have been raised by District Six, which includes the administration of the National Forests in the States of Washington and Oregon. These will accompany additional forest engineer units now being recruited to follow the first one.

The welfare of the men is being looked after in other ways, and while no Y. M. C. A. unit accompanied it abroad, the work of such an organization is

being done by the regiment itself through men attached to headquarters. The Chaplain, assisted by Private Knowles Ryerson, who had specialized in rural social organization in California, will help to provide recreation, reading matter, and other comforts and conveniences. He took along a phonograph for each company, and was busily looking before he left for an angel to donate a motion picture projector. Six dozen talking machine records will help to introduce American ragtime to sylvan communities in France, and after they have been played out others will follow over. The Forest Service will help to supply the regiment with reading matter, and with various other necessary luxuries, under a systematic plan; and the American Forestry Association will see that they are supplied with tobacco and other comforts. If some of the fellows wear all the olive-drab knitted sweaters and mufflers that have been promised them they will be so swaddled up that they cannot move to do any work!

The last days at the camp were full of seeming confusion, but every activity was bent toward hastening the final get-away. Some of the last-minute hustle was due to the effort on the part of many of the newer arrivals in camp to make sure that they would be included in the first contingent, in case somebody, for any reason, might be unable to go at the last minute. No one wanted to remain as part of the nucleus of the following battalions. But everyone was cheerful and everyone was busy. Here was a group checking up the service records of the men who were going; there was another squad stenciling labels on boxes that were standing on every hand, while others with black paint and brushes were marking some of the boxes for use on the boat going over and some to go into the holds of the ship.

Major Dubois was omnipresent, gathering up the loose ends, and, as he expressed it, "busy like a bee." Major Chapman, with a most unpractised hand, was endeavoring to sew indelible name labels on his blankets and articles of apparel, while Major Benedict interrupted his own work of making a will to cast aspersions on Chapman's sewing, telling the latter to use white thread instead of black, to take shorter stitches and more of them, and finally to stop sewing said Chapman's name on his, Benedict's, blankets. There is no telling how much seriousness was cloaked under the raillery; possibly there was nothing but a boyish gladness at the prospect of their early departure. Captain Mason, at an Atlantic seaport—to use the phraseology of the "Official Bulletin"—was looking after the procurement and stowage of supplies; Eldredge was busy with equipment; Colonel Woodruff, in his office in the headquarters building, was the guiding center of all, to and from whom a succession of officers came and went on many errands. Every one was busy, clear down to the last private doing a farewell clothes-washing before he had to learn the methods of French laundering.

And now they have gone, sooner than most persons thought they would get away; sooner than seemed possible when the very barracks were begun only in late July; sooner, indeed, than they themselves had dared to hope.

A second regiment is already forming, with a good start in the later arrivals who came in for the first regiment, which was overmanned from an abundance of volunteers before the time came to go. The next regiment is to have ten battalions of lumbermen and

woods workers, the first two battalions to be raised at once, with the help of the Forest Service; the other eight are to follow in a short time. In addition, nine labor battalions to be used in connection with the forest regiments are to be recruited, two of these to be made ready just as soon as possible.

Both the officers and the rank-and-file have been rapidly gathered for the following contingents, and the activities at the engineers' camp at American University have not been greatly slackened by the departure of the first twelve-hundred. It is hoped that the next unit will be ready in as short a time as that taken by the first regiment, and that they can quickly be put to work for the triumph of democracy in overseas service. More men are wanted, between the ages of 18 and 40, and preferably with skill in woods work. Lumberjacks, portable-mill operators, tie-cutters, logging teamsters, camp cooks, millwrights and charcoal burners are among the types of men desired.

Majors Graves and Greeley, already on the other side before the first contingent started, saw the great possibilities of usefulness for many more men than went at first. The British authorities first called attention to the need of the foresters: now General Pershing's army needs the aid of forest engineers quite as much as do the English and French.

The regiments which follow promise to be equal to the earlier one in everything except possibly in youthfulness and "pep." They already show a probability of being ahead of it in maturity of personnel and seriousness of purpose. A spirit of adventure undoubtedly allured many of those who went over with the Tenth; sober judgment and a deep realization of duty are calling the others. Even at that, it seems that many a forestry college will give of its undergraduates for the forces now gathering, provided they can get in by passing the required tests of physique and experience. Last year the professors were urging their students to stay in school and complete their courses; this year all are more strongly imbued with the idea that every one who can go over should do so, and in the capacity for which he is best fitted. Young men in the forestry schools ought to make good in the forestry regiments, and they will undoubtedly gain invaluable experience. The facts that some forestry students were among the first to go, and that the call for all able-bodied men to get into action is so clear and insistent, are incentives for an increased number of applicants from this type—a type which can be very useful, especially among the lower grades of non-commissioned officers. Preference is being given, however, to men who have had actual woods experience.


The first of the "goodlie companie" of foresters has gone. Others will follow soon. It is a good thing for the profession of forestry, and it is a good thing for the business of lumbering that both classes are working shoulder to shoulder in the forests of France. It was in these same forests of France, some four hundred odd years ago, that two classes—knights and yeomen—fought side by side and learned the beginnings of democracy, and the dependence of one upon the other. American foresters and lumbermen have been learning this interdependence to some extent already; there will be a hastening of the process in the solidarity which is bound to spring up from a common experience on the same ground in a far greater struggle.

# WIDESPREAD ACTIVITY IN HOME FOOD THRIFT

By CHARLES LATHROP PACK

President of the American Forestry Association and President of the National Emergency Food Gardens Commission.

An inspection trip of community canneries was recently made by Charles Lathrop Pack, president of the National Emergency Food Garden Commission which is affiliated with the American Forestry Association. In these canneries, where neighboring families work together on a co-operative basis, Mr. Pack sees a splendid example of productive thrift. He makes plain in the following statement that the work of food gardening, of canning and of drying from Maine to California and from the Great Lakes to the Gulf has justified all expectations.

ET us consider what our home gardening signifies. It means that 1,100,000 acres of city and town land are under cultivation this year—much of it heretofore non-productive. The country-wide survey made by the National Emergency Food Garden Commission located nearly 3,000,000 food gardens, but this is not the best of the story. The canning and drying movement has brought back to thousands of American households an art almost forgotten since the days of our grandmothers. This is particularly true of the drying of vegetables and fruits which this year is being done by good housewives on a vast scale.

There is much evidence that our food gardens are helping our people to feed themselves more reasonably and will continue this helpfulness throughout the winter. The editor of the North American Review says in the September number: "Last spring, at garden planting time, we urged the increase of production partly through intensified culture to increase the yield per acre and partly through the increase of acreage by the cultivation of neglected fields and even small plots in suburban and urban areas. How well this policy was executed is seen in the reports of the National Emergency Food Garden Commission that the gardens of the country were this year more than trebled in area. Beyond question this achievement has much to do with the fact that the increase in price of garden products in the year was only 22 per cent, or less than one-fifth of that of bread stuff."

The results will this winter mean much for food F. O. B. the homes of America, and help us, by feeding ourselves, to feed our boys and our allies. We already have a million men under arms in our army and navy. There will be two million by spring. They must all be fed and the soldiers and people of France and England must be fed, and to a large extent fed by us—and we are going to see that this is done. In the canning and drying of vegetables and fruits the homes of America are contributing an important share.

The glass jar manufacturers of this country have delivered, to September first, about 119,000,000 quart glass jars. A survey of the household supply of jars in some twenty typical towns throughout the country shows that the housewives of America this year will use but one new jar to over three and one-quarter old glass jars on hand, and all of them, old and new, have been filled or will be filled. This makes possible the conservative statement that the home women of the country will conserve more than 460,000,000 quart glass jars of vegetables and fruits—certainly three

times what has been accomplished before. The drying has also added several million dollars worth to the food supply by preserving vegetables and fruits.

All of us can contribute our share in fighting the battles of the great war by doing our part in food conservation. This war is as much our war as it is the war of Europe. Unless we can keep the soldiers of the allied armies properly fed and can prevent hunger among the women and children of France, Russia and England, the western line of defense may be thrown back toward the Atlantic seaboard, and it is well within possibilities that in that event we would see the army of the enemy on our own shores.

Much has been said about food thrift and food economy, but I want to come to the defense of the good women of this country because it is the women who really understand what thrift means. It is my experience that the patriotic women of America have been practicing thrift all along and that they know how to practice economy without parsimony. This year they have added to their duties the patriotic work of food production and food conservation. A thrifty woman is a blessing to mankind and the women know very much more about real thrift than the men.

We are going to win this war, and we are going to win it by fighting with food. You cannot starve Germany. Ambassador Gerard has told us so. But we will starve our allies if we are so short sighted and small and mean and unpatriotic as not to deserve the name of Americans. This must not be and I feel safe in saying that it will not be. We face a race of people under a government intent upon the mastery of the world. The war seems far away to most of us but we are in reality fighting for our national existence and our national fate. We will realize this more fully when the great stream of wounded and maimed of our soldiers are sent back to us from France. But none the less, we are going to win this war. Our soldiers are going to do their part. We are sending our sons to the front and we who are at home, men and women, can carry on the good fight and do our part quite as well as the man with the gun. I feel sure that the men and women of America are doing their duty. I feel sure of victory, and when that victory comes there may be erected a monument commemorating the greatest event in modern history, bearing these words: "FOR DEMOCRACY AND CIVILIZATION—A WAR WON BY FREE MEN AND FREE WOMEN FOR HUMANITY."

## FOREST FIRES BURN MUCH TIMBER

**A**BSENCE of rain in some of the western states during the current season has created an unusual menace in the matter of forest fires. Until recently the danger has been kept down by the increased efficiency of the fire-fighting forces of the United States Forest Service and other agencies concerned with protecting the forests. Their work has been so effective that during the earlier part of the season the losses were slight and confined to small areas. Late in August, however, the outbreak of fires became so general as to cause serious alarm.

Reports received by the Forest Service indicated that the situation had then become more dangerous than at any time this year. Millions of feet of timber were threatened and it became necessary for the service to suspend some of its other activities in order to concentrate all available man-power and resources in fighting the flames. In Montana and northern Idaho two thousand men had to be engaged in the work under the direction of forest rangers. The expenditures in these two states during the earlier part of the season had aggregated about \$170,000. With the increased danger the expenditure rose to \$15,000 a day. The entire organization of the Forest Service in the affected districts has been devoting itself exclusively to fire fighting. Men from regions in which there are no fires have been relieving the rangers who have become worn out by their long exertions.

A grave phase of the fire menace is the threatened destruction of valuable timber intended for furnishing airplane stock for the fighting forces of the United States and its European allies. In Oregon and Washington this danger has been particularly emphasized. Several large mills supplying the government with material of this nature are in danger of having to make complete suspension of operations. The gravity of this situation is recognized by the Forest Service and every effort is being made to reduce the hazard to a minimum.

Prolonged dry weather has been responsible for the fire damage. The forests have become so dry that any fire which makes a start is likely to become a serious conflagration. High winds have prevailed also, and this has made control of even the smaller blazes extremely difficult. The seriousness of the situation is shown by the action of the governor of Oregon in postponing the opening of the hunting season in that state. This was made necessary by the need for keeping people out of the woods as far as might be possible.

Among the causes lightning has played an important part. Severe thunder storms have been prevalent throughout the mountain districts and these have resulted in many serious blazes. As a factor in causing forest fires lightning is one of the most difficult things with which the forest protectors have to contend. In a single limited area a short time ago 19 fires were started in one night as a result of lightning strokes.

These fires usually start at the foot of trees which have been struck and they smoulder for some time before making headway. Frequently they cannot be detected until a wind fans them into a blaze and it is no uncommon occurrence for a number of such fires to betray themselves simultaneously to observers through the columns of smoke that arise some time after the storm. One of the most serious phases of fires started by lightning is that they are apt to be in places that are inaccessible to the fire fighters. Trees at great elevations are more exposed to the bolts than those lower down and this increases the hazard.

The efficiency of the fire-fighting forces in the west is declared to be better this year than ever before. This is largely due to the lessons taught by the experience of the last year. The loss in the National Forests until late in August was comparatively small as a direct result of this increased efficiency.

At the offices of the Forest Service in Washington it is said that some of the fires of the summer and fall are reported to have been due to incendiarism, but that carelessness has shared with lightning the chief responsibility. Fires started by campers, settlers and locomotives have been frequent. Little or no rain has fallen for weeks, and, while it may be possible to keep the fires in check by organized protective work, officials say that the danger will not be eliminated until the fall rains set in, and nature asserts her protecting influence.

### WAR TIME USES FOR WOOD

**T**HE manufacture of gunpowder requires large quantities of charcoal, which can be secured only from hardwoods, and even smokeless powder requires the use of wood alcohol in its manufacture. This product is particularly necessary in the making of gun cotton. Wood alcohol is also used as a solvent in medicine and the wood distillation industry will contribute largely to the extra amount of hospital supplies needed during the present war. Acetic acid or wood vinegar, which is another important product, is used in the manufacture of cordite and liddite, two high explosives. Necessary increases in the production of steel for war-time uses will require a large amount of charcoal for use in blast furnaces. Besides these direct uses, the development of the American dye industry takes over a great deal of the wood alcohol obtained from the distillation of hardwood.

**T**WO pieces of maple received from the National Hardwood Lumber Association, one of which was badly discolored, were tested at the Forest Products Laboratory at Madison, Wisconsin. In mechanical tests, where slowly applied loads were used, the two samples were about equal in strength, but in resistance to shock the discolored piece was decidedly inferior. A microscopic examination showed the cell walls of the inferior piece to be partially destroyed by fungi.

# WAR AND THE FOOD PROBLEM

BY NORMAN C. McLOUD

If the individual members of the American Forestry Association could see the results achieved by the Association's Conservation Department in its efforts to help solve the national food problem they would realize that the work has not been in vain. In affiliation with the National Emergency Food Garden Commission this department has played an important part in the creation and conservation of a vast food supply. Through home gardening, home canning, home drying and home storage America has achieved a wealth of food products for both summer and winter. The growing season of 1917 has produced results hitherto unapproached in the annals of American gardening. In reckoning the worth of this garden crop general opinion accords generous credit to the efforts of the Commission and the Association's participation therein. The conservation of this yield is now under way, with results as important as those already achieved in the line of production. Every member of the Association is in position to help the cause by doing what he may to stimulate interest in canning, drying and storage for winter uses. Co-operation in this respect will be cordially appreciated by the officers and will constitute a patriotic service.

**T**HE more closely one looks at the food situation these days the less certain he becomes as to the real center of interest. National attention is being given so many phases of the question that it is hard to tell which seems most important. Food production, food prices and food conservation are all occupying the center of the stage. The effect is that of a three-ring circus, and in the face of this circumstance the individual citizen has responsibility to all three. That he is fully conscious of this responsibility is shown by the success of the home garden movement, the popular enthusiasm on the subject of price regulation and the persistence with which the people of America are engaged in the home canning, home drying and home storage of vegetables and fruits for winter uses.

All America has been amazed at the success of the home garden movement. The new planting area created through the efforts of the National Emergency Food Garden Commission and the Conservation Department of the American Forestry Association embraces back yards and vacant land in and around every city, town and village in the United States. With more than three million of these gardens flourishing where none had grown before there has come an addition of three hundred and fifty million dollars in crop value. This tremendous contribution to the resources of the nation is of vast importance in its relation to food prices and food conservation. Its effect on prices is immediate. New competition to the extent of three hundred and fifty million dollars has been no mean

factor in the cost of living during the summer of 1917. The thoughtful student of economics cannot fail to realize that without this competition the cost of living would have been greatly increased. Household expenses have been bad enough as it is. Without the food gardens they would have been far worse.

Herein lies the importance of food conservation in its relation to the generous crop of the home gardens of the nation. It is not alone for the growing season that the increased planting area must be made to exert its beneficent influence. Nature's contribution has as much meaning for the winter months as for those of summer. Wise utilization of the heavy crop demands conservation for the future. Conservation for the future demands home canning, home drying and home storage. These things must be done on a national scale. This means that they must be done in every household, or, in larger terms, by every community of households working together as a unit. In no other way may America

reap the full benefit of her heavy home garden crop. In no other way may the individual do such effective work in the regulation of food prices. In no other way may he accomplish such effective food conservation.

In its efforts to bring about the most effective thrift in handling the garden crops the National Emergency Food Garden Commission is conducting a nation wide campaign of education. This campaign is fashioned along lines to stimulate canning, drying, storing and other forms of preparing foodstuffs for



THE OLD BACK YARD.

A scene which was all too typical before home gardening was stimulated by the National Commission. Note the crop carefully and then look at the picture of the new back yard on another page.

the winter season. The Commission's Home Canning Manual was its first contribution to the literature of practical conservation. This was a companion book to the Home Gardening Primer, which was circulated to the extent of a million or more copies during the spring planting season. In the canning manual explicit directions are given for preparing vegetables and fruits by the single period, cold pack method of canning in tins and glass. As an indication of the care taken in its compilation it may be mentioned that the original manuscript was prepared by the Commission's experts on a basis of their own experience and on information obtained from the United States Department of Agriculture and various other agencies. When the manuscript was in completed form copies of it were sent to a

large number of the most competent authorities on the subject throughout the United States. In each case explicit criticism and constructive suggestion were requested, and in every instance the request was met with prompt compliance. In this way the manual was made to embody the best information from the best possible sources, and it was published in full confidence that it carried to the people of America the latest and most complete knowledge of the art of canning as developed by modern science.

That this confidence was well warranted has been shown by the acceptance of the Home Canning Manual as a standard and authoritative addition to the national literature on domestic science. This acceptance has been widespread and cordial. In various branches and bureaus of the United States Government the manual has been given the stamp of official approval by its adoption

for issuance to government institutions. Through the Marine Hospital Service and the Bureau of Education the booklet has been given wide circulation. As a result of suggestion in official bulletins government department employes have procured the manual for use in their own homes. In addition to general recognition from these official sources the manual has been the subject of a large demand from senators and congressmen for distribution to their constituents. Throughout the

country the recognition has been in keeping with that accorded in official circles at the national capital. Its distribution has been undertaken and its use urged on the public by state and local departments of education, by state and local war committees and by countless clubs and organizations interested in food conservation and domestic preparedness. That this general acceptance was based on merit is not to be questioned. Without such merit the acceptance would not have been possible. With such widespread endorsement the Commission cannot fail to feel that its manual has taken a foremost place in the literature of economics and that its influence for constructive conservation is fully demonstrated. In the preparation of the Home Drying Man-



READY FOR EITHER CANNING OR DRYING.

Who wouldn't envy the home gardener who produced this assortment of vegetables? The table is loaded with the products of a war-garden, worthy of the best professional growers. The products are here collected for canner or dryer and give rich promise for the winter.



SHOWING HOW SCHOOL CHILDREN GET AHEAD.

This picture suggests interesting possibilities in the way of pumpkin pies for the coming winter. The pumpkins were raised in war-gardens, planted and cultivated by school children and it is safe to guess that none of the young gardeners will go hungry for pie during the school season.

ual similar care was exercised. Every precaution was taken to insure authenticity in the instructions for reviving the lost art of vegetable and fruit drying in the homes of America. No available authority was overlooked and the Commission felt that the booklet was a worthy companion to its manual on canning. In this instance also was the confidence given warrant by the reception accorded the work. The official recognition given the canning manual was invariably shared by its





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**DRIED FOOD TAKES ITS PLACE IN SOCIETY.**

Recognition of the value of dried vegetables, fruits and meats was given in a luncheon at the National Capital at which the hostess was Mrs. Robert Lansing, wife of the Secretary of State. This picture shows the guests, all of them prominent in the official set of Washington society. They agreed that the luncheon was one of the most delicious they had ever eaten. At the table, from left to right, are: Mrs. Redfield, wife of the Secretary of Commerce; Mrs. Hugh L. Scott, wife of the Chief of Staff of the United States Army; Mrs. Champ Clark, wife of the Speaker of the House of Representatives; Mrs. Lansing, the hostess; Mrs. Atlee Pomerene, wife of the Senator from Ohio and Mrs. Josephus Daniels, wife of the Secretary of the Navy.



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**TOOTHsome VIANDS AT MRS. LANSING'S DRIED FOOD LUNCHEON.**

When Mrs. Robert Lansing, wife of the Secretary of State, entertained prominent Washington matrons at luncheon the entire bill of fare was made up of Dried Foods. This picture gives an idea of the appetizing spread. The six course meal included dried vegetable bouillon, dried chicken, dried vegetables of many kinds, dried fruit and dried mint. The Neapolitan salad was typical of the luncheon. It was made of dried peas, dried lima beans and dried tomatoes, with cream cheese filling. All the vegetables were "brought back" before using, by steaming and soaking. The roast chicken, shown in the center of the picture, had been first cooked, the dried in the oven and then steamed and soaked, to restore its original volume. With the chicken were served caramel sweet potatoes, corn balls and creamed dried cucumbers on toast.



SUCH A POTATO PATCH!

With war gardens of this nature thriving throughout the land America faces the winter with cheerful confidence. The boys did all the work and deserve all the credit.

sister booklet. Wherever the government or other agencies undertook the distribution of the one it did the same thing with the other. As a result of these various forces and of the distribution of 30,000 or 40,000 a day from the offices of the Commission each of the manuals has attained a circulation of several million copies. The aim of the Commission to place the booklets in practically every home in the land has approached realization and those who are familiar with the enterprise are of one voice in expressing appreciation of this patriotic gift to America at war.

As an indication of the national importance attached to the preparation of foodstuffs for winter uses widespread interest was taken in a luncheon recently given in Washington by Mrs. Robert Lansing, wife of the secretary of state. At this luncheon the entire bill of fare was made up of dried food products. Women prominent in the social life of official circles at the national capital were included in the list of guests and all of them manifested genuine enthusiasm over the excellence of the luncheon.

Not content to rest on its laurels with a realization of work well done the Commission late in August made contribution of another booklet in its series of publications on food conservation. In the fourth manual explicit instructions are given on a variety of subjects involved in preparedness for the winter season. The topics include storage, pickling, fermentation and salting and to these are added directions for making potato starch, fruit butters and kindred products. Prepared with the same care given the other manuals the new booklet met with immediate welcome, and the demand for it has been such as to place a severe strain on already overtaxed printing facilities. With a determination to meet the demand promptly the Commission has had some of the largest printing establishments in Washington, Baltimore and Philadelphia running day and night. As a result there

has been no delay in meeting requests for the various publications and this promptness has played its part in giving the manuals the widespread distribution with which they have met.

The storage of vegetables for future uses is as important as canning and drying. To keep vegetables in their natural state is regarded as the simplest form of preparation for winter needs and therefore one of the most useful. As a premise the manual declares that by taking proper precautions against decay and freezing an abundant supply of many kinds of fresh vegetables may be kept for winter uses at a minimum expenditure of money and effort. From the introduction to the manual I quote some of the arguments in favor of home storage as follows:

"The importance of making provision for winter food needs was never so great as this year. Every pound of foodstuffs than can be spared for export will be needed in Europe for feeding American troops and to prevent the starvation of the domestic and military population of the Allied Nations. Every pound of vegetables stored away for home uses will release food for export. A nation at war is a nation with a food problem. A nation with a food shortage is a nation in peril. For this reason it is of vital importance that no vegetables of high food value be allowed to go to waste.

"The home gardening campaign conducted by the National Emergency Food Garden Commission this year resulted in the creation of a vast new planting area. More than three million gardens have been planted where none grew before. The output of these gardens is greatly in excess of immediate needs. Unless proper steps are taken to safeguard the surplus the waste will be prodigious. This Commission has already stimulated nationwide activity in canning and drying. The purpose of this booklet is to arouse similar interest in the storage of



THE NEW BACK YARD.

Instead of trash and tin cans the backyards and vacant lots of America now show crops of this nature. Note the contrast with the earlier picture of the old back yard—and take your choice.



DOESNT SHE LOOK LIKE A PRIZE WINNER?

This young woman has put up 56 varieties of vegetables and other food products. She is typical of those who are eligible to the winning of prizes in the Commission's national contest for the best canned goods displayed at a fair. She is an earnest believer in the cold-pack process, for she knows what it can do.

vegetables and in other forms of winter preparedness.

"Storage is an essential factor in Food Conservation. Households which fail to store their own supplies will find themselves forced to pay winter tribute to the wide-awake business concerns which have practiced storage on a commercial scale. By storing vegetables during the season of lowest prices even the household which has no home garden can save much of the cost that would be involved in winter purchases and incidentally make important contribution to the national food supply."

In its list of vegetables which may be placed in home storage to good advantage the Commission includes late potatoes, beets, carrots, parsnips, turnips, sweet potatoes, onions, celery, cabbage, salsify, dry beans, dry lima beans, cauliflower, brussels sprouts, squashes, parsley and even tomatoes. Various methods are explained for keeping these vegetables, ranging from the pantry shelf, the attic and the cellar to outdoor pits, cellars and cold-frames. One form or

another of storage is available to every household. Even the apartment dweller can find the room and meet the requirements for storing some of the products mentioned. The results will well repay the slight effort involved.

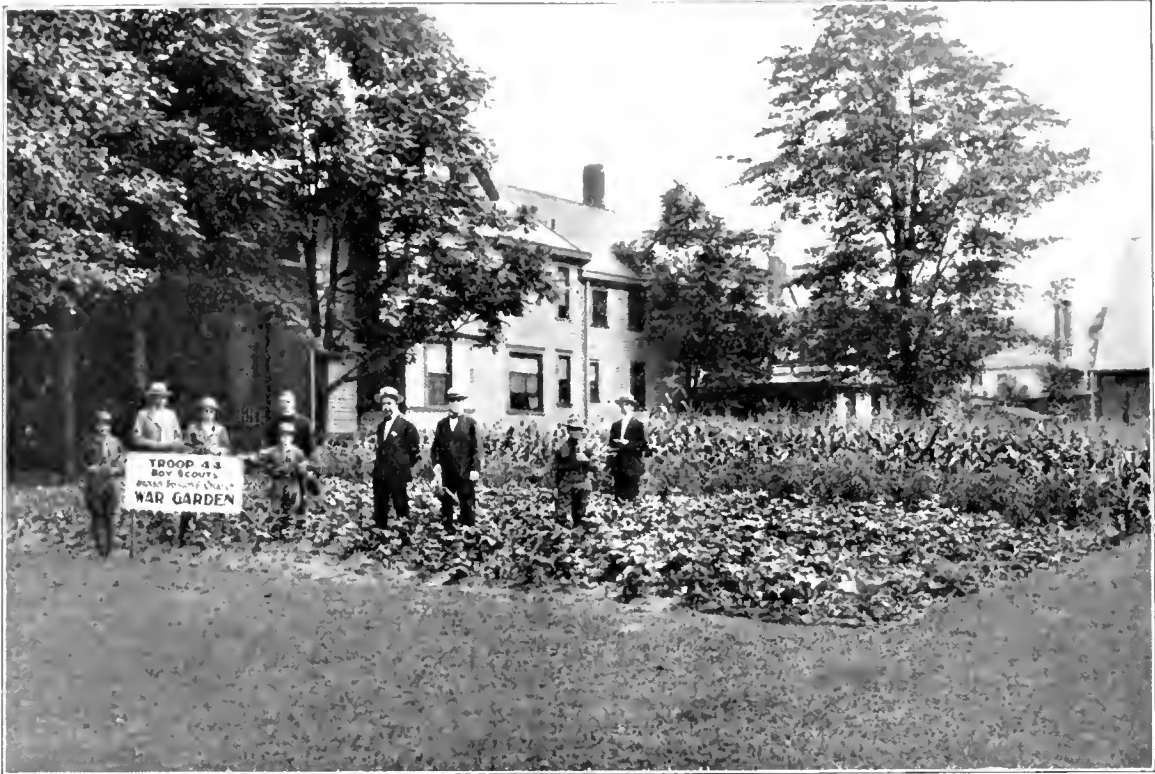
Potato starch is given special attention in the manual. As an article of diet this home-made product has qualities that commend it to the consideration of every house-

hold. As a measure of conservation it utilizes culls, bruised, poorly developed and otherwise useless potatoes, of which it is estimated that probably 75,000,000 bushels go to waste in the United States each year. Another advantage is that it provides a healthful and appetizing food product which can be used in many ways where flour is now used. Added to these are the ease and simplicity with which it may be prepared. No equipment is needed other than a cylindrical grater or sausage grinder, a pan or galvanizing vessel for holding the potatoes, another vessel into which the grating



FAIR CANNERS AT A STATE FAIR.

An exhibit of canned goods prepared by a club of girls and displayed as an object lesson for their neighbors. This is food thrift in its most practical form and is the sort of thing that will enable Uncle Sam to feed the world.



**A MAYOR AND A WAR GARDEN CHAIRMAN WHO ARE JUSTLY PROUD.**

This picture shows Mayor Davis of Cleveland and George A. Schneider, chairman of the Mayor's War Garden Committee, inspecting the crops in a garden planted and cultivated by a troop of Boy Scouts. This garden is in the heart of the city and fronts on Euclid Avenue, a street as famous as the Champs Elysee or Piccadilly. This garden is one of the many which are to be found on the Lawns of Euclid Avenue. It is surrounded by homes of wealth and fashion, and this environment doubtless had its influence in prompting the young gardeners to make their garden as attractive as possible. Mayor Davis is the man with his hands behind his back. Mr. Schneider stands next to him, towards the center of the picture. Scout-master McMasters is shown with his hat off, near the sign.



**WAR GARDEN ON THE LAWN OF ONE OF CLEVELAND'S HANDSOME HOMES.**

In Ohio the home garden found ready response. Cleveland is noted for its beautiful homes and broad sweeps of lawn. In this picture is shown the home of Mr. and Mrs. Edmund Stevenson Burke in the Wade Park district, one of the most exclusive residential portions of the city. Mr. Burke is a man of great wealth to whom home gardening appealed as a patriotic movement. Converting his well kept lawn into a garden patch he raised the crop here pictured, consisting of corn, cabbage, carrots, beets, tomatoes, beans, parsnips, pepper and parsley. Mr. and Mrs. Burke are spending no time waiting to see what the neighbors will send in for their evening meal.



WHAT ONE CLEVELAND FACTORY ACHIEVED IN ITS WAR GARDEN.

This is not a Kansas Ranch, as might be suspected from the broad acreage devoted to the raising of farm produce. It is the war garden of the Otis Steel Company's employes, on vacant land near the company's big manufacturing plant, in Cleveland. This is one of the gardens in which Mayor Davis and Chairman Schneider take much pride. It is typical of the factory gardens in one of America's greatest industrial centers. Such gardens have been made throughout the manufacturing district of Cleveland and other cities and their contribution to the nation's food supply is of tremendous volume. This garden includes thrifty crops of such vegetables as cabbage, corn, beans, potatoes, tomatoes, cauliflower, egg-plant, celery, beets, cucumbers and kohlrabi.



ANOTHER WAR GARDEN WHICH HAS THRIVED ON A CLEVELAND LAWN.

Louis F. Krieg is also a Cleveland home gardener who does not have to sit around waiting for contributions from the neighbors. From the looks of the garden here pictured the Krieg family has enough for the entire neighborhood. As a result of converting his vacant land into a new planting area Mr. Krieg has a crop which ranges through the alphabet from beets to turnips, and embraces cauliflower, onions, tomatoes, carrots, cabbage, Swiss chard, corn and cucumbers. According to a report received from George A. Schneider, chairman of the Mayor's War Garden Committee, this garden is one of the thousands which have made Cleveland one of the most important centers of city farming during the war emergency.

or grinding is done and another into which to empty the gratings: water in abundance and cloths for wiping. The starch resembles wheat flour in whiteness and smoothness. Its use in making such dishes as boiled custard, lemon pudding, fruit blanc-mange, lady fingers, angel cake, lemon pie and

sponge cake is described in detail in the manual. For these and some other purposes many expert cooks declare the starch to be superior to wheat flour.

Fermentation and salting are also given detailed attention in the new manual. Complete instructions are given for the making of sauerkraut by both methods and directions are also included for the preservation of cucumbers, green tomatoes, beets, string beans and peas by fermentation. During the winter these vegetables may be served as they are or they may be freshened by soaking in clear water and cooked as fresh vegetables. Because of this feature they make an important addition to the winter diet and furnish useful variety for the daily bill of fare.

The manual also gives instructions for making peanut



CANNER INSTEAD OF CANNON.

The group here pictured forms an important part of the National Army. It is made up of members of a canning club in a Middle Western community. These food savers are playing a big part in the war-time emergency.

butter, apple butter, gingered pears, grape jam and various vegetable and fruit pastes for use as desserts or as garnishes. The variety of subjects included make an important addition to the household collection of books on food conservation. As with the booklets on canning and drying it is intended for

free distribution. To procure a copy of any of these booklets an application enclosing two cents for postage should be sent to the Commission at 210-220 Maryland Building, Washington, D. C.

In addition to its publication and its daily canning, drying and storing lessons published in 2000 newspapers throughout the country, the Commission has made another contribution of national importance to the campaign for food conservation. This contribution takes the form of \$5000 in prizes and National Certificates of Merit to be given home canners in every state of the Union and in various parts of each state. One thousand prizes of \$5 each will be awarded for home canned vegetables displayed at fairs, food shows or other public exhibits held anywhere in the United States. With each



FROM GARDEN TO PANTRY SHELF.

Some of the steps in cold-pack canning are here illustrated. The vegetables make the journey from left to right, passing through the various processes from picking-over and washing to sterilizing in a wash boiler hot-water bath, placing in jars and sealing. The girls are all eagerness and enthusiasm as may be seen from their expressive faces. Suppose you try this on your own household.



#### HAVE SOME CARROTS?

Who could refuse such fresh and palatable looking vegetables as are here shown? These carrots were raised in a home garden and canned by the cold pack process.

prize will be awarded a certificate to serve as a permanent record for the holder. The only stipulations are that the canned goods entered in the contests shall be home canned and the product of a home garden in a city, town or village. Keen interest has been shown in the prizes and so general has been the response from fair officials as to indicate that the competition will be one of the most popular ever conducted on a national scale.

While popular interest is now concentrated on canning, drying and storage, the echoes of food gardening pour into the Washington offices of the commission in never ending stream. Typical photographs taken from the day's mail are those from Cleveland, Ohio, reproduced in this issue of *American Forestry*. In Cleveland the home gardening movement made a remarkable showing. Through the activities of a war garden committee appointed by Mayor Harry L. Davis, and with the cooperation of the National Emergency Food Garden Commission, the Ohio metropolis blossomed with food gardens from center to circumference. Chairman George A. Schneider was the active head of the mayor's committee and he carried on his work with an enthusiasm and effectiveness that have won recognition for him as one of the most successful of the year's leaders in enterprises of this nature.

In the work of individual gardeners an example of

what may be accomplished in small space is given by the results of the home garden of Mr. and Mrs. R. L. Betty at West Point, Mississippi. On a piece of land less than 70 feet square the Betty family has produced and is still producing all the vegetables used on the table of a family of three for seven months, giving a supply that will continue until Christmas. In addition to this yield the garden provided the material for 640 cans of fruits and vegetables, prepared by Mrs. Betty on a small home canner. As an added measure of crop value may be mentioned the realization of \$30.00 in cash from the sale of products not suitable for canning. Other results are one peck of dried corn, one peck of dried butter beans, one peck of California white peas, sufficient good seeds for next spring's planting, a good crop of potatoes and sweet potatoes, 10 pumpkins, 150 collards for winter and a 70 foot row of peanuts. The total expense for the garden was less than \$5.00 and the expense for cans, canner and fuel less than \$30.00.

This garden may be taken as typical of the results achieved by home gardeners throughout the land. Their contribution to the resources of the nation is tremendous. Their yield in individual comfort and satisfaction to their owners is of similar worth. Of no less value is the object lesson in thrift which these gardens have furnished. In the case of the Betty garden this thrift prevailed from seed time to harvest. Even the grass and weeds on the planting site were not wasted. All vegetable matter of this nature removed from the garden plot was saved to use in enriching the soil. This utilization extended throughout the season with the maturity of



#### COMMUNITY CANNING WORK.

The Commission recommends cooperative canning and drying. If several families join forces and buy equipment the cost is slight to each household. By working together at some central place the work is easier for all.

the various crops. Tomato vines, for instance, were employed to enliven the soil for the asparagus bed. Corn stalks were placed in a ditch under the late potatoes to hold the moisture. Waste tomatoes from canning operations were thrown on a fertile spot, where the seeds germinated and produced plants which were sold to eager buyers for late planting. As a lesson in thrift such gardens as this furnish inspiration to all home gardeners. They are a manifestation of the true patriotism. Their owners are the true conservationists. Their carefully guarded food supply is the true secret of national preparedness. Without them America would face the chill of winter with dread and apprehension. Without them we would have difficulty in feeding even ourselves, to

say nothing of supplying food for our troops in foreign fields and the people of our European allies. With the rich harvest of these gardens and the careful conservation of their output we can go into the coming winter with the calm assurance and quiet confidence which are essential to a nation at war. We can know that America is in position to do its duty toward civilization—a duty which involves food supply as much as it involves men and munitions.

Among the nations engaged in the fight for freedom America is the one country with a surplus of foodstuffs. All Europe is in a state of chaos. Her fruitful farms are devastated and her producing peasants have become embattled warriors. Lacking the land for cultivation and the men for doing the work she must look to the United States for the means of sustaining life. Without our help she must face famine, and famine means defeat. Her soldiers cannot fight unless they are fed. Under the pinch of hunger her domestic population cannot give her armies adequate support. America's duty, therefore, is manifest. We must share our abundant stores with the

people of Europe. That this may be possible we must practice food thrift without cessation. Nothing must be wasted. Nothing must be unwisely used. The surplus of summer must be made the abundance of winter. By canning, drying and storing for our own uses we will release foodstuffs for European export. Nothing less should be considered. If the world war is to result in

victory for democratic arms and democratic institutions nothing less is possible. Every American citizen must become a soldier in the army of food conservation. Food waste is the foe and food extravagance the enemy plotter. Food economy must be the watchword and food thrift the battle cry. To keep these things in mind and act accordingly will mean victory. To ignore them will

mean that the fight is hopeless. Faith in the people of America leads to the conclusion that the American food



WHAT COULD BE SIMPLER THAN THIS?

Here you see one of the easiest forms of vegetable and fruit drying. The three trays are made of strips of wood with galvanized wire mesh. They are placed on a table and facing the end of the trays is an electric fan. Excellent results are obtained in this way.



DO YOUR APPLES LOOK LIKE THIS?

A dish of dried apples, neatly and efficiently curled by modern methods of drying. Think of the apple pies made possible by having a store of such apples on your pantry shelf.

supply will be so wisely utilized as to bring about complete triumph for the allied forces of democracy.

**P**ROFESSOR R. R. FENSKA who has been professor of engineering at Wyman's School of the Woods at Munising, Michigan, has resigned to accept a position as assistant professor of forestry at the University of Montana, Missoula, Montana.

**A** DEPARTMENT of Forest Chemistry has been established at The New York State College of Forestry with Dr. S. F. Acree, formerly of the United States Forest Service Laboratory at Madison, Wisconsin, in charge.



## WHAT ABOUT TREE SURGERY?

BY J. HORACE McFARLAND

**T**REES are marvels of natural engineering. When I see a tall tulip or a great elm sustaining a gale of wind; when the small boy comes into view hitching himself out to the perilous end of a cherry branch; when a saucy robin scolds me from the very tip of a twig on which he has just alighted, I think again of the wonder of the woody structure that can carry so much of an overload, do and be so many things in flower, fruit and timber production, and yet be a most beautiful object in its adornment of the surrounding landscape.

I have several times tried out the breaking strain of little tree twigs, brought to the ground by progressive ice-storms. From twelve to sixteen times its own weight of ice encased the twig before it broke away, and then the break occurred by reason of wind pressure, not of overweight. Few engineers provide such a factor of safety as is found when a certain twelve-foot cedar at my garden gate bows its tips in a graceful semi-circle until the topmost twig touches the snow under the influence of the weight of slush with which it is laden.



READY FOR THE FILLING

Tree on the State Capitol grounds at Albany, N. Y., with decayed portions removed and ready to be filled by an expert tree surgeon working for the New York State Conservation Commission.

When I see a scene of this nature and realize that the tree is going to straighten up and become upright again after its winter trials are over, again the wonder assails me; wonder whether any human engineer would even think of designing a structure to stand such a strait! And, if he did venture, how would the engineer's tree look, in comparison with God's cedar.

Even disease is sustained by trees with resistance and fortitude not possible to man-made construction. When, after what must have been at least two generations of progressive decay, the great oak succumbs and is broken, it is seen that for many years the tree has existed, made leaves and acorns, and has done its beneficent work on a mere shell and remainder of its once sturdy trunk. The man-made column of Bessemer steel, once it has begun to rust, simply disappears in a few years.

Once a certain horse-chestnut at my home showed a "split" at the fork of its two main branches. When investigated, the split developed into a mass of rotten wood,



THE WORK PARTLY COMPLETED

The filling of the lower cavities of the tree with concrete has been completed and the method by which the operator is filling the upper cavities is indicated by the photograph.



*Courtesy the Missouri Botanical Garden*

TREE IN NEED OF REPAIR

in which was growing a young horse-chestnut tree with a bundle of roots fully two feet long and six inches through. In the crotch, opened by wind and snow, a mature root had lodged and finding germinating conditions, had begun literally to eat the heart of its own father-and-mother tree.

When fully explored, and the decayed wood removed, the cavity in this tree was found to embrace all of its main bole but a bare inch inside the bark and cambium, and to extend more than ten feet

up the main branch. The tree was nothing but a shell, and the first gang of "tree surgeons" which had opened its wounds and diagnosed its injuries was aghast at the situation, being afraid to undertake final treatment. As the horse-chestnut occupied a strategic position on my lawn, and I was not of an age to calmly contemplate waiting twenty years or more for the gradual replacement of its effective beauty, I was willing to call in a consultant.

His conclusion was that the tree might be saved; and he prescribed an interior arrangement equivalent to the artificial leg my father tried to wear after his heroic experience at Gettysburg in 1863. Two lengths of flat iron,  $2\frac{1}{2}$  inches by  $\frac{5}{8}$  inch, each eleven feet long, were inserted and cross-braced. The clean cavity was made aseptic; a curious drainage lip was carefully cut around its edges, and then the whole of it was concrete-filled.

No, not the whole of it; for the concreting stopped short or inside of the bark surface at the drainage

lip, or "water-shed," as I was informed it was called in the terminology of the trade. There must be no obstacle in the way of the rolling over of the cambium layer, if the operation was successful and the patient also lived.

All this trouble had arisen because of the original split in the crotch of the tree. To avoid a recurrence of this split when the winds should again blow, the surgeon braced the big limbs above, not by rigid, unyielding iron, but by easy chain links, connecting the parts of the tree, but permitting wind movement. These chains were anchored by bolts run clear through the solid wood above the cavity, the heads being recessed into the central structure inside the cambium layer.

To provide an outlet for any moisture that might leak through, a drainage tube was inserted at the lowest level of the excavation.

There were five of these horse-chestnut trees, all

of them important to my home, and all having been growing about it some thirty-five years before I came into possession. All were in trouble from crotch splits, though not to the extent described above. All were treated as seemed necessary, being cleaned out to sound wood, braced above and below, and duly filled with concrete. The work was expensive, as well as extensive; but when I contemplated the bill on the basis of putting the trees into prosperous health, as compared with their im-



*Courtesy the Missouri Botanical Garden*

BOLTED AND BRACED



*Courtesy the Missouri Botanical Garden*

FILLED WITH CONCRETE AND PAINTED

pending death by disease or mutilation by wind-storms, it did not seem so large. If I had had the amount of it piled up in copper cents, the bulk of them would not

narrower cavities are almost closed; the trees have grown vigorously and bloomed exuberantly.

But there has been some later treatment by the tree-surgeons. Just as with man-surgeons, they are learning. When I think of the suffering endured by my father in the thirty years he lived after the surgeons had done their Civil War best—and worst!—with his two legs, and



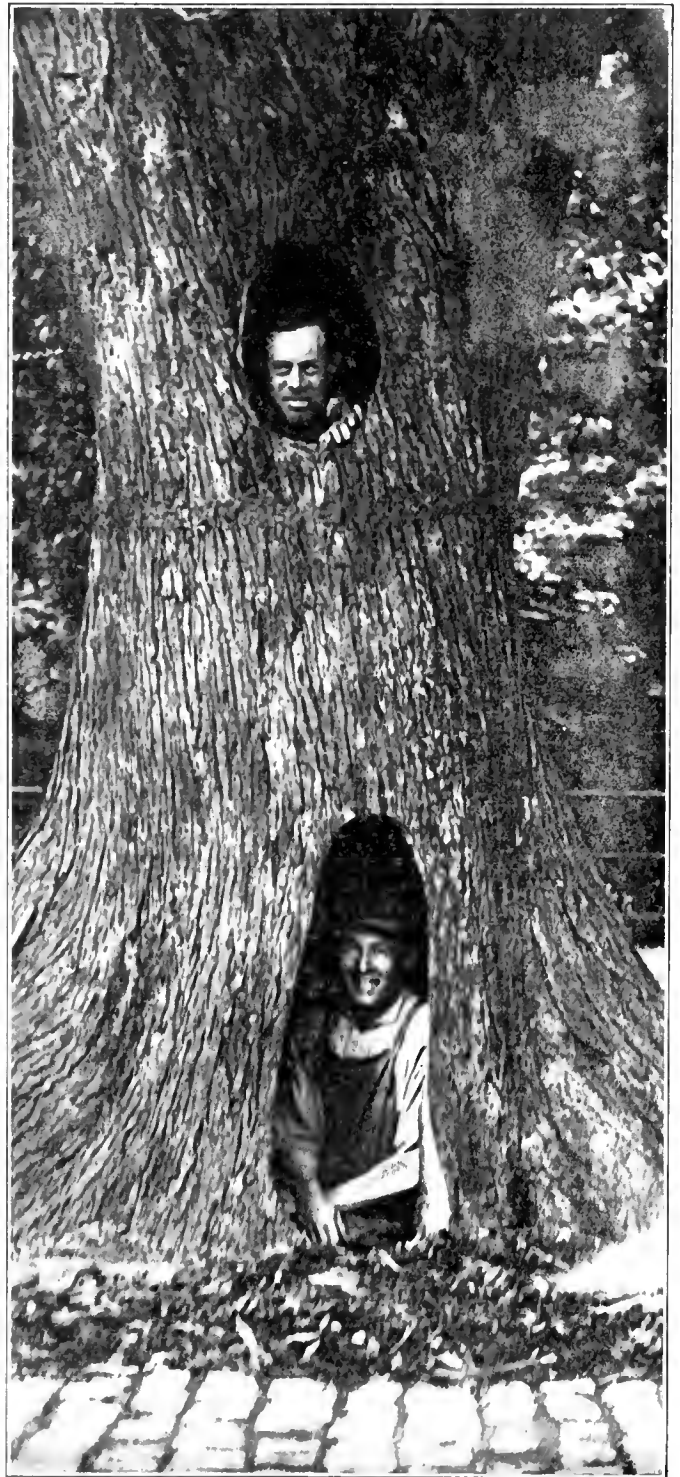
CUTTING OUT A CHESTNUT BLIGHT CANKER

A member of the Pennsylvania State Forestry Department being a tree surgeon, cut out this canker, filled the cavity and the tree was saved.

have gone far toward providing me with the shade and eye-satisfaction furnished by the living trees.

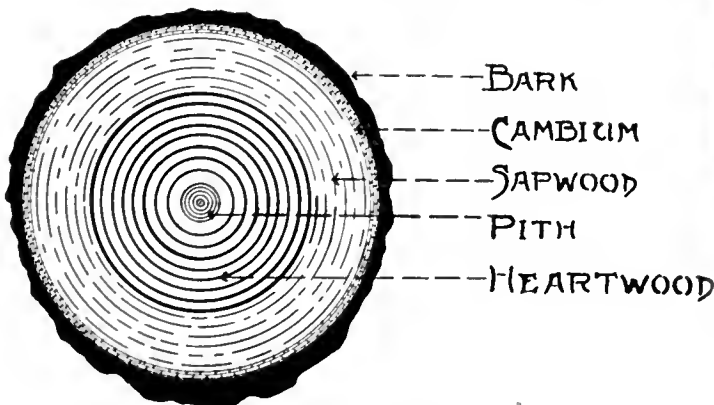
All this was eight years ago. What has happened? Has the tree-surgery been worth while? Did the patients live?

Indeed they have lived! And they have prospered amazingly, as shown by the way in which the cambium layer has "rolled" over the openings in the limbs and trunks. Some bolt-heads are covered in; several of the



Copyright 1917 by International Film Service  
TREE SURGEONS OPERATE ON PHILADELPHIA'S VETERAN ELM

The giant old elm, that has stood for nearly two centuries at the Dauphin Street entrance to Fairmount Park, Philadelphia, has undergone a wonderful and what promises to be a most successful operation at the hands of the Park Commission's tree experts, diseased portions of the trunk having been completely cut away and the huge cavity filled in with cement and the limbs braced with bolts and bars.



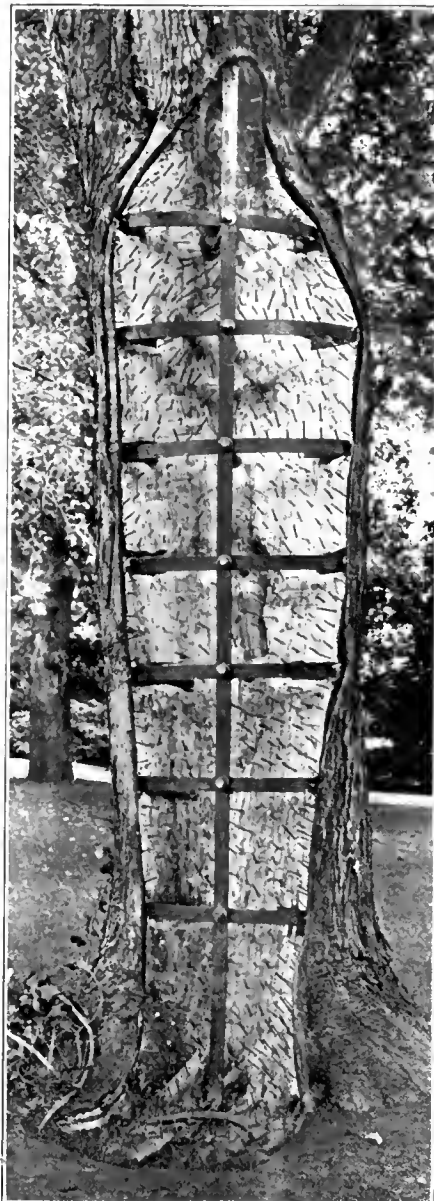
CROSS SECTION OF TREE TRUNK

compare the conditions with the surgery of today, I have patience with and admiration for the advances in tree surgery within the past decade.

The solid concrete filling has proved to be too resistant to wind pressure, and it has been replaced by sectional filling, which yields enough to prevent strain on the remaining tree structure. The sides of the long cavities are now held together by ingeniously simple threaded bolts. The former coverings of zinc or tin have been discarded. More care is taken to make cavities aseptic.

There are other refinements and some foolishnesses—at least some of the refinements look expensively foolish to me.

It is, after all, a question of good judgment, of tree values. That real tree-surgery is both successful and desirable, I am sure. That it is practiced by some who are ignorant and some who are venal—and by some who are neither, but are injudicious—is probably true. That its common-sense application, by men who have actual knowledge, will prolong the life of many fine old trees,



Photographs by courtesy of the Dacey Tree Expert Company

TYPICAL EXAMPLE OF "TREE PATCHING"  
ALONG IMPROPER LINES

If men were subject to such monstrous incompetence as that which has been applied to so many thousands of our fine old trees by untrained and irresponsible pretenders, men would suffer blood-poisoning, lock-jaw and death. But fortunately trees are sturdier than men and they come to their death more slowly, but none the less surely. This case of tree patching, like most of its kind, has violated all the principles of tree surgery and ignored the laws of tree life. The decay was only partly removed. The disease continued with increased intensity. No means had been provided to exclude the moisture. No mechanical bracing had been provided, in spite of the fact that decay had left the tree very weak.

MECHANICALLY BRACED TREE READY  
FOR THE FINAL WORK

Real tree surgery does three special things and insures a fourth. First, it removes all decay—all, not nearly all—and prevents further decay by proper disinfection, water-proofing and skillful preparation of the cavity. Second, it excludes all foreign substance, especially water, by the use of a novel and highly important device called the watershed, and also by a skillful method of filling. Third, it restores the physical strength of the tree by the use of wonderful types and combinations of mechanical bracing, most of which is completely encased in the filling on the inside of the tree. All three of these things are of vital importance and value.

OPERATION PROPERLY COMPLETED ON A  
VETERAN TREE

The fourth thing which real tree surgery insures is the restoration of the health of the tree and its preservation. An injury usually permits the entrance of a fungus disease. Once disease starts by attacking the interior cell structure, it proceeds with increasing severity. The tree responds gloriously to proper treatment and starts almost immediately to heal over the filling. In filling a cavity in a tree, it is highly important to insure it against cracking and breaking to pieces in the swaying and bending of the tree, which is often violent in the heavy winds. This is accomplished by correct mechanical bracing, plus the all-important sectional filling method, which is clearly illustrated in this photograph.

cannot be doubted by any man of practical experience.

In a southern city I found sad evidence of work of the tree-charlatan. Certain splendid trees of *Magnolia grandiflora* had been "repaired" by the fakers permitted to represent a landscape-gardening firm carrying an honored name. These chumps had climbed the magnolia with pole-lineman's spurs, in order to brutally maltreat the head of the tree. The result was dreadful!

Other frauds, knowing nothing of tree life, and being essentially "butchers" rather than surgeons, saw off great limbs, calling it "trimming." One of this type filled with concrete a great cavity in an important family tree, making no provision for the rolling of the cambium. Water got in easily, rot was accelerated, and the tree had to be removed.

In another case, capable workers spent an unconscionably long time on two decrepit silver maples, at a frightful cost to the owner. Honest advice to him would have been that the trees were not worth the cost of repair, and that they would live awhile as they were, better trees being meanwhile encouraged to take their places.

The rapid expansion of tree surgery has led to the employment of men not at all acquainted with trees, or sympathetic with them. One such, probably knew the surgery part well enough, but did not know apart a pear and a persimmon! Tree-surgeons ought to be tree lovers and tree know-

ers, if I may force a word.

If tree-surgeons should know trees, then they could do more for trees than repair the mechanical injuries to which they are subject. The real tree-doctor ought to know about insects, and fungous diseases, and spraying and fertilization. He ought to be welcomed, whether he ever laid hand on a tree or not, from the assurance he could give to the tree owner as to actual conditions.



FOUR YEARS LATER

Note the result of scientific tree surgery. The bark has completely overgrown the concrete filling and the bolts and the tree's appearance indicates its healthy condition and sturdy development.

What about tree-surgery? It is, I believe, a proper and wholesome practice, if sensibly pursued and sensibly used. As I have hinted, there are frauds and fakers practicing it, just as frauds and fakers operate on men and women. They are in the minority, in both cases. The facts of tree repair are accessible to any one, as, for instance, in Dr. Bailey's great "Standard Cyclopedia of Horticulture." The practice of the work needs skill and experience. A tree-owner can decide for himself as to the essential importance to him of any certain tree; and he can get the opinion of an honest tree-doctor; or rather his diagnosis. Much good work has been done in tree repair, and more ought to be done. Many old trees exist in locations where they mean much to the nearby home or to the landscape. No newly planted tree can replace them, at least for decades of time. Such trees may often be given a new lease of life by thoughtful tree surgery. To me, there is a certain definite gratification in the realization that I have done my best for an old friend, that I have stopped the decay of his structure, and given his life processes free sway. A tree is a living organism to me, and I dislike the very thought of seeing such a marvel of God's creation in distress.

Tree-surgery is with us to stay, just as is the treatment of feeble-minded or crippled children.



THE OPERATION COMPLETED

Note how this maple on the grounds of the Dan River Cotton Mills, Danville, Va., was treated in 1913. The concrete filling and the bolts can be plainly seen in the picture.

It is a work of mercy, and it evidences respect for age or dignity. It should be applied with good sense and good judgment. As I have said, tree-surgery ought to be joined to tree diagnosis and to tree doctoring, so that whatever was necessary for the prosperity of trees under consideration could be supplied, whether it be spraying, or protection against insects, or the repair of injured or decayed portions.

# VALUE OF GRAZING MANAGEMENT ON THE CARIBOU NATIONAL FOREST

BY C. H. SHATTUCK

Professor of Forestry, University of California

**C**ARIBOU National Forest has developed the management of its grazing lands probably to a higher degree than any other forest in Idaho. It has been the writer's privilege to spend parts of two summers in an intensive study of the range and the methods employed by the officers in charge of this work, and to note carefully the present conditions as well as to make many comparisons of the present methods, and the results obtained by these management operations with former conditions and methods.

Ten years ago many parts of the range in Idaho were badly overgrazed. This resulted in the increase of the non-palatable plants, the decrease of the valuable forage plants, especially the better grasses, the destruction of the young trees, and often in severe erosion. All of these results were bad for the range and therefore for the men devoting themselves to the highly important industries of stock raising and wool growing. The general attitude of these men toward the future of these industries was extremely pessimistic. They were discouraged. They felt that there was far too much stock on the range for the good of either, and that the encroachments of the settler and new stockmen would soon ruin what had been a great and profitable industry. Many of the older men would talk of the good old days when the range

was *good* and there was no strife and contention among them over the grass and water. But a large number of them had come to regard grazing as a badly overdone business which had seen its best days and was rapidly on the decline. The Department of Grazing of the United States Forest Service began some nine years ago to work out a system of grazing management with the general object of improving the conditions of the range and the range business. How was this to be accomplished? The problem was of vast magnitude, and was involved and complex. To

begin with, the stockmen themselves had few suggestions as to how the range could be improved. In fact, most of them said it could never be done. A careful analysis of the situation revealed the fact that very little definite information was at hand with which to undertake the solution of such a tremendous but highly important problem.

Five general objects were deemed highly desirable and therefore most valuable to be secured.

Greater production in the amount of forage plants.

Improvement in the class of forage plants.

Closer utilization of much of the range lands both as to forage and water.

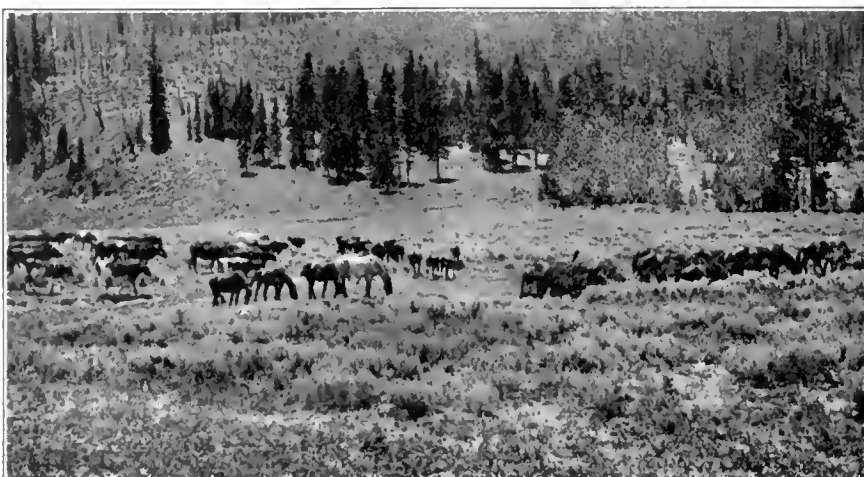
Improvements in the methods of handling stock.

A better system of protection of young forest



CATTLE GRAZING ON THE CARIBOU NATIONAL FOREST

Forage of this region has greatly improved during the past six years owing to proper handling of the stock and the range.



CATTLE AND HORSES TOGETHER.

These are to be found on the higher alpine meadows of the grazing range, Caribou National Forest.

growth against fire; and against excessive browsing; protection of range animals against poisonous plants and predatory animals; protection of the soil by avoiding excessive or very early grazing, and of the forage plants by proper rotation and deferred grazing.



RANGE CATTLE ON GRAZING LANDS

The types of range cattle showing different breeds and condition of each as seen on the Caribou National Forest grazing lands.

In order to decide on the best methods to be employed for securing each of the foregoing improvements it was necessary to spend much time and money and employ considerable scientific and technical assistance. Also the experience and knowledge of the practical stockmen had to be drawn upon in no small degree.

In attempting to solve the problem of greater forage production certain studies were undertaken. One great fact was admitted by all, namely: that the range was gradually deteriorating both in the number of varieties of range plants and in the number of individual plants of the better varieties. First a careful grazing reconnaissance was made. This gave the topography, the types of plants, the per cent of ground-cover, the number of forage acres, etc. Then certain plots known as quadrats were carefully selected on which intensive studies of the plants were made. All the plants were named and carefully located on charts before the area was grazed; some of these were fenced and not grazed at all; others were grazed as the rest of the range; and others were grazed after the seed had fallen. These plots were carefully charted each year both as to the number of plants and the number of species. Also large numbers of range animals have been weighed repeatedly and careful records kept relative to their condition and that of the range. As a result certain fundamental facts have been very definitely determined, of which the following are the most important: that continuous and close grazing before the seeds fall causes a diminution not only in the number of individual plants, but also in the num-

ber of species of the more palatable and highly nutritious forage plants; that grazing in the early spring when the ground is soft is very injurious to the range, especially on hillsides and in marshy meadows where many plants and seeds are thrust down into the mud

to perish, while others are stunted or destroyed because such ground dries out much worse later in the year than ground not so "cut up" by the feet of the grazing animals. It has thus been found that the amount of forage can be considerably increased by a close study of the actual conditions and the causes producing them.

It has been found that the class of forage plants gradually becomes poorer if the plants are not given an opportunity to mature and drop seeds at least every third year. Therefore it is now planned to defer grazing on each area as often as practicable until after the seeds have fallen. As a result of this practice the class of range plants has been steadily improving as anyone who has been at all familiar with former conditions may at once observe.

A closer utilization of the range both as to forage and water has in many places been brought about by studying the palatability of various plants for the different kinds of stock and for each kind of stock at various periods of the grazing season. For instance, the so-called green dock (*Weyethia amplexicaulis*) is greedily eaten by sheep if grazed about the time of flowering, but only sparingly later in the season; it and many other plants can be utilized much closer by being grazed at the proper time. Again, many parts of the range have been much more closely utilized by developing watering places in such a manner that the stock is not compelled to travel as great distances for water as formerly. A single spring dug out and piped into a series of watering troughs may be the means of utilizing from 2,000 to 5,000 acres of good range which has heretofore been useless for want of this water-development work. It is gratifying to see that many acres formerly of no worth have become highly productive by this means.

Much improvement has also been made in the methods of handling stock on the range, the close method of herding sheep has now been practically abandoned, and where considerable areas were formerly rendered useless for one or more years as a result of continuous bedding in one place, the range now remains uninjured by the new method practiced of shifting the bedding grounds after one or two nights spent at once place. Shifting the salting places is another method for saving the forage from excessive tramping and cropping, thus greatly protecting the more palatable and highly nutritious species. Also it has been found that closer utilization of the range can be secured by ranging both sheep and cattle on some

kinds of range at different periods of the grazing season. Sheep, for instance, following cattle, may find much good forage which the cattle have not injured, and vice versa.

Finally, the great subject of protection has been studied from every angle, and every phase of it has been improved. Formerly the range was annually burned off, the young tree growth largely destroyed, and each year large areas of standing timber were killed by these fires which were oftentimes set by the stockmen themselves to, as they thought, improve the range. This practice has been discouraged and prohibited as has the practice of excessive browsing which also did much injury to the young tree growth. As a result of these wise measures the forests on the Caribou are everywhere advancing and improving.

The range animals are now protected in a large measure against danger from poisonous plants, areas containing large numbers of such plants being marked and stockmen informed. Predatory animals and those injurious to the range are trapped, poisoned, and shot in large numbers. The soil is protected from erosion by wind and water because it is now much more evenly covered with plants than formerly, due to the improved methods of rotation, deferred grazing, and the avoidance of early or excessive use of any portion of the allotments.

On the whole, when one who knew the range ten years ago studies the same areas today and notes the great improvement in the forage, in the stock, and in the contentment and general satisfaction of those now engaged in the grazing business, he is amazed. Anyone who comes to see and understand all that has been planned and accomplished for the good of the range can have only words of praise for our wise Government in inaugurating a system which has produced such remarkable changes for the better over such vast areas. No one now wants to go back to the days of

the over-crowded and unprotected range. The range business today is on a firm and thorough-going basis, and the stockmen and settlers should be thankful to the Forest Service for the methods so carefully planned and ably worked out by its officers and technical



OPEN METHOD OF SHEEP HERDING

This is the method now generally practiced on the Caribou National Forest. The scene here photographed is on the Morgan Meadows.

men. These methods are also a great aid to the farmers both directly and indirectly. The farmer who desires an allotment is directly benefited because he now gets better range and absolute protection; he may also be helped indirectly because the range business is now on such a stable plan of operation that he may count on a sure and excellent market for his grain and hay each year. This is because the stockmen are sure of their range both in the quality and quantity of their allotments and are therefore willing to pay good prices for the feed necessary to bring their stock through the winter and back to the range in the best possible condition. Thus the entire western region has been immensely benefited by the improved methods of grazing management as now practiced on the Caribou and many other National Forests.

### TAKE ADVANTAGE OF LARGE TREE SEED CROP

**T**HIS year promises an unusually good crop of forest tree seed. Farmers owning woodlots should bear this in mind and make thinnings and cuttings wherever possible. Now is the time they say to get into the woodlot and inspect the trees before cutting. The trees can best be examined while they are in full leaf. All old, over-mature, decaying or otherwise unhealthy trees should be taken out at the earliest opportunity. Trees which are taking more than their share of light and space as well as those trees which are badly over-topped by their neighbors should go. Avoid making large openings in the woodlots, but plan on having any closed up within three to five years. A good crop of tree seed will do much to keep the land from going wild, but the woodlot owners must be careful not to cut too heavily.

### POPULAR INSTRUCTION ON THE USES OF LUMBER

**C**ORRESPONDENCE has been started by the National Lumber Manufacturers' Association with some 30 colleges and universities with regard to the giving of popular instruction upon the uses of lumber. The University of Wisconsin offered such a course two years ago, and similar courses were later offered by 10 or 12 of the leading schools. Since the war began there have been such great advances in the prices of all other materials, and such actual scarcity of some of them, that now is the best time we have ever seen to talk the right use of wood as a building material. The attention of the schools is being called to these facts, and it is expected that considerable interest will be aroused in instruction along these lines. It is proposed later to outline also a course of instruction upon structural timber for engineering students.



# THE MOCKINGBIRD FAMILY

(Mimidae)

BY A. A. ALLEN

Assistant Professor of Ornithology, Cornell University

**W**HAT the nightingale is to Europe, the mockingbird is to our southern states. There is this difference, however, that the nightingale has but one beautiful song, while the mockingbird enriches his repertoire with the notes of many other birds. In fact, there is a record of one mockingbird which imitated 32 different species during the course of ten minutes' continuous singing. All individuals are not good mockers, however, and perhaps the majority confine themselves to their own brilliant notes. And brilliant their songs are, for the mockingbirds have marvelous technique and, while some people complain of their lack of feeling, others declare that they excel even the nightingale and the American thrushes in their emotional outbursts. They do not seek the deep forest and perhaps for this reason their music is less appreciated. "But," says Dr. Frank M. Chapman, "listen to him when the world is hushed, when the air is heavy with the rich fragrance of orange blossoms and the dewy leaves glisten in the moonlight, and if his song does not thrill you then, confess yourself deaf to Nature's voices."

Often it is the fence post in the garden, the ridgepole of the house or the top of the chimney that the bird selects for his songs and often he seems not to leave these spots

for days at a time, pouring forth one continuous burst of music from dawn until dark and from dark again until dawn. At times he seems carried away by his song and springs into the air with quivering wings and trembling throat only to alight again with renewed enthusiasm. In fact, his wings seem at all times to feel the harmony and try to find some way of expressing it.

This is at the height of the courting season when no other mockingbird dare trespass upon his domain or venture to glance at the mate that he is defending, without inviting a combat. For his inspiration for singing is equalled by his ardor for fighting whenever another bird appears. Nor does he confine his pugnacity to others of the same species. Any enemy, real or supposed, cat, dog, hawk, owl, or man, has to suffer equally, receive his scolds, his buffeting and even the sharp pecks from his bill, if it venture too close to the nest. Mockingbirds are the wardens of the bird community and the presence of an enemy is announced from one bird to another more rapidly than the enemy can travel until the whole neighborhood is alarmed.

There is but one species of mockingbird found in the United States, but the bird of the West is sufficiently



Photograph by G. A. Bailey

#### READY FOR A FIGHT

With such weapons as it has, the brown thrasher is always ready to defend its nest against man or any other enemy.



#### A HOME AMONG THE GRAPE VINES

Where there are thickets or tangles of vines, the catbird is always found. Where these disappear, the catbird goes with them.



MUCH LIKE THE THRASHER

The wood thrush is often confused with the brown thrasher, but its breast is spotted rather than streaked, and its bill and tail are shorter.

distinct to be recognized as a sub-species. The species ranges throughout the country in suitable places as far north as the 38th parallel and occasionally further, occurring sparingly in New York and New England. Southward it ranges through Mexico and Central America to South America and most of the West Indies, being a permanent resident in all but the northern part of its range. From Mexico to South America there are other



THE UNSPOTTED, GREENISH BLUE EGGS OF THE CATBIRD

The other members of the family lay spotted eggs, but all build nests of sticks and rootlets.

species, some ranging as far south as Patagonia, the total number being about twenty.

Our mockingbird is a slender, ashy-gray bird about the size of a robin, with white marks in the darker wings and tail. It is found about bushy pastures and the scrubby borders of woods, as well as about gardens, or indeed, wherever there is a thicket in which to hide and an exposed perch from which to sing. In some places along the Gulf it is the most abundant bird and its rich songs on every side drown out all the lesser bird voices of the vicinity.

The nest, which is a rather bulky structure of sticks and straws, rags and paper, is lined with rootlets and placed in a thick bush, an orange tree, a yucca, or even on the vines on the porch. The eggs are greenish-blue rather than heavily marked with dark brown.

In former years it was customary to keep mockingbirds in cages as pets because of their wonderful songs,



A BEWILDERED CATBIRD

A rag was placed across the eggs on the nest and the bird is here wondering what to do. It made no attempt to remove the rag but started to incubate beside it, illustrating the non-adaptability of the species.

and many birds seemed content to sing as beautifully from behind their bars as out in the open, even though their plumage usually became quite disheveled. These were birds taken from the nest when young and reared by hand, for adult birds, no matter how tame when free, would never submit to being caged. Instead they would beat their wings and peck the bars until they became covered with blood. Today it is a serious offense, punishable by heavy fines, to kill or to cage the mockingbird, for in most states there are laws forbidding the caging of native song birds. Likewise a Federal statute prohibits the shipping from one state to another or the importation of song birds native to this country, and more recently the Migratory Bird Treaty gives absolute protection in every state and in Canada to all insectivorous birds, the mockingbird among them.

Today, however, we care less for caging song birds for we have learned to attract them and hold them about our gardens by means of food and nesting places and protection from their enemies, so that cages are no longer necessary. Almost anywhere in the South, even in the heart of cities, if one has an extensive garden one can hope to have a pair of mockingbirds. He need only plant a suitable thicket for the nest, keep the cats away and put out plenty of food. In winter and early spring they are fond of suet, doughnut crumbs, pieces of bread and a few seeds, and later on of mulberries and other small fruits such as are borne on the dogwood, wild cherry, etc. Surely no garden in the South should be without its mockingbird.

There are over sixty species in the mockingbird family, only eleven of which are found north of Mexico. One of these is the true mockingbird, one is the catbird and the rest are called thrashers. The catbird resembles the mockingbird in being a long, slender, gray bird, but it differs in being darker and in not having the white bars in the wings and tail. Its only marks are a black cap, black tail and reddish-brown under-tail coverts. It gets the name "cat"bird from the harsh, catlike notes with which it scolds every intruder and with which it ruins an otherwise melodious song. Some catbirds are much better singers than others, many learning to imitate the notes of other birds with almost mockingbird skill, but all of them, sooner or later, interrupt their musical refrain with harsh mewling notes.

Catbirds are either very sympathetic to the troubles



A HUNGRY CATBIRD

When the catbird returns in the spring it can usually find plenty of insects to maintain its irrepressible energy. At times, however, a little suet is appreciated and it will come quite frequently to a feeding station.



A WELL PROTECTED HOME

The nest of a mockingbird in a yucca. All members of the mockingbird family nest in dense bushes or thickets—where they are safe from most enemies.

of all the bird world or very inquisitive, for whenever a bird is in distress and gives an alarm cry all of the catbirds of the neighborhood assemble to stare and to scold at the disturber. In the defense of their own nests they are seldom excelled for bravery, for be it cat, squirrel, snake or man, the intrepid birds bristle out their feathers and fly at the enemy with loud cries, pecking with their bills and buffeting with their wings in the attempt to divert attention from their treasures. Often they fall prey to sly cats which by stealthy leaps are able to reach them, but usually they slip out of reach into the thick vegetation, for the catbird always nests in the densest thicket, thorny bush or tangle of vines that the neighborhood supports. The nest resembles that of the mockingbird, but the eggs are deep greenish-blue without spots.

In parks and gardens where thickets do not exist the catbird is not to be found, for unlike some birds such as the phoebe, robin, barn swallow and swift that have come to associate with man, the catbird is always unable to adapt itself to changed conditions. A few years ago the author pointed out the difference between the catbird and the phoebe in this respect.

The phoebe formerly nested only on the face of cliffs, but with the advent of man and his bridges and buildings, it has modified its nesting habits to avail itself of these conditions and now builds wherever there is a ledge to support and another to shelter the nest. The catbird, on the other hand, has never changed and probably never will. That the two birds have a fundamentally different

make-up was shown by the simple experiment of laying a rag across the nest of each bird, thus concealing the eggs. With one look the phoebe grasped the situation, flew to the nest and pulled the rag away. The catbird, on the other hand, was unable to comprehend, examined the rag from all sides and finally began to incubate beside it with no attempt at removing it. It showed itself, thereby, a non-adaptable species, and thus we find it throughout its range.

In some places in the south the catbird is regarded with suspicion and is believed to rob the nests of other birds, but in the north it is a favorite and no stigma is attached to its name. It is very largely insectivorous and therefore beneficial, although, together with the robin and the waxwing and many other birds, it shows a partiality for cherries and other small fruits in their season. Where mulberries and wild fruits are available, the cultivated varieties seldom suffer.

The thrashers, numbering about twenty species, are the largest of the mockingbird family. Their center of distribution is in Southwestern United States and they extend southward through Mexico and westward through Southern California and Lower California. Only one species, the brown thrasher or "brown thrush," as it is sometimes called, is found east of the Rocky Mountain region. It occurs throughout the East as far north as Quebec and occasionally somewhat further.


Thrashers or "thrushers," as the word is sometimes written, are dark brown birds, more or less thrushlike in appearance, but larger and more slender and have longer tails and somewhat curved bills. In fact, the word "thrasher" is thought by some to represent a "comparative" of the word "thrush," applicable because of the larger size of the thrashers. However this may be, the brown thrasher is often confused with the wood thrush, although it differs in its much longer bill and tail and its streaked rather than spotted underparts. It is a shy bird, much more often seen than heard, for it keeps to the undergrowth, where it scratches among the leaves or digs holes with its bill, in its search of larvae. The sound produced as it apparently blows the soil from its nostrils is an almost animal-like sneeze. When singing the male mounts to the topmost branches of a tree from which its loud ringing notes can be heard for long distances. The song is a rich medley and though limited in its range and confined to one air, rivals the mockingbird's in its exuberance and perfection.

Occasionally the thrashers live about gardens, especially if some effort is made to develop a tangle of shrubbery in which they can always find seclusion and safety from stray cats. Like the mockingbirds and catbirds, they will come to a food shelf for suet and crumbs and sometimes become quite friendly. They are equally ferocious in the defense of their nests, which are built in the heart of a thicket or on the ground beneath a tangle of vines, and they do not hesitate to peck and scratch one venturing too close. Their nests resemble those of the catbirds and mockingbirds, having an outer

layer of sticks and a lining of rootlets, but the eggs are different from both, being rather slender, grayish in color, finely and evenly speckled with brown.

The curve-billed thrasher of Texas and New Mexico, the Palmer thrasher of the cactus deserts of Arizona, the California thrasher of the Pacific Coast region and the Crissal thrasher of the whole Southwest are all about the size of the brown thrasher, but are less strikingly marked, being uniform shades of brown or gray with few streaks. The sage thrasher is a somewhat smaller bird, appearing like a small mockingbird with a streaked breast. It is one of the commonest birds of the sage brush country and has much the same habits as the other members of the family.

## LUMBER FOR THE EXPEDITIONARY FORCE


 WENTY-FIVE million feet of lumber and timber are wanted in France at an early date, it is reported, for the use of the American expeditionary forces. This will supply some of the needs of the troops for forest products until the American forest engineer regiments reach France and begin cutting.

It is reported that 10,000,000 feet of lumber and timber should be delivered in France by September 1, 8,000,000 feet by October 1 and 5,000,000 feet additional by November 1. All this is said to be in addition to the 4,000,000 feet of dock timber and lumber for which the engineer corps of the army opened bids July 21.

The material wanted for use in France is described by lumbermen as square and sound. It is needed for wharves and docks, railroads, bridgework and terminal construction. It is said that it may all be bought within a hundred miles of the seacoast in order to insure prompt delivery.

Samuel M. Felton, president of the Chicago & Alton Railroad, who is in charge of arrangements for the ten or twelve regiments of railroad engineers for service in France, is much interested in the plans for buying American timber and lumber for use in France.

## FORESTERS IN DEMAND

 Y reason of the enlistment of numerous foresters throughout the country for service abroad the war is making a heavy demand upon the forestry profession. Further, the war-time demand for forest products for a thousand uses from wood alcohol to bridge timbers means increased activity in the lumber business, which employs many men having forestry training. The national and state forests of the country must not be neglected in the face of so great need for their products, which points to the increased opportunities for men in this young but important profession.

**"FORESTS do not improve by disuse any more than a man's muscles grow stronger in idleness." The farm woodlot is a small forest and will repay the owner who takes care of it.**

# QUEEN ANNE'S LACE; THE PAPAWE TREE, AND SELF-HEAL

BY R. W. SHUFELDT, C.M.Z.S.

**N**EXT to a big field of ox-eye daisies in June or July, we have no wild flower display in the eastern half of our country that can in any way compare with an old pasture field, overgrown with Queen Anne's Lace, or one which in reality is more thoroughly picturesque (Fig. 1). Of course, our farmers have long ago ranked the plant among the most vicious of weeds and an arrant pest, and he finds no trouble or lack of facts to support the execrations he is ever ready to heap upon its name. In so far as his material interests are concerned, he is doubtless quite correct. To the lover of wild flowers, however, the plant has everything that is beautiful of its kind to offer—everything that appeals to the lover of life out-of-doors. Ages ago, it was a common plant of many parts of Europe as well as of Asia; and, as Neltje Blanchan truly remarks: "From Europe it has come to spread its delicate wheels over our summer landscape, until whole fields are whitened by them east of the Mississippi. Having proved fittest in the struggle for survival in the fiercer competition of plants in the over-cultivated Old World, it takes its course of empire westward year by year, finding most favorable conditions for colonizing in our vast, uncultivated area; and the less aggressive native occupants of our soil are only too readily crowded out. Would that the advocates of unrestricted immigration of foreign peasants studied the parallel example among floral invaders."

The entire structure of the plant makes for this marvelous extension over vast areas; not only is it hardy by nature, exempt as food for cattle of any kind, but nearly a hundred different species of very industrious insects take part in its thorough fertilization. Indeed, blooming as it does all the way from June to September, it thrives during that part of the year when insect life is

most abundant and varied. Thousands of the wasps that construct the paper nests are among the forms that may be seen in any field of Wild Carrots—as some people are pleased to call them—though wild carrots they surely are not, notwithstanding the fact that the big, fleshy root looks like a carrot. Armies of beetles, bees and many kinds of flies also do their part in fertilizing the flowers of this plant; in fact, it well repays one to visit a field overgrown with Queen Anne's Lace, and, magnifying glass in hand, study the remarkable structure of the tiny, individual flowers as well as the hosts of insect forms that visit them in August. Even the flower shown here in Figure 2 may be studied with profit by the aid of a good lens—which the reader can easily demonstrate by trying it.

So well known and distinctive is this plant that it quite obviates the necessity for giving a detailed botanical description of it here. One may readily turn to this in any reliable work on American wild flowers. It may be as well to note, however, that the flowers of this conspicuous biennial are arranged in umbels; that its stem is bristly, and that its leaves are pinnately decomposed. Many people call it "bird's nest" because late in the season the flower-stalks erect themselves to form a concave mass, not altogether unlike in form the nests built by some birds.

On one point authors differ with respect to these flowers. Neltje Blanchan says that they possess a "suffocating odor," while Alice Lounsberry remarks that they are "scentless." Truly it may be said that, through their rather strong odor, a field of



AN ARMY OF QUEEN ANNE'S LACE

FIG. 1.—View of a meadow in August monopolized by Queen Anne's Lace, a widely known plant of the Parsley family (*Daucus carota*).

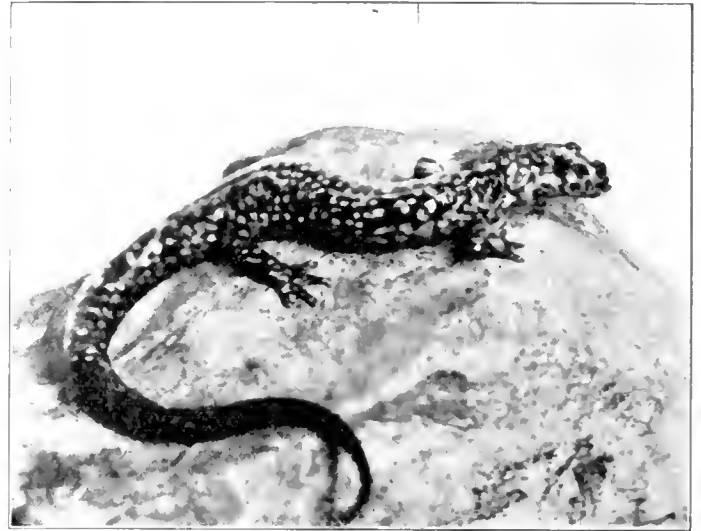
them may be perceived at quite a distance, provided the wind favors its conveyance to the point where you are standing. It possesses a sort of wild, out-of-doors, waste-field pungency that is by no means altogether disagreeable.



QUEEN ANNE'S LACE IN FULL FLOWER

FIG. 2.—Note the one in the middle which has been generally fertilized, and is now closing up. These hollow "nests," late in summer, are familiar to all who know the plant. Note the central dark purple flower in each umbel of the other two, a feature that may be absent in some. The beautiful green beetles on the plant are well known to collectors.

Not a few of our native trees possess very beautiful blossoms; and, as they stand among our wild flowers, they legitimately come in here for occasional description. The blossoms of our Papaw tree are among the most interesting of these, and fine specimens of them are here shown in Figure 4, while the semi-ripe fruit is shown in Figure 5. Charles S. Newhall, in his work on "The Shrubs of Northeastern America," states that the flowers of the Papaw are "dull purple, in drooping clusters, appearing with the leaves." That they are in drooping clusters is far from correct, as may be seen in the accompanying illustration. The blossoms are of a very deep liver red, bordering on dark purple; as a matter of fact, they come out at the time when the thin, obovate-lanceolate, pointed leaves appear. Our North American Papaw (*Asimina triloba*) is the sole representative of the Custard Apple family (*Anonacem*) in this country, while it has many trees and shrubs related to it in the tropics; these belong in the same family. Note that the flowers



THE SLIMY SALAMANDER

FIG. 3.—While collecting flowers in the damp woods in August, one may meet with the Slimy Salamander (*Plethodon glutinosus*). This beautiful little batrachian ranges from Canada to Florida, and westward to Texas. It is generally black in color, finely speckled with pale gray. The reproduction here given is from a photograph from life, and gives the specimen natural size.



FLOWERS AND YOUNG LEAVES OF THE NORTH AMERICAN PAPA W

FIG. 4.—The fruit is edible in the autumn, and in its half-ripe stage is shown in Figure 5.

have six rather thick petals, arranged in two rows, the outer set being the larger. A globular mass in the center is made up of numerous stamens. The pistils are few in number, and when they mature and ripen they come to be a large, pulpy fruit, having the form of the one we see in Figure 5. These range from six to fourteen centimeters in length; and while a palish green at first, and slightly speckled, they gradually turn a deep brown or almost black. At this stage they are ripe and possess a soft, sweet, custard-like pulp, which many people appear to relish in the early fall. Papaws are found growing only along the banks of streams and rivers, often surrounded by the aquatic plants and shrubs found in such places. Some of the trees may attain a height of from twelve to fourteen feet, while others are stunted and shrub-like. One of its peculiarities is to give off rather a disagreeable odor when the smooth, pale grey bark is bruised in any manner. The flat seeds of the fruit are not numerous and are arranged horizontally.

Papaws are found growing in many localities throughout the eastern parts of the United States, and of recent years they have received no little attention on account of the demand for the ripe fruit in the autumn. The



FRUIT OF THE PAPAWE

FIG. 5.—Papaw trees grow luxuriantly along the Potomac River, on the Maryland and District sides, above Washington. The insect shown resting on the fruit is a common cicada, popularly known as the "locust," which is erroneous, as the American locust is a very large grasshopper.



A MUCH DESPISED WEED

FIG. 6.—The plant and its flowers here shown is a specimen of *Prunella vulgaris*, popularly known as Self-heal, Heal-all, or Carpenter-weed, with some dozen or more other names in the vernacular. It is a plant with a history, and occurs over large areas of country in North America, Europe, and Asia. The example here shown was collected in the District of Columbia, and Gray states that a variety of it, *P. laciniata*, is "said to be introduced near Washington, D. C.," where, it may now be added, it is very abundant.

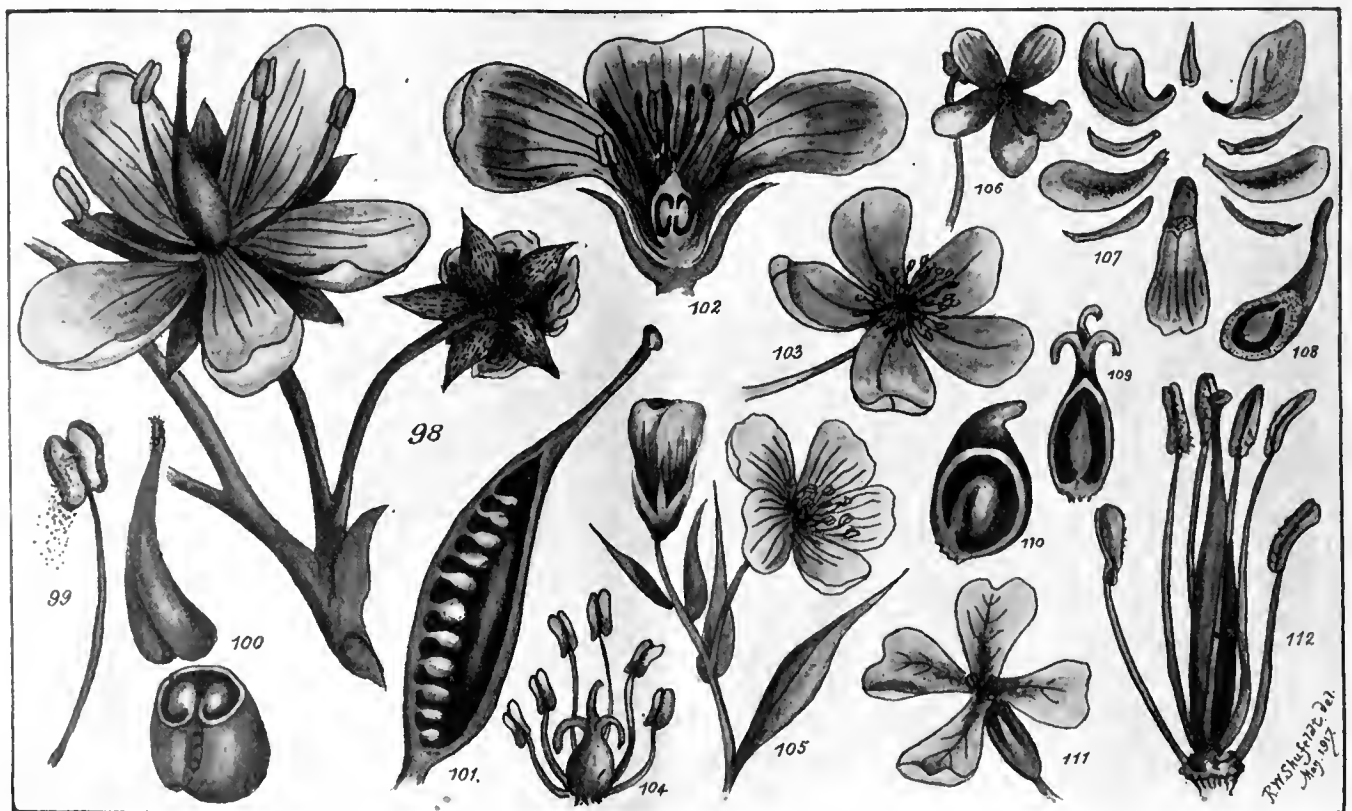
leaves become very large and long by August, while the flowers may appear as early as the last days of March. It receives its generic name from Asiminier of the French colonists, and this from the Indian name *assimin*; its specific name, *triloba*, from the flower structure described above.

We have a large family of wild flowers in this country known as the *Labiatae* or Mint Family, so called on account of the labiate form of the corolla. Small glands are scattered over the leaves containing a volatile oil of a warm, aromatic pungency, for which mints and their allies are well known. Many familiar plants are contained in the group, such as Bugle-weed, Germander, Pennyroyal, Blue Curls, Skull-cap, Cat Mint, Horehound,

Giant Hyssop and the Horse Mint and Sages, Nettles, and so on. Among this very interesting assemblage we find a modest little plant widely known as Self-Heal (*Prunella vulgaris*). This flower is not only found in the woods and open fields, but it grows abundantly along the roadsides in the country districts. Here it is often thickly powdered with dust, and appears to be but a shabby, good-for-nothing weed; but a summer shower soon washes off the dust of the roadway, and a most beautiful little plant is at hand for study and admiration. Upon referring to Figure 6 we can appreciate what Gray says of *Prunella*: "Low perennials, with nearly simple stems, and three-flowered clusters of flowers sessile in the axils of round and bract-like membranaceous floral leaves, imbricated in a close spike or head." As will be noticed, the leaves are ovate oblong in outline, and their margins may be either entire or toothed, petioled, pubescent or somewhat smooth. The two-lipped flowers are very rarely white, but most often violent or creamish flesh color, being almost twice the

length of the calyx, which latter is of a purplish color. The flowers are well shown in the accompanying cut, and by its aid the plant can be easily identified when taken in connection with the above description.

*Prunella* was formerly written *Brunella*, from the old German word *bräune*, which means quinsy, and all the old herbalists believed that Self-Heal would unfailingly cure that disease, or indeed any other malady affecting the throat. It was also employed for many other ills, and may still be so employed in the country districts. Originally the plant came from England, and after its introduction here the flowers gradually became a much paler shade of purple. In England it is also known as "carpenters' herb" for the reason that, when carpenters bruised themselves in any way while at work, they relied entirely upon a decoction of *Prunella* to cure the resulting inflammation. It was also used by the French, and the country people of that nation still have the saying that "No one wants a surgeon who keeps *Prunelle*."



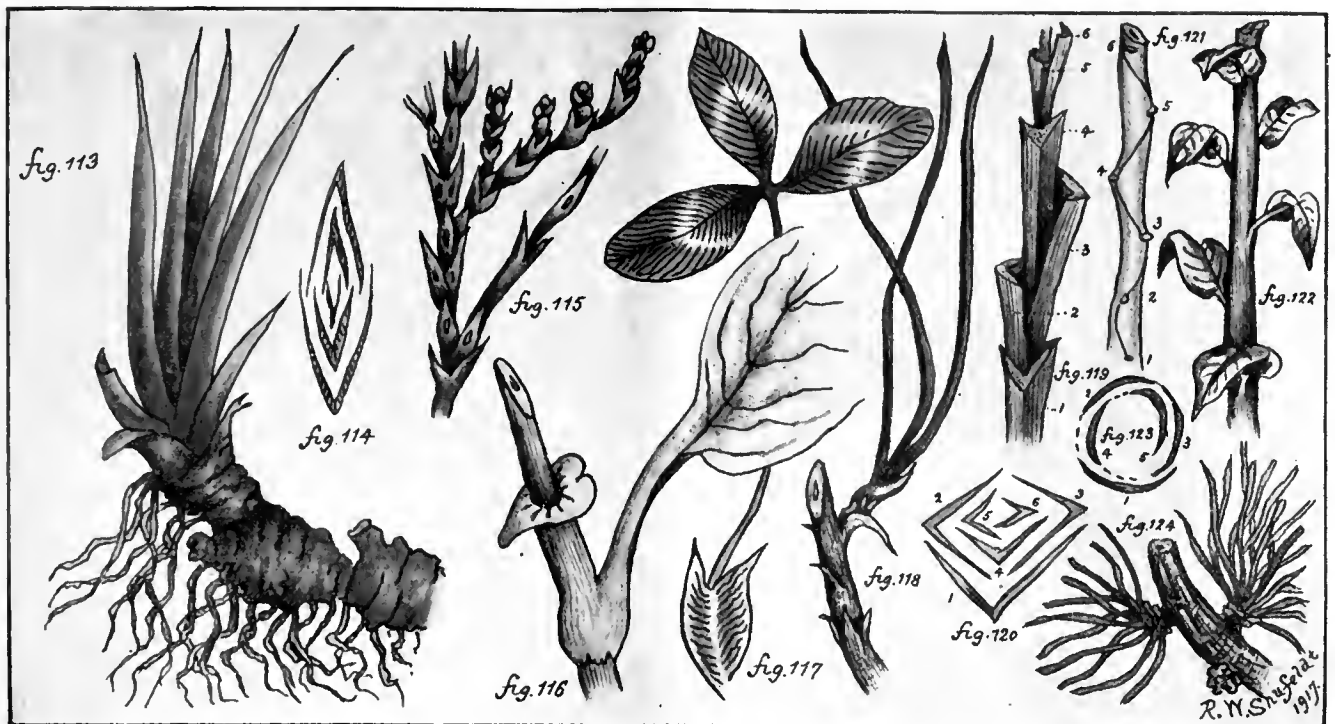
### THE FLOWER AND ITS PARTS

Fig. 98, the parts of an average flower, showing the five petals in its corolla; the five sepals composing its calyx; the pistil rising from the center, the enlarged base being the ovary, followed by the slender style and surmounted by the stigma. There are also four stamens shown, each springing from the base of the pistil, and each bearing at its upper free end an anther. Fig. 99 shows a stamen detached, with its double anther on top, from which the dust-like pollen is falling. Fig. 100 is the pistil cut in two transversely, showing the seeds within, while Fig. 101 gives the same sliced longitudinally, exhibiting the arrangement

of the seeds. Fig. 102 is an average flower sliced vertically through its center, and it shows three petals of its corolla; the section of the sepals of the calyx; the ovary containing two seeds, with the multiple styles of the pistil, and the stamens. Fig. 103: Some flowers are incomplete in that they have no petals (*apetalous*), and the one here shown is the flower of the *Anemone pennsylvanica*. Fig. 104: A flower may also be naked and yet perfect, as in the case of the Lizard's-tail, here shown. Fig. 105: Here is the flower of the Common Flax; it is not only symmetrical, but likewise perfect, regular, and

complete, having all of its parts in fives; it is shown bisected in Fig. 102. Fig. 106, anterior view of a common Violet and Fig. 107, its five petals and five sepals dissociated. Fig. 108: An ovule or seed, when it is said to be suspended in the ovary,—that is, hanging perpendicularly from the summit of the ovarian cell. When situated as in Fig. 109, it is said to be erect, and in Fig. 110, ascending. Taken in the order given, these are the ovaries of the *Anemone*, the *Buckwheat*, and the *Buttercup*. Fig. 111 gives a cruciform flower (*Mustard*), and Fig. 112 its pistil and stamens removed and much magnified.





LEAF TERMS

Plants, such as the Iris (Fig. 113), present no distinction of petiole and blade, and on section their narrow leaves are arranged as in Fig. 114. In the Pitch Pine (Fig. 118) the three needle-shaped leaves form a fascicle or bundle; a short sheath surrounds this at its base, furnished by the thin scales of the axillary bud. In the Larch (Fig. 124) the arrangement is much the same, as it is, too, in the Spruce. Such leaves are called awl-shaped. Another kind are the scale-shaped, such as in the Arbor-vitae (Fig. 115), Juniper, and the Cedars. Here the scales which represent the leaves are in great numbers, and they gain the required spread of surface in this way. Petioles that expand and flatten, thus taking the place of the blade, are termed *phylladia*, such as in some Acacias (New Holland).

The stipules present as many variations as the petioles, and their extremes are to be seen in the Pea, the Magnolia, Tulip Tree. In the first they make a conspicuous part of the leaf, while in the beans they are more or less minute. In the Cloves they are united with the base of the leaf-stalk (Fig. 117), while

in the Prince's Feather (*Polygonum orientale*), Fig. 116, the stipules unite to form a sheath for the stem. The *ligule* corresponds to the stipule in some of the grasses, where the sheaths support the blade on their summit, and it occurs on its apex. There are two principal arrangements of leaves on the stem, alternate (Fig. 122) or opposite. When alternate, the single leaves spring, one after the other, from each joint (node) of the stem, and when opposite, there is a pair of leaves at each joint of the stem—one leaf of any of the pairs being exactly opposite its companion on the other side of the stem. When a circle is formed of three or more leaves about the joint as in the Bedstraw (*Gallium*), the arrangement is said to be of the whorled or verticillate variety. The rule is merring which determines the place of a leaf upon the stem in the case of any plant; it appears at its pre-destined point with mathematical accuracy, and the special formula in any case holds true for all species in the vegetable kingdom. Figures 119-123 throw some light on these formulæ.

It is not at all likely, however, that it has been used in the present horribly destructive war in France.

When we come to study the leaves of the plants here figured in the cuts, as well as in those in previous articles, or, indeed, in trees and plants in general, it will have to be observed that never more than *one leaf* springs from the same point on the stem; but, should two arise from the same joint, they are always situated on opposite sides of the stem, the distance of half the circumference separating them. If there should be more than two, as in whorls, they are placed equidistant around the joint of the stem, being separated by one-fifth, one-fourth or one-third of the circumference of the stem from each other, depending upon the number of leaves. This assures their being at the greatest possible distance apart, and we never see two or more leaves standing side by side at the same joint, nor are they ever clustered or one above the other. Clustered or *fuscled* leaves are shown in Figure 124 of the Leaf Terms to the present article; they represent leaves of an entire branch crowded

into a fascicle. Trees of the Pine family should be closely studied to work out such problems as these.

Leaves do not make their appearance on trees and plants in a haphazard manner, but spring normally from points which appear on the stem with absolute mathematical precision. Their arrangement is uniform for the species, but not the same for other plants.

From this it is clear that the greatest possible divergence is where the *second leaf* is found on exactly the opposite side of the stem from the first one, with the third on the side opposite the second, and so on, and consequently over the first one, with the fourth over the second. Two ranks are thus formed, one on one side of the stem and one on the other. This, then, is the *two-ranked* arrangement. By varying the intervals or distances on the *spiral line*, it is easy to see how we also get a *three-ranked* arrangement, as well as the most common one of all, the *five-ranked*. It is very instructive to study these several arrangements on the stems and branches of the plants and trees we can collect.

In Figures 119 and 120 of the Leaf Terms on this

page, we have the *three-ranked* arrangement in the Sedge. The various arrangements are expressed by *fractions*; for example, if we find the formula to be  $\frac{2}{5}$ , which expresses the divergence of the *successive* leaves, the number of turns made by the spiral line around the stem is indicated by the numerator, while the denominator gives the number of leaves in each cycle, that is the number of perpendicular ranks. Passing through the series, we may even find a *thirteen-ranked* arrangement, as in the house leek, and its formula would be  $\frac{5}{13}$ . Ordinarily there are no arrangements known above  $\frac{15}{33}$ . The rule and symmetry of it is truly marvelous and known only to the comparatively few. Parts of it are too technical to be touched upon here; but it is well to remember one thing: leaves do not spring out on plants and trees everywhere and anywhere. Each leaf arises at a *predestined point*, and the entire foliage appears according to a rule, which

has been shown to be based upon principles involving the greatest possible mathematical accuracy.

The spiral arrangement is shown in the Leaf Terms in Figures 121-123, where a line is drawn through the insertion of the ascending spire of leaves, and so winds spirally around the stem; in the same species of plant there will always be the same number of leaves for each turn around the stem. "That is," says an authority at hand, "any two successive leaves will always be separated from each other by just an equal portion of the circumference of the stem. The distance in *height* between any two leaves may vary greatly, even on the same shoot, for that depends on the length of the *internodes* or spaces between each leaf; but the distance, as measured around the circumference (in other words, the *angular divergence*, or angle formed by any two successive leaves) is uniformly the same."

## NEW YORK'S FOREST WEEK

**F**OREST week was celebrated at the Lake Placid Club September 4-8 by the New York State Forestry Association. The program included a series of indoor and outdoor conservation gatherings, for which a picturesque prelude was afforded by an Indian Council Fire, held under the auspices of the association in co-operation with the Conservation Commission, the State College of Forestry, the forestry department at Cornell University and the Lake Placid Club.

Among the features of the week were a five minute pagan sermon in the language of the Senecas, by Chief Sosondoa, (Edward Cornplanter) and Indian legends and fairy tales by the official story teller of the Iroquois, Yehsenowehs, (Miss Mabel Powers), in costume. An address was made by Charles Lathrop Pack, president of the American Forestry Association. Other addresses scheduled were:

"The New York State Forestry Association," President Herbert S. Carpenter; "Forest School Education for Boys," Professor L. H. Somers; "Forestry Work of the Delaware and Hudson Railroad," H. R. Bristol; "Wild Flowers of Forest and Field," H. D. House, State Botanist; "The Palisades Interstate Park," Dr. Edward L. Partridge; "Forests and Birds," Professor A. A. Allen; "Food Producing Possibilities of Our Inland Lakes and Forests," Professor F. F. Moon; "The Profession of Forestry," Professor R. S. Hosmer; "Conservation in the Adirondacks," Commissioner George D. Pratt; "The Timberland Owner and the Great War," Professor A. B. Recknagel; "A National Capital Forest," W. M. Ellicott; "Forestry and the Newspapers," Royal J. Davis, of the New York Evening Post; "The Forest Parks of New York State—The Motorists' Mecca," Eugene M. Travis, State Comptroller; "Water Storage in the Adirondacks," a paper by John G. Agar, President of the

Association for the Protection of the Adirondacks, presented by Edward Hagaman Hall, secretary; "Forestry and Education," United States Commissioner of Education P. P. Claxton.

## INDIANA'S FORESTRY WORK

**I**N advocating greater attention to reforestation the Indiana State Board of Forestry calls attention to the United States Geological Survey's estimate that at the present rate of consumption the coal supply will be exhausted within 50 years. It is pointed out that thousands of acres have been cleared that should not have been cleared and that no warring foe ever threatened more certain destruction than does neglect to conserve natural resources. The people are urged to sow now that they may reap in the future.

For this year's Indiana state fair particular attention has been paid to the forestry exhibit. Under the management of President W. A. Guthrie and Secretary Richard Lieber, of the state forestry board, the exhibit was made possible by generous aid from the state and the United States Forest Service, with the willing assistance of lumbermen and manufacturers of wood products. One of the features is a working model showing the erosion of land. This illustrates how the forests on steep hillsides conserve water supply and feed springs, wells and rivers. It also shows how the same hill, when cleared, becomes washed and does not produce enough to pay taxes. In the exhibit of native woods is included a sample of every variety of tree indigenous to the state. Other exhibits include colored photographs of birds, with a chart to show the percentage of insects and weed seeds entering into the diet of the birds. Forest fire effects are shown in specimens of trees damaged by fire.

# TURNING A DESERT INTO FERTILE SOIL

BY ROBERT H. MOULTON

**O**NE of the most remarkable examples of soil transformation to be found anywhere in the United States is on the farm of Mr. A. N. Abbott near Morrison, Whiteside County, Illinois. In six years Mr. Abbott has accomplished the seemingly

dollars an acre. Mr. Abbott's farm lies on the edge of the so-called River Bottoms, three or four miles east of the Mississippi River. When in geological ages the channel of the Mississippi was changed, the sand in the old river bed was blown up on the east side of



SHOWING HOW A TRANSFORMATION IS POSSIBLE

In the background may be seen a tract of barren sand; in the foreground is a tract formerly without a trace of vegetation on which grass is now growing because of the protection of the line of trees in the middle distance. To the right is part of the forest plantation.

impossible task of turning some seventy acres of sand, formerly as barren as the Desert of Sahara, into a

the river, forming many sandy tracts. In time these tracts became covered with a sparse growth of grass.

flourishing forest.

Nor is that all; for this forest, acting as a sandbinder, has been the means of saving other fertile acres from the inroads of the drifting sand, the total result being that Mr. Abbott's farm has increased several times over in value. The sandy tracts, which before being planted to trees were practically worthless, are now worth anywhere from fifty to one hundred



THE ONE REMAINING BLOW HOLE

The trees in the background protect the corn field beyond. Note how the wind has scooped out the sand. This is part of the original seventy-acre tract of sand on the Abbott farm.

Then in a dry season the grass was killed, and the sand began to blow about, covering everything in its course. Such was the situation when Mr. Abbott came into possession of his farm.

Being something of an enthusiast in afforestation, Mr. Abbott determined to attempt the reclamation of the sand tracts on his farm. He was encouraged in the belief that trees could be



SIX YEARS AGO THIS WAS A BARREN BLOW HOLE

Since then the planting of black walnuts, locusts and cottonwood, together with a luxuriant growth of grass, has quite transformed its appearance.

made to grow there by the presence of one huge cottonwood tree standing almost in the middle of the tract. This tree also suggested the species which would most likely thrive in the sand. He also decided

ing of sand in their immediate vicinity, thereby protecting growing crops on other land nearby. He then went into the business of tree planting on a huge scale, planting about 70,000 trees altogether on some



TREES PLANTED IN SAND AT END OF A BLOW HOLE

These trees, cottonwoods, are now seven years old and act as perfect sand binders. The grass is beginning to creep into the sand in front of the trees.

to try the black locust, since, like the cottonwood, it has the faculty of storing nitrogen in the soil through the ministration of the bacteria on its roots.

The first year Mr. Abbott planted 5,000 yearling trees, and in a little over a year they were three or four feet high, and grass began to creep in between. In another year they had successfully checked the blow-



THIS TREE GAVE THE PLANTER HIS IDEA

This large cottonwood was the only tree on a seventy-acre tract of sandy soil when it came into possession of A. N. Abbott, and it gave the idea of planting other trees in the effort to reclaim the sandy wastes.

70 acres of land, or at the rate of 1,000 trees per acre, the spacing being about 6 by 7 feet. The yearling plants were bought at an average price of \$5 per thousand, and the cost of planting them was relatively

small, since two men could easily plant 3,000 trees a day.

The rapidity with which the sand drifted in many places is well illustrated by some of the accompanying photographs which show the original fence posts, set before the tree planting began, almost entirely covered.

Mr. Abbott has allowed one blow hole to remain unplanted, merely for the purpose of showing other farmers what can be accomplished in the way of reclaiming sandy tracts of land. This blow hole also shows in a manner most unmistakable how the trees

serve to lower the temperature. On the day these photographs were taken, in mid July, a test of the temperature in the blow hole indicated 115 degrees Fahrenheit (it has been known to go as high as 150 degrees) while over among the trees it was only 95 degrees. This difference was due, of course, to the fact trees drink in and transpire an enormous quantity of water, and this giving-off tempers the dryness of the nearby atmosphere. It is also a known fact that moisture-bearing currents of air are caught by forest areas as they are not by the heated plains.

## THE LE CONTE OAKS

**T**HE noble old liveoaks which flourish on the campus at Berkeley are one of the chief prides of the University of California. Wishing to pay tribute, of love and honor to Joseph and John LeConte, distinguished as scientists and beloved as teachers, a class dedicated to their memory one of the finest of the old oaks on the campus. These two brothers were born in Georgia, of old Huguenot stock, were professors in South Carolina College, and at the close of the Civil War went to California, where John LeConte became Professor of Physics, and later President of the University, while Joseph LeConte became Professor of Geology and Natural History. Although in the forties a pupil of Louis Agassiz at Harvard, Joseph LeConte was one of the first scientific men in America to maintain the truth of evolution. He served as President of the American Association for the Advancement of Science and as President of the Geological Society of America and when he died, in 1901, he left behind him many volumes of writings on geology, evolution, and many scientific papers.

Recently the University of California has had all the oak trees on its campus thoroughly cared for by the methods of modern tree-surgery, under the direction of J. W. Gregg, Professor of Landscape Gardening and Floriculture in the University.

The 520-acre campus of the University of California possesses a wealth of native California trees, shrubs and flowers. During the past five years the hill lands of the University, including the watershed of Strawberry canon, have been planted by the University with approximately a hundred thousand trees of many hundreds of species, the work being done with careful consideration of the purposes of the landscape gardener, the botanist and the student of Dendrology and Sylviculture. The University of California within the last three years has developed a notable Forestry School, headed by Walter Mulford, formerly Professor of Forestry at Cornell, the department including also David T. Mason, Professor of Forestry, and Woodbridge Metcalf, Merritt B. Pratt and Donald Bruce, Assistant Professors of Forestry.



THE LE CONTE OAKS, UNIVERSITY OF CALIFORNIA

# Forestry for Boys and Girls

by Bristow Adams

## ONE TELLS OF THE ADIRONDACKS



**B**OYS and girls, big and little and young and old, have written to me about the stories here set down. One says she likes them, another wants to know where I get my twisted history, and another tells me about my foolish notions on some other point. Mainly the letters have told that the readers like to know of the children about whom I write, or that other children have learned to look for interesting facts in forestry.

**O**NE boy, sixteen years old, has put down what he learned at first hand about forestry in the Adirondacks, the wooded mountains in northern New York. He went up there last year as a boy scout, to help protect those forests from fire, and to do his part in building trails into the wilder parts of the mountains. What he saw and heard he has written; and because it seems good to me I am passing it on to you.

This year, boys of his age have worked in garden and grain field; their camps have been headquarters for farm labor rather than for the more pleasant and more exciting work in the woods. All of us have had to do what we could to help the food supply; next year we shall have to do even more. I am hoping that there will be built up a habit of work, and that many Americans will get away from the present plan by which they "let George do it."

This boy who wrote about the Adirondacks is Beverly Galloway, and his father knows about all there is to know

about plants. The first thing that strikes Beverly about the Adirondacks mountains is that they form one of the largest pieces of wild woods in the country, and that they are in the same state that contains the largest city in the world. He tells how they first became known, through the discovery of deposits of magnetic iron. "A number of these mines," he says, "were worked in the hope of getting good rich ore, but they never amounted to much. Many people went there to help develop the mines, so when the mines failed, the workmen had to find other ways to make a living.

**"F**ARMING was out of the question; the region was too rocky, even if the forest were removed. The forest was there; why remove it? Possibly it could furnish a means of livelihood. Indeed it could, as they soon found out. Within its borders were many creatures which could be trapped during the winter for their furs, or shot all-the-year-round for their meat. And there was the forest itself. So the two industries of trapping and lumbering were started. Since new traps and other supplies had to be obtained from the outside, a means of traffic was started. As the output of the region grew, so did the traffic grow. But the lines did not go into every nook and corner of the mountains, but were main roads going north and south. So we have the Adirondacks of today,—easy to get at in a general way, yet with large portions out of the usual lines of travel. There are only a few railroads open to the general public, but a great number of private logging roads and railroads.

"Recently with the coming of the au-





tomobile there have come some good roads. But here again, as in the case of the railroads, the heart of the Adirondacks cannot easily be reached.

**"A**T FIRST only a few persons came in for vacations. These usually came during the hunting season. The next year they would return with friends. In this way the fame of the Adirondacks spread abroad. Hunting led to fishing, so the sportsmen not only came in the fall but also in the spring. Some of those who came in the spring stayed later and found that the summer climate was better than the 'lumber-jack' painted it. Then came summer hotels.

"These summer hotels are now to be found in nearly every place that is easy to get at. And since this mountain region is also a lake region, the ways of getting about were simplified. Now, in nearly every place where there are boats there are also guides, whose rates are from four to seven dollars a day. At first these rates seem high, but they are truly not so. Where in any city could one get a man who would paddle a canoe—provided there were places for a canoe to go—and paddle it for thirty miles, carrying it and all the baggage too over portages, make the camp and cook the meals, find fish and game, and keep one from being drowned or shot for a deer, all for seven dollars a day?

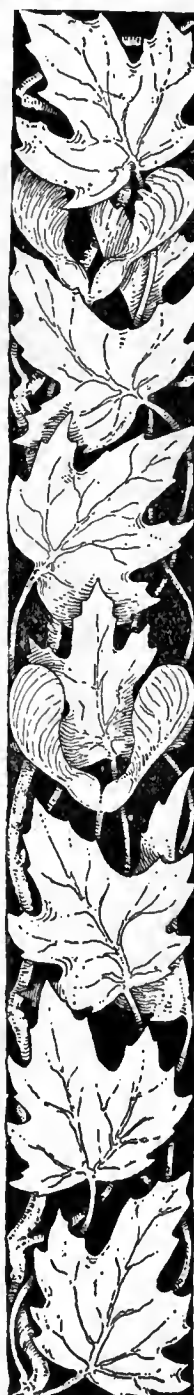
**"T**HE lumber industry is still a big one. The old method of lumbering had to have the winter's snow. Roads were made to tap the heart of the best timbered country, and followed the lower and more level ground.

These roads were as free from bumps as city asphalt streets. When the first freeze came they were sprinkled with water; after several sprinklings and freezes they were covered with a layer of ice some inches thick. Heavy loads could now be hauled on sledges over these ice-ways with very little trouble. Even now the traces of these old roads may still be seen, leading from the heart of a pine section to some water course.

**"W**HEN the sawlogs had been cut and hauled to the banks of a stream they were piled at the edge of the water, or on the ice, with the log ends easy to get at. The marking was simple. On the end of a sledge hammer were raised letters, these letters being the 'trade mark' of the company doing the lumbering. When a log was to be marked its end was hit with the hammer and the dents left were the reverse of the letters on the hammer. By this it will be seen that the letters had to be made wrong-way-round, or mirror-wise. After the logs had been driven down stream on the spring freshet to the mills below, every owner was able to claim his own logs.

"Now there are very few of these spring drives. The logging railroad has taken the place of the river, although horses are still used in skidding the logs to the rollways. At the present rate, unless some measures are taken to start new trees the supply in the Adirondacks will run short in something like twenty years. It takes time for trees to grow. They are not good for paper until they are twenty or

*(Continued on next page)*



## FORESTRY FOR BOYS AND GIRLS

*Continued from Preceding Page*

thirty years old, and must be over fifty years old before they make good lumber. A beech and birch will take twice as long, and are not made into paper at any stage.

"On State land the lumber must not be cut. Fish and game are protected by state and federal laws well enforced by wardens.

"The forests are protected from fire by lookouts, wardens and guards. At present there are not enough guards to stop large fires that may get started, so the people have to turn out and become fire-fighters to save their property. Outside of the State lands little has been done to renew the forest; but any who wish to take the time and trouble to plant may get young trees from the State, and a few have undertaken to replant. When all do this the future of the Adirondack forests will be sure."

Thus ends Master Galloway's story of the Adirondack region. Some day, as a forester, he may look back on what is, as far as I know, his first printed work on the subject. Looking back at it as a grown-up, will he think, as I do, that he found out a great deal, or will he then decide that he knew very little in the light of all the things he has learned since?

## THE POISONOUS CICUTA

**C**ANY deaths, both of human beings and domestic animals, are caused every year by cicuta, or water hemlock, a poisonous plant. It is the most violently poisonous of temperate region plants, yet it is not generally recognized. Cicuta is widely distributed. Unfortunately, it resembles a number of harmless plants and is not easily recognizable. It belongs to the same family as carrots and parsnips. It has a number of popular names, of which the most common is "cowbane," or "water hemlock." In the mountain regions of the West it is frequently called "parsnip," or "wild parsnip." Other names, less common, are "snake-root," "snakeweed," "beaver poison," "muskrat weed," "spotted hemlock" and "spotted parsley."

The plant grows in wet places and is especially common in some parts of the West along irrigating ditches. It has a thickened rootstock with roots which sometimes takes the form of a group of tubers. The cicuta is most readily distinguished from plants of similar appearance growing under the same conditions by the transverse chambers in the rootstock. Further description, except by botanical terms, is difficult.

Only the root of cicuta is poisonous. Cases of poisoning are more frequent in the spring, partly because the roots are more likely to be noticed at that time and partly because they appear to be more poisonous than later in the season. Occasionally stock find the roots when they are washed out by high water in small streams. Farmers in their plowing sometimes bring to the surface a considerable number of roots and these are eaten by cattle, with resulting sickness and death.

## SPRUCE FOR AEROPLANES

**C**APT. DE LA GRANGE of the French aviation corps, says that Uncle Sam's greatest aid to the allies can be accomplished by aeroplanes, built of American spruce, of which large quantities are being shipped from the forests of the Pacific Coast both to American and English manufacturers. He says:

"If the Government wishes to, before the first of April, 1918, it can have a tremendous aero fleet. Suppose it decided to have only 5,000 planes and 10,000 motors. In order to keep that number of aeroplanes always at the front it will be necessary to build 2,000 planes and 4,000 motors per month, viz, 18,000 planes and 36,000 motors during the next nine months. Therefore, between January 1, 1918, and December 31, 1918, the United States must build 22,000 planes and 46,000 motors. This means a great effort on the part of the American factories. They can make this effort, as they have already the buildings, the workmen and part of the machinery needed. They have also a large number of the best scientists and technicians. The size of the orders given them will insure obtaining the money necessary to organize the plants for their construction."



*Photograph by G. T. K. Norton*

## A FAMILIAR SIGHT TO WASHINGTONIANS

**T**HIS "house" stands on the lawn or mall of the Department of Agriculture, Washington, D. C. It is made of a hollowed section of a red cedar and was first exhibited at the World's Fair; in pieces it was brought to Washington and set up, when the roof was added. It is sixteen feet in diameter; the lower portion is used for the storage of gardener's tools, while birds by the hundreds live in the upper story. The whole is a rich, dark red and is ivy-grown, and forms one of the most attractive bits of wildness in the city. The dome of the New National Museum building is seen on the horizon at the left.



# OUR SNAKES A NATIONAL ASSET

BY GAYNE T. K. NORTON

**T**HE fear of snakes, or to speak more exactly, the very general tendency to kill snakes on sight, is as universal as war. Some people associate the fear with mythology; others blame the misinformation that has been spread for generations. This state of affairs has existed—with disastrous effects to the snakes and injurious reactions upon ourselves—principally, I believe, because editors have not seen fit to change it. They have reasoned, and correctly, that the public, with few exceptions, would rather not be educated in herpetology.

With this summer, however, the millions of war gardens have given the snakes popular interest—a “news angle” editors must consider. The gardens are bringing outdoors many people who ordinarily would not tread from the paving blocks. Tremendously increased tillage is bringing people and snakes together.

Unless much educational work is done

the number of snakes that will be killed by the well-meaning but misinformed gardeners will be very large. Our snakes, and we are rich in reptile life, are a national



THEY KNOW AND DO NOT FEAR SNAKES

A group of hunters with some pet snakes from private collections. Allen Samuel Williams, founder of the Reptile Study Society, is seated in the foreground.



A CHARMER CHARMED

A khaki clad, soft shirted hunter who had never touched a snake until five minutes before the photograph was taken.



WITH THEIR PET SNAKES

Allen Samuel Williams (left) with a large pet pine snake. Mr. Williams is an eminent herpetologist and naturalist, an authority on the American Indian, and a well-known author and lecturer. His knowledge of the ways of the wild things verges on the uncanny. He is perfectly fitted to lead the boys in the work of snake conservation. The writer is holding a large bull snake, another pet caught by Mr. Williams in the South.



Photograph by G. T. K. Norton,  
by courtesy of New York Zoological Society.

#### A REAL "SNAKE CHARMER."

Gladys Ditmars is a born zoologist; she is the daughter of Mr. Raymond L. Ditmars, reptile curator of the New York Zoological Society. Gladys has traveled much with her father and absorbed much of his wisdom. She goes out of her way to save a snake's life. The king snake photographed is a pet she caught in southern New Jersey.

it bears to successful crops is important—more important than even the average farmer realizes.

Reptiles may not manifest friendship toward us, few would welcome such a condition, yet they are not enemies. They never attack unless in self-defense. Of our 111 species but 17 are poisonous—two species of Elaps, coral snakes, and 15 species of Crotaline snakes, the copperhead and moccasin, the dwarf and typical rattlesnakes. On the other hand the help they render is valuable. The pests destroyed each year, especially the rodents that injure crops and carry communicable diseases, roll up a large balance of good service in their favor.

Rodents are destroyers of farm products, cause loss by fire through gnawing matches and insulation from electric wires and of human life, through germ carrying, particularly the bubonic plague. Before the war the United States Department of Agriculture placed the bill

at \$500,000,000, one-fifth of which equals the loss of grain. With advanced prices this is increased.

They also destroy eggs, young poultry, squabs and pigeons, birds and young rabbits, pigs and lambs. A loss to husbandry not estimated in figures but realized as extensive is due to the killing of fruit trees by girdling or other injuries to the bark by species of wild rodents. Eminent medical authorities agree that many plagues can be accounted for by rodents. As a destructive agency the rodents have no rival.

The explanation of the big figures representing damage from the rodent is due to the vast numbers of those small animals owing to the characteristic fecundity of the species. One investigator paired two common house rats late in December. By the middle of the next September he had 880 rats.

Reptiles are a very important factor in the natural work of restraining the too rapid increase of rodents. Practically all our snakes feed largely upon rodents. One in particular which has a wide range is the *Lampropeltis*



#### AN OLD TIMER AND A RECRUIT AT SNAKE HUNTING

George Von Buehren (left), an ardent herpetologist of many years' experience and owner of a very unusual collection of serpents, is really not the sort of chap the photo makes him out to be, and Frederick Beebe, a new and enthusiastic recruit. George trusts the pine he holds, but Fred wants to see what the large gopher, or indigo, snake he has is up to. The gopher and king are the snakes which domesticate the best. They are both of great economic value.

*doliatus triangulus* (milk snake, house snake, spotted adder, checkered adder), which finds 90 per cent of its diet in small mammals. This reptile, together with dozens of others, is absolutely harmless, defenseless and in no way destructive, though many ridiculous tales are told about it.

The gross ignorance regarding our snakes causes slaughter of all things that wear scales and crawl. Farmers should protect and breed the harmless snakes rather than kill them. Many European countries have protective legislation. Another fact: all the king snakes, and the family is large, are natural enemies of other snakes and eat many of them. In numbers they probably overbalance the poisonous species and by general distribution usually occupy the same habitat as the dangerous snakes. In this way they materially help to lessen dan-



SOME HIGHLY PLEASED HUNTERS

These snakes were caught on the first hunt of the season and among them were DeKay's garter, swamp snake and many others. The hunters were very proud of their "bag."



Photograph by courtesy New York Zoological Society.  
AFTER A GOOD MEAL

This shows a young king snake that has just eaten two sparrows, shown against the paper, and illustrates the economic value of snakes. During the hunts snakes captured would disgorge recently eaten food. Disgorged mice showed plainly their value right in the field. Such an instance was shown to a farmer who had told a group of hunters to take every blamed snake off the place. His views changed suddenly.

ger of poisonous snake bite. Until a person is able to immediately distinguish and name a snake, and know whether it is dangerous or not, that person has no right to kill any snake. Every time a snake is killed more damage is being done than good. I will not go into detail regarding the very interesting life histories of snakes, facts it will repay anyone to investigate, but will briefly mention the Reptile Study Society and the work it is trying to perform.

Founded a number of years ago by Allen Samuel Williams, scientist, author and lecturer, and now organized in many states, the Reptile Study Society is actively pushing an educational campaign to save the snakes. Practically all the leading zoologists are members, and the roster includes the names of many women. Juveniles form the class to which the most urgent appeal is being made. Hundreds of youngsters are being reached through the Y. M. C. A. and Scout organizations and the like. Energies are directed to correcting false popular beliefs.

Field meetings and hunts have been found the best medium. The boys, expertly guided and carefully watched, catch their own specimens. Fear is overcome by handling and explanation; proper catching methods are illustrated. Dangerous snakes are exhibited and studied; the treatment for poison bites is demonstrated. The boys are not allowed to handle these snakes and are warned regarding them.

The catching and handling brings a psychological condition, heroics, into the scheme and helps to make every boy a protector of snakes. The captured specimens are exhibited and many people are reached through them. This may not appear as a large field for service, but the good being done is surprising.

The Ditmars Club—boys of the Newark, N. J., Y. M. C. A.—has been very active. Two hunts, both well

attended and successful, held before May 15, netted many specimens, and the exhibit is attracting much attention.

A snake hunt, to phrase it mildly, is exhilarating. Quite naturally the sighted snakes resent capture and provide thrills a plenty. Hands and forked sticks do most of the catching. Often, indeed, are the hunters bitten—just scratches that hardly break the skin, clean and painless—but these seem to have a paradoxical effect; they diminish rather than increase fear.

The boys have taken to snake hunting like ducks to water; but they do not hunt—they ransack. A swamp is approached and half surrounded with cold-blooded efficiency, then it is combed from end to end; in squads with a leader they spread out and nothing alive escapes. No regiment could attack trenches with more vim and determination than the youngsters bestow upon old stumps and rotting logs. Literally no stone is left unturned. And a glance backward at the country hunted gives evidence of the battle waged.

Up to their knees in mud and ooze they will collar a banded swamp snake, *Natrix fasciata sipedon*, as long as themselves and bring it in; swimming avails the reptile nothing; on a sunny upland they will race a blue racer, blacksnake; it will have no chance to find a hole—a tail in sight means a snake in bag every shot. Even the evil-looking and bad-acting hognose, the stubby, slow-moving snake that hisses loudly and flattens out when disturbed, the much-feared but altogether harmless “adder,” the bluffer of the snake kingdom, is shown no consideration—merely and unceremoniously bagged, hisses and all. It is characteristic of boys to do anything as hard as it can be done.

Milk snakes, several varieties of garter snakes, ribbon and De Kay's snakes have all been captured by New York and New Jersey members. The value of these snakes is very distinctly, though a little unhappily, demonstrated. Our hunts took place in early spring, but a short time after the end of the winter hibernation. The snakes were hungry; nearly all that we caught had recently eaten. As is always the case, capturing or handling a snake shortly after it has eaten will cause it to disgorge any food it may have taken. Numbers of our specimens, even while talks were being given on the subject, disgorged the partly digested bodies of small rodents.

Indirectly in this way several farmers were “shown.” They would ask us what we were looking for on their land. Our reply would give us “the run of the place. Take every bloomin' critter y' see.” We took the trouble to talk and illustrate the value of the snake to these men and in every case their ideas immediately changed. In one instance the man finally replied, smiling: “Well, if that's the case, guess I want all my snakes and I'll have to ask you gentlemen to move on.” And another in our presence called his five sons from the house and told them to give the snakes a chance.

The older and more experienced herpetologists have brought in copperheads, *Ancistrodon contortrix*, and

timber rattlers, *Crotalus horridus*. About every specie of snake in this section is represented in one or more of the society's collections. Turtles, frogs, toads and a rather complete collection of local salamanders, including a round dozen species, are also in the exhibits. Many snakes not found nearby are also in the collections, pine and king snakes, green snakes and boas.

All of these private collections are interesting; one contains the ugliest snake, another a sort of misfit, a swamp snake with rusty skin instead of the usual dark, faintly marked back; a five-foot snake caught by a four-foot boy, and so on. The value of these collections is great; they not only give their owners certain responsibility, but are talked about and widely viewed.

To visitors the boys enjoy “showing off,” so, indirectly, taking the fear from other people; they “dare” visitors to handle a snake and, when once acquainted, the dislike and repugnance disappear. To the writer it is always a source of wonder to see how quickly the snake wins friends. My own fear vanished in five minutes. It would seem that unjustified prejudice accounts for the snake's unpopularity.

The most interesting of these private collections is owned by George Von Buehren, who lives at an apartment on Southern Boulevard, New York City. All the serpents found in this section of the United States are represented. He lives alone with them and no mother's proud young hopeful could be in better condition or have more painstaking care. Many of the specimens he has had for years; many he has reared from eggs or seen born. All are very tame and a few seem to show slight intelligence. At present he has 30 odd specimens, including a young, perfect boa.

## ANTS IN GARDENS



GARDENERS who are worried about ants in their gardens may be interested in the statement that ants in gardens do not as a rule cause as much injury as their numbers would indicate. They feed only to a very limited extent on growing vegetables. Many of them feed on the honeydew secreted by plant lice and their presence is often an indication that the plants are infested with these insects.

In case it is found that the ants are actually injuring the plants many of them may be killed by injecting into their nests kerosene, gasoline or carbon bisulphide. In the case of small nests the liquid may be applied with a small oilcan. About an ounce should be injected into each opening. In larger nests the opening may be enlarged with a sharp stick and a greater quantity of the liquid used. After the liquid has been placed in the ants' burrow the opening should be closed with earth and packed down with the foot. In case of large ant hills it will add to the effectiveness of the treatment if an old rug or wet gunny sacks are placed over the hill to hold in the fumes. Some of the ants may escape and start new colonies. It is therefore usually necessary to go over the garden several times and treat new nests when they become noticeable.

# FORESTRY AND THE WAR

From An Address By President Charles Lathrop Pack, of The American Forestry Association,  
At the Lake Placid Forestry Meeting, September 6, 1917



It is an unusual pleasure to be the guest of the New York Forestry Association and other representative institutions here today in beautiful Lake Placid. I bring you all the greetings of the directors of the American Forestry Association—an Association of constructive interest in fundamental and progressive forestry with members in every state and territory of the Union, an Association whose membership has doubled even in wartime.

We stand for all that is best in forestry. We wish the New York State Forestry Association and the others here represented God-speed in the splendid work you have in hand. We foresters and lumbermen have an important work to do in war time. The forests of America are increasing in direct and potential economic value and importance on account of war. Now that we are building hundreds of wooden ships, everyone thinks of the larger part lumber is to play in winning the war. There are many other war uses for wood. Take the matter of so-called "naval stores"—tar, pitch, resin and turpentine. These products are essential to every navy and are particularly needful to a wooden merchant fleet. More than two-thirds of the world's supply of these things come from our southern pine forests. We have been wont to refer to turpentine and resin as "naval stores," but now resin is employed in great quantities in filling the space between the bullets in shrapnel shells, so that when shells explode the missiles will be evenly distributed in every direction.

We have sent many portable sawmills and their equipment and crews of trained men to our Allies to aid in overcoming the great shortage of lumber for nearly every war use. The peculiar style of warfare which the great war has brought forth necessitates the use of enormous quantities of timber for trench walls, for trench floors, for braces, shoring, and stays. Millions and millions of feet are required for building behind the fighting lines, for temporary hospitals, for housing non-combatants, for temporary storehouses, for railroad building. Enormous quantities of forest products go into mine props, bridges and for other military preparations. In all this, I have not mentioned what is in all your minds; the great amount of lumber used in building the cantonments and camps and storehouses used in connection with the army training in this country.

As some of you know, sometime since the War Department announced the organization of a regiment of forest engineers composed largely of forestry officers and hardy men accustomed to the ways of lumbering. Now we are told that there will be six of these regiments instead of only one. Some of the leaders of this great force are already in France, prominent among whom are Major Henry S. Graves, Chief of the United States Forest Service, and Major William B. Greeley, also of the Forest Service. We are told that other experts will also be commissioned to go forward with these new commands to France. Their work will be largely in the forests of France, providing all sorts of lumber and wood for the activi-

ties of our army at the front. While organized on military lines, the work of these regiments will be more largely industrial than combatant.

For one thing it has been announced that the American engineer forces with the army in France will have to construct a railroad from Bordeaux all the way to the fighting front to better facilitate the transportation of our troops and to better keep them supplied with all the necessities of war. The building of such a railroad in so short a time would even a few years ago have been considered a great engineering feat. Today it passes as only an incident of a colossal war.

A Committee of the Council of National Defense sometime since estimated that two billion feet of lumber from our forests would be used for purposes directly connected with the war during the year beginning June 1st last. This amount, it is evident, will be exceeded because of the new war necessities for the use of wood. It is now announced for one thing that a large amount of spruce, largely from the western coast, will be used in the construction of a great aeroplane fleet, the greatest fleet of the kind that has ever been constructed in so short a time. It is now thought that the war consumption of American lumber is likely to reach two billion, two hundred and fifty million feet for the twelve months. These new uses and the increased old uses for the products of the forests increase the economic value of the forests and add to the importance of all the questions you are here to consider.

I have an announcement that I want to make which will have, I hope, not only the approval of your minds but of your hearts also. The American Forestry Association, in view of the fact that the majority of those in the forestry regiments going to Europe are trained foresters, lumbermen and woodsmen, has decided to establish the American Forestry Tobacco Fund to provide them and the men of the sawmill contingents with such comforts in the way of tobacco and other things as they may require. My friends, the fact is we are going to do our duty in this hour of trial. This is as much our war as it is the war of England and France and Italy and we all want to do our part. I hope you will join with us in promoting the American Forestry Tobacco Fund that we may give some little satisfaction and comfort to those who are particularly fighting for us in France. We will all be glad of an opportunity to help look out for our own. Contributions should be sent to the American Forestry Tobacco Fund, Washington, D. C.

That we are going to win this war none of us doubts. To do this we must bend our every effort and utilize our every resource. Our timber is essential but our food is just as important. Every individual can help in fighting with food as well as with men and munitions. The production and conservation of food is within the reach of all of us. Former Ambassador Gerard has told us that we cannot starve Germany. Our common sense tells us that we must not starve our army or our allies. We are fighting for national existence and the perpetuation of Democracy.

# THE BLUE MESA FOREST FIRE

BY HENRY L. SPENCER, Forest Ranger



THE season opened hot and dry on Blue Mesa. For thirty days no rain had fallen. The large expanse of Engelmann spruce, with its dense floor cover of down timber and underbrush, was thoroughly dried and awaited but a carelessly thrown match or cigarette stub to start the worst fire that had ever occurred in the Blue country.

Blue Mesa, in Gunnison County, Colorado, embraces the territory between Big Blue Creek on the west, and the Lake Fork on the east; and from the Black Canon of the Gunnison on the north to the north boundary of the Uncompahgre National Forest on the south; a stretch of country ten miles in width east and west, and fifteen miles in length. The upper half of the Mesa reaches up the easy north slope to the Uncompahgre Forest. This fine body of timber, unmarred by axe and saw, lies principally on the public domain, below the National Forest boundary, and contains about 200,000,000 feet, board measure. This timber is particularly susceptible to fires because of the large number of sheep outfits passing through it, and because it lies entirely outside of a National Forest and has no fire protection.

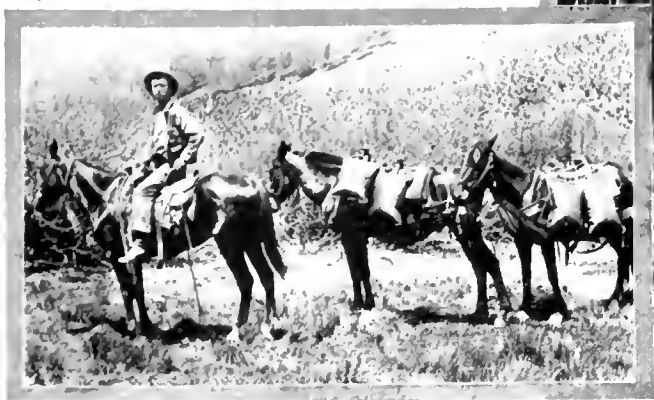
While on a trip over my district, on June 21, I received telephone word from Bill Doran, fire guard at my station, that there was a big forest fire below the Forest boundary, between the Little Cimarron and the Big Blue. Telephone messages came from other sources at the same time and all indicated that the fire was serious, and traveling rapidly toward the Forest. Enlisting Frank Carpenter, who had carried the news to Doran, I arranged to have the Alpine and Bally tool caches, a camp outfit and a supply of food packed to the fire that evening. Ranger Wagner, who had been my fire guard for three previous years, telephoned me that three automobile loads of men would be ready to start from Ridgeway by the time he could reach there from Jackson. I told him to get the men and come on, and I planned to pick up the first-aid crew from the lower Lake Fork and have a follow-up crew come in from Lake City and vicinity the next day. Arranging to have Tony Baker provide six horses at the J-J ranch the next morning, I started from Lake City in an automobile with a chauffeur. As our car rolled out of the town and around the shoulder of a mountain our eyes caught the huge cloud of boiling smoke from the fire. It was 20 miles away, as the crow flies, yet it seemed to be just over the brow of the Mesa.

On the hurried trip we gathered up all the men we could find at their homes and camps. During the night we abruptly topped a ridge, to see the red glow,

toward which we had been traveling, suddenly give way to the countless bright lights of the fire itself. The first impression of such a sight is one never to be forgotten. Close your eyes and imagine thousands of brightly burning camp-fires set in the vast, black background of an inky night, and you will gain a faint idea of the wonderful panorama before us. Over a thousand feet of steep hillside, down to Little Blue Creek, which had checked the fire after its first furious rush, then up the slope on the other side and on south for an unknown distance glowed the myriads of bright lights. No conception of the area of the fire could be gotten other than that it was very large. My sense of the beautiful was dispelled by the thought of the morrow, and the days to follow, when the fire would awaken to the prevailing high day winds and do its utmost to level the Blue Mesa forests.

In making our way to the fire we had to bow our heads against the thickening smoke and as we worked onward I could see that if the fire should cross the parks through which we had traveled, and get into the heavy timber on the east, it would be beyond control and probably the greater part of the Blue Mesa forest doomed. Just before daylight we reached the camp of the men brought by Doran and Carpenter and with the first sign of dawn we started for the fight, with arrangements completed by telephone for camp equipment and commissary to be sent us. We were joined by Ranger Taft and Guard Lucas of the Gunnison Forest and Andy Enbom, a sawmill man, who had information concerning the northwest part of the fire area. We had already determined to fight it on the east and south, and their news confirmed our judgment. The wind was rising rapidly and the fire was responding in many places with high crown blazes. It was about seven miles around the outer edge but the weak places were on the east and south sides. During the day the follow-up crew from the Lake Fork arrived, with Ranger Wagner; Borden came from the Gunnison Forest and Sheriff Hanlon of Gunnison County arrived with ten men, camping on the north end. Wagner brought further reinforcements at midnight.

On the second day every effort was needed to combat the sparks that were carried over our lines by the high wind from the west. The situation was intensified as the fire burned closer to the lines and the spark danger grew greater. Within the fire area were many small patches of trees, which on account of topography and slight isolation had not been burned by the first afternoon rush, and as the fire crept into this heavy timber, high crown fires were started which



FIGHTING FOREST FIRE ON BLUE MESA, IN COLORADO

In the picture in the upper left hand corner of this layout is shown the place in which the fire started, and the timber to the south and east, where the fire fighters concentrated their work. The picture in the upper right hand corner shows fire equipment being packed to the scene on horseback. The round picture shows the camp made by the fire fighters. To the right of this is a remarkable view of the fire going up a spruce tree. The fire area contained a vast quantity of Engelmann Spruce and it was in the effort to save this and to prevent the flames from spreading that the fire fighters toiled. The tented scene beneath the round picture shows visitors at the camp of the fire brigade. In the picture in the lower left hand corner of the page is illustrated one phase of the strenuous work required in checking the progress of a fire in the mountain forests. The bags slung over the backs of the horses are filled with water, which has to be carried for a long distance for use in putting out fires in smouldering trunks and stumps. In the lower right hand picture is shown the floor of the forest after the flames had passed. The fire was a serious one and came near to dooming the greater portion of the Blue Mesa forest.

scattered sparks at an alarming rate. Sparks repeatedly jumped 600 yards across a deep canon to heavy timber. It was absolutely necessary to extinguish these sparks within a few minutes, since an unmanageable fire would result from one of them in a short time. About 3 o'clock in the afternoon the situation became so serious, during the burning of a heavy patch of big timber, that we called out the entire night crew and scattered its members through the heavy forest to the east of our line, patrolling for sparks. Several times we had narrow escapes from the fire getting outside our lines.

The morning of the third day did not develop the danger of the fire jumping our east line that had been present the first two days, and by noon it seemed that the worst hazard on this line had passed. The high wind was now coming more from the north. In the afternoon on a trip around the north and west sides of the fire area I found a heavy patch of 300 acres of Engelmann saw timber located between the fire and the rim of the Middle Blue. The fire had just eaten into the timber, perhaps an hour before I rode up, but was in the crowns and beyond reach by direct attack. Quick action was necessary. I rode through the burned area to camp, quickly got together a crew and returned with them. The thing which astonished and alarmed us was that the fire was traveling north in the face of the wind almost as fast as a horse could walk. The bulk of the timber lay to the north and it was this that we wished to save. A favorable place, where the heavy spruce gave way to a narrow strip of aspen running west, was selected and we began work. Our water bag was emptied in a short time, and as every man was needed on the line, Mrs. Patton, the wife of a sheepman, volunteered to go for water.

Taking two water bags on her saddle she quickly rode three-quarters of a mile to a creek and returned with them full of water. We had men in camp who were much more afraid of venturing around and through the fire than this woman. We finished our line to the rim by sundown.

The next morning arrangements were made to move a camp with full equipment to the west side near the work. Ranger Taft returned to this location with us, and at his suggestion we decided to run a permanent control line up the hill through the heavy timber along the edge of the fire to "corral" it. The "corralling" of this part of the fire was perhaps the most spectacular work done on the job. Carpenter had departed at sun-up to get a gang of Swede timber cutters at Enbom's sawmill. They arrived at noon with a good skid team, five men and Mr. Enbom. By night, under Ranger Taft's direction, the line was well up the hill through the heavy timber. The situation on the east side still demanded the attention of most of our men and no attempt was made to continue the west side control line during the night. The work was resumed early the next morning by Taft and the Swedes. The wind rose with the sun and veered completely around to the southeast, and it was necessary to keep a constant watch for spark fires over the line. By great effort and remarkable endurance Enbom and his men outran the fire to the bare rim of the Middle Blue by a narrow margin. We had it "corralled," but with the wind from the south it was mighty liable to jump out any time. It did jump in several places, but was promptly caught each time, and after the fire had burned up to our control line and burned down, the Blue Mesa fire was under control.

## FIGHTING THE PINE BLISTER DISEASE



THE results of scouting this year have shown that the pure blister disease is generally scattered throughout New England. In some localities currant and gooseberry infections are few and far between, but in the vicinity of pine infection centers they are heavily infected. In Maine and New Hampshire reports of 90 per cent infection of currants and gooseberries were made for several localities as early as the latter part of June. Many new infected areas of native white pines have also been discovered and the disease has reappeared at practically all of the points where diseased pines were found in 1916. Among the important centers of native pine infection found this year are Intervale and Conway, New Hampshire; Bath, Maine; South Roy-alston, Vermont; Bridgewater and Topsfield, Massachusetts, and Pomfret, Connecticut. The disease has been found on large and small trees; no white pines have been found to be immune, regardless of size or age. At Stratham, New Hampshire, more than 600 separate in-

fections on twigs and branches were found on a tree about 3½ feet in diameter, 50 or 60 feet high.

About 400 men are engaged in blister disease work in New England. The work consists mainly of eradication of currants and gooseberries. Scouting in localities where the disease was not abundant last year is also being done to a certain extent and private owners of pine timber, as far as possible, are being educated in the means necessary to make their pine timber safe. Each state has selected one or more areas of varying size from which all currants and gooseberries, wild and cultivated, are being removed. These areas represent different environmental conditions, some having diseased pine, others none; some with an abundance of wild currants and gooseberries, others where these are scarce. All of these areas, however, have good white pine growth and by eradicating all the currants and gooseberries they can be made safe for the growing of pine.

The eradication crews are trying out different schemes



in order to find the cheapest and most efficient method of work. Each eradication crew must endeavor to improve its methods of work in every way possible. At present the general plan of work of the crews is as follows: The men are lined up 6 to 10 feet apart, and proceed back and forth over the strip of territory to be covered. The end man acts as guide and keeps the line straight. Tags, whitewash, paint, compass and breaking the underbrush are a few of the methods which have been tried by different crews to keep a line through the woods. Thus far the compass has been found to be by far the best and cheapest method where practical.

The tendency is for the members of the crew to work too far apart. For example, in one small swamp a crew working unsystematically reported finding about 100 wild currants and gooseberries. On going over the area in close formation the crew reported finding approximately 500 bushels additional. Most efficient results are obtained when the crew foreman acts as inspector and checks up the work of the crew all of the time. This statement carries no reflection on the efficiency of the individual members of the crew. Apparently most poor work is simply the result of an unsystematic attempt to cover the ground rapidly and thus reduce the cost per acre.

Messrs. Stoddard and Moss of Connecticut have found by experiment that the best and easiest way to pull firmly rooted currants and gooseberries is as follows: One man pull straight upward; another man takes hold near the base of the plant and pulls at right angles to man number one. They claim this method makes the work quite easy and efficient.

In some states county agricultural agents have become interested in the blister disease and their aid has been of great value in assisting scouts in their work. They have also been of material assistance in arousing public interest. The aid of such organizations should be obtained whenever possible.

Massachusetts is taking a census of currants and gooseberries in each town. Work is also being started on a map to show the distribution of pine and currants and gooseberries in all of the Eastern States. The following classifications are being used:

1. White pine comprising half of stand or more
2. Scattered white pine of commercial value.
3. White pine present but of negligible value.
4. Commercial Currant growing areas.
4. Commercial growing areas.
5. Wild currants and gooseberries numerous.
6. Wild currants and gooseberries few.
7. Areas where skunk currants are found.

In co-operation with Ontario all currants and gooseberries on strips one and one-half miles wide along each side of the Niagara river have been eradicated by New York State to prevent the spread of the disease into New York State from Ontario. West of Connecticut

and Massachusetts another strip about two miles wide was eradicated in 1916 to prevent the spread from the above mentioned states. This strip was gone over again this year to remove any remaining currants and gooseberries. Early in August several new currant and gooseberry infections were reported north and south of the terminating points of this line, but no infections have yet been found directly west of the line.

A general infection of considerable extent was discovered last year in the northeastern section of New York. Results of recent scouting outside of this area have shown that the disease is distributed from Lake Champlain well into the eastern portion of the Adirondack region. The line of western extension of the disease, as located by scouting to date, runs through Constance, North Bangor, Malone, Bloomingdale and Saranac Lake. Franklin county; and Lake Pleasant, Hamilton county. Infected currants and gooseberries have also been found at Chestertown, Weaverton and Warrensburg, Warren county; in the best white pine section of the state.

A previously unreported plantation of imported pine, from the Heins nursery, Germany, may explain the wide distribution of the disease in northern New York. This planting was made in 1903 or 1904 at Hurricane, Essex county, New York, not far from the locality where numerous diseased native pines were found last year and this year. This area of scattered native pine infection covers a number of square miles between Lewis and Cross, Essex county, and has been selected to demonstrate the practicability of controlling the disease. Eradication crews have removed cultivated currants and gooseberries and are now pulling up the great grandfathers of all wild gooseberry bushes. About fifty men are engaged in blister rust work in New York State.

Scouting is in progress in other parts of the State and a few isolated infections of planted pines have been found. Currants and gooseberries are eradicated in and around diseased plantations for a distance of approximately one-half mile. Near Geneva, New York, diseased pines were found in a plantation made in 1905 from stock purchased from a large nursery in Illinois. Currants and gooseberries were eradicated around this plantation last summer and very early this spring the plantation was scouted with extreme care and all diseased or suspicious trees were removed. The results have been very gratifying, as frequent inspections have been made and no currants and gooseberries outside of the control area so far have been found to be infected.

Diseased pines have been found in four places in Pennsylvania, but in each instance they were removed before the fungus had fruited. No diseased currants and gooseberries have been reported to date.

Scouting is in progress in New Jersey, but only one infection has been found. This was in a private nursery where the disease appeared last year. Hitherto New Jersey has been considered as being practically free from wild currants and gooseberries, but recently they have

been found rather abundantly in the northwestern part of the state.

Two specimens of diseased pine have been reported from a nursery located at Cuyahoga Falls, Ohio.

Scouting in Maryland, Virginia, West Virginia, North Carolina, South Carolina and Georgia has thus far revealed no blister disease. Planted pines in these states are not abundant, but scouting has revealed a larger number of plantings and a greater abundance of wild currants and gooseberries than was previously suspected.

The blister disease has been found on imported pine in a nursery at Pontiac, Michigan. These trees came from France in 1910 and all shipments from this nursery are being traced. A force of eight men are engaged in general scouting under the direction of Dr. Pennington, of Syracuse University.

A few currant and gooseberry infections found close together near St. Croix, Wisconsin, have been reported, but the source of this infection has not yet been discovered on pine. A force of 24 men are scouting the state.

More than a dozen infections have been found in the St. Croix valley, in Minnesota, scattered over a territory approximately 60 miles long and 10 miles wide. Several native pine trees and many currants and gooseberries were found diseased. Infections appear to be spotted over the valley and an attempt is being made to eradicate the disease on both pine and currants and gooseberries. Pine stock shipped from nurseries has been traced and several of these shipments were found to be diseased. Twenty-six men are engaged in scouting and eradication.

One tree on an estate located at Estelline, South Dakota, has been found diseased. The tree came from an infected Minnesota nursery in 1911 and illustrates the danger of spreading the disease through shipments of nursery stock.

Blister rust scouting is now carried on in Iowa, Illinois, Indiana, Missouri, Kentucky, Tennessee, Nebraska, Kansas and North Dakota, in co-operation with the various state authorities. Thus far this year no disease has been discovered in any of these states, although numerous plantings of pine have been found and examined.

Survey work in the Rocky Mountain and Pacific Coast States having native five-leaved pines has thus far revealed no evidence of the presence of the white pine blister disease. The rumor that the blister disease was found in the State of Washington is apparently unfounded.

A fungus having somewhat similar appearance to the white pine blister disease was found in Kansas in 1892 and in Colorado in 1897 and later. Inoculations by members of this office have practically proved that the rust on currants and gooseberries in Colorado is not the white pine blister disease.

Specific appropriations for the control of the white pine blister disease have been made as follows:


Massachusetts, \$50,000, for 1 year; New Hampshire, \$28,000, for 2 years; Vermont, \$20,000, for 2

years; Maine, \$10,000, for 2 years; Connecticut, \$20,000, for 2 years; Rhode Island, \$2,500, for 1 year; New York, \$25,000, for 1 year; Pennsylvania, \$10,000, for 1 year; Wisconsin, \$15,000, for 2 years; Minnesota, \$15,000, for 2 years.

The Federal Government appropriated \$300,000 for the fiscal years 1917 and 1918, \$150,000 of which is being expended on a dollar for dollar basis in the various states which have made appropriations for this work.

The present outlook for controlling the disease seems to center entirely on whether or not wild currants and gooseberries can be completely and economically removed and whether owners of cultivated currants and gooseberries prefer to lose their bushes rather than the pine. Professor E. G. Cheyney, Dean of the Minnesota Forest School, is engaged in a study of the eradication problem from every angle. He has suggested that in each demonstration control area data be secured this year for providing accurate information in the future on the effectiveness of control and the rate of progress of the disease outside of control areas. A rough topographic map will be made showing the distribution of pine by age classes, also showing type of area for currant and gooseberry growth, such as swamp, open meadow, brush land, pine woods, hardwood forests, etc. In the control area the record of these plants by species and amount of infection will be made, for each type, on permanent sample plots 50 feet square. Outside of the area several lines radiating from the control area will be run for some distance to provide check plots for determining the rate of advance of the disease.

## NEW HAMPSHIRE CONFERENCE

 UNDER the joint auspices of the Society for Protection of New Hampshire Forests and the New Hampshire State Forestry Commission, the eighth annual state forestry conference was held September 4 and 5 at Dartmouth College. The program included addresses by Governor Henry W. Keyes, Professor Filibert Roth, director of the forest school of the University of Michigan; Professor J. W. Tuomey, president of the Connecticut Forestry Association; Harris A. Reynolds, secretary of the Massachusetts Forestry Association; Allen Hollis, president of the Society for Protection of New Hampshire Forests; Dr. Charles H. Bolser, Professor F. A. Updyke, Professor James W. Goldthwait and Professor A. H. Chivers, all of Dartmouth; Elwood Wilson, forester of the Laurentide Paper Company; Dr. H. H. York, professor of botany at Brown University; S. L. DeCarteret, manager of the Timberlands Mutual Fire Insurance Company; Karl Woodward, professor of forestry at New Hampshire State College; F. H. Tucker, president of the Appalachian club; Mrs. A. H. Harriman, president of the state federation of women's clubs; E. E. Woodbury, Allen Chamberlain, Winthrop Packard and Frederick W. Kilbourne.

# WESTERN QUAILS BEING EXTERMINATED

BY DR. R. W. SHUFELDT, C.M.Z.S.

(Illustrations from *Life by the Author*)

HERE is no better evidence of the approaching extermination of any wild bird in nature, in any country, than the increase of the price demanded for it by ornithological collectors from year to year, when the skins of any species are offered for sale to museums, taxidermists and others. In 1830 the Great Auks were being cut up by the hundreds for bait by the fishermen, who frequented the fishing banks about the mouth of the St. Lawrence river; to-day, a single skin of that bird probably could not be purchased for a less sum than one thousand dollars. When Alex-

ander Wilson wrote his *American Ornithology*, the Carolina Parroquet occurred in nearly every State east of the Mississippi, and its skin could be bought for a trifle;

whereas now, as the result of eternal persecution and wanton slaughter, this species exists only in certain restricted sections of Florida, and its skin cannot be purchased for less than ten or fifteen dollars. In a few years it will bring double that amount.

These two well-known examples are very fair ones as to what is going on along such lines all over the world, and other cases of it may be seen with respect to the Wild



THE PLUMED QUAIL

This handsome bird is found in Oregon, California and Western Nevada. It is a slaty-gray bird, overtone with olive brown. It has black and olive feathers on the sides and is otherwise charmingly colored.



THE MEARNS' QUAIL

This remarkable species is found chiefly in Arizona. The male here shown is spotted and barred with black and white, while other areas are in various shades of tawny and brown.



THE CALIFORNIA QUAIL

This bird is one of the most beautiful of all western quails. It is found generally in Oregon and California and also to some extent in Colorado.



MALE TEXAS BOB WHITE

This bird is the western quail which most closely resembles our eastern species. It is found no farther westward than the southeastern corner of New Mexico.

Passenger Pigeon and the Labrador or Pied Duck, described in the February (1917) issue of *AMERICAN FORESTRY*, where figures of both species are presented.

More or less suddenly it will be observed that a certain species, or several species of birds are becoming less and less abundant every year, be the cause what it may—known or unknown. Museums and collectors then get busy, and the very movement put on foot to satisfy the demands of such sources materially increases the danger of the extinction of the species sought.

This critical stage seems to now have been reached in the case of all the beautiful species of quails found throughout the Pacific Coast region. I can well remember when, fifty years ago, those returning from that region, in the early days of California, reported the presence of several of the species here shown in the illustrations in vast bevvies, often numbering several thousand each, such hosts occurring wherever the nature of the country suited them. At the time to which reference is made, millions of these birds were to be found in California alone, and they were equally abundant in adjacent regions. But the gunners and hunters got after them in ever-increasing numbers, with constantly improved weapons, until the usual result was brought about; so that, at the present time, the various forms being considered are, with ever-increasing rapidity, confronted with the same fate that man had in store for the Wild Passenger Pigeon and the Great Auk. Already the prices for the skins of these several species are being advanced in the market for museums and collectors; and this, as pointed out above, is a very ominous sign for these most beautiful members of their kind in any part of the world.

There is but one remedy for this very undesirable state of affairs: to pass laws against the shooting, trapping or otherwise destroying any of these species for a long period of years.

Of course, sportsmen will protest vigorously against any such legislation; but the only way to save the quails of the Pacific Coast is to stop shooting them. The birds in mind are all generically represented in this article. Our Bob-whites do not extend so far to the westward. To be sure, the Masked Bob-white occurs on the southern border of Arizona; but the bird that most closely resembles our eastern species is the Texas Bob-white, and that form is found no farther westward than the southeastern corner of New Mexico.

In so far as our own avifauna is concerned, there are, beside the Bob-whites, four entirely distinct genera of these western quails, and each genus contains, in addition to its type species, from one to three subspecies, there being about nine forms in all. In a brief article like the present one, it will be quite out of the question to give the descriptions, much less the ranges, where all of these truly beautiful birds are to be found at this writing; their photographs must stand for their appearances, and their habitats are not essential; the main object of this article being a plea to save them from certain and utter extermination.

Apart from Mearns' Quail I have had living specimens of all these birds in my possession for the purposes of photography, while the figure of the first-mentioned species was made from a mounted specimen in the collection of the United States National Museum.



THE BLUE QUAIL

This bird is also called the Chestnut-bellied Scalded Quail. It has a noticeably slaty blue plumage.

**CANADIAN DEPARTMENT**

ELLWOOD WILSON, SECRETARY,  
CANADIAN SOCIETY OF  
FOREST ENGINEERS

There has been a serious depletion of the ranks of professional foresters during the past month, Millar, of the University of Toronto, and Benedict and Lafon, of the British Columbia Forest Service, having joined American Forestry Units going overseas. D. P. Brown, manager of the mills of The Brown Corporation at LaTuque, has gone to Scotland with a Forestry Unit, and his cousin, S. Brown, is going to Plattsburg to train.

Dr. B. E. Fernow and Clyde Leavitt spent a few days visiting Dr. Howe's Camp and discussing the work which it is doing in the investigation of cut-over pulp wood lands. They also visited the nurseries and plantations and some of the experimental lumbering operations of the Laurentide Co., Ltd., at Grand' Mere, and then went on to visit the Quebec Government Nurseries at Berthierville and the plantations on drifting sands at Lachute, both under the direction of Mr. G. C. Piche, Chief Forester of Quebec. Dr. Fernow remarked that the conditions in the lower part of the St. Maurice Valley were practically identical with those in the western Adirondacks.

On July 31st a meeting of the Quebec Forest Protective Association was held in Quebec, at which all the Fire Protective Associations were represented. Matters of general interest were discussed and a conference was had with Mr. Hall, the Chief of the Quebec Government Fire Service. A committee was appointed to see the Minister of Lands and Forests to urge him to make it obligatory for gum-pickers, berry-pickers, hunters and fishermen, not members of licensed clubs, and prospectors to obtain permits from the district fire rangers before going into the woods. The Minister was also asked to scrutinize more carefully applications for settler's lots, as the high prices for pulpwood were beginning to encourage speculators.

Mr. Avila Bedard, Assistant Chief Forester, is making a tour of the province, giving a series of lectures on forestry and forest protection in co-operation with the Canadian Forestry Association, assisted by Mr. Black, the Secretary. At Grand' Mere they had an audience of about 180 who much enjoyed the lecture and the excellent slides.

A conference was held at Grand' Mere on August 6, between Clyde Leavitt, Forester of the Dominion Conservation Commission, G. C. Piche, Chief Forester of Quebec, Dr. C. D. Howe, in charge of field work for the Conservation Commission, and Ellwood Wilson, to discuss the subject of the investigation of the condition of cut-over pulpwood lands and the best manner of handling them and also the best method of regulating the cut. The



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whole question of a supply of pulpwood for the future is of vital importance to the Provinces of Quebec, Ontario and New Brunswick, and the large increase in consumption makes it necessary to plan for the future. Heretofore and at present the cutting is regulated simply on a diameter limit basis, and this has by no means fulfilled the purpose which was intended. The operators have always gone along on the comfortable assumption that uncut lands were producing so much additional growth each year that enough trees were being left under the diameter limit system to insure a cut for the future and that the supply was practically inexhaustible. The sudden rise in price of wood has compelled them to give a little thought to this matter, and it is hoped that the present study being made will give us a sound basis on which to discuss this question and will lead to the obvious improvements in cutting and handling of timber lands which are necessary. Lumbering practice has not kept pace with mill practice and has not yet availed itself to any very great extent of the discoveries of modern forestry and engineering.

P. Z. Caverhill, in charge of forest surveys in New Brunswick, has resigned to go back to the British Columbia Forest Service and his place has been taken by G. H. Prince. This survey is beginning to open the eyes of the New Brunswick Government and it is hoped they will see the necessity for an up-to-date Forest Service. The stumpage dues of that province have just been largely increased and the lumbermen should demand an efficient management of Crown Timber Lands. New Brunswick should also reorganize its forest protection work and put it on an up-to-date basis.

Arnold Hanssen, for five years with the Laurentide Co., Ltd., after completing his two-years' course for the degree of Master of Forestry at the Yale Forest School, in one year, has enlisted in the Royal Army Medical Corps and is training at the Valcartier Camp.

The figures for the consumption of pulpwood for the year 1916 have just been published by the Dominion Forest Service and show a large increase over 1915. The total consumption for 1915 was 1,405,836 cords valued at \$9,426,217.00, and that for 1916 was 1,764,912 cords valued at \$13,104,458.00. The increase in the year in the price per cord was seventy-one cents. The increase in the consumption has increased in the period from 1908 to 1916 over 265 per cent, and the price per cord during the same period has increased 229 per cent. The increase in consumption if it continues at the same rate will necessitate the most expert handling of the forests in order to insure a supply for the future and the increase in price will be more rapid than it has been owing to the increasing scarcity and inaccessibility of the supplies.

The appointment of men to the outside service of the Dominion Forest Branch continues to be nothing short of a scandal. The District Foresters are compelled to consult the local political boss before making appointments and men are forced on them who are absolutely incompetent and often physically incapacitated. The Canadian Forestry Association made representations to Sir Wilfrid Laurier, when he was Premier, and has twice sent deputations to Sir Robert Borden. Both Premiers promised reforms, but nothing has been done. It is high time that a stop was put to this sort of thing for the good of the country at large. British Columbia has put its Forest Service on a merit basis and its example should be followed by the Dominion Government.

In France German prisoners under their own non-commissioned officers are working at lumbering and enjoying it hugely. They are said not to work very hard. The Canadian bushmen are put on the more technical jobs and superintendence. Much of the lumbering is done by attaching ropes and pulleys to the trunks of the trees and after cutting the roots pulling them over.

## PLANTING PECANS

"It has been found that pecans thrive in Mississippi where I live," writes L. B. Fowler, of Shubuta, Miss., "and I am repeatedly asked: Does it pay to use dynamite to plant these trees? I put out 298 pecan trees in February, 1915, using 75 pounds of dynamite which, with caps and fuse, cost me \$15.00. I did not lose a single tree. I have a neighbor that put out 46 trees in the same locality, in the same kind of soil, at the same time. He refused to blast his holes because of the expense. He lost 40 trees out of the 46 and is now replanting, blasting all the holes this time. It cost me thirty cents a tree to set my trees, and it cost him twenty cents each to put his in the ground the first time. As all kinds of explosives have advanced in price the past year, it is costing him about thirty-five cents per tree to replant, thus making his total cost of planting fifty-five cents per tree. In addition, he must count as expense what the trees that died cost him. My trees are all thoroughly rooted by this time, so he is just one year behind me and always will be."

## IMPLEMENT BLUE BOOK

The Midland Publishing Co., St. Louis, Mo., has left over a few copies of the 1916 Implement Blue Book, one of which it offers to mail free of charge to any subscriber of this magazine who will send 25 cents to pay the packing, postage, etc. The book has nearly 500 royal octavo pages and contains complete classified descriptive lists of all farming implements, tractors, tractor plows, vehicles, wagons, and kindred goods made in the United States, with names and addresses of manufacturers.

## EXTENSION OF LACEY'S ORGANIZATION

**W**ITH the opening of a New York office the firm of James D. Lacey & Company has increased its staff of experts by the addition of E. A. Sterling and C. A. Lyford. Mr. Sterling is in active charge of the New York office, which is located in the Forty-Second Street building at 30 East Forty-Second Street. He will serve as Eastern manager for the firm. Mr. Lyford has become chief forest engineer and will be located in the Seattle offices, where he will co-operate in field work and in the selling of timber properties.

In thus strengthening its organization

the firm increases its widely known facilities for technical service in properly estimating, mapping and reporting on timber properties. The expansion is in accordance with the firm's long recognition of the necessity for complete and accurate reports as a basis for the financial and operating phases of timber investments. Mr. Lacey has been actively identified with the lumber business for several decades. Of the other members of the firm, Wood Beal has been associated with Mr. Lacey since 1882, and Victor Thrane since 1900. The firm is known to the entire lumber industry throughout North America.

As Eastern manager, Mr. Sterling brings to the firm broad experience, highly developed technical training and splendid ability. He is a graduate of Cornell with the degree of Forest Engineer. His college work was followed by a season of study in Europe, in 1903. After serving as forester with the New York State Forest Commission, he entered what was then the United States Bureau of Forestry. In this bureau and in the succeeding United States Forest Service he had wide opportunity for investigations and experience, covering the entire United States in his extensive travel. After two years of investigation into forest conditions in California he prepared and procured the passage of the first comprehensive forest law enacted in that state. As chief of the division of forest extension in the Forest Service, Mr. Sterling spent two years in administrative work and field travels in connection with the development of the

government policy of reforestation in the National Forests and in giving assistance to private owners along the line of forest extension. For five years, from 1907, Mr. Sterling was chief forester of the Pennsylvania Railroad, in which field his work gained broad recognition.

His next step was to establish himself as consulting forest and timber engineer. As a specialist in wood preservation he gained a national reputation and in 1913 he was elected president of the American Wood Preservers' Association. Recently Mr. Sterling has been manager of the trade extension department



E. A. STERLING



C. A. LYFORD

of the National Lumber Manufacturers' Association, where his constructive work was of great value.

To the duties of chief forest engineer Mr. Lyford will bring an experience of several years and an intimate knowledge of forest engineering work. His familiarity with tide-water timber in British Columbia is pre-eminent, besides which he has had broad experience in the pulp region of Eastern Canada. Some idea of the magnitude of his work may be had from the statement that his firm of Clark & Lyford, Limited, has made forest surveys of more than 5,000 square miles of territory, or 3,200,000 acres. Mr. Lyford was in personal charge of much of this work, often spending weeks and months in the commercial forests in order that the survey might be perfected on a high engineering basis. In connection with this work he effected an improvement in survey methods and placed timber estimating for pulp wood properties on a new scientific basis.

Mr. Lyford has been in charge of a British Columbia logging operation for some time. He is a graduate of Cornell University, with the degree of forest engineer. At college he was prominent in athletics, stroking the Cornell "four" and playing football and baseball. With the addition of Mr. Sterling and Mr. Lyford to its staff the firm of James D. Lacey & Company is in position to do even greater work than in the past. Mr. Lacey's home is at Newburgh, New York, and he will make the New York office his eastern headquarters.

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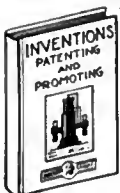
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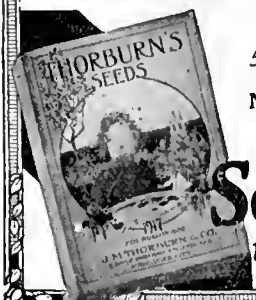
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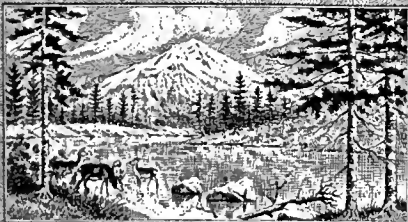
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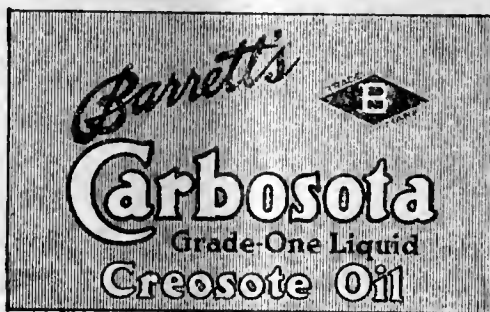


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577

# AMERICAN FORESTRY

THE MAGAZINE OF THE AMERICAN FORESTRY ASSOCIATION

PERCIVAL SHELDON RIDSDALE, Editor

OCTOBER 1917 VOL. 23

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Therefore, we have arranged to train 250 young men this fall and winter—either at their homes in their spare time, or under personal instructors at our Kent headquarters—so that they will be ready to take up their new positions with us next season.



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we will call you in for practical training and a guaranteed position with the Davey organization. For full information of this offer mail the "Mail Training" coupon below.

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# REAL ESTATE AND TIMBER



## Tenders for Pulpwood Limit

Tenders will be received by the undersigned up to and including the seventeenth day of December next for the right to cut pulpwood and pine timber on a certain area situate in the vicinity of the Kapuskasing River in the Districts of Timiskaming and Algoma.

Tenderers are to offer a flat rate per cord for all classes of pulpwood, whether spruce or other woods. The successful tenderer shall be required to pay for the Red and White Pine on the limit a flat rate of \$10 per thousand feet board measure.

The successful tenderer shall also be required to erect a mill or mills on or near the territory, and to manufacture the wood into pulp and paper in the Province of Ontario, in accordance with the terms and conditions of sale which can be had on application to the Department.

Parties making tender will be required to deposit with their tender a marked cheque payable to the Honourable the Treasurer of the Province of Ontario, for Twenty-five Thousand Dollars (\$25,000.00), which amount will be forfeited in the event of their not entering into agreement to carry out conditions, etc. The said Twenty-five Thousand Dollars (\$25,000.00) will be held by the Department until such time as the terms and conditions of the agreement to be entered into have been complied with and the said mills erected, equipped and in operation. The said sum may then be applied in such amounts and at such times as the Minister of Lands, Forests and Mines may direct in payment of accounts for dues or of any other obligation due the Crown until the whole sum has been applied.

The highest or any tender not necessarily accepted.

For particulars as to description of territory, capital to be invested, etc., apply to the undersigned.

G. H. FERGUSON,

Minister of Lands, Forests and Mines, Toronto, September 19th, 1917.

NB—No unauthorized publication of this notice will be paid for.

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## SALE OF TIMBER, WHITE MOUNTAIN APACHE INDIAN RESERVATION.

SEALED BIDS, MARKED OUTSIDE "BID, White Mountain Apache Indian Reservation Timber" and addressed to "The Commissioner of Indian Affairs, Washington, D. C." will be received until 12:00 o'clock noon, Eastern Time, Wednesday, October 24, 1917, for the purchase of timber upon about 68,000 acres within Townships 8 and 8½ North, Ranges 23, 24, 25 and 26, and Townships 9 North, Ranges 24 and 25 East, G. & S. B. P. M., Arizona. The sale embraces approximately 400,000,000 feet of timber (about 95% Western Yellow Pine and 3 to 5% Douglas Fir and other species). Each bid must state the amount per thousand feet, Scribner decimal C. log scale, that will be paid for timber of all species cut prior to October 1, 1924. Prices subsequent to that date are to be fixed by the Commissioner of Indian Affairs by three year periods, in accordance with operating and market conditions. No bid of less than three dollars per thousand feet for all species within the sale area for the first period will be considered. Each bid must be submitted in triplicate and be accompanied by a certified check on a solvent National Bank, in favor of the Superintendent of the Fort Apache Indian School, in the amount of fifteen thousand dollars. The deposit will be returned if the bid is rejected, but ten per cent. of it will be retained if the bid is accepted and the required contract and bond are not executed and presented for approval within thirty days from such acceptance. If the bid is accepted and the contract and bond executed, the deposit will be applied as an advance payment on the purchase price. The right to reject any and all bids is reserved. For copies of bid and contract forms and for other information regarding the offering, application should be made to the Commissioner of Indian Affairs.

The Department of Agriculture has advertised a tract adjacent to the Indian Reservation containing approximately 25,000,000 feet of timber. The Indian timber and the National Forest timber are being advertised at the same time with the understanding that the purchaser of these tracts may log them together. Information as to the National Forest Timber may be obtained from the District Forester, Albuquerque, New Mexico. Washington, D. C., August 27, 1917. CATO SELLS, Commissioner of Indian Affairs.

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# AMERICAN FORESTRY

VOL. XXIII

OCTOBER 1917

NO. 286

## A RELIEF AND COMFORT FUND

**W**ITH the entry of the regiments of foresters, woodsmen and lumbermen into service in the European war zone there arises urgent need for providing definite relief for families of its members requiring assistance while they are on service, or if they are killed or wounded, and for affording field comforts for the men themselves. To meet both phases of this need the American Forestry Relief and Comfort Fund has been organized. Through the operation of this fund it is believed that much can be accomplished in behalf of the men and their dependent families.

That this enterprise will commend itself to the individual membership of the American Forestry Association is certain. Every man and woman interested in the woodland wealth of America will have a direct interest in the men who have gone into the forests of devastated France. A common love for the open places of the great outdoors cements the two classes into a brotherhood of sympathy and understanding. The members of the Tenth Engineers (Forest) are doing a work which appeals to all those to whom it has been given to know the message of the forest. They are doing this work in answer to the urgent call of their country and the vital needs of the allied nations joined with America in the fight for the perpetuation of Democratic institutions. Those of us who remain at home have no duty more imperative than to show them that their patriotism is appreciated and their sacrifices met with adequate response. To achieve this nothing will be so effective as to give them assurance that their loved-ones will not suffer and that their own welfare in the war-zone will be looked after by the people back home.

In sending the Tenth Engineers (Forest) to France the War Department has made only a beginning. Another regiment is now in process of formation and within a short time there will be 9200 men in these organizations in French territory. With the increased number will come increased needs. In order that adequate provision may be made for these needs it is important that the Relief and Comfort Fund shall make headway as rapidly as possible.

The primary purpose of the Fund will be to look to

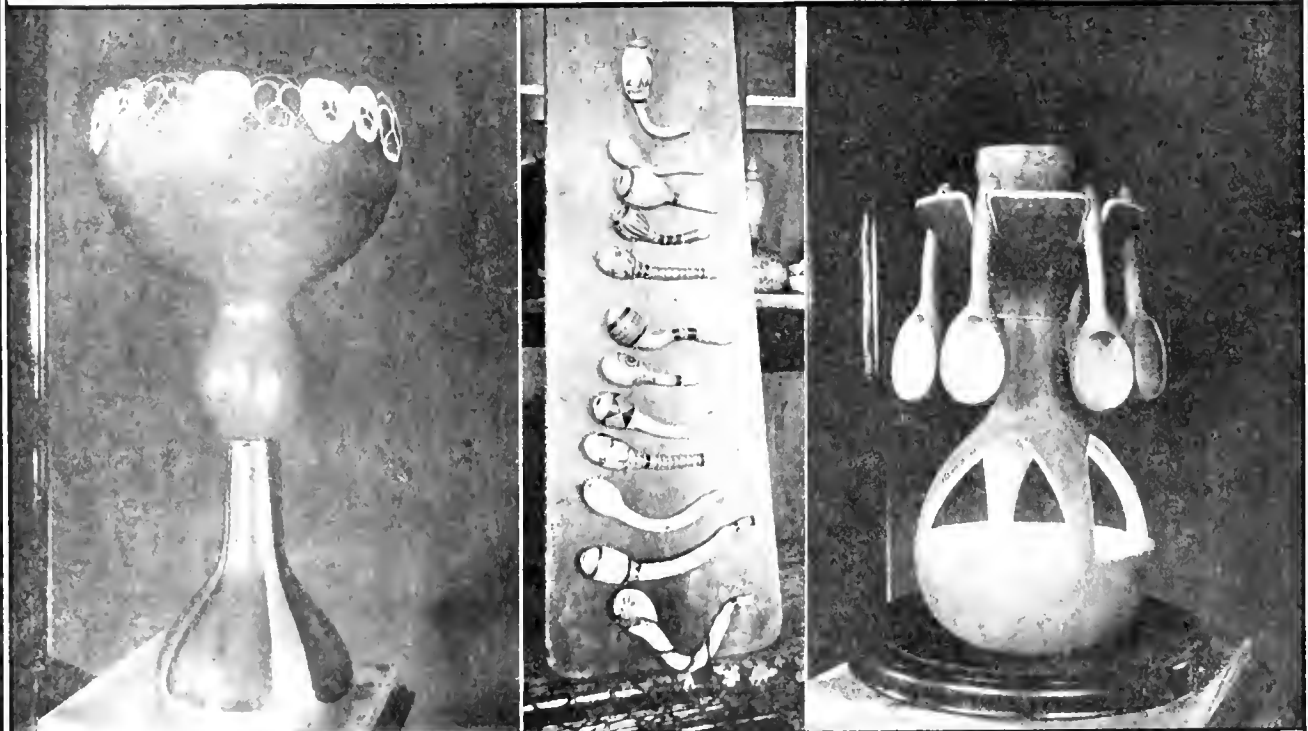
the needs of dependent families. Among the thousands who answer the country's call for forest workers it is inevitable that there should be some who are illy prepared to leave their families properly provided for. The pay of a soldier does not go very far toward meeting the requirements of a household left without its usual means of support. If there be illness or other misfortune the deficit is emphasized. With the haunting fear that his loved ones are not properly cared for the soldier forester will be sadly handicapped in his work. That he should labor under this handicap is manifestly unfair. The people of a grateful nation are under a patriotic obligation to remove this source of worry from the man who has gone to France to contribute his skill and to risk his life in the interests of the cause of freedom. The aim of the fund is to make provision for such dependent families, to assist the man and his household in the event of injury and to provide insurance money in the event of death. In making these things possible the generous people of America will be doing that which is not only a duty but a privilege as well.

The personal comfort and entertainment of the men in France will be another important consideration of the Fund. The man who undertakes the man-sized job of a woodsman needs all the comfort and relaxation he can find. This is true even when he is in his own woods in his own country. When he is taken from his native environment and transplanted to the battle-torn forests of an alien land, among the people of an alien tongue, his needs are vastly multiplied. He will want every form of comfort that can be provided. For relaxation and mental stimulus he will want books and periodicals from home. These things are especially important, as is attested by all army men who have had experience in field and camp. As a panacea for strained nerves and homesickness he will want his pipe and tobacco, through the medium of which to reap peace and contentment otherwise lacking. For his bodily comfort he will need sleeveless sweaters and mufflers with which to protect himself from the chill winds of the French winter. For his recreation he will need phonographs and records with which to beguile the hours of leisure that otherwise would hang heavily on his hands. For these things he will look to the American Forestry Relief and Comfort Fund.



WHAT A WELL-TRAINED GOURD VINE CAN DO WHEN IT TRIES

It is no longer considered necessary for a gourd to grow in the old-fashioned form, which made it chiefly useful as a dipper to accompany the old oaken bucket. A gourd enthusiast has taken the time to produce gourds of various shapes and in proof of his skill he submits this picture of his vineyard. One of his proudest achievements was the production of gourds that were so much like eggs in appearance as to cause visitors extreme consternation when the "eggs" were "accidentally" spilled.



NOT THE PRODUCT OF THE SILVERSMITH, BUT JUST GOURDS

Among the curious developments of the gourd in the vineyard of the enthusiast referred to above is the flower vase shown in the left hand picture. In the center, mounted on a board, is a display of earthen holders, plucked fresh from this same vineyard. At the right is a bowl, also of gourds. The grower of these remarkable gourds is Frank Wilcox, a New York banker, and he insists that any gourd fancier can obtain the same results. The pictures were taken on the Wilcox farm.

## WOOD ON THE WING

By BRISTOW ADAMS

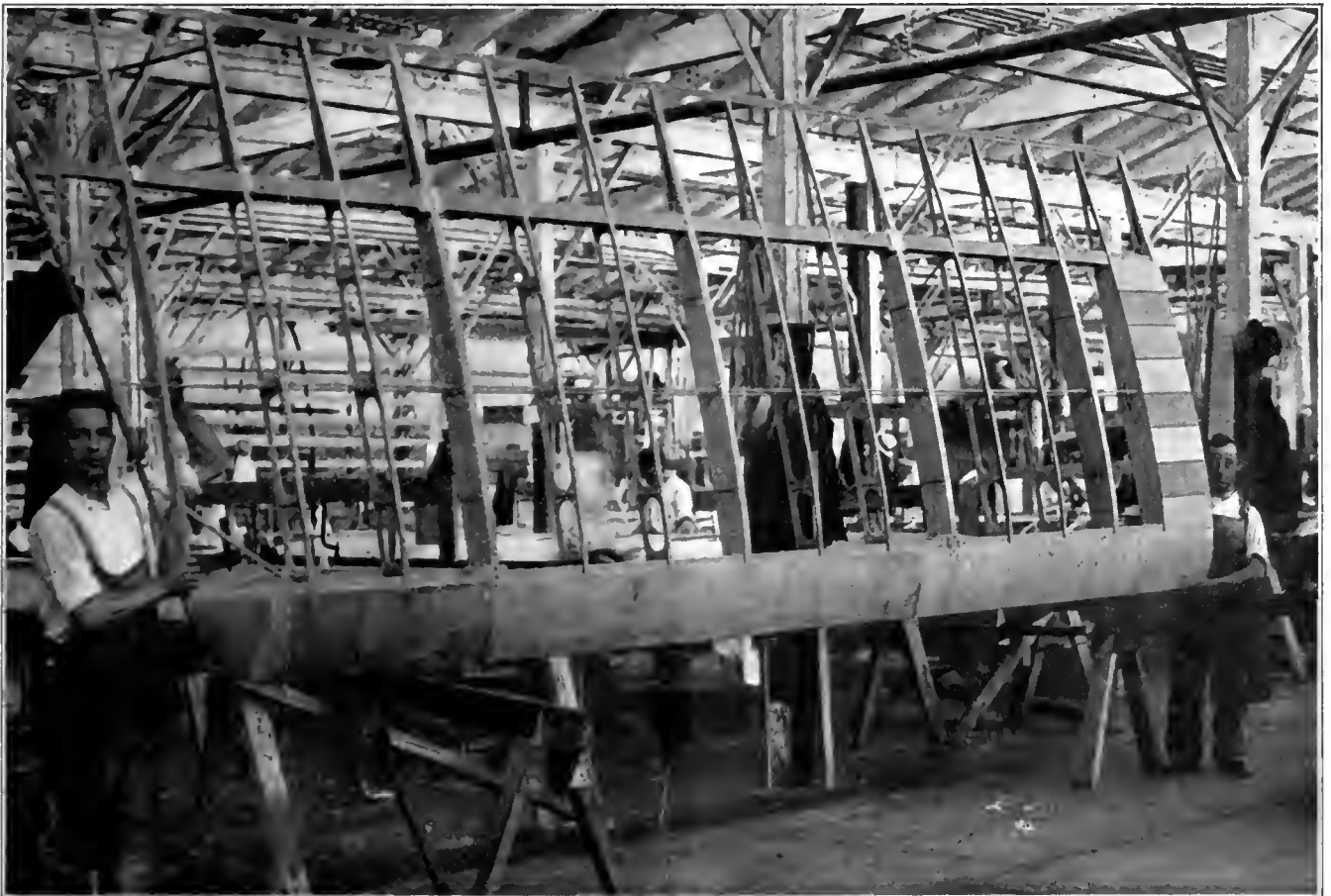
**B**OMBS from a foreign airplane were employed in a bombardment of the White House on Saturday, September 22, 1917. That the bombs were floral and that the airplane carried the colors of a friendly nation are merely incidental. The important fact is that the bombardment took place and was witnessed by thousands of interested spectators.

On a brisk autumn morning an ivory-tinted airplane gleamed against the bluest sky that ever domed the City of Washington. The sky was essentially Italian, imported especially for the purpose of welcoming the ivory tinted biplane which had been piloted by an Italian flyer from Norfolk to the banks of the Potomac. Thousands of people awaited the arrival of the plane and greeted the visitor with the enthusiasm born of international brotherhood in arms. Hardly had the aviator received the cordial welcome of sky and populace when up from the horizon swept another and larger biplane, silver-gray, to be followed shortly afterwards by the great Italian war-tractor carrying a dozen or more persons.

It was during the flight over the city that the floral bombs were dropped on the Executive Mansion.

Less than ten years before a group of watchers had looked toward the same Southern horizon for the appearance of another biplane. This machine had passed the preliminary tests and was on its final supreme trial before acceptance by the United States Government. The supreme trial was an overland flight from the parade ground at Fort Myer, just across the Potomac from Washington, down to Alexandria—all of seven miles away—and back again to the starting place. As the wind died down with the setting sun, this Wright machine, started by means of the pulley-and-weight launching device, made a few preliminary circlings and then sailed away over the tree-tops out of sight to the South.

The wait for its return seemed interminable; watches were consulted; it had been gone ten minutes. "I'm afraid it won't get back!" said one; "probably couldn't make the turn," said another; "maybe he hit a tree—he was flying rather low." This was the tenor of the com-



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### BUILDING AMERICA'S GREAT AIR FLEET FOR USE IN THE WAR

The extent to which wood enters into airplane construction is attracting the attention of foresters and lumbermen. The Government's program calls for the construction of 23,000 airplanes within twelve months. This call for 20,000,000 feet of lumber for propellers alone. For the aviation school cantonments the need is 120,000,000 feet and for coastal airplane stations 22,000,000 feet. This picture shows one of the processes in building the planes in a factory which is turning out large numbers for the Government. It illustrates the construction of the frame of a plane.

ments, with certain optimistic reassurances from others. Then the faint burr of propeller and engine electrified the group of watchers; faint and far a bird-like form showed above the trees, and then swept up fully into view. Was there ever such a thrill? There was no cheering; everybody was holding his breath!

In 1917 it was different. Airplanes were, comparatively speaking, quite common. Washington, between the parade ground at Fort Myer and the flying field at College Park, had become quite *blase* to flying machines gliding across the city at twilight. Then, too, the aerialists who exhibited their powers at fairs, had added to their repertoires the feat of circling the capitol dome and

looping-the-loop above the apex of the Washington Monument.

But these Italians had something new. They used large planes and did all of the exhibition stunts and a few others besides, including a heart-stopping sidewise fall that might fool even an enemy pilot into believing they had been mortally hit.

"Eyetalians pullin' dat stuff!" was the disparaging remark of a messenger boy who stopped to watch the performance, despite a half-dozen telegrams in his hat. "Don't tell me a bunch o' Wops is gettin' away wid dat box o' tricks. Dem's Americans; we're de only ones dat's got de goods in dat stuff." And he would not be persuaded otherwise. No sir-ree!

But there were the planes, heavier than air, larger than a freight car in outside dimensions, disporting themselves like playful swallows, and doing topsy-turvy tumbling that no sane swallow ever thought of undertaking. Structures of cloth, and wire and wood, supporting heavy engines and passengers, playing in the air with the easy, careless grace of fur-seals in the billows of the sea!

"And wood," says the recurrent and insistent thought of the forester, "is the essence of their construction." History, which does not go far back in this case, says the same thing. Here is the record.

During the years from about 1910 to 1915, the Forest Service made a series of studies of the wood-using industries of the United States, by States. These were made in co-operation with the States themselves, or with organizations within the State boundaries, and the results were published by the co-operating agency, or, in some instances by lumber trade journals.

These reports took up each wood-using industry in alphabetical order, discussed its needs and its value, gave the kinds of woods used and the sources of the raw material. The alphabetical lists usually began with "agricultural implements" or "automobiles," and ended with "umbrella



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#### AT WORK ON THE FRAME FOR A GOVERNMENT AIRPLANE

Great care and precision are required in the building of an airplane. If the plane is to be used in warfare this accuracy of construction involves not merely the life of the aviator, but the safety of an entire army may depend on it if the bird-man is engaged in directing the operations of the fighting forces below. This means that every step must be taken with the utmost skill and caution. The delicate construction is apparent.



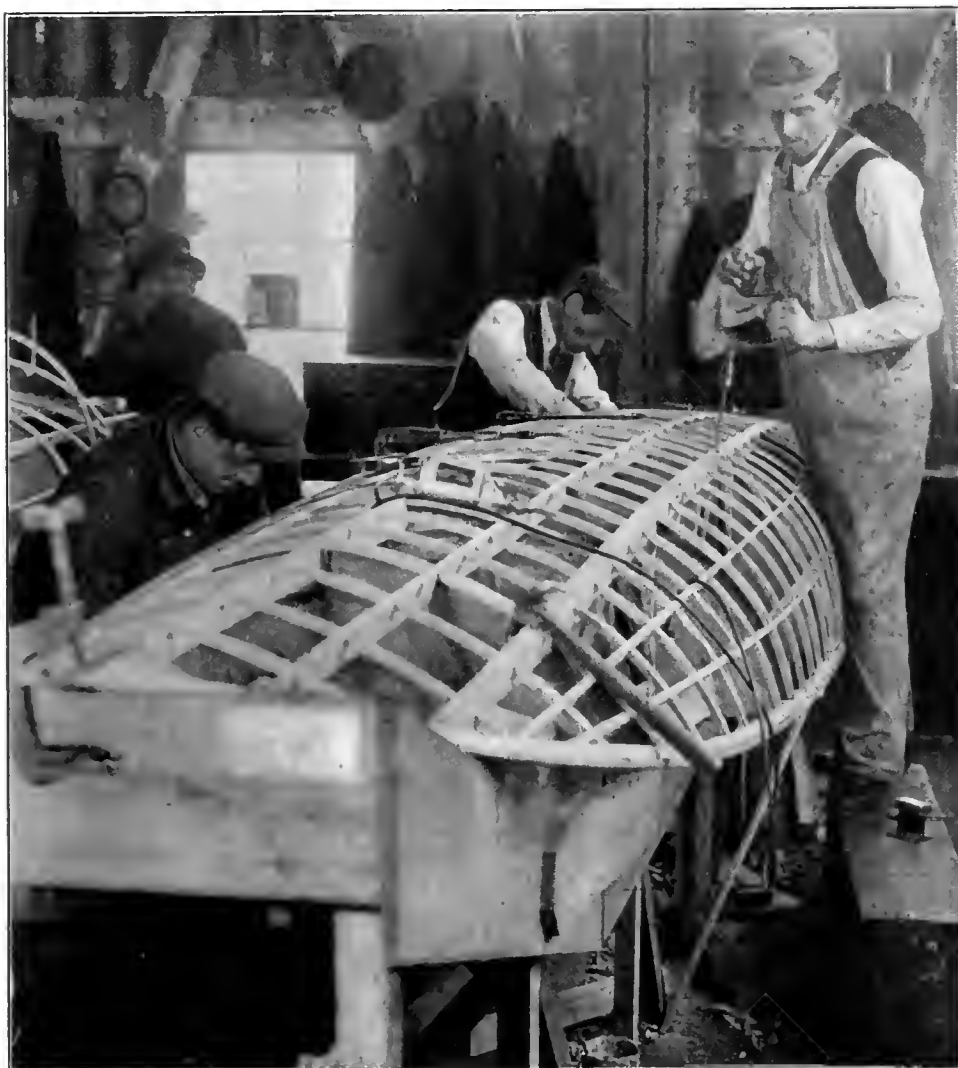
sticks," "vehicles" or "wood-ware." In only one that the writer has seen—and he has made a pretty thorough search through them—has there been any mention of airplanes, yet wood is the essential material in their construction. In other words, airplane manufacture, upon which the outcome of the war is said to depend, was scarcely mentioned in this series of government reports issued within the past five years.

The one exception to the general dearth of facts about airplane manufacture was in the report on the wood-using industries of New York, issued in 1913. It listed three manufacturers who made planes or their parts, and gave the quantity of wood used annually as 31,400 board feet, of which spruce furnished about half, the other woods mentioned being ash, yellow poplar, white oak and hickory. The total cost of all woods used was less than \$1,000.00, to be exact, \$968.

Compare these figures of four years ago with the present plans for 7,500,000 feet of oak, and from 40,000,000 to 100,000,000 board feet of spruce.

It is difficult to state authoritatively just how much lumber is going into airplane construction, because authorities disagree. One statement which has official sanction is about as follows: "The war is going to be won in the air. The program calls for the construction of more than 20,000 airplanes within twelve months." Since then it has been stated that the estimates have been revised—and it has been a revision upwards. In another statement it is pointed out that "each propeller uses 300 feet of lumber, and if 23,000 airplanes are built as proposed, and two propellers are held in reserve for each machine, it will take 20,000,000 board feet for the propellers alone." This corresponds to the 7,500,000 feet of oak for the supplying of the blades actually needed for initial construction, without allowing for reserve propellers. The government now is using, according to another authority, some 3,500,000 feet of lumber for airplanes themselves, and 120,000,000 feet for aviation school cantonments with an additional 22,000,000 for coastal airplane stations.

Spruce stands first in the kinds of wood demanded in airplane construction. Practically all of the framework



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#### WOOD IN THE WING OF A WAR AIRPLANE

Spruce stands first in the kinds of wood demanded in airplane construction. Practically all of the construction is of built-up or laminated wood. One advantage of this construction is that the lamination divides the stresses and prevents them from coming in full force on any one grain. Another advantage is that the laminated stock can be bent to form curves or can be bent to curves without splitting or weakening the piece. This picture shows men at work making a wing for a Government war plane.

is of spruce and it bids fair to hold its place, with a possible supplementing by bamboo. Metal tubing has been tried, but has not given satisfaction.

The essential qualities of airplane woods include straightness of grain, strength and lightness, and absolute freedom from defects. The "struts" or upright posts used in biplanes and triplanes are of spruce, as are the supporting ribs in the planes themselves, and the beams, running lengthwise. In these, in particular, the grain must be straight, and must continue the whole length of the piece without going across from one side to the other, or without "running out."

Practically all of the construction is of built-up or laminated wood, in which thin layers are glued together to form the part needed. That is, each post, beam, or rib is made up of thin strips glued together. Except for tacks used in covering the wing frames no nails are used, because they make weak spots where they are driven.

The laminated construction has many advantages. In the first place, the smaller the pieces of wood that are



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#### FASHIONING A PROPELLER FOR A WAR SHIP OF THE AIR.

The speed of a propeller's revolutions make heavy demands on their strength. Some idea of this strain is afforded by the statement that some engines run at 1700 revolutions a minute and can be geared up to 2000. An engine of this power would use a nine and one-half foot propeller and the speed of the blade ends would be approximately 600 miles an hour. Such speed subjects the blade to pressure of a good many thousand pounds to the square inch and propellers are apt to split at the center and fly apart unless made of perfect material and with great care.

used the more likely are they to be free from defects. Further, the lamination divides the stresses and prevents them from coming in full force on any one grain. It is, on the whole, another exemplification of the adage that in union there is strength. Still another advantage comes from the fact that the laminated stock can be built to form curves, or can be bent to a curve without splitting or weakening the piece. The planes are curved from front to back, and the ribs upon which they are stretched form the basis of this curve.

The main reason for the use of spruce is its uniformity of structure and freedom from defects. Other woods have desirable mechanical properties, but



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#### FEW NAILS ARE PERMITTED IN AIRPLANES

Nails are not a great deal used in the building of airplanes. Each post, beam or rib is made up of thin layers glued together. Nails weaken the structure. One part of the construction in which nails or tacks are used is in covering the wing frames, as pictured herewith. This must be done with the utmost care and requires the employment of men of skill and intelligence.

lack what might be termed the reliability of spruce. Upon the wood's reliability the safety of the aviator depends, and in turn this may mean the safety of a whole brigade of men on the ground, whose movements the aviator is directing. In other objects made of wood there can be a slight margin of material which is not quite perfect, and this is recognized in the lumber grading rules; but not so with airplanes.

Spruce has the quality of being what it appears to be on the surface. It does not have hidden defects, and this material frankness makes it a favorite. If one picks out a stick of spruce that looks good—is clear and straight—he may be sure that it is good. Other woods very



Photograph from Underwood & Underwood, New York.

#### WHERE PROPELLERS ARE BUILT IN LARGE QUANTITIES.

This is a picture taken in the propeller department of one of the great airplane plants now devoted to turning out machines for the United States Government. Ash has been preferred for this feature of construction, but the largest single order for propeller-blade material is said to have been for the finest grade of quarter-sawed white oak. Propellers are sometimes made of mahogany or of a combination of mahogany and spruce to alternate layers. Some propellers are made wholly of black walnut, which does not splinter when hit by a projectile. The sponginess of texture that keeps walnut from splintering is one of the chief reasons for the use of this material in rifle stocks.

like spruce in general appearance may look as straight and clear, but will occasionally deceive.

Propellers, like the other parts, are made of built-up pieces. Ash has been preferred; but the largest single order for propeller-blade material is said to have been for the very finest grade of quarter-sawed white oak. Some propellers are made of mahogany, mahogany and spruce in alternate layers, or mahogany and ash. Black walnut has been used in place of mahogany, and some propeller blades are made wholly of black walnut. This is partly because black walnut, hit by projectiles, does not splinter. It has a sponginess of texture which gives it this quality, and furnishes one of the reasons why black walnut is universally in demand for rifle stocks.

The propellers are subjected to other trials than those of gun fire, and their normal action makes heavy demands on their strength. The very speed of their revolutions tends to disrupt them. In a test run with propellers made of wood which had been dried to the lowest possible moisture content, or bone-dry, as they say at the Forest Products Laboratory, the ends of the blades actually exuded sap which was forced out by centrifugal action. In tests, at least, it has been possible to speed the propellers up to such a pitch that the outer end of the blade on an eight-foot propeller travels at the rate of 400 miles an hour.

Some air-machine engines run at 1700 revolutions a minute, and can be geared up to 2000. An engine of this power would use a nine-foot-six-inch propeller, and the speed of the blade ends would be in the neighborhood of 600 miles an hour. A good many thousands of pounds of pressure per square inch are generated by this action

alone, and propellers have been known to split at the center and fly apart. Even the smallest lack of balance between the two blades is very serious, since the pull of one must counterbalance that of the other.

In addition there is the gyroscopic force which tends to keep the blades rotating in the same plane. At high speed this force is hard to overcome, and the cross strains it introduces when there is a change of direction, either up, down, or sidewise, are enormous.

Yet under conditions of modern warfare, when an aviator has to "loop the loop" or plunge, or ascend sharply in maneuvering to bring down, or to escape from, an enemy the machine has to meet and withstand these unusual tests.

Ash is used somewhat in propeller blades, but serves its main purpose for engine beds; maple, birch and cherry have found some place in propeller manufacture; Douglas fir has been used for struts, and while there is a plentiful supply of this wood it does not have all of the required characteristics. Sugar pine has value, but the commercial output is not large enough to make it wholly dependable.

Already the demand for woods is forcing a search for substitutes in place of spruce; of these, Port Orford cedar appears to be the most promising. It is marketed from a comparatively small area in southern Oregon only, and sufficient quantities cannot be gotten out at once. Other substitutes for spruce are eastern white pine and southern white cedar, though it must be admitted that the latter has been suggested because of some of its known advantages and not from actual tests.

The best of the spruces for airplane manufacture is

the western variety, or Sitka spruce. There is more than enough of it, but there is difficulty in getting the very highest grades. The Forest Service estimates that only 13 per cent, approximately, is available for plane construction. Of Port Orford cedar, 10 per cent is about all that can be counted on as good enough for planes; about 8 per cent can be used from the spruce of Virginia and West Virginia, and only about 5 per cent from the smaller trees of Maine. A member of the Curtiss firm is reported to have said that only 167 board feet, on an average, goes into planes from each 1000 board feet; he further estimates that 117,000,000 feet of spruce is needed between now and next July.

The Italians, who have made some of the largest planes, have gone farther into the use of Douglas fir than have the other nations, claiming that it has enough of the required mechanical properties and that its greater weight is no bar in the heavy machines that they are building. Laboratory tests indicate, however, that it may lack somewhat in shock-resisting qualities. A recent contract, reported from Seattle, calls for 25,000,000 feet of Douglas fir for airplane use by Italy.

In the New York report of 1913 the average cost of the woods then used in plane manufacture was about \$30 a thousand board feet, which was high as compared with the costs of wood used in other industries, though some industries far exceeded this cost of raw material; black walnut for fire arms, woods used for sporting goods, and cigar-box woods were more expensive. Some

manufacturers reported special prices as high as \$100 a thousand, a cost exceeded only by the woods used for cigar boxes. At that time, with the smaller machines, the total cost of lumber in an airplane ranged between \$100 and \$150, while the labor cost was between \$800 and \$1000.

Since then, prices have increased enormously. It is said that construction experts of four nations—American, English, French and Italian—have agreed on a price of \$105 a thousand for the grades of Sitka spruce which they have specified as coming up to the excellence demanded. The quantity of wood needed for each plane varies, of course, with the size of the machine; few of the present-day types contain less than 250 feet, and it may take 2000 feet in the rough to furnish this amount. One Washington lumberman is making sure of getting only the straightest of straight-grained stuff by splitting it out of the log instead of sawing it. He gets quality at the expense of considerable waste, just as there has always been enormous waste in riving out choice white oak cooperage stock, or hickory for spokes. But the resultant product is sure to have straightness of grain. There is no place where this is more important than in planes.

There has been an actual dearth of the kind of Sitka spruce that must be had, but the northwestern loggers and mill men, in spite of labor troubles said to have been fomented by our enemies, have begun to catch up with the demand; before long they should be able to keep up



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#### WHERE FLYING IS LEARNED BY UNCLE SAM'S AVIATORS.

With the constant increase in the army aviation corps comes an increased demand for training school facilities. This picture shows carpenters at work on the construction of hangars for the storing of airplanes at one of the Government schools. Skilled aviators are being turned out rapidly at these camps, to man the thousands of airplanes now being built by the Government. Evidence that aviation is perhaps the most interesting branch of army service during the present war is given by the way the young men of the country are flocking to join the corps. Every camp in the country is being enlarged to take care of these future warriors of the air.

a sufficient and constant supply. In fact, they promise to do so.

The use of wood in airplanes constitutes a new field for this most necessary commodity. It would be surprising to the layman to see the work that is being done all over the country in perfecting this use. The best engineers of the country are busy designing, many of them being gathered in Washington with the Council of National Defense. There is a national advisory committee on aeronautics whose members are performing experiments and plotting curves all day long. Some are specialists on propellers, others on the structure of the planes, to say nothing of all the work that has been done

and as to workability or ease of manipulation in manufacture.

It is currently reported that those who have studied the possibilities of manufacture within the next year agree that Germany can almost keep pace with the combined output of England and of France. Numerically, there will be no marked supremacy in the air on the western front until the United States gets into the game and gives the Allied forces a distinct advantage. For the Allies to win the war, it is generally admitted that the German air forces must be literally smothered, thus putting out the eyes of the Teuton armies. In addition, the war which has long been practically a deadlock in



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SPEED IS SUGGESTED BY THE VERY LOOKS OF THESE BODIES

In this general scene in a manufacturing plant is shown a line-up of airplanes almost finished and ready for delivery to the Government. Each of the long slim bodies shows the seats for observer and pilot. In the lower left-hand corner are rudders painted with the red, white and blue stripes which are the emblem of identification for the American flyers. Each week sees this room emptied by the transfer of the bodies to the final assembling rooms. The factory in which this picture was made turns out scores of machines every month and within a short time the very planes here shown will doubtless be carrying American aviators over the fighting lines in France.

on engines. The research branch of the Forest Service has been busy in this field, and the timber tests conducted at the Forest Products Laboratory have been invaluable. Private firms have had their own experts investigating. If air supremacy does not come out of it, then American inventiveness and ingenuity have at last been stumped.

Back of all there is the insistent thought that the forest resources of the country, serving so well in war in addition to their basic value in peace, are worthy of every effort that can be made to conserve them. They furnish in the case of airplanes, a material for which there is no substitute as to strength in proportion to lightness,

the trenches, must be carried into Germany by the air route, with destruction showered from the skies, ten times as far inland as the range of the biggest guns, upon the great war works at Essen and upon the fleet at Kiel. This is to be an important phase of America's helpfulness in winning the war.

The editorial staff of AMERICAN FORESTRY has made contribution to the aviation corps of the United States Army through the enlistment of Mr. C. W. H. Douglass. With commendable patriotism Mr. Douglass made no attempt to exert the influence at his command toward procuring a commission. He was content to go as an enlisted man and is now with the army in European territory.

**C. H. SHATTUCK** has left the University of Idaho to become professor of forestry in the University of California. He will pay especial attention to developing the department of grazing and announces a class of 28 students in this subject.

**F**ORESTRY students of the University of Missouri, Department of Agriculture who belong to the Tenth Engineers, Forest Regiment, are C. R. Fritchle and E. B. Hotze, of St. Louis; F. G. Kraft, of Kennett, Missouri, and G. A. Calloway, of Lafayette, Missouri.

# FLYING WEDGE OF BANKERS AND FARMERS

An Address Before the American Bankers' Association at Atlantic City, September 24, 1917, by Charles Lathrop Pack, President of the American Forestry Association and the National Emergency Food Garden Commission.

**F**OOD CONSERVATION is as important and vital as food production. In the work of the National Emergency Food Garden Commission, our Washington offices have concentrated their efforts for the last three months on a nation-wide drive for winter preparedness. We have conducted a campaign of education intended to reach every town and city home in America. How well this has succeeded is shown by the circumstance that our manuals on home canning, home drying, home storage and home pickling of vegetables and fruits have been circulated by millions of copies, in every part of every state in the Union. The daily lessons and helpful hints prepared by our experts on food conservation have been published constantly in nearly two thousand newspapers throughout the country. As a result the Commission feels that the homes of America are acquiring familiarity with the subject of food conservation hitherto unknown, and this familiarity has brought about an unprecedented activity in preparing foodstuffs for winter uses.

This brings us, naturally, to the general question of eliminating the middleman as far as may be possible. The town people who have been gardening and who have been storing away food in their cellars and on their pantry shelves have been striking a telling blow at the prices that have made the cost of living so prohibitive. An economist tells us that the price of garden vegetables has risen only about twenty-two per cent the past year, while the increase in grain and some other products has been several times as great.

Let the bankers and the farmers of America now unite in a flying wedge against the middleman and the food problem will be near solution. The farmer is the best friend the country has, and the more thoroughly we show recognition of this fact the better off we will be. If he is prosperous you bankers and all the rest of us are prosperous. The thing for you to do, for us to do, is to get together—bankers and farmers—and smash the cornerstone of high prices. The man who is carrying the ball in this great home game of supplying food is the town and city farmer, who, as a result of the country-wide campaign of the National Emergency Food Garden Commission and the work of the Department of Agriculture, has planted three million food gardens during the current year—most of them where none were planted before.

The town and city farmer has not merely produced three hundred and fifty million dollars' worth of food F. O. B. the kitchen door. In the football game of food he has tackled Mr. Middleman, thrown him for a loss, and is driving him back from the goal of high prices. Now, with a flying wedge of banker and farmer as a

further help, a touchdown for conservation is certain. Your part, Mr. Banker, is to work with even greater zeal with the farmer. Aid him over the rough spots, so that next year he can produce more foodstuffs than ever before.

We must all wake up to the fact that this country is at war. No one knows when the end will be. This is not a parlor game, nor the annual maneuvers. It is war. If Sherman lived today, he would probably say that war is—supplies. Secretary Baker says that we will have two million five hundred thousand men under arms by spring. Uncle Sam's board bill for his soldiers and sailors will very soon be one million dollars a day. What are you doing—going to do—towards keeping those men fed, that the world may be made safe for Democracy?

Let me give you a quick picture of the food problem as I see it. At breakfast in New York I noticed on the bill-of-fare: "Cantaloupe, half portion, fifty cents." In my morning paper I read what the newspaper boys call a "Page One Freak," which told that a newspaper in Denver was giving away free, with every want advertisement placed in its Sunday edition, a cantaloupe of one of the most famous brands. There you have it. Half cantaloupes fifty cents in New York City, and whole ones nothing in Denver. The metropolis is far from the source of supply. Denver is its center. That tells the whole story.

You do not now have to be told again the need of food F. O. B. the kitchen door. The town and city gardener who can raise even half his winter supply of vegetables is able, as a result, to accomplish much as a constructive citizen, to leave his savings account untouched and to add to it. He can buy a Liberty Bond and he can keep his children in school instead of at work. In other words, we must make a big drive to produce food as near the point of consumption as possible, rout the excessive profits of the middleman, and help the railroads in the tremendous transportation problem that confronts them while the country is at war.

Glass jars and other containers for food must be conserved this winter and their manufacturers must next year be prepared to meet the largest demand for them the country has ever seen. From every section of the United States and Canada comes report that the production of vegetables and fruits suitable for canning will next year far exceed the high-water mark of this year. If twenty-five per cent of war gardeners failed, owing to inexperience, to get a good crop this year, not ten per cent will fail next year. People who did not plant this year have been so impressed with the nation-wide success

of the home-gardening and home-canning movement, that they will not be doing their duty to themselves or to their country if they do not do their share in 1918—and they will do it.

The food problem is one of the vital issues of today. It is a problem from which none of us may escape. Each of us has his individual responsibility in the situation. To win the final victory in the great war, America must feed not only herself and her fighting forces, but she must help to feed the people of England, France, Italy and Russia. To do this with the highest measure of efficiency is the real problem. There must be no lost motion. Every move must be made to count. Every act must be a blow for liberty in our work for Democracy to save and redeem civilization. It is not enough that we should all be alert to the food needs of America and

her Allies; we must back that alertness with constructive skill and real industry.

The necessity for all this is well expressed by Lord Rhondda, the English Food Administrator. He said last week, "I hope the exportable surplus of American primary foodstuffs will be much larger than the present estimates, as the result of food economics by which the United States and Canadian homes are helping to win the war, just as surely as in the production of munitions. Every American woman is in a position to bring nearer the inevitable atonement for the brutal outrages in Belgium, Armenia and Serbia—the sinking of the Lusitania and other horrors, by her day-by-day economies. There need be no fear that the sacrifices will be wasted over here. Unless the Entente Allies are able to import the supplies necessary for the army and the populations, victory may slip from our united grasp."

## FIRST APPLE TREE OF THE NORTHWEST

By H. E. Zimmerman

In the Vancouver Barracks, State of Washington, there stands an apple tree of more than ordinary interest. Its history is very interesting and Bancroft, the noted historian, tells the following little incident in regard to it: "At a lunch party in London, about 1825, given in honor of some young gentlemen who were about to embark for Fort Vancouver, in the employ of the Hudson Bay Company, seeds of the fruit eaten were slyly slipped by some young ladies into the waistcoat pockets of the young men, and upon their arrival at their destination the young men, in overhauling their wardrobes, discovered the seeds and gave them to Bruce, the gardener at the fort." Mrs. Mary Whitman, wife of Marcus Whitman, also wrote an interesting history of this tree, September 12, 1836.

It is said that the seeds planted by the gardener, Bruce, produced several trees, three of which lived for a long time, and were pointed out as the only apple trees in the northwest. In the course of time two of them disappeared, leaving the present tree alone. Even the existence of this tree seems to have been almost entirely forgotten by the general public, not even the commander of the Barracks knowing that such a tree stood on the very ground which he controlled. It was largely through the horticultural inspector of this district, Mr. A. A. Quarnberg, that the tree was discovered and identified. In 1911 Mr. Quarnberg wished to have a gavel made of wood from this apple tree for the Washington State Horticultural Society, and, upon examining the same, found it badly infected with San Jose scale, half its branches dead, and in a bad condition generally. On January 13th that year he called upon Col. G. K. McGunnigle, Commander of the Barracks, and got the necessary permit to prune, spray and do anything necessary to preserve the life of the tree. On January 25th, by direction of the Washington State Commissioner of Horticulture, he took measurements—the same year—and found the tree to have the following dimensions: One



A TREE WITH AN INTERESTING HISTORY  
It is an apple tree and stands in the Vancouver Barracks in Washington, the sole survivor of several planted about 1825, the seeds having been brought from London.

foot from the ground, 1½ feet in diameter; height, 33 feet, and spread of crown, 33 feet. On February 20-21, this year, the tree was pruned, and all dead branches and brush removed, the rotten wood in the trunk and branches cleaned out and filled with plaster-paris and cement, and all cuts painted. Later it was sprayed and a good coat of manure applied at its roots.

In 1915 the Department of Agriculture at Washington requested Mr. Quarnberg to send them specimen apples for making wax forms.

# THE FRIAR, HIS DOG AND THE IRON CROSS

By ALICE SPENCER

**W**HEN science tackles some of the problems of wood structure the freaks of nature not infrequently have the best of the argument. One of the most difficult things for the scientist to determine is the cause of such peculiarities as are shown in the accompanying illustrations. These freaks are shown with photographic accuracy and have not been retouched or altered in any way.

In the first picture is shown a formation found in a poplar board at a Cincinnati upholstery furniture factory. The friar here represented in speaking likeness is considered one of the most interesting freaks of wood structure ever discovered. In the second picture is shown a curiously wrought animal face which might be taken for that of a dog or a hog. For the purpose of classification in a family group it is here chosen to designate it as the Friar's dog. This formation was found in a board cut from a new species of dogwood which was



THE HOODED FRIAR

This freak formation was found in a poplar board and shows the extent to which nature will go in varying the monotony of everyday tree growing.

ing. During its years of growth the tree apparently healed the outer scar by supplying a new covering of bark. This gave the exterior a normal appearance, but left the iron cross in the center for discovery when the trunk should reach a sawmill.



THE IRON CROSS

Perhaps the suspicious will think the discovery of this freak structure indicates that German spies are endeavoring to force American forests to supply iron crosses for military decorations. The suspicion is groundless. recently discovered by Secretary R. S. Kellogg, of the National Lumber Manufacturers' Association.

The singular wood structure shown in the third picture comes from Greenfield, Ohio, and has been the subject of considerable speculation among scientists to whom it has been submitted. The exact cause of the formation has not been determined, but the best opinion seems to be that it resulted from the stripping of the bark of the young tree on four sides. The removal of the bark is supposed to have caused a discoloration which ultimately reached to the very center of the growing trunk, while those portions of the tree where the bark had not been damaged retained their natural color-



THE FRIAR'S DOG

Those who think this animal looks as much like a hog as a dog must remember that the board in which the picture was found was a piece of dogwood. This circumstance should settle all disputes.



# SOME ACHIEVEMENTS IN FOOD

BY NORMAN C. McLOUD

**A** BACKWARD look at the growing season of 1917 cannot fail to make one proud that he is an American. Throughout the nation the call to the flag of food production and food conservation met with response genuine and swift. The whole country organized itself into an army of soldiers of the soil and age has been foiled and famine has been forced to surrender. The close of the season is a time for stock taking in connection with the food situation. We have had production past all previous records and beyond all expectation. A nation-wide survey undertaken by the National



"THE BIGGEST WAR GARDEN IN THE WEST."

One of the most impressive results of the campaign conducted by the National Emergency Food Garden Commission was the war garden at Inspiration, Arizona. This garden was 3,300 feet above sea level, in the heart of the copper mining district. It covered an area of 217 acres and the double crop system was used to increase the fruitfulness of the land. The needs of the community were considered in planting and 85 per cent of the ground was used for raising Mexican pink beans and sweet corn. Nothing was allowed to go to waste and the Commission's manuals were freely used in encouraging canning and drying activities.

warriors against waste. In the creation of this army no draft was required. Confronted with threatened national food shortage the people of the United States acted with singular spontaneity. Enlistments were voluntary and enthusiastic. Service was energetic and constant. During the early months the symbols of service were the rake and the hoe. With the maturity of the crops these were supplanted by the canner and drier as tokens of the patriotic gift of the people to America at war. Through the combined attacks of the allied forces of producers and preservers food short-

## EPIGRAMS ON HOME GARDENING AND FOOD THRIFT

From Literature of the National Emergency Food Garden Commission—Season of 1917.

Provide a Food Supply F. O. B. the Kitchen Door.  
Winter Food Supply F. O. B. the Pantry Shelf.  
Soldiers of the Soil; Warriors Against Waste.  
Every Soldier of the Soil Should Promote Himself to a Colonel of Conservation.  
In Its Power Against the Enemy the Can Is as Certain as the Cannon; the Drier as Dauntless as the Dreadnaught.  
Can All Food That Can Be Canned.  
The Nation Is Fired With the Spirit of a New Freedom.  
Food Waste Is the Enemy, Food Thrift the Battlecry and Food Conservation the Weapon.  
War's Emergency Has Brought With It a Sense of War's Responsibility.  
In Wartime a Nation With a Food Shortage Is a Nation in Peril.  
It Is Time to Begin Starving the American Garbage Pail.  
Otherwise We Will Begin Starving Our Allies in Europe.  
Instead of Empty Tomato Cans the Backyard Now Has Its Crop of Tomatoes. For Unnumbered Tins We Have Substituted Foodstuffs in Unmeasured Tons.  
Make Food Thrift Your Wartime Gift.

Emergency Food Garden Commission has located over three million home gardens, most of which were cultivated where no planting had been done before. On this vast area has been raised a food crop valued at \$350,000,000 — equivalent to \$350 of nourishment for each man of the million now under arms in the military and naval establishments of the United States. For this tremendous achievement of production too much credit cannot be given the Food Garden Commission which has worked in affiliation with the Conservation Department of the American Forestry Association.

Through its aggressive and forceful campaign of stimulation America has been thoroughly roused to the need for increasing the food supply as a measure of wartime preparedness. In the same way and by the same methods the people have been inspired to food conservation on a scale never before approached. As a direct result there was never a season that brought to the tables of America such a wealth of health-giving vegetation F. O. B. the kitchen door and never a winter which faced such abundant stores of home-grown and home-prepared food supplies F. O. B. the pantry shelf.

The first duty of this enormous yield of garden stuff, already accomplished, was its tremendous value in keeping down the cost of summer living for the people of America. That household expenses have been bad enough is painfully obvious. That they would have been far worse without this garden crop is equally apparent. Students of economics agree that if the war gardens had not created this increased supply, prices for vegetable products would have been a great deal higher. The average increase in prices for garden stuff has been little more than 20 per cent while the increase in the cost of grain products has been several times as great. This may well be taken as direct evidence of the worth of the home garden movement to the people of the United States.

The significance of this newly discovered planting area does not end with the summer season. The war gardens will exert their influence on the cost of living during the winter months just ahead. Their value is a thing of the future as well as the past. Conservation has been practiced on a national scale. In the homes of America there has been definite recognition of the importance of looking ahead. The individual citizen has realized that the over-supply of the growing season must be translated into terms of abundance for the winter. Food saving and food conserving have been practiced on a national scale. From a wasteful nation America has been remade into a nation alert to the needs of the future. The keynote of this new national spirit has been that nothing should be allowed to go to waste—that nothing useful should be thrown away. How well this spirit has crystallized into

action is shown by the plaintive cry of the garbage collectors throughout the United States. The men who make a business of converting waste into tangible assets are agreed that the new cult of Food Thrift is playing havoc with their profits. I know of one collector who complains that although he covers twice as much territory as he covered a year ago his collections are actually smaller. As a tribute to the American spirit of Food Thrift nothing could be more eloquent.

Of similar importance is the thrift shown by the people of America in achieving winter preparedness. Canning, drying and storage operations have filled cellars,

storerooms and pantry shelves with a tremendous supply of foodstuffs for winter use. It is a conservative estimate that close to half a billion jars of vegetables and fruits have been stowed away as a result of the season's canning operations. To this must be added the stuff prepared by drying, pickling, fermentation and other forms of conservation, and millions of bushels of vegetables stored in their natural state. The whole forms a national asset of tremendous volume.

In bringing about this great movement for production and conservation the National Emergency Food Garden Commission's offices in Washington have been a center of activity second to none of the wartime agencies at the seat of government. The commission's staff of experts and large office force have worked under emergency pressure during the entire season. The manuals prepared and issued



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WINNER OF CANNING PRIZE NO. 1

As a stimulus to home canning the National Emergency Food Garden Commission offered one thousand prizes of \$5 each for home canned vegetables from war-gardens. Miss Helen Tew, of Washington, D. C., was the first winner, receiving check No. 1 and a certificate of merit

by the organization have been accepted as a notable contribution to the literature of food production and food conservation. Free distribution of the books on home gardening, home canning, home drying, home pickling and home storage has been made to the extent of millions of copies. The aim of the Commission was to place this literature in every home in America. That this aim has been approximated by results is apparent to those in touch with the situation. No channel of distribution has been overlooked. The manuals have been sent through agencies of federal, state, county and city governments, through school officials, through libraries, through councils of defense, through women's clubs and

through every conceivable avenue for reaching the people. In addition to this wholesale distribution the Commission has filled individual orders averaging 25,000 a day, received as a result of a persistent campaign of publicity in 2000 newspapers in the United States. The aggregate has been staggering, and the demand has taxed the capacity of the largest printing offices in Washington, Baltimore and Philadelphia.

Early in the campaign for canning and drying it developed that the government could not meet the demand for literature on these two subjects. Because of the war emergency the pressure on the government printing office was so heavily increased that there was unavoidable delay in printing for all branches of the public service. In one of the bulletins issued by the Commission it was stated that its Washington offices had received numerous calls from Congressmen asking for help. "One Congressman wanted 30,000 of our manuals," said this bulletin, "because he was swamped with requests and the government printing office, he said, could not fill the demand because of great tax upon it from all departments."

Through all of this activity the serious purpose of the Commission has been given frequent touches of relief by episodes incidental to the day's work. One of the most startling incidents of the campaign was the receipt of a telegram requesting that canning and drying manuals be

#### NO CAMOUFLAGE OF FOOD

While conceding the value of camouflage for the purpose of deceiving the enemy the National Emergency Food Garden Commission has taken a firm stand against trying to practice camouflage on the human stomach. "You may fool the enemy by masking your batteries and making the battlefield look like a peaceful landscape," says a recent bulletin; "but the stomach of a soldier is not so easily hoodwinked. The soldier must have real food."

sent immediately to Inspiration, Ariz., for use in connection with "the biggest war garden in the West." The Commission's staff includes people from all over the United States, but none had ever heard of Inspiration outside the fields of poetry and the arts. As a town it had no meaning for any of the staff. Nor could it be located through consultation of maps or postal guides. It was not until inquiry had been made at the Postoffice Department that Inspiration was found, and even then it was learned that the place had to depend on a town two miles away for its mail facilities.

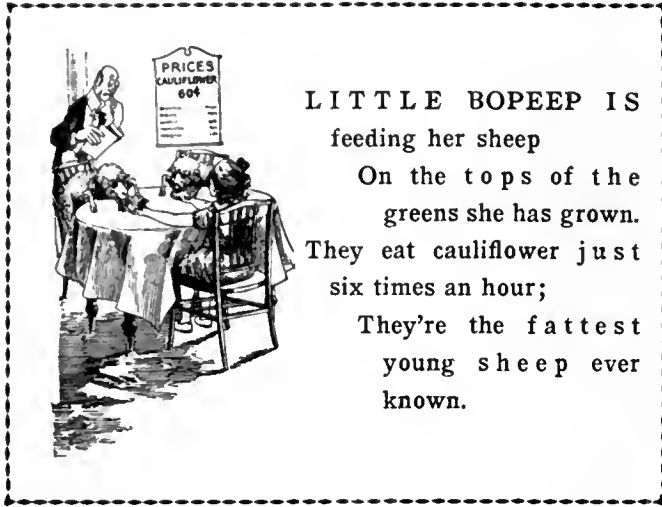
This was a puzzle. That a community which did not even boast a postoffice of its own should claim the biggest war garden, created a new situation and one not lacking in dramatic value. The manuals were forwarded by express without delay and the Commission then set in motion machinery for procuring further information about the big garden in the hidden community of the Southwest. The results were amazing—not to say an inspiration. From J. R. Sandige, the expert in charge, came the following statement of fact:

"The gardens are two miles east of Miami, Gila county, Arizona, at an elevation of 3,300 feet. The climate is semi-tropical, making it possible to grow some vegetables throughout the year. A majority of the gardeners are employes of the Inspiration Consolidated Copper Company, but quite a number of residents of

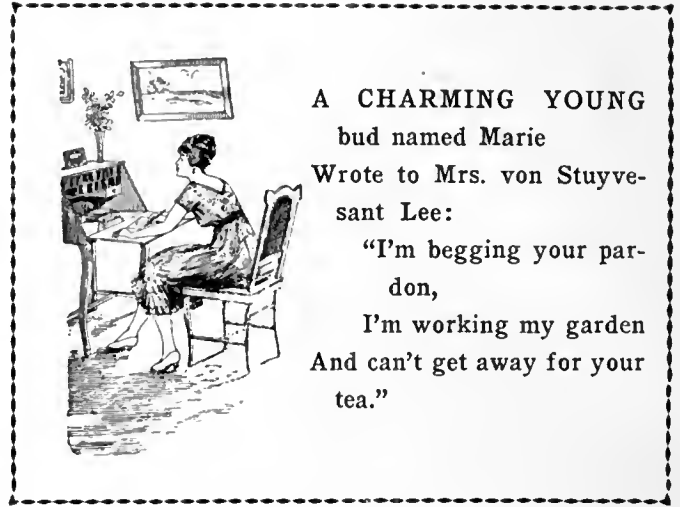


WHERE RACE MEETS RACE IN GARDEN WORK.

Not the least impressive feature of the war garden enterprise at Inspiration, Arizona, was the polyglot character of the workers. Perhaps no other garden in the country was cultivated in as many different languages. The picture gives a comprehensive idea of the diversity of races. Reading from left to right the men represented the following named races or nationalities: Apache Indian, Negro, Hungarian, English, Mexican, Irish, Chilean, Italian, American and Austrian. The gardeners in this big garden were for the most part employes of the Inspiration Consolidated Copper Company and the members of their families.



**LITTLE BOPEEP IS**  
feeding her sheep  
On the tops of the  
greens she has grown.  
They eat cauliflower just  
six times an hour;  
They're the fattest  
young sheep ever  
known.



**A CHARMING YOUNG**  
bud named Marie  
Wrote to Mrs. von Stuyve-  
sant Lee:  
"I'm begging your par-  
don,  
I'm working my garden  
And can't get away for your  
tea."

Miami and a large number of children have been given space. The gardeners are made up of many nationalities, including Italians, Mexicans, Indians, Chileans, Germans, Finlanders and Swedes. Over seventy per cent have never had experience in this work, or at least where it is necessary to irrigate, and they had to be taught.

"The gardens were planned by C. E. Mills, general manager of the company. An expert makes three trips a day over the gardens to instruct the gardeners. Bulletins and posters are placed at convenient spots in the gardens which are 217 acres in area. The double crop system was used. For example, squash were planted among corn so that when corn came off squash covered the ground. We grew most anything but need was considered first and 85 per cent of the ground was planted to Mexican pink beans and sweet corn. Nothing goes to waste and drying and canning is encouraged, especially drying, for our climate permits sun drying.

"We have opened a war garden market where the excess vegetables are sold for the gardeners, without cost to them. Nothing is sold at this market except that which is grown in the war garden. This market, I believe, is the first of its kind in the United States. This is the largest single tract of land devoted to war gardens in the west. With 217 acres under cultivation I believe it is the largest in the country."

Another high spot in the season's activities was the

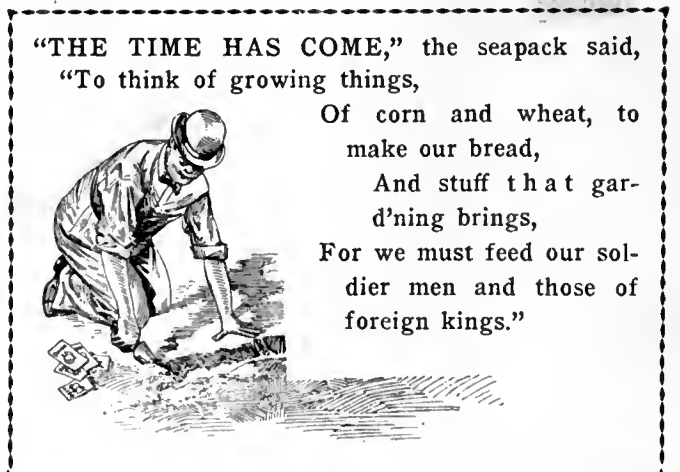
word which reached the Commission from Laurel, Mississippi. In this southern community practical application was given of the most efficient and reliable methods of conservation and thrift. Some of the moves were the substitution of motor trucks for horses for the sake of saving horse feed and the cutting of wood as a blow to over-reaching coal men. In a letter to the Commission Mayor T. G. McCallum wrote:

"Immediately upon the entrance of the United States into the war and the Government's appeal to the people to conserve and produce all products we proceeded at once to motorize all departments where motor trucks could be substituted for horses and disposed of the horses to farmers to produce more food, as well as to save food by the introduction of the automobile. The next step taken by us was to secure and plant sufficient lands to corn and peas in order to produce enough corn and hay to take care of all the remaining city teams, and while we scarcely had time to do this, war having been declared late in the spring, we are glad to say that the city will make all the corn and pea-vine hay necessary to care for the teams owned and used by the city in the public work.

"As soon as this matter was out of the way we took up the question of fuel for the city schools, city hall, jail and other public buildings, and upon inquiry of the mines or coal dealers, many of them refused to quote us prices on account of the scarcity of cars, and with those



**IF OLD Mother Hubbard**  
should go to the cup-  
board  
She'd find all the food  
she'd desire;  
For stored away there is  
foodstuff to spare,  
The product of canner  
and dryer.



**"THE TIME HAS COME,"** the seapack said,  
"To think of growing things,  
Of corn and wheat, to  
make our bread,  
And stuff that gar-  
d'ning brings,  
For we must feed our sol-  
dier men and those of  
foreign kings."

that did, the prices were from 50 per cent to 75 per cent higher than we had formerly paid for similar coal. So we proceeded to cut our own wood and while we are not quite through with the wood cutting proposition we are far enough along with it to know that we will, without great inconvenience, be able to secure all the wood needed for city schools and the city generally and at the same time effect a great saving in the revenue of the city.

From Elyria, Ohio, came tidings that Mrs. Thomas Edwards was believed to be the oldest woman in the United States to raise a war garden. Mrs. Edwards is 94 years of age and her garden was planted and culti-

Through the bureau of education the campaign was carried into the public schools of the nation. In cooperation with School Commissioner P. P. Claxton the Commission sent about 25,000 copies of its manuals on canning and drying to superintendents of public schools and co-operating with Commissioner Cato Sells, of the Indian Office, thousands of copies of its manuals were sent to the Indian schools in various parts of the country. It was felt that a great deal could be accomplished with the aid of the school children just as hundreds of thousands of vegetable gardens had been planted by pupils early in the spring. The bulletins on canning and



PART OF THE INSPIRATION OF INSPIRATION, ARIZONA.

If the gardening season of 1917 has left any person unconvinced of the value of child labor in war gardens the skeptic would do well to make a trip of exploration to Inspiration. The advantage of child labor of this type is that it is as valuable to health as to the cause of food production. Those who think to the contrary are cordially invited to submit pictures showing a healthier band of young people than here shown. Every boy and girl shown in the group worked in the biggest war garden in the West and their rugged health is as eloquent as the pictured crops as to the value of garden work.

vated entirely by herself. Early last spring she sent for the food garden primer issued by the Commission and carefully followed instructions given in this complete manual. Her success attracted national attention.

At East Orange, New Jersey, L. G. Hinsdale, librarian, distributed 5000 manuals on canning and drying to the housewives of the city on Food Registration Day. These manuals were given at the polling places as a helpful contribution to the women in the food conservation work for which they were being registered.

In Chicago the public libraries entered with genuine enthusiasm into the work of stimulating canning and drying operations. In requesting the co-operation of the Commission, Assistant Librarian C. B. Roden wrote that 10,000 manuals would not last a week in the 40 branch libraries in their distribution of the booklets to the housewives of Chicago. Impressed with the spirit shown by the request the Commission sent 20,000 manuals instead of the 10,000 that had been asked for—making the biggest single consignment sent to any library system in the United States.

drying were given to the pupils with instructions that the booklets were to be taken home so that their entire households might be benefited by the helpful information. Advices received in Washington during September and October indicated that these manuals were eagerly used by the school communities and that results of great importance were achieved along the line of food conservation.

Typical of the recognition accorded the Commission's work is this editorial comment from the *New York World*: "The announcement of Charles Lathrop Pack, president of the National Emergency Food Garden Commission, that housewives this year have canned 400,000,000 jars of fruits and vegetables indicates a very large addition to the nation's food supply. Like the perishable product of the small home gardens, it is not to be measured accurately, but no one can question that the impetus given to individual effort through public agitation has been of immense help. No government census can ever fully cover so wide a field of activity or give exact figures for the total output."

Similar editorial comment appeared in the Chicago Evening Post as follows: "The Department of Agriculture, as we noted recently, omitted from its crop report any estimate of the home gardener's crops. The backyard farmers, however, are not lost sight of by their Uncle Sam. Charles Lathrop Pack, of the National Emergency Food Garden Commission, after a careful survey, reports that there are more than three times as many gardens growing vegetables in the United States today as there were a year ago. The increase represents a gain of one million, one hundred and seventy-five thousand acres, and he estimates the total home garden crop will aggregate \$350,000,000. If you doubt whether the home garden is a real factor in the food situation ask the man who peddles vegetables in your neighborhood."

It has not been alone in the United States that the work has gained recognition. Newspapers and letters have been received from Great Britain, France, Italy, Australia, Hawaii, the Virgin Islands, Cuba, South America and other far away corners of the globe, showing that the Commission's home garden movement has attracted the attention of the press of the entire world. From many of these countries have come requests for the literature issued by the Commission. One such request came from Nigeria, British West Africa. The letter was from D. O. Gundsdlabor, of Opobo, who wrote: "There are signs here of inevitable famine and we are doing all we can to save the situation. This means the storing of food and the best way to preserve it. How can I store and preserve such foods as are common in this section of Africa?"

It is needless to say that the full literature of canning, drying, pickling and storing was sent Mr. Gundsdlabor by the first mail and that the Commission's experts gave him all available additional suggestions that would apply to his particular conditions of climate and products.

One of the whimsical, but impressive, suggestions arising from the campaign was that if the season's home canned jars should be placed in a pyramid with the Washington Monument as a center, the structure would completely hide the towering shaft which dominates the landscape of the National Capital. It was also suggested that the jars do not have to be collected into a pyramid in order to stand as a monument to American patriotism. Tucked away on pantry shelves from East to West and from North to South they make a fortress of impregnable strength in this crisis which demands all the strength the nation can muster. They are the foundation of America's wartime preparedness. The food thus conserved has a value as vital as the country's armed forces. In the battle for world freedom these household stores are as important as our soldiers; the jars as potent as our blue-jackets and the cans as powerful as the cannon.

Among the constructive activities of the Commission none proved more useful or attracted more widespread attention than the offer of \$5,000 in prizes for home canned vegetables from home gardens. The fund was divided into a thousand prizes of \$5 each, awarded at local fairs and food exhibits throughout the country during September and October. The competition was keen and close observers agreed that no single incident of the food thrift campaign did more to stimulate interest

in home canning than this contest. At state, county and local fairs and at public exhibits of various kinds the prizes were eagerly sought. With the close of this month 1000 home canners from coast to coast will have received the individual rewards in cash, together with certificates issued by the Commission giving permanent record of the holder's success in the competitive enterprise.

While congratulating itself on the results achieved, America is in no position to rest on its oars. This point

## THE SLACKERS



I WISH I WERE the license clerk  
Who grants the right to wed,  
For I'd bring up with vicious jerk  
The man who hides his head  
Behind the heart of some poor girl  
Who little knows the craft  
With which he's set her brain awirl  
That he may dodge the draft.

'Twould do me good to take the chap  
And kick him down the stairs,  
And thus bestow a needed slap  
On these misguided pairs.  
I'd make each slacker heed the call  
To take a gun and fight  
The foe whose cruel deeds appal  
All men whose souls are right.



But since I have no license job,  
To catch this shameless shirk,  
I'll form a little private moh  
And do some other work.  
'Twill give me joy to slug and swat  
The folks who help the foe  
By wasting, or by letting rot,  
The stuff their gardens grow.

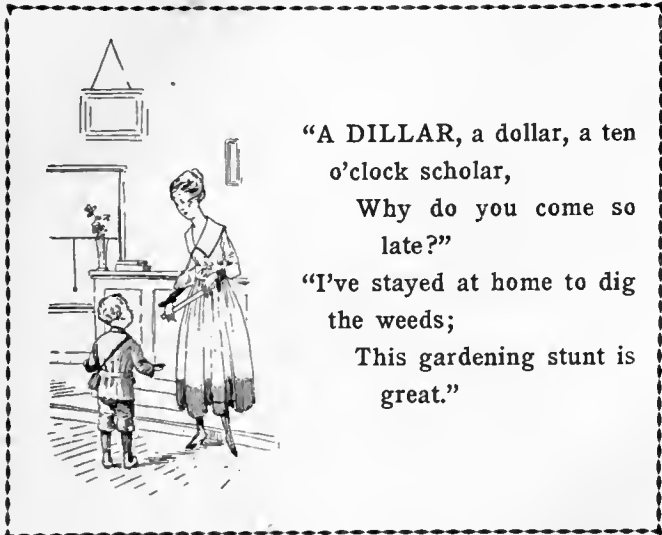
I'll drive them to the garden patch  
With patriotic haste,  
And make them hustle to the scratch  
To stop this sinful waste.  
I'll make them get a wiggle on,  
And either can or dry  
The garden truck, ere summer's gone,  
For winter time supply.



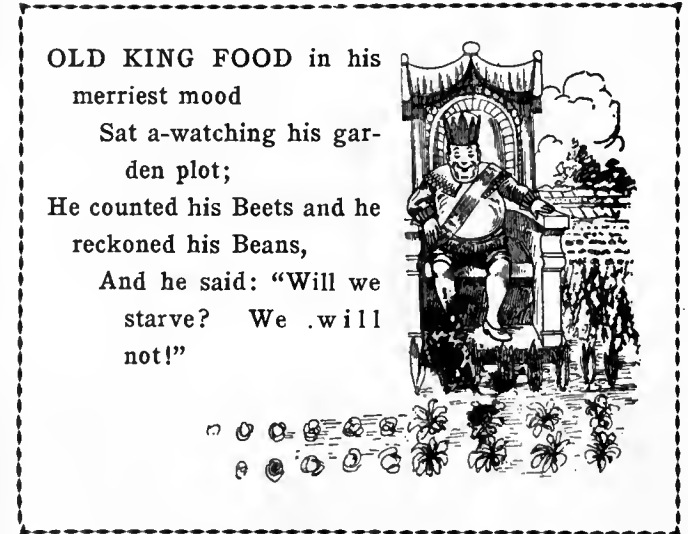
There'll be no slackers left alive  
If I can have my way;  
For I will make a mighty drive  
And set them making hay.  
The bridegroom slackers, conscience  
knows,  
Deserve a deadly shaft;  
But after all I'm out for those  
Who dodge the Food Thrift Draft.

was given emphasis in the early autumn when 125 cattle raisers met in Washington to confer with Secretary of Agriculture Houston and Food Administrator Hoover over the world-wide shortage of meat. These producers were told by the representatives of the federal government that the shortage will continue for several years.

duce in our war gardens. Next year we must do even better. We will then have more war gardens and the average product will be larger. Housewives of this country this year have preserved and canned at least 450,000,000 jars of vegetables and fruits. Next year, profiting by their experience of this year, they will can



"A DILLAR, a dollar, a ten o'clock scholar,  
Why do you come so late?"  
"I've stayed at home to dig the weeds;  
This gardening stunt is great."



OLD KING FOOD in his merriest mood  
Sat a-watching his garden plot;  
He counted his Beets and he reckoned his Beans,  
And he said: "Will we starve? We will not!"

With this condition before us the Commission urges every city gardener to look ahead to the coming year of production and conservation.

It is not merely a question of today, but one of tomorrow that we must answer. With the prospect of having close to two million men under arms and the possibility of having to help feed a big part of Europe, we are confronted with the vital need for planning ahead for 1918.

Germany reports that its war gardens produced more this year than any year since the war started. This shows the value of experience. We have had one year's experience and have raised \$350,000,000 worth of pro-

millions more. More will be needed, for too much emphasis cannot be placed on the fact that there will be a greater demand for food exportation next year than there ever has been before. We must fill this demand. To make this possible the home gardeners must augment their forces and increase their labor of patriotism and the soldiers of conservation must extend their activities in canning, drying and otherwise preparing foodstuffs for winter uses. To reap the full benefit this year's experience must be applied to the solution of next year's problems. That the results will then be even greater than those of 1917 is assured and America will win renewed recognition as the most powerful factor in the great war for human rights.

**J. DENNY O'NEILL**, who recently became state highway commissioner for Pennsylvania, has issued a statement advocating the planting of trees along the roadside throughout the state. He urges that the shadeless roads of the state be transformed into well-shaded avenues, and is particularly strong in his advocacy of fruit trees for this purpose. As especially desirable he suggests ox-heart cherry and the apple tree. For purely shade trees he suggests the sugar maple and red oak. In a letter to the engineers and road superintendents of the various counties he instructs these officials to interest residents along the highways, by appeal through caretakers and foremen on state roads. He names fall arbor day, October 26, as a good time to make a start.

**THE GULF**, Mobile & Northern Railroad plans extensive improvements at Mobile, Ala., to cost \$1,000,000. The project includes three new piers and a series of warehouses. The new construction will be especially designed to handle lumber traffic. One pier will be arranged to take care of 2,000,000 feet of sawed lumber, and another will have a capacity of 5,000,000 feet. The plans have been submitted to the War Department, and after approval the railroad company will need a large amount of piling and timbers.

**THE Harvard Graduate School of Business Administration** in co-operation with the Department of Forestry, announces a course in the lumber business for college graduates who look forward to undertaking some branch of lumbering for a life work, and also to graduates of forestry or engineering schools who desire special instruction in the lumber business. The course covers two years, and upon completion graduates are given a degree of Master in Business Administration.

**THE ENDURING** strength of wood is evidenced in the Fairbanks house in Dedham, Mass., built in 1636, and believed to be the oldest frame house in the United States. The oak timbers were brought from England about 1635. They are still solid.

# THE LURE OF THE BEAVER

BY D. LANGE

With Photographs by the Author

**B**EAVERS have been called animal engineers, and the title is by no means an empty honor. No animal possesses such remarkable constructive ability as the beaver. Even the most sceptical scientist who sees the dams they have constructed, the dome-shaped houses they have built, the canals they have dug, the trees they have felled and the piles of brush and poles they pickle for their winter food will marvel at the intelligence of these furred dwellers of the wilderness, and will secretly wonder, if after all, beavers might not possess a spark of human reason.

The Chippewa Indians believed that the beaver people once did possess both human reason and a human language, but Manitou had to take away from them the power of speech so that they would not become wiser than the Indians themselves.

When North America was discovered, the beavers lived on almost every stream and lake north of Mexico and were an important source of both food and clothing for all the tribes inhabiting the present Northern States and Canada. So numerous and so generally distributed were these animals that the needs of the Indians made no impression on their numbers.

With the increase of trade between America and Europe the beaver became a veritable animal of fate to both Indians and Whites, and within historic times no other animal has played such a fateful part in the suppression of one race and the spread of another and indeed in the conquest of a whole continent by the white race as the American beaver. Beaver wool, the

fine dense fur which protects the beaver from the icy water of his habitat, was found to be the most suitable material in the manufacture of fine hats, and for more than two centuries, until 1825, the European markets were insatiable in their demand for beaver furs. From a very modest beginning the American fur trade rose to world wide proportions and importance. Such in-

trepid explorers, pioneers and traders as Kit Carson, Jim Bridger, George Cartwright, John Jacob Astor, Larpenteur, the two Henrys and unnumbered nameless and forgotten adventurers and explorers who wooed fortune, suffered untold hardship, faced death, and committed dark and bloody crimes as loyal servants of three great rival fur companies, all followed the lure of the beaver. They followed him to the small headwaters of the Mississippi and St. Lawrence and they crossed the divides and followed him down the streams which send their waters to the distant Pacific and to the ice-bound Arctic.

When the Americans had won their liberty in the Revolutionary War, tobacco was no longer used as currency in Old Virginia, but beaver skins were still the standard of value in the

country of the upper Great Lakes and in vast regions farther north and west. A few records from the Jesuit Relations and other documents of the eighteenth century are interesting, and the present day reader may even find grains of humor in them. One of the Jesuit Fathers reports that, "in 1656 Monsieur de la Poterie opened a tavern at Three Rivers at which wine was sold to the savages, two pots for a winter



OUR FRIEND THE BEAVER

The clever, sagacious, hard-working animal—the chief engineer of the animal world—not so protected by game laws that the chance of his becoming extinct is growing remote.



*Courtesy of the American Museum Journal*

YOUNG BEAVERS AT HOME

Part of the new group recently constructed in the American Museum.



beaver and one pot for a summer beaver." Monsieur the Governor of Montreal ordered this tavern closed but the order was not obeyed.

About 1761 the trader, Alexander Henry, spent



A FAT BEAVER TRAPPED

The trap was placed near the top of his house and he was caught as he was entering it. He has been shipped to the state game farm of Wisconsin and is prospering there now.

some time at Mackinac in the present State of Michigan. From this place, which was for many years an important point in the fur trade, he relates the following incident:

"The Jesuit father killed an ox which he sold by the quarter. He took for the meat the same weight in beaver skins. Beaver skins were worth a dollar a pound. Money is very little used at Mackinac, all trade being carried on in furs. A pound of beaver skins is worth sixty cents in trade."

In 1776 the same trader visited the Assiniboinis at Fort des Prairies in the Saskatchewan country, and a few paragraphs from his journal give interesting glimpses of the trade in beaver skins in the far west.

"Four different interests," he writes, "were struggling for the Indian trade of the Saskatchewan, but fortunately they had this year agreed to join their stock, and when the season was over to divide the skins and meat. This arrangement was beneficial to the merchants but not directly to the Indians

who . . . paid greater prices than if a competition had subsisted. A competition on the other hand afflicts the Indians with a variety of evils in a different form.

"The following were the prices of goods at Fort des Prairies:

	Beaver Skins
A gun .....	20
A stroud blanket .....	10
A white blanket .....	8
An axe of one pound weight.....	3
Half a pint of gunpowder.....	1
Ten balls .....	1

but, the principal profit accrued from the sale of knives, beads, flints, steels, awls and other small articles.

"Tobacco, when sold, fetched one beaver skin per foot of Spencer's twist, and rum, not very strong, two beaver skins per bottle; but a great proportion of these commodities was disposed of in presents.

"The quantity of furs brought into the fort was very great. From twenty to thirty Indians arrived daily, laden with packs of beaver skins."

The meat which Henry refers to was not beaver meat, but dried and smoked buffalo meat. Although beaver meat is good eating and was freely used by both Indians and Whites in the fur country, I have rarely found it mentioned as an article of trade, while the meat of buffalo, deer, elk and moose was a common article of trade. For curing the meat, the beaver was too small an animal.

In places where there was no competition, it is claimed that traders made a profit of 2000%. Father Charles Lemant writes that about 1625 the French Trading Company exported from Quebec 12,000 to 22,000 skins annually. The Company paid 4 1-3 livres



BEAVER ON THE DAM

The animal swam down the stream and climbed on top of the dam just as the photographer took the picture. It is exceedingly difficult to get such a photograph in the beaver's native haunts.

in Quebec, and the skins sold in Paris at one pistole apiece, which amounts in our money to a buying price of 85c and a selling price of \$4.00.

A good trapper in a well-stocked country could catch two to three hundred beavers in one season and secure a good deal of other fur at the same time.

Many Indians, becoming temporarily rich beyond their dreams, invested their wealth in all kinds of silver ornaments which they could wear on their persons. Whole Indian villages went annually on a drunken debauch when they had carried the product of their winter's hunt to the traders, for rum was one of the great staples in the Indian trade. Its sale was immensely profitable, and no one trader or company could stop the unspeakable havoc it caused among the Indians; for if one trader had no whisky, or refused to sell it or give it away as presents, the Indians took their peltries to one who would give them plenty of the white man's milk.

It is not surprising that an animal of such commercial importance and remarkable habits as the beaver aroused the interest of travelers and scientists. But as most travelers had neither the time nor the patience to make personal observations on an animal so shy and wary and largely nocturnal in its habits, many absurd stories of its life became current and were accepted by credulous writers and a still more credulous public.

Some of the most interesting glimpses of life and conditions in the beaver country during the height of the fur trade may be gained from the narrative of John Tanner, a white man, who, when a boy eleven years old, was kidnapped by some Shawnee Indians in Boone County, Kentucky. He was sold by his captors to Netnokwa, a Chippewa woman, who adopted him as her own son. He lived amongst the Chippewa from about 1780 to 1830, mostly in the regions now embraced in Northern Minnesota, Ontario, Manitoba, North Dakota and Assiniboia.

Referring to a bear hunt which ended a period of starvation, he relates the following: "The old woman said, 'My son, look in that kettle and you will find a mouthful of beaver which a man gave me since you left us this morning. You must leave half of it for Wamgonabiew (her son) who has not yet returned from hunting, and has eaten nothing today.' I accordingly ate the beaver meat, and when I had finished it, observing an opportunity when she stood by herself, I stepped up to her and whispered in her ear, 'My mother, I have killed a bear.'"

From other remarks of John Tanner one may glean the sad story of the degradation of the Indians as well as the story of the rapid extermination of the beaver.

Netnokwa and her sons had visited an old friend,

Peshauba, in the present province of Assiniboia. The party started in canoes down a tributary of the Assiniboin River with all the furs Peshauba had accumulated during several years of hard labor. They intended to return to their former home on Lake Huron. Of this journey Tanner writes:

"When we came from the Little Saskajawun into the Assiniboin River, we came to the rapids, where was a village of one hundred and fifty lodges of Assiniboins and some Crees. We now began to feel the want of fresh provisions, and determined to stop a day or two to kill sturgeon at this place where we found a plenty of them. . . . In two days from these rapids we came to Mouse River where both the Northwest and the Hudson's Bay Company have trading-houses. Here Peshauba and his friends began to drink, and in a short time expended all the peltries they had made in their long and successful hunt. We sold one hundred beaver skins in one day for liquor. The price was then six beaver skins for a quart of rum, but they put a great deal of water with it. After drinking here for some time, we began to make birch canoes, still intending to continue on our journey."

The journey was never completed. After telling of two years of toilsome wandering back and forth, of hardships and misfortunes, Tanner again strikes the sad refrain which rings through all the stories of the unbounded forests of the Indian and the beaver:

"The old woman, being much dissatisfied at the misconduct of her son, the disappointment of her hopes of returning to Lake Huron, and other misfortunes, began to drink. In the course of a single day she sold one hundred and twenty beaver skins with a large quantity of buffalo robes, dressed and smoked skins and other articles, for rum. It was her habit, whenever she drank, to make drunk all the Indians about her, at least as far as her means would extend. Of all our large load of peltries, the produce of so many days of toil, of so many long and difficult journeys, one blanket and three kegs of rum only remained, besides the poor and almost worn-out clothing on our bodies. I did not, on this or any other occasion, witness the needless and wanton waste of our peltries and other property, with that indifference which the Indians seemed always to feel . . . ."

"We repaired to Rainy Lake trading house, where we obtained a credit to the amount of one hundred and twenty beaver skins, and thus furnished ourselves with some blankets, clothing and other things necessary for the winter."

For about a hundred years, during the eighteenth century, Canada practically lived on beaver furs. Beaver skins paid for her imports from Europe; in beaver furs the church received its tithes, and in beaver furs the converted Indians paid for the mass which the priest read for the souls of the departed

braves. It is quite fitting that the beaver has been given a place on the national coat-of-arms of Canada.

In the valuable historical documents known as the Jesuit Relations, no animal is so frequently mentioned as the beaver, and the journals of all the early traders and explorers show that from about 1600 to 1825 and even later, the beaver was over a region larger than all western Europe, of as much economic importance to the inhabitants as gold was in the early days of California and as cotton is now in our Southern States.

Under these conditions the slaughter and destruction of the beaver proceeded at a fearful rate. The annual export of beaver skins probably did not much exceed half a million, but it is likely that two millions of the animals were killed every year.

The beaver hunter, like the placer miner, exhausts the source of his wealth in any one locality very soon, and is compelled to move into new regions. Beavers, in spite of their apparent sagacity, are easily caught, and as their size and manner of life make concealment impossible, the beaver population has so rapidly decreased that today there are probably not

more than 500,000 of them alive in the whole of North America, although the original beaver population of the continent must have been at least 50,000,000.

In 1871 the Hudson's Bay Company still furnished 174,461 skins, in 1905 the supply had fallen to 54,119. The total production of beaver skins from 1672 to 1902, largely based on figures of the Hudson's Bay Company, is estimated at 3,000,000 skins, and valued at \$100,000,000.

About 1825 the Hudson's Bay Company absorbed the Northwest Company and the ruinous competition in the fur trade and the unrestricted liquor traffic came to an end. The company did much for the Indians and prevented the wanton extermination of beaver in its territory. About the same time silk was substituted for beaver hair in the manufacture of hats, and this

invention also checked the destruction of the animals. Since that time beaver skins came within reach of the furrier. A good beaver skin now brings the trapper about \$8.00 and a full length beaver coat is worth about \$200.00. Beaver fur is not in prime condition until February and March, but in the early days the Indians killed some for both food and fur at all seasons, although they did most of their trapping during the winter months.

When, in 1869, the Hudson's Bay Company surrendered its sovereignty to the Dominion of Canada, the humble wild fur bearers lost their best protector, and are now rapidly following the buffalo and the elk

in all regions where they are not rigidly protected. With them the most interesting animals of our whole fauna, the founders of American commerce, the first engineers and the first lumbermen of North America, will be seen and heard no more on the streams in the forest, where their ancestors have worked and played since the leaves of the aspen first began to whisper in the summer breeze.

Where, however, the beaver is actually protected,

it not only holds its own, but increases rapidly. This has been shown in Minnesota, Ontario, Michigan, Wisconsin, and elsewhere, for under favorable environment no animal is better fitted to take care of itself.

In 1902 three beavers, one male and two females, were set free in the Itasca Forest Reserve of Minnesota, where the species had become extinct. The liberated beavers built a house at the mouth of Nicollet creek that same fall and within ten years they had spread over the whole of the Reserve and had built about thirty lodges and had made half a dozen large ponds.

In a settled farming country, beavers would not be desirable, because their dams will flood meadows and they cut down quite a few trees and kill others by flooding their roots. In a wild country, however, the



*Courtesy of the American Museum Journal*

#### HOW BEAVERS CUT TREES

Black ash cut by beavers near Port Kent, New York. Gift of W. H. Howell, on exhibit at the American Museum. The cuttings show characteristic marks of the beaver's teeth.

trees they kill have no value. Where beaver have to be killed or removed the work should be done under the direct control of an efficient State Game Department.

Wherever general trapping is permitted, the animals will soon become extinct. I believe, that in certain wild regions as on Isle Royale, in Lake Superior, colonies of beaver might yield a reasonable income, if properly managed.

Against their natural enemies they are well protected. Lynxes and wolves cannot attack them in the water nor in their houses or burrows. I have seen



OPENING A BEAVER HOUSE

The opening in this beaver house is large enough to admit a man who is well on his way to explore the interior. Note the large branches of which it is built.

otter trails near beaver houses and it is possible that this agnostic hunter may attack them in the water or even invade their houses. A hungry eagle would no doubt pounce upon the young, but the beaver children seldom venture more than a few yards from the parental roof and castle.

To harmless woodland neighbors the beavers are indifferent and live at peace with them; and for catching glimpses of the life of the wood folk there is no better place than a beaver pond.

At one place I observed daily from my shelf-platform in a tree the feeding and playing of a brood of black ducks. A young woodchuck also browsed right below me and used the beaver dam as his turnpike. Once he tried to cross the stream on a pole, but lost his hold and fell with a splash into the water.

At another pond, a flock of Canadian jays tried to steal my bacon out of the frying pan, and at a third pond I observed the play and calls of loons that were unconscious of my presence, and I watched deer feeding for an hour near a beaver clearing.

The Indians indulged in many practical jokes at the expense of their pious Jesuit teachers. One of



HOW A BEAVER SAVED WORK

Whether the animal knew how to do it or not the fact remains that this tree was felled after the beaver had cut through only one side of it.

them, Father Joseph Louvence, tells us that the beavers have two teeth projecting from the sides of their mouths like swords and that they use these like saws in cutting down trees, that their houses are divided into several stories and that their dams are so ingeniously built that one could expect nothing better from the most skilful architect. The account shows that the good father had never seen a beaver house, a dam nor a beaver.



PINE TREE CUT BY BEAVER

Note the size of this tree and guess the amount of work required to cut it down. The power and sharpness of the beaver's teeth may be judged by the fact that some of the chips are four inches long.



A BAD NEIGHBOR OF THE BEAVER

The lynx is frequently found along the water side where beavers are active. He is one of their worst enemies, but can catch them only in the open, as their houses are lynx proof.

I had casually observed a few beaver colonies in the wilds of Northeastern Minnesota, in Northern Wisconsin and in the Itasca Forest Reserve, and so attractive did I find their habits, that one summer I devoted over a month exclusively to studying them in the Itasca Reserve; but the difficulties I encountered in trying to secure new and reliable information were at times quite baffling.

My first attempt was made at a dam and pond in a dense cedar swamp. In company with two friends



NEIGHBOR PORCUPINE

The well known but carefully avoided porcupine is one of the neighbors of the beaver, although that does not prove that they have much in common, except a fondness for the same locality.

My next attempt was made on a large pond which the beavers had created by building a dam across a small creek in a more open valley. Here I built against the trunk of a large balsam fir a platform twenty feet above the ground. Two afternoons and evenings I spent alone on that platform after having made a break in the dam. On both occasions I saw a beaver swimming about in the pond as if he were scouting for the cause of the trouble. He was not alarmed and neither saw nor scented me, but he never left the pond and did not repair the dam. When it grew too dark to see anything, I left for my camp two miles away. On both occasions the break was repaired during the night. About the number of beavers living in this pond I had been able to make no direct observations.

Having been disappointed at this pond, I selected a beaver house on the shore of a small lake and directly below a high bank. This seemed a most favorable locality. I intended to observe the beavers from behind some bushes on the high bank; the house was built in the open and was exposed to the west, making the conditions of light very favorable. It was only



A MUSKRAT HOUSE

This is a cross section showing the interior chamber and entrance under water or ice. The boy has his left hand in the entrance to this domicile.



SIZE OF A BEAVER HOUSE

This photograph gives an excellent idea of the size and the stability of the beaver house. It is built on the edge of a pond in southern Wisconsin.

half a mile to a good log cabin and I expected good results.

But again I was disappointed. I did indeed see several beavers every evening but they nearly always scented me and gave their plunge-and-slap danger signal, which, at times, was taken up by a colony on the other side of the lake until the resounding plunges made a noise as if half a dozen concealed giants were throwing rocks into the lake. Building a platform in a jack pine did not bring better results; the beavers always knew I was there.

At last I discovered the source of my difficulties. Towards evening the wind nearly always ceased and a current of air set in flowing gently from the high bank down to the lake.

I now decided to make a large beaver house, located on a point of land across the lake, the scene of my investigations. An open grove of poplars covered this point and I planned to build a comfortable platform almost vertically above the beaver house by connecting three of the trees by means of stout poles and strong boards. On shore near my camp I built a raft and a portable ladder and cut the poles and then ferried poles, ladder and boards across. I adopted this method in order to avoid unnecessarily alarming the beavers by much cutting and hammering near their house; still it required four hours of hard work to build my observatory. Having no companion and working eight miles from the nearest settlement the work did not lack a spice of danger. That evening, knowing that the beavers would be alarmed, I re-

mained quietly in camp observing the deer-mice in the cabin and the snowshoe rabbits around the camp-fire, both of which were more numerous than I have ever known them before.

The following day I paddled across the lake on my raft in the middle of the afternoon. The raft enabled me to avoid a long detour around the shore of the lake where the going was extremely bad, especially after dark, and it also made it possible for me to land at the beaver point without noise. After dark, on the homeward trip, I steered for three white birches, near which I tied my raft within half a mile of camp. At the end of a week, however, the craft became so water-logged that the stern travelled ten inches under water, but as I did not have to travel in strong winds and big waves, the raft remained a most convenient and fairly safe transport.

Having arrived at the beaver point I ascended to my platform and waited. About 6.20 I observed a line of bubbles arising near the house and traveling rapidly into the lake, and about two hundred feet from the house, as I had expected, a beaver came up at the end of the bubble line. He scouted about, his nose turned toward the shore, but found nothing to alarm him. Soon another beaver left the house. I could see his dark body under the water but he caused neither ripples nor bubbles. He also, after rising, sniffed the shore, but in another direction, and like his fellow was not alarmed. A little later a half grown beaver cautiously put his head out among the poles at the edge



BEAVER HOUSE IN WINTER

This house was deserted for several years. Late in the fall a colony whose pond had been drained by a poacher repaired the house, hurriedly pickled a large amount of brush and occupied the house.

of the house, and not scenting or hearing anything suspicious, swam away to the feeding grounds.

At last I had found a place and method at which the wariness of the animals would not baffle me, and new facts came rapidly during the week I watched from the platform spiked to the three poplars.

On this level point of land there was no downward air current and the beavers could not scent me. To noise they were not so sensitive as I had expected. The rather loud click of a camera which several times caused a muskrat to plunge with alarm, made no impression on the beavers, and to their eyes the large platform, six feet by three, and myself sitting on it without any screen whatever, conveyed no import of danger.

As far as I could tell they did not see me at all. Once, however, I thought a beaver some hundred yards away caught sight of me against the sky line as I moved to shift my position.

Every evening between six and half past, the young beavers of the season began a sort of child-like whining. Within half an hour after that, one or two full grown animals left the house under water and arose at a distance of about two hundred feet to scout along the shore as already described. In most cases I failed to see them leave the house. Once I saw a large piece of poplar, perhaps three feet long and four inches in diameter, taken into the house under water. I could not see the dark beaver, but only the whitish piece of poplar, and the movement under water produced no ripples on the surface. About ten or fifteen minutes after the old beavers had left, the half grown yearlings generally left the house and all swam towards the feeding grounds, a quarter of a mile to the west. I think there were four of these yearlings. Once I saw



THIS DAM IS FIVE FEET HIGH

So firmly constructed is this dam that despite frequent rise of the stream it still remains firm and strong, its top five feet above the average water mark. It is in Southern Wisconsin.

them leave so close together that their bodies touched one another.

I concluded that the beavers just mentioned were yearlings because they were not full grown, and the house was also inhabited by three or four animals only about the size of muskrats. These little fellows seldom showed themselves and never followed the parents to the feeding grounds so I concluded that they did the whining I regularly heard, because I heard it after parents and yearlings had left the house. This house I now knew for certain was inhabited by about ten beavers belonging to three generations. The two parents, easily distinguished by their large size, always left the house first and scouted along the shore for indications of danger. If their suspicion was aroused, they gave the danger signal and I soon learned that after that I should see very few or no beavers that evening. If they suspected no danger they either swam away to feed or returned leisurely to the house and left again later. Near the house, they never went on land, although from my platform I could see seventeen wharves or landing places. But for some reason the beavers were feeding at this time exclusively a quarter of a mile away.

The house under the high bank also harbored parents, yearlings, and young of the season, but I secured no good evidence as to their number; however, to judge from the size of the house and other signs, the number was less, perhaps only six or seven.

The yearlings did not heed the danger signals of the parents as implicitly as they would do with the writers of nature fiction. Twice one of the parents became alarmed at my raft moored on the other side of the point and gave the plunge-and-slap signal, but the yearlings near the house paid no attention to it although the alarmed parent was not more than two



WOMEN WALKING ON BEAVER DAM

Not many women have walked over a beaver dam and those who have see no particular reason why they should do it a second time. These are members of the Minnesota Forestry School at Itasca Lake, Minnesota.

hundred feet away. The youngsters reminded me of boys who go their own way in life, feeling satisfied that the old man doesn't know what he's talking about.

Contrary to a statement made in a very reliable natural history, the muskrats and the beavers lived entirely at peace with each other, one paying no attention to the other. In the house below the high bank beavers and rats also lived together peacefully, but in both cases the rats generally used small entrances close to shore, and I think they lived in a small cavity in the bank by themselves. In a third house muskrats were also present, but I did not learn on what

man's thumb. The next moment, seizing the butt with his mouth or fore feet—I could not make sure which—he swung the leafy branch over his left shoulder from which it slid off almost immediately; he then seized it with his teeth, dragged it into the water, dived with it and took it into the house. No sooner had he entered than the babies of the family set up a lively whining in appreciation, as I imagined, of the prize the big brother had brought in. This was the most intimate glimpse I had of the beavers' home life and was the only time I saw a beaver on land.

I noted that the beavers never touched the other poplar tops I had dropped almost on their house and they had practically done no cutting in the poplar grove near their house. They nearly always left the house at the same exit and, after the old ones had scouted along the shore, both parents and yearlings often swam directly to their feeding place about a quarter of a mile to the west. Several times I watched one swim as straight as the crow flies with a speed of about one hundred yards a minute.

The most remarkable beaver structures are the dams, built across small streams and creating the well-known beaver ponds. Dams from a hundred to three hundred feet long are common, and in rare instances a beaver dam may reach a quarter of a mile in length. The height of a dam varies from a few inches near the ends to five or six feet in the highest places. It is built of dead brush and sticks held together by mud scooped and dug up immediately above the dam. The beavers had cut no standing trees for any of the dams I had seen. No stakes are driven into the ground and no large rocks used to hold down the brush. The dams are not given any artistic finish, and look as if a lot of boys had built them; but by being kept in repair they hold the water in the pond. The amount of work expended in their construction is very large, considering that a beaver averages only about thirty pounds in weight and has only his small fore feet to use as hands and his four chisel-like teeth for cutting brush, trees and sticks, or for seizing his material when he drags or floats it to his house or dam. I estimated that duplicating a certain three hundred foot dam would take a man equipped with pick, ax and shovel about four weeks.

The streams which the beavers dam up to make their ponds vary in size from insignificant rills to streams large enough to carry a row-boat. In the late fall of 1912 they built two dams across the Mississippi where the stream issues from Lake Itasca. A beaver pond is frequently a quarter of a mile long and covers an area of from five to ten acres, but ponds have been observed covering from fifty to sixty acres. None of the ponds in the Itasca Reserve are over ten years old, but in the early days a well located beaver pond may have been occupied for a century or longer, although the life time of an individual beaver probably does not



WHERE BEAVER THRIVED

Scene in a poplar grove in winter after the beavers have cut down and pickled their supply of brush and food poles. This is in the Itasca Forest, Minnesota.

terms they lived with their larger relatives. At Poplar Point rats fed almost entirely among the lilies and other plants in a little bay in which the beaver house was located, and seldom traveled more than a few rods from home, but they also ate the foliage and bark of poplar on the beaver house. They generally appeared about half an hour before the beavers came out. The beavers, on the other hand, all swam to the feeding ground a quarter of a mile away, where three kinds of water lilies grew in abundance and where they had also done much fresh cutting among the poplars on shore.

The most interesting observation I made on the last evening I could spend on my platform at Poplar Point. Beavers began to show themselves very freely about seven o'clock; once I saw four or five at the same moment. About 7:45 a beaver, a yearling to judge by his size, came very carefully out of the house. He hesitated a minute, and then, almost directly below me walked slowly up to a green poplar I had cut the night before and with a few lateral movements of his head cut off a twig the thickness of a



extend beyond ten or fifteen years. Of all the wild and weird places one comes upon in the primeval forest, a beaver pond is the most desolate. As the water backs up from the dam, the cedars, tamaracks, spruces and firs gradually die and within a few years they begin to lean and fall in all directions, while long tufts of gray lichens hang, like gray funeral wreaths, from every dead bough. Few men can spend a night alone at a beaver pond without having the primitive fear of the wilderness creep in upon them.

Beaver houses are constructed like the well-known muskrat houses which every country boy has seen in sloughs and sluggish creeks, but the beavers use sticks, poles and mud as building material instead of the rushes and mud employed by their small cousins. A large beaver house stands about five feet above the water and measures from fifteen to twenty feet in width at water level. A large house at the south end of Lake Itasca could be clearly seen at the distance of a mile and a half. Each house has two or more entrances, always under water, but it has only one cavity where from six to ten beavers live, sleep and eat. I found no bedding in the deserted houses I opened, but the cavities were large enough that a man might use them as places of concealment.

The beavers seem to prefer building their houses in ponds where they can control the water level and where no enemy, except man, can reach them, but they also build many houses against the banks of lakes and some of them live in burrows near the water, which was undoubtedly the manner in which their ancestors lived long ago. How and when they learned to build dams, create artificial ponds and build their dome-shaped houses we can, at present, only surmise.

Some of the extinct relatives of the beavers were several times as large as the present race, and one grotesque species was even provided with horns.

Fully as striking as the hydraulic engineering of the beavers is their lumbering. The term beaver clearing is not hyperbole, for they frequently fell from one to two hundred trees, occasionally taking a tree of two feet in diameter, but they prefer trees from a few inches to a foot thick. Just as the tiny wild mice cut down grasses to secure the seeds, the beavers fell trees to feed on the twigs and on the bark of the boughs. Accurate observation shows that they do not determine the direction in which the trees fall. Most of them fall naturally toward the pond or lake; but in a large clearing trees may be seen lying in all directions and many become lodged in the tops of other trees. These lodged trees do not fall to the ground and are lost to the beavers. An intelligent lumberman secures every tree he cuts.

For use during winter they cut boughs and trees into sticks and poles varying from about two to six feet in length and reaching six inches in diameter. This material they pickle in the cold water near their houses, just before the lakes and ponds freeze over,

and at this time of the year they are as busy as farmers in harvest and haying time.

Their favorite food is the brush and bark of the common poplar, but they also eat balsam poplar, cottonwood, white, yellow and dwarf birch and a few other deciduous shrubs and trees, but no evergreens. They are strict vegetarians and if their home stream contains any trout, some big fish may be looked for in the beaver pond.

Very remarkable also are the beaver canals and ditches. They are dug to a width of two or three feet and are from one to two feet deep. They connect natural lakes, marshes and ponds or run from a pond to their cuttings. They use these canals for purposes of travel and for floating their food to their houses. I found one fifty feet long connecting two natural lakes, but Lewis H. Morgan, a careful observer writing about 1865, observed one in Michigan which was two hundred and eighty feet long.

The beaver is a rodent and resembles in appearance a large muskrat. He is very dark brown in color, but has a black, paddle-shaped tail. The hind feet are webbed and act as powerful propellers in swimming, while the fore feet are rather short and not webbed and are used like hands. The story that beavers carry mud on their naked, scaly tails, and that they use them as a trowel, is a fable. The tail is admirably adapted to regulate their up and down movements under water, but whether they steer themselves with their tails or their feet I have not yet been able to learn.

Recently I made a midwinter trip to the beaver colonies in the Itasca Reserve. Near several of the houses I could clearly trace their brush piles of winter food, which extended from twenty to thirty feet from the house and were about ten feet wide. One old house, which had been vacated for three years, a family had repaired late in the season and had then hurriedly provided themselves with whatever food happened to grow nearest at hand. Their brush pile contained only white and dwarf birch, and a little white elm, black ash and alder. Evidently they had not had time to go after poplar.

A well located colony in a pond on a small creek had been able to do things right. They had built three dams and created three ponds above their home pond. On the bank of the upper pond they had cut their winter food and had then floated it down from pond to pond half a mile to their house. The three upper ponds contained no houses and had only been used for the transportation of food.

On all inhabited ponds the animals had made a small opening in the dams when the ice was about three inches thick. In this way they had probably provided small air holes near stumps and trees and in front of the dams, because about a foot of water had run out of the ponds and the ice had settled down to the water level. By this procedure they had also pre-

vented the water from flooding the ice and rising into their house or causing uncontrollable leaks in the dam.

The domes of their houses freeze hard in winter, and while wolves and deer and all kinds of animals pass freely over the frozen ponds, it is impossible for any creature, except a man with an ax, to open a beaver house in winter.

I would not ascribe human reason to the beavers, but in the sphere of their own peculiar life and activities they do certainly display such a marvellous instinct and adaptability that one is ever tempted to ascribe at least a high degree of intelligence to them. However, comparing the beaver's intelligence with that of wolves, domestic dogs, coyotes and foxes, I should rate it rather low. The wild flesh-eaters have every man's hand against them, but still they hold their own. With remarkable adaptability they have learned to avoid guns and traps, hounds and even poison. The beaver has become wonderfully adapted to an aquatic life and to the advantages of his ponds, dams and houses, but as compared with the wild canines the castors seem a dull tribe. It is easy to trap all or nearly all of a colony of beavers, but nobody ever trapped all of a pack of wolves. Wolves hold their own wherever they find food and shelter. Beavers became extinct over immense areas where their food and shelter existed in abundance, because they adhered stubbornly to the ways of their ancestors. They were guided too largely by instinct and were too slow to learn.

I shall illustrate by three instances how tenaciously beavers follow the bidding of instinct and how slow and dull they are in grasping a new situation.

A pair of beavers built a dam across a creek which furnishes the water for the State Lodge in the Itasca forest. Twice the dam was torn out and twice the beavers came at night and put it in again. Then a lighted lantern was left near the place. The first night they avoided the place, but during the second night they again built their dam. Then in despair, the lodge keeper set a steel trap and caught one of the beavers. When after daylight the man approached the trap, the animal broke away, leaving one of his

toes in the trap, and at last this beaver and his mate understood that this creek was not a safe place for building a dam.

Two other interesting instances bearing on the beaver's intelligence have come to my notice. I was watching beavers from my platform on Poplar Point. As already told, both beavers and rats inhabit the same house and both were perfectly at home with each other. One evening about 7:30 a muskrat came swimming home with a water lily leaf, which had accidentally turned up on edge. Almost directly below me a yearling beaver was lying with his head out of the water. When the rat approached him within about a foot he took a sudden fright and dived and rushed into the house in such a wild panic that I could see only a streak of swirling water. This beaver had many times seen a rat come home with a lily leaf, but at the somewhat unusual position of the leaf he was thrown into a panic and rushed for the house.

One of my friends, a forester, saw a beaver on shore toward evening. A rabbit hopped out of some bushes near by, and the beaver rushed into the water in a wild fright. There were literally thousands of rabbits in the Itasca woods and the scent and shape of a rabbit must have been well known to the beaver.

This tendency to panic does not speak for a high grade of intelligence, but it must be admitted that a tendency to rush for the water or the house would be beneficial to the beavers against their four-footed enemies.

But though we admit freely that the Indians and early writers overrated the intelligence of the beaver people, their ways and works will always lure the naturalist into the wilderness.

Nature has been most sparing in the bestowal of her greatest gift. Where the dim, flickering candle of animal instinct and intelligence has been sufficient, she has not turned on the brilliant searchlight of human reason.

The works of the beaver, executed under the guidance of a human mind, would be nothing remarkable; only when accomplished by a creature guided by instinct and a humble animal mind do they appear truly wonderful.

**C**HESTNUT blight has already done damage in Pennsylvania estimated at from \$9,000,000 to \$10,000,000. No tree attacked by it has ever been known to recover, although dozens of fake remedies have been brought out.


**O.** M. BUTLER, assistant district forester of the United States Forest Service, Albuquerque, New Mexico, has been appointed assistant director of the Forest Products Laboratory, at Madison, Wisconsin, and has assumed his duties. Mr. Butler has been engaged in Forest Service work for ten years, principally in the West, where he was at different times assistant district forester in various districts.

**U**NRESTRICTED grazing in the woodlot is a losing proposition. The farm woodlot cannot serve profitably for the production of timber and also as a pasture for stock. Either all grazing should be stopped and the area given over exclusively to the growth and reproduction of trees, or else the trees should be cut and the land used for the production of grass.

**I**T has cost France over \$30,000,000 to learn that denuded forest areas must be reforested. Pennsylvania and other states are learning the same lesson in the same way.

# MARSH LAND AND OTHER AQUATIC PLANTS

By DR. R. W. SHUFELDT, C. M. Z. S.

REQUENTLY, while carrying out their instructions or making their investigations, our foresters are not always confined to the high timber lands or to the forests of the valleys and more level stretches in the regions where they are on guard. Often slow streams have to be crossed, swamps waded, or lakes and big ponds skirted, as they follow the many itineraries throughout the heavily timbered parts of the country where their duties call them. In these latter localities they will be very sure to meet with a great number of our water or aquatic plants. Some are more or less inconspicuous forms, and so rarely attract attention; but upon the other hand many of them are among the most visible of any of the representatives of our flora, and the present article will be devoted to giving brief accounts of their characters and other points, through which they may be readily recognized.

Let pickerel weed be taken as the first example, and we have two good figures of it illustrating the present article. Many who have pulled or paddled through miles of it in a boat or a canoe; who have seen thousands of its beautiful, purplish-blue flowered spikes, and who are more or less familiar with its stems and leafage, have never happened to find out that the name of the genus in which it belongs is *Pontedaria*, it having been named for Giulio Pontedera, the famous botanist of Padua, who flourished in 1730, nor that the deer up in the Adirondack Mountains regularly go down to the shores of the

lakes there to browse upon the leaves of this very same pickerel weed. Its flowers are extremely ephemeral, and bloom but for a single day. Mathews is mistaken when he says that it is a tall plant, "with one blunt arrowhead-shaped, dark green, thick leaf," for we frequently find specimens of the plant supporting *two* such leaves—indeed, such an example is here figured. Another peculiar thing about the pickerel weed is the fact that its fruit—a curious little bladder-like affair—contains but a single seed. It is also said that the flowers of this plant are sometimes *white*, and such specimens have been most frequently observed in the northern parts of its range. It blooms from July to the middle of September, and it is often associated with the arrowhead, to be described further on.

Pickerel weed flowers are comparatively safe from the ruthlessness of the wild-flower vandals, for most of them are found along the river banks, and those growing in a pond are too far out in the water to be reached, which fact is the best protection that the plant possesses.

Doubtless pickerel lay their eggs among the leaves; and there is no doubt but that this splendid fresh-water game fish is frequently found in abundance where the plant grows. Then, too, the insects attracted by the blossoms often fly low over the surface of the water; a hungry pickerel may take a fancy to some of these, so that, by a sudden leap, he may succeed in capturing such tidbits. It may be said in passing that the pickerel weed



OUR LARGEST SPECIES OF GRASSHOPPER

This is the lubber grasshopper or locust of the southern United States. It is a remarkable large-bodied genus, with short red wings, and shiny, jet black body; the antennae or horns are also short. Its scientific name is *Rhombuleum micropterum*, and it has a near relative in the West which is a greenish species. In the environs of New Orleans, the very small, intensely black young ones hatch out in the cracks in the dry, verdureless patches in the woods, and at a short distance look like little black anastomosing veins on the ground. Dr. L. O. Howard says: "It occurs frequently in enormous numbers in the rice fields near the mouth of the Savannah River, and is an extremely disagreeable object on which to step; in fact, it reminds one of Thackeray's famous remark when he swallowed his first saddle-rock oyster." The two males here shown are New Orleans specimens.

family (*Pontederiaceae*) contains but one other plant besides the true pickerel weed, and that is the mud plantain (*Heteranthera reniformis*), which bears but very slight resemblance to the former.

The story of the very essential cross-fertilization of the flowers of the pickerel weed reads, as we often say,



A GLIMPSE OF THE HISTORIC POTOMAC

View from the Maryland side of the river, below Great Falls. On the bank in the foreground is seen growing both Broad-leaved Arrow-head (*Sagittaria latifolia*) and Pickerel Weed (*Pontederia cordata*). The trees here shown are upon a small island, where, in days gone by, a pair or two of turkey buzzards used to breed.

like a fairy tale. It seems that there are three kinds of blossoms on the spike, "one raises its stigma on a long style reaching to the top of the flower," says Neltje Blanchan in her excellent account of it; "a second form lifts its stigma only half way up, and the third keeps its stigma in the bottom of the tube. Now there are two sets of stamens, three in each set, bearing pollen grains of different size and value. Whenever the stigma is high, the two sets of stamens keep out of its way by occupying the lowest and middle positions, or just where

the stigmas occur in the two other forms; or let us say, whenever the stigma is in one of the three positions, the different sets of stamens occupy the other two. In a long series of experiments on flowers occurring in two or three forms—dimorphic and trimorphic—Darwin proved that perfect fertility can be obtained only when the stigma in each form is pollenized with grains carried from the stamens of a corresponding height. For example, a bee, on entering the flower, must get his abdomen dusted with pollen from the long stamens, his chest covered from the middle length stamens, and his tongue and chin from the set in the bottom of the tube nearest the nectary. When he flies off to visit another flower, these parts of his body, coming in contact with the stigmas that occupy precisely the position where the stamens were in other individuals, he necessarily brushes off each lot of pollen just where it will do the most good. Pollen brought from high stamens, for example, to a low stigma, even should it reach it, which is scarcely likely, takes little or no effect." As pointed out, cross-fertilization is extremely essential, and in these "three-formed flowers there are two chances to one of securing it." Darwin



A FAMOUS PLANT OF THE SWAMPS AND RIVER BANKS

This is a beautiful specimen of the Pickerel Weed, the spike on either hand being in full bloom, while the center one has gone to seed. So luxuriantly does this plant grow in some rivers that it has greatly interfered with navigation, and special means have been recently devised in order to clear the usual shipping tracks of it. Three forms of Pickerel Weed are described,—that is, different flowers on different plants, and the whole group depend entirely upon visiting insects for fertilization. In late summer, when creeks, swamps, and ponds dry up, the Pickerel weeds turn brown, wither, and die, and frequently the seeds are lost in the dry mud wherein the sorry plant now finds itself.

made hundreds of such experiments, all with the same patient care and thoroughness, describing them with marvelous lucidity and point. Little wonder that when his life ended England found a place for him in Westminster Abbey.

Growing with the pickerel weed, we frequently find another famous aquatic plant, the arrow-head, a specimen of which is shown in one of the accompanying figures; the fertilization of its flowers, too, is a story most wonderful in all its details, but it would occupy too much space to give in detail here. There is but one thing to do: "Get your botany," and bring your compound microscope into play. Although a thousand cannon are barking away as these lines are being written, we must not overlook the fact that the war must come to an end some day; the far-seeing wise ones will not put entirely aside scientific research until it is over. When the upbuilding and the uplifting again fills the room of killing



ONE OF OUR MOST CONSPICUOUS  
AQUATIC PLANTS

This, the common large Yellow Pond or Water Lily, also called the Cow Lily or Spatter-dock (*Nymphaea advena*), is another strictly aquatic plant of our flora of very wide distribution. It prefers the shallow shore-stretches of slow streams, and less frequently extensive ponds or standing fresh water anywhere. In suitable localities it may be found from Nova Scotia to the Gulf, and westward to the Rockies. This species is almost entirely scentless, while its beautiful relative, the great white water lily, has a flower that is extremely fragrant—indeed, so much so that it has been called *Castalia odorata*.

and destruction, no one of the many departments of biology must be utterly dead—as has previously happened in the world's history.

There are a good many species of *Sagittaria*, but they all belong, with numerous other genera, in the water plantain family (*Alismaceae*). The one to be described here is the Broad-leaved Arrow-head (*S. latifolia*) (see figure). It is well named, for sagitta is an arrow, while the specific name refers to its broad leaves. One of its chief charms is its decorativeness, and hardly any one can pass the plant in nature, where it is growing luxuriantly, without being struck by its peculiar beauty. Its flowers are arranged in groups of three, and are very striking from the fact that they are so glistening white. Below them, also arranged in groups

of three, we find the inconspicuous pistils, hardly entitled to be called flowers. The two sex-elements frequently occur on separate plants; but this does not prevent cross-fertilization through the agency of visiting bees and flies, so the plant is sure of perpetuation.

One of the most remarkable things about this arrow-head is the fact that the plant frequently develops two kinds of leaves—a character often to be observed in other aquatic plants. The broad, arrow-head shaped ones are grown above the surface of the water, where they are exposed to the air, and can assimilate from it the maximum amount of carbonic acid, as well as release the greatest amount of oxygen. These leaves are shiny and more or less thick and tough; they also endure should the water dry up where the plant is growing. Now those below the surface of the water are like long, narrow ribbons, so formed in order that the river current may not destroy or even mutilate



THE ELEGANT SPIKE OF THE  
PICKEREL WEED

This gives the purplish-blue flowers full size, in that their great beauty may be the better appreciated. The distal portion of a leaf of this plant is shown below, with a young, sheathed spike just ready to burst open. Each plant has several leaves, and they sheathe the main stems as shown in one of the figures. They appear truly gorgeous in the bright sunlight of summer; and they are not only beautiful but extremely picturesque as they line, in thousands, our river banks at this season.



THE SNOW FLAKES OF THE MARSH  
LANDS AND RIVER BANKS

In shallow water and muddy tracts, this, the Broad-leaved Arrow-head (*Sagittaria latifolia*) flourishes, in its chosen localities, from the sub-polar regions to the Rio Grande and the Mexican boundary westward. As we flounder through a marsh where thousands of its kind grow in crowded masses, we are sure to be struck by its glistening white flowers, with their brilliant golden centers, as they peep out here and there among the army of broad, sagittate leaves that surround them upon all sides.



ONE OF THE MOST GLORIOUS FLOWERS IN ALL NATURE

The Pond Lily or Sweet-scented Water Lily (*Castalia odorata*) is known to nearly everyone, not only throughout America but in the Old World. It blooms all summer long in many localities, being a plant confined to ponds, lakes, and sometimes to rivers without a perceptible current. The picture here given is from a steel engraving of one of the late Dr. Robert Collett's superb series, copied from one of his remarkable photographs made in Norway, where this plant is also found.

them, which it would be likely to do were they like the ones above the surface. These long, delicate, subaquatic leaves are also exposed to the air contained in the water, and so perform a similar function with respect to giving off carbonic acid and the absorption of oxygen. When the water dries up, as often happens during long, dry summers, these latter leaves shrivel up and entirely disappear. In fact, such plants must be amphibious although stationary, and be able to *breathe* as an aquatic plant as well as a terrestrial one. Wonderful indeed are the results that have come about since the time plants first appeared on this planet, and similar marvelous changes are still in progress upon every hand. To understand most of these we must needs study—industriously and intelligently—all the thousands upon thousands of fossil plants that science has collected and classified.

Writing about the arrow-head, Alice Lounsberry quaintly remarks: "The demure arrow-heads are surely the Quakers of the flower-world; and that they do not

condone frivolity, we may gather from the way in which they keep their pistillate and staminate members apart. The pistillate ones also deck themselves in very seemly little petals that fall early and do not vie in comeliness with those of the staminate blossoms. It hardly seems possible that one of these little under-flowers would ever have the courage to call out boldly: 'Joseph, thou art keeping the sunshine from falling upon my head.'"

All through the Gulf States is a fine region in which to study aquatic plants. In the country about New Orleans, some of the big, stagnant ponds are good places in which to study the lilies, the wonderful growth of grasses and sedges, and plants that flourish in wet places generally. As one passes from pond to pond in the summer time, remarkable flowers may be collected, and no end of interesting animal forms observed. Among the latter we may note thousands of specimens of the big, black hubber grasshopper, of which insect a reproduction of a photograph is here presented. As throughout all the eastern part of the United States and westward, we meet,



IN THE HEART OF A MARYLAND SWAMP

It is in the water and deep mud of such a place as is here shown that our Broad-leaved Arrow-head flourishes in all its glory; it is associated with Cat-tails, Monkey-flowers, Pink Milkweed, Cone-flower, Bind-weed, Common Dodder, and many other marsh and aquatic plants.

along the sluggish streams and in standing water generally, the very abundant cow lily or Yellow Water Lily, of which a cut is likewise given. The specimen shown, however, was collected at Warwick, Virginia, where the plant is very abundant along the shores of the Potomac River. It grows in dense masses, filling up extensive inlets and marshes connected with the stream; it is associated with species of arum and other aquatic plants. Chester A. Reed, in his very useful little "Flower-Guide," says of it that it "is not unattractive, and is interesting in its makeup. The leaves are thick, rough, ovate, slit or lobed to the stem, which is long and hollow. The flower is raised above the surface of the water on a long hollow stem. What appears to be six large green and yellow petals, are in reality sepals; the real petals are numerous, stamen-like, inserted with the very numerous stamens under the golden-yellow rayed disk that forms the stigma." (P. 66.) Some people call them "frog-lilies" because they flourish best in big ponds with muddy bottoms. Our English friends have named them "brandy-bottles;" but for what reason it would be hard to say, as there seems to be nothing in their odor, their general appearance, or in the form of their fruit that would suggest such an object as a bottle—especially a brandy bottle. The country folk in England say, when they smell this lily they are reminded of the odor of an *empty*

brandy bottle that originally contained that liquor. Strange notions some people have! In any event, the odor is not a very pleasant one; but this may be forgiven for the sake of the memory of the many boating-trips on the ponds which it revives.

In the yellow pond lily cross-fertilization is effected, as in so many other plants, through the agency of insects, they being attracted by the highly colored sepals. Some small beetles (*Donacia*), and various species of bees and flies are also attracted to these flowers, and assist in the perpetuation of the species. Besides *N. advena*, the one here being described, Gray gives two other forms of the plant, namely *I. microphylla* and *N. sagittifolia*, with a questionable hybrid, *N. rubrodisca*, all being found in the eastern part of the United States.

In their usual poetic vein, Ellen Miller and Margaret



THE GREEN SPATHES OF THE ARROW ARUM

This very abundant and stately plant flourishes in swamps, ponds, and along the banks of slow-running rivers all over the eastern part of the United States. Many know it as the Green Arrow Arum (*Peltandra virginica*), its dark green, glossy leaves being of enormous size, the plant itself often attaining a height of upwards of five feet or more. Sometimes they occur in masses of several acres, and are generally rooted in soft, deep mud, some of the shorter plants occasionally growing on the adjacent dry short line; they are then less luxuriant.

Christine Whiting say, in their "Wild Flowers," that this yellow pond lily is "a flower of primitive type; the combination of yellow and red in the star design of the pistil is suggestive of Egyptian color and design." (P. 36.) Mathews notes that "On the first opening of the flower there is a triangular orifice over the stigma, so small that an entering insect must touch the stigma. On the following day the flower expands fully and the anthers beneath the stigma unfold, spread outward, and expose their pollen. Cross-fertilization is thus insured and is generally effected by means of the bees of the genus *Halictus*, and the beetle named *Donacia piscatrix*, as has been announced by Professor Robertson.

Our Water Lily family (*Nymphaeaceae*) contains besides the Yellow Pond Lily just described a number of other very beautiful or very interesting aquatic plants. None of these are better known or more generally admired than the common Water Lily or Water Nymph, of which fine examples are here shown in one of the accompanying cuts. Three other genera make up the group, insofar as our United States flora is concerned. These are the Water Chinquapin (*Nelumbo lutea*), also called the Yellow Nelumbo; the Water Shield (*Brasenia schreibei*), and finally the Cabomba (*C. caroliniana*), a pond plant found from southern Illinois to Florida and Texas.

No species of all these can compare with the White Water Lily. As elsewhere pointed out, this superb aquatic species, with its great, white flowers, has almost a cosmopolitan range in the temperate belt of the Northern Hemisphere. Many gorgeous varieties have been bred from it, and these, from white to the darker shades, run through many yellows and reds of every conceivable



VIEW IN THE MARSH NEAR SOMERSET, MARYLAND

Here is where you find the Cat-tails and Broad-leaved Arrow-head growing in the greatest luxuriance. Many aquatic ferns and other water plants are profusely mingled with them, while the trees beyond mark the limitations of the swampy area.



AN ANOMALY IN A MARSH PLANT

As a rare coincidence, we sometimes meet with double cat-tails. Here is one that was collected in Washington during the summer of 1915. Two beautiful Monarch butterflies are resting upon these pistillate flower-heads. Note how thoroughly their markings agree; there is no doubt about their being of the same species (*Anosia plexippus*).

tint. Some of their forms, too, are extremely unique, and many fetch high prices in the flower markets of the world.

After all is said, however, none of these fancy varieties—they are all very unstable varieties—appeal to us like the pure white common one of our lakes and ponds. "To my mind," says Reed, "it leads all other flowers in beauty, grace, purity and fragrance. It is composed of four sepals, greenish on the outside and whitish within, and numerous pure, waxy-white petals. They sometimes are gigantic in size, often spreading five or six inches across."

Neltje Blanchan, too, breaks forth in raptures when she begins to write about this very same White Water Lily of our ponds—thus: "Sumptuous queen of our native aquatic

plants of the royal family to which the gigantic *Victoria regia* of Brazil belongs, and all the lovely rose, lavender, blue, and golden exotic water lilies in the fountains of our city parks, to her man, beast and insect pay grateful homage. In Egypt, China, India, Japan, Persia and Asiatic Russia, how many millions have bent their heads in adoration of her relative, the sacred lotus! From its center Brahma came forth; Buddha, too, whose symbol is the lotus, first appeared floating on the mystic flower (*Nelumbo melumbo*, formerly *Nelumbium speciosum*)."

White lilies in nature close up all night, and open a short time after sunrise, when they load the air with their delicious fragrance; again they close up from noon on till eventide.

For many years a controversy has been indulged in, often at a lively rate, among botanists, as to the correct interpretation of the metamorphosis of the stamens and petals of this white lily, and it still seems to be a mooted question even at this late day. Some claim that



certain of its petals are developed from its stamens, while others entertain the very opposite opinion. The stem to the flower is sometimes of very considerable length and very red, while the round, semi-heart-shaped leaves float flat upon the surface of the water, where they expose their entire upper surfaces to the air — a most necessary provision. See the little puddles of rain that have formed upon them in Professor Collett's magnificent picture here reproduced in one of the cuts.

Water lilies are fertilized by numerous aquatic insects, as well as by bees and various species of beetles. The stamens and anthers are of a golden color and arranged concentrically. In the winter these lilies sink to the bottom of the places where they grow, and hide in the mud until the return of warm weather; it was from this fact that they gained the name of Water Nymph. During chilly evenings, it is said, they will also disappear under the surface of the water, and not reappear until the morning sun once more warms up the cool air. If you look sharp, you will sometimes meet with specimens in which the waxy, white petals are tinted pink; the plant may also present other anomalies in its makeup.

One of the most conspicuous plants that we have



AN ELEGANT GROUP OF PITCHER PLANT FLOWERS

This gives a perfect flower, front view, and next in height to the tallest specimen, which is commencing to go to seed. It will be noted that the form of the granulated capsule varies considerably. The seed pod is well shown in a specimen on the left, and the appearance of the back of the flower is seen in the center of the illustration. Some call this the Side-saddle flower, but for what reason is hard to say. Others have applied the name of Huntsman's Cup to it, though no well-informed huntsman ever drank out of one of them; as a rule, huntsmen do not relish stagnant water, full of dead insects, nor drink out of a half-washed cup that once contained such a mixture.



ONE OF THE MOST DECORATIVE OF ALL WATER PLANTS

The Cat-tail Flags belong in the genus *Typha* of the Bur-Reed family (*Sparganiaceae*). There are two species of them in our country, they being the Common Cat-tail here shown, which is found throughout temperate North America, and *Typha angustifolia*, a narrow-leaved form, which is found near the coast and not further South than North Carolina.

among the ones growing in great abundance along the muddy shores of slow-running rivers, such as the Potomac below Washington, is the giant-like

growth known as the Green Arrow-*arum*; its leaves may be at least two and a half feet in length, and the spathes—three of which are shown in the cut—are over a foot long. They are of a dark, glossy green color, and yellowish along the fluted margins of their slit-like openings. Upon studying one of these, it is to be noted that it forms a sheath snugly enfolding the spadix within. On this latter grow the inconspicuous florets, which are both pistillate and staminate. Flies passing up and down over these effect fertilization. Later on the green berries appear, and soon after the stalk bearing them curves over, to such an extent that its distal pointed end is forced into the mud in which the plant grows. Here its decaying structure acts as a fertilizer for the germinating seeds, and the species is thus perpetuated.

Coming to the extremely curious and most remarkable pitcher plant, it may be said that scant justice could be done it in the remaining paragraphs of this article; and, as a matter of fact, it is intended to devote an entire contribution to its history later on. For the present, the two illustrations here presented must suffice until another day, when more reproductions of photographs will be in order, with a full account of its unusual flowers; its still more unique leaves; its range and flowering season; its habitat and allies, indeed, its entire history will be dwelt upon in detail and with all the fulness that it most surely deserves.

In many marshes, and in shallow ponds with soft, muddy bottoms, there grows, throughout North America, the picturesque cat-tail, of which there are two species in the United States—that is, the Common Cat-tail (*Typha latifolia*), and the Narrow-leaved Cat-tail (*Typha angustifolia*), found only

from southern Maine to North Carolina and westward.

In favorable localities the common cat-tail may grow to become nearly nine feet in height, the ribbon-like leaves passing beyond, or rather above, the russet brown



ONE OF THE MOST CURIOUS PLANTS IN AMERICA

This is the far famed Pitcher Plant (*Sarracenia purpurea*), which has claimed the attention of writers and others for nearly two centuries. It is named for Dr. Michel Sarrasin, who first sent specimens of it to Europe. He was a physician at the Court of Quebec in the early days of the eighteenth century. This will account for his not having sent the Southern form of the plant (*S. flava*), which flourishes in the bogs of Virginia and southward, usually flowering in early April. The flowers of the plant here shown are on the wane, while perfect ones are presented in another cut below. Another pitcher plant is found in the swamps in certain parts of Guiana, South America.

flower-heads. These latter have both staminate and pistillate elements upon them; and, curiously enough, not possessing either petals or the ordinary parts of a true flower, they are quite independent of fertilization by insects. In the cuts here given, the upper part of the flower-spike is not shown—that is, not fully; it is only in the double specimen that its stem is, in part, seen above. Stamens occur only in the superior part or half, while the inferior moiety consists of the pistils; these are the flowers that are fertilized by the yellow pollen falling upon them from above. What we are most familiar with are the cylindrical, light snuff-brown heads, which appear along in August and September (see cuts). One of these is composed of a densely packed down, made up of the pistillate flowers which are bractless. The remainder of the flower essentials have withered and blown away long ago. Specimens of these elegant, pistillate parts may be over an inch in transverse diameter and nearly a foot in length.

Sometimes cat-tail swamps are of great extent, covering acres of marshy, or rather muddy shores of slow-running rivers and inland bodies of water. As plants, they seem to be just as well suited to salt water as to fresh, and they thrive growing in either. Fifty or more years ago there was an extensive cat-tail growth in a salt water marsh, in an inlet not far from the steamboat landing at Stamford, Connecticut. In those days our common barn swallow was extremely abundant, and at nightfall a great many thousands of those birds used to roost on the leaves and heads of the cat-tails in that marsh, sometimes in such immense numbers as to crush down the plants in masses. Many other kinds of birds delight in making their homes in the cat-tail swamps, and most of the species build their nests and rear their young there. Among these species we are familiar with the several species of rails and bitterns; the red-wing blackbirds, and various species of sparrows; the different kinds of rails and coots; the cute marsh wrens, which build curious ovoid nests; and sometimes a short-eared owl and a pair of marsh hawks.

AT the recent annual meeting of the Landowners' Co-operative Forestry Society in Edinburgh, Sir John Maxwell made an address in which he stated that the war has brought about a considerable change in the public attitude toward forestry. With large tracts of woodlands throughout the country being swept clear of their trees the importance of the whole question is being brought home to the public as never before. Sir John Maxwell pointed out that the cutting of trees should be fairly distributed over the country and that poor and understocked woods should be utilized in preference to flourishing plantations which are entering their period of most rapid increment and which will be needed for the period of reconstruction. The work of the Landowners' Co-operative Forestry Society is along the line of far-sighted organization of effort and resources, both as to cutting and planting.

AS an interesting example of the problems which a forester has to work out, it is said that forest officials in India have undertaken to girdle undesirable trees in order to kill them off and give more room to the Deodar and other valuable species. Himalayan bears, however, have discovered that the sap from these girdled trees is sweet and toothsome and have undertaken some girdling on their own hook. They have caused a good deal of trouble because they do not confine their operations to undesirable trees.

SHIRLEY W. ALLEN, of the Extension Department of the New York State College of Forestry at Syracuse University, has been appointed, temporarily, to succeed Victor A. Beede as secretary of the New York State Forestry Association. Mr. Beede has gone into forest fire insurance work at Portsmouth.

# SELECTING NUT TREES FOR PLANTING

By C. A. REED

Nut Culturist, United States Department of Agriculture

**I**N the planting of trees for most purposes, it is now possible to exercise practically the same degree of choice with regard to special fitness as is employed in the selection of men for positions or tools for a piece of work. The fruit grower in every part of the country has his special species and pomological varieties from which to choose. The foresters and landscape gardeners have their species and botanical varieties or improved strains to pick from.

Among the important purposes for which trees are planted, the production of native nuts is singularly behind. The leading species of native nut-bearing trees include the hickories, the walnuts, the chestnuts, the pines, and the beech. Of these, one of the hickories, the pecan, is the only species which has so far been developed by cultivation as to become of importance for the production of an orchard product.

The timber of the pecan is less valuable than is that of most other hickories and is in commercial use only as second-class material. However, it is the most important species of nut-bearing tree in the United States. Its native and introduced range includes the fertile lands of the plains of practically the entire southeastern quarter of the country. It is neither an upland nor a wet land tree. It is not found in the mountainous sections, nor, to any important extent, south of Middle Florida.

Several of the accompanying photographs illustrate the beauty of pecan trees both individually and in orchard or highway avenues. The immense size of one tree illustrated proves that under favorable conditions the pecan is one of the largest growers of any species east of the Rocky Mountains. It also suggests the great age which it may attain. When photographed in 1909 this particular tree measured 18 feet 3 inches in circumference at breast height. It was situated near the Mississippi River, at Hohen Solms, Louisiana, twenty-eight miles south of Baton Rouge.

With very few exceptions there are no named pomological varieties of any other native nut now being propagated. So far as these exceptions are concerned, it is probable that fewer than one hundred budded or grafted trees of such varieties are yet of bearing age, and of such as have attained the age at which fruit might be expected, exceedingly few have borne in paying quantities for any number of consecutive years. Therefore, with reference to the planting of native nut species for profit, the truth of the situation is simply this: In the ordinary course of events, with the exception of the pecan, years of experimentation in the testing of varieties and in a study of their cultural requirements must be gone through before any native species of nut-bearing trees can be planted in any part of the United States with a



A BEARING ORCHARD OF PERSIAN (ENGLISH) WALNUT TREES

The trees in this orchard in Bucks County, Pennsylvania, are thrifty, seemingly entirely hardy where situated, and as a whole are fairly productive. Being seedlings they vary greatly in varietal characteristics; some bear heavily while others yield very light crops; the nuts of some are quite desirable, but from others they are of little value. Trees of this species should be budded or grafted on some hardy stock. Just now the American black walnut (*J. nigra*) is believed to be the most generally desirable as such stock.

certainty of commercial return from nuts alone which would be comparable with that of many other crops which already are upon a well-established commercial basis in the same parts of the country.

With reference to two of the foreign species of nuts which have been introduced, the situation is quite differ-

neither species can yet be recommended for general planting.

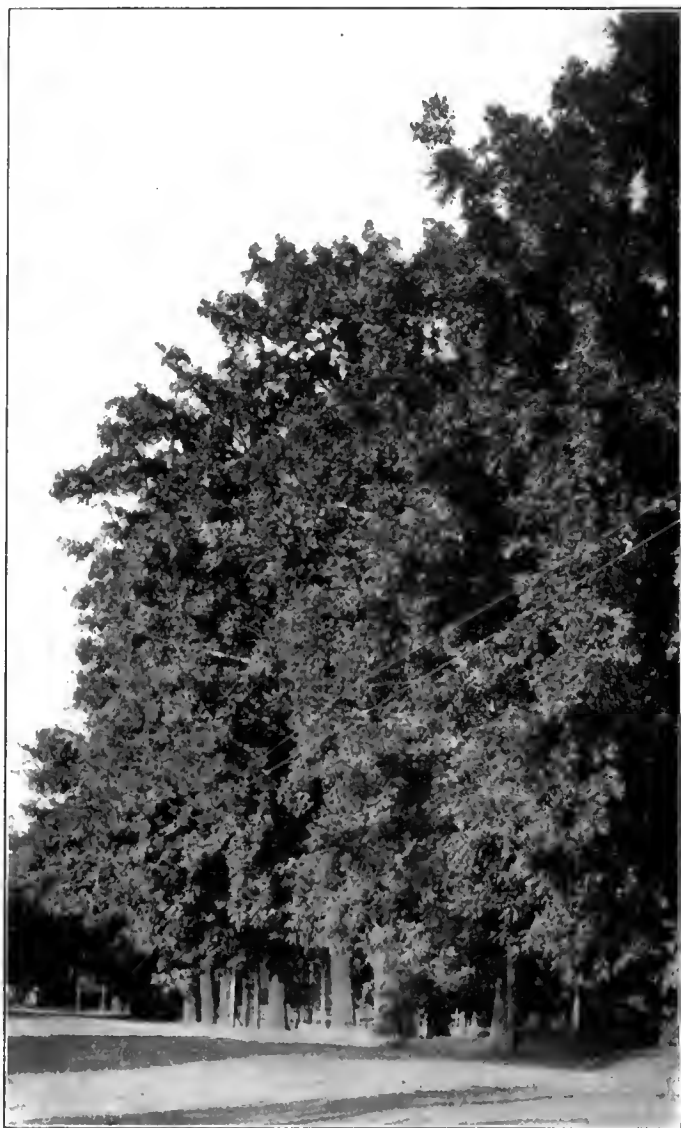
The proper place for such partially improved species, as are most of the native nut producers at the present time, is that in which they may be used for more than the single purpose of nut production. Most of the species of the botanical family *Juglandaceae* to which the walnuts and hickories belong, are slow growers, and as such, are objectionable to the average planter. In answer to this, it may be said that among trees, slowness of growth is invariably associated with longevity of tree and its value when cut as timber. Also, when due pains are taken, it is possible to select species which are ex-



A MONSTER PECAN TREE

This tree, growing in the rich alluvial soil of Louisiana, near the banks of the Mississippi River, thirty miles south of Baton Rouge, measured 18 feet 3 inches in circumference at breast height when photographed in 1909. The size and condition of this tree and of hundreds of others of nearly equal size in the same section should dispel any fears that the species is not long-lived, or that it is not a large grower. A larger tree, measuring 23 feet 9 inches in circumference at breast height, was photographed near Webbers Falls, Oklahoma, in 1909. Avenues of such trees along the Lincoln Highway would be exceedingly impressive and appropriate.

ent. In order of commercial importance of the nuts now grown in this country, two foreign species, the Persian (English) walnut and the almond stand second and third, respectively, the pecan, which is an American species only, being first. With these exceptions, the foreign introductions are all in the experimental or test stage, and while possibly the European hazel (filbert) may now be making a strong bid for commercial recognition in the northwest, and the pistache in parts of California,



CALIFORNIA BLACK WALNUT

These trees are used for street planting on the Pacific Coast. This species is of little value for nut producing purposes, but is very valuable for its timber. It makes an excellent stock upon which to graft the Persian walnut. So long as nut trees are in a healthy condition they are not necessarily too large for top-working.

ceedingly satisfactory in the landscape. Several of the accompanying photographs illustrate the individual beauty of selected nut trees and some show their effective use in the landscape.

Foresters are now advocating the planting of trees in

waste places in the country, especially about farm buildings. There are, perhaps, no conspicuous waste places with a greater aggregate area than the strips along the public highway. In certain foreign countries, the highways are planted to fruit trees and the right of harvest awarded to the highest bidder. The revenue so obtained goes a long way toward keeping the highways in good condition. It is possible that this practice may sometime be introduced into the United States, but until public sentiment is radically changed the planting of fruit trees along the highways cannot be expected to yield any satisfactory returns to the public. The experience of Dr. Robert T. Morris, of New York City, who planted cherry trees along the public road past his farm in Connecticut, is typical of what under present conditions might be expected in any part of the country. When the cherries were ripe, automobile parties came for many miles to pick the fruit, and when that in the highway was gone, the cherries from the nearby orchard were taken. In both cases, the branches were broken down and the

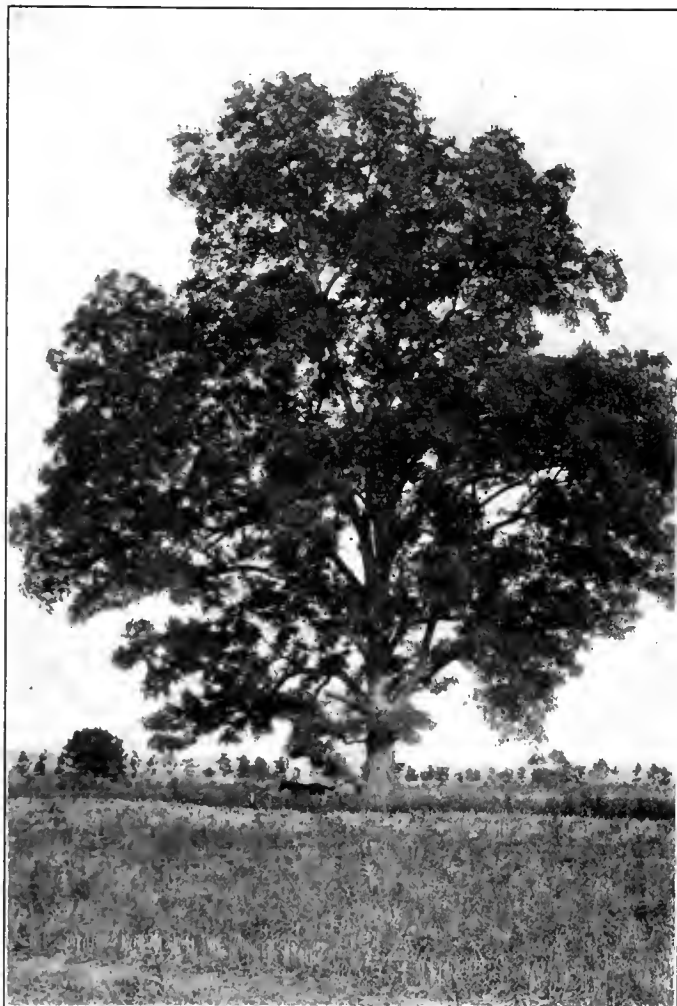
trees left in badly mangled condition. Dr. Morris then tried nursery-grown and expensive evergreens, but on Sundays, automobile parties came again with spades and shovels and dug up the trees.

The ratio of population to tillable land in this coun-



A PIGNUT HICKORY

The hickories are not commonly looked upon as belonging to the ornamental group, but for density and luxuriance of foliage, symmetry of form, and general beauty, it would be difficult to imagine a more perfect specimen than is this tree. The hickories are commonly regarded as being slow growers, but they are quite lasting and valuable when once mature. The nuts of this species often compare favorably with those of the shagbark hickory in character of kernel. This is one of the hardiest of the hickories, and altogether should make one of the most valuable trees for highway and home planting beyond the range of the pecan.



THE PARENT TREE OF THE BUTTERICK VARIETY OF PECAN

This tree is situated on the Illinois side of the Wabash River, northwest of Evansville, Indiana, at a latitude slightly less than that of Washington, D. C. This tree is typical of the pecan species as it is found in nature near its northern limits. It and other varieties originating in the same general section bear hountiful crops of choice nuts. Farther north pecan trees make good tree growth but are uncertain as to bearing. As far as can be seen there is no reason why the pecans should not wisely be planted along the highways and about the home grounds as far north as Southern Michigan and New York State. Occasionally, crops of nuts might be expected from even the most northern planted trees. In middle Indiana and Ohio trees should do somewhat better, bearing not infrequently. In Southern Indiana and other sections of fairly comparable climatic and soil conditions, especially along the Atlantic Coast from the District of Columbia to New Jersey, there is no apparent reason why this should not become one of the most commonly planted shade and ornamental trees.

try is not such that, for a long time to come, the American people as a whole will be pressed into the using of highway land for the production of crops or into respecting the right of the public to harvest such crops as might be grown in its highways. Therefore, for the present, except in densely populated or in more than ordinarily well regulated communities, it would be useless to advocate the planting of ordinary fruit trees along the public roadways.

Irrespective of the possible value of their crops, fruit



NATIVE PECAN TREES IN A MEADOW

These give shade for stock and yield a nut crop at the same time. Not infrequently such trees bear a bushel or more of nuts worth at least ten cents a pound, or a minimum of \$4.00 a bushel. It is not unusual for single trees in the open to yield two bushels or more of nuts which readily bring twelve to fifteen cents a pound.

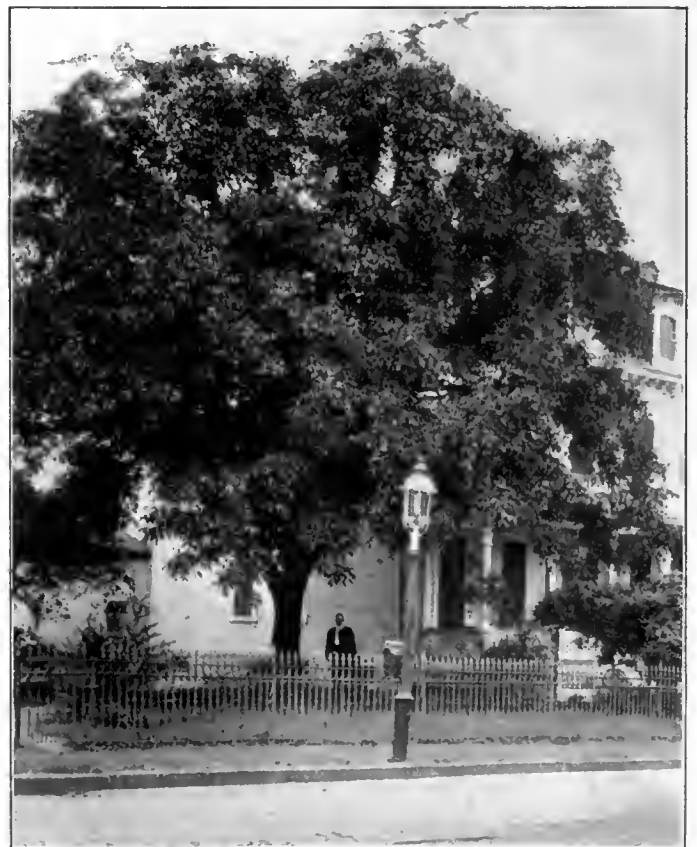
trees of most species are both too small and too short-lived to be suitable for highway planting. With nut trees, the situation is entirely different. The native walnuts, most species of hickories and the American beech are large-growing and long-lived trees. In addition, they are capable of withstanding severe temperatures; they are tough and strong and not liable to injury by storm or while being climbed by ordinary persons; and they readily adapt themselves to a wide range of soil, moisture and climatic conditions.

Ordinary species of nut trees cannot be recommended for the dual purpose of timber and nut production, as, for the former purpose, the trees should be planted close together in order to induce length and straightness of trunk with a minimum of top or bearing surface, while for the latter, they should be planted in the open and given space for the maximum development of bearing surface and a minimum length of trunk. The great demand for hickory in the making of axles, wheels and other vehicle parts and handles for tools, and for walnut in the manufacture of furniture and gun stocks makes it not only possible but common practice to use these woods in short lengths. Therefore, both species planted along the highways and in other waste places might profitably be converted into timber upon reaching maturity, if their crops of nuts should prove to be of small commercial value.

The butternut, *J. cinerea*, is less a symmetrical grower than are the black walnuts. The timber is less valuable and the nuts are cracked with greater difficulty. Nevertheless, it is the most hardy of any native species of *Juglans*. Its kernels are rich in quality and of a flavor more pleasing to some persons than that of any other nut. Cracking the native butternut and marketing the

kernels affords the rural people in many sections a fairly profitable means of employment during the winter months. Its native range extends farther north than does that of either the eastern black walnut or the shagbark hickory, *Hicoria ovata*, and is considerably beyond that of the shellbark hickory, *H. laciniosa*. Therefore, in view of its hardiness, and the merit of its kernels, it is well worthy of consideration for planting in the most northern parts of the country.

The black walnut of the Southwest, *J. rupestris* is one of the sturdy, graceful and durable species of that section. The nuts are seldom of sufficient size to be of commercial value. The California black walnuts, *J. californica* and *J. hindsii*, fall into about the same class as does this species in respect to the points mentioned. So far as the planter is concerned, the main differences are those of adaptability to different sections. Under favor-



A PERSIAN (ENGLISH) WALNUT

This particular tree, by a residence on Wisconsin avenue, Washington, D. C., is very satisfactory as a producer of shade and ornamental effect, and in addition, it yields fair crops of nuts. Similar trees are by no means uncommon from Washington northward to Connecticut and west to Southern Michigan.

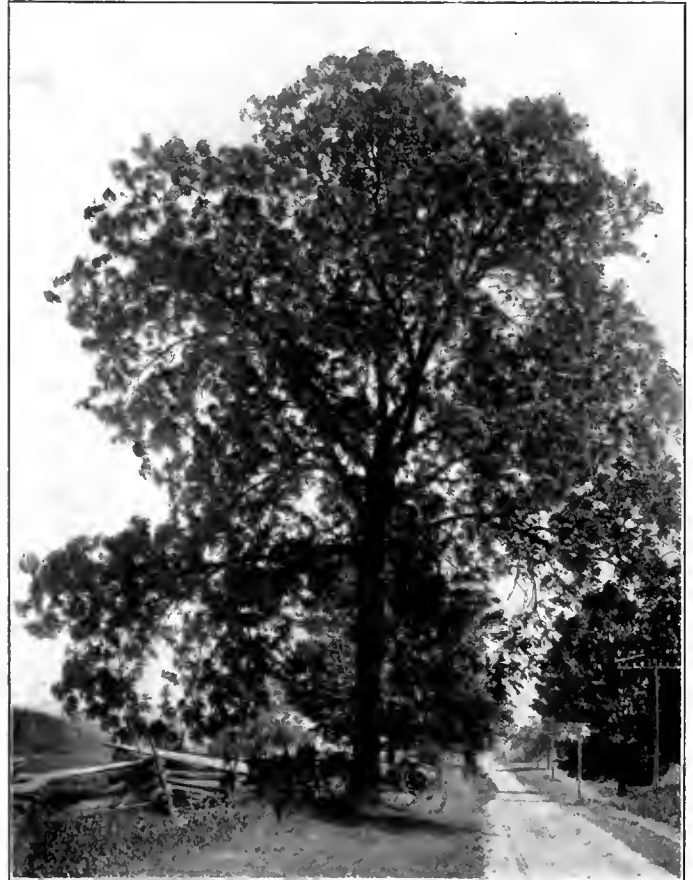
able conditions of soil, moisture and climatic environment, all are capable of rivaling the eastern black walnut in such points as size, as beauty of tree and in size of crops.

Were it not for the blight which is now making practically a clean sweep of destruction over the eastern states, wherever the native chestnut is found, the American chestnut *Castanea dentata* would certainly be entitled to leading consideration as a highway and ornamental tree. Unaffected by blight or other disease, it is one of the largest growing and most graceful species in the eastern United States. The European chestnut is nearly as susceptible to this blight as is the American species. The chestnuts from eastern Asia now appear to be sufficiently immune to offer a practical solution to the situation by their introduction into this country. However, they commonly lack the sweet agreeable flavor of the American species and need hybridizing in order to improve their quality. This the Federal Department of Agriculture is now doing, and in due time there may be something to offer in ample quantity which will make a satisfactory substitute for the native species. Exclusive of the Asiatic species and the government hybrids, there are now no available species which can be recommended for planting in the blight affected area, and these should be planted only for test purposes.

The pines referred to at the outset of this article as being important nut producers are all western species found only on the mountains and nowhere under cultivation. There are at least fourteen species. Representatives are found in most of the Rocky Mountain states. The most important species is *Pinus edulis*. It is found at altitudes of from five to seven thousand feet in the mountains of New Mexico, Arizona and northern Mexico. In favorable years, the seeds are gathered in enormous quantities under the name of "pinons," or according to the Mexicans, "pinyonies." The nuts are rich in flavor, but small and difficult to extract from the shells. They are not well known in the eastern market, but in the Southwest they form a highly important article of food for the Indians and Mexicans. These pines are exceedingly slow growers and not of graceful form. They could scarcely be considered for highway planting, except at the altitudes to which they are common, and then, probably, only where some more satisfactory shade trees would not succeed.

Among all American species of trees, it is probable that in a combination of beauty, longevity, strength and hardiness, the American beech *Fagus grandifolia* is unexcelled. Although commonly looked upon as being a northern species, its range extends south to northern Florida and west to the Trinity River, in Texas. It is most familiar as a clean-barked, spreading tree, with low head, and a height of from fifty to sixty feet. However, its form depends largely upon environment. The writer has seen it in the bottoms of southwestern Georgia, in common with the magnolia, growing to a height of from seventy-five to one hundred feet and with trunks of two feet in diameter extending upward in a manner which, with regard to height and uniformity of size, com-

pared favorably with the long-leaf Georgia pine. The nuts of the beech are rich in quality and of excellent flavor, but owing to their small size and the great difficulty attending the extraction of the kernels, they are not ranked as being of direct importance for human food.



A TYPICAL NATIVE BLACK WALNUT

This species is one of the most rapid growing of any of the native timber producing trees. Its range has been extended until it now covers practically the entire United States with the exception of the sections representing the extremes of latitude, altitude, moisture and dryness. It is very useful in the landscape, and in the number of bushels of nuts produced it was the leading species of the country when the last census was taken.

Their principal use in this country is as a mast crop for turkeys and swine, for which they serve a most useful purpose. Crops which can be used in this manner to good advantage, thus practically obviating the problems of harvesting, storing and marketing, are certainly well worth thinking about in these days of labor scarcity.

There are few large sections of the United States adapted to the growing of trees to which some nut-bearing species is not suited. Most species of nut trees are as capable of producing shade and ornamental effect, and are as hardy and lasting as any others which might be mentioned. In addition, they produce an edible product which is entering into the list of staple food products with great rapidity. The present scarcity of meats and the consequent high prices are compelling the substitution of other products. The superiority of nuts over practically all other products which are available, as substitutes, scarcely needs argument. Already nuts are being pressed into service as rapidly as production permits and perhaps more so than prices and comparative food values justify.

Singularly enough, the oldest and most thickly populated portion of the country and that within which the greatest number of edible species of nuts are indigenous, is today practically without pomological varieties for planting. Within this area individuals have made tests of species and varieties for many generations, yet little progress has resulted. The obvious need is for further test on a large scale. A better opportunity for the making of such a test could scarcely be imagined than that of highway planting.

Pomologists are firmly recommending the exclusiveness of budded or grafted trees. But this advice applies only to orchard planting for purposes of commercial production. Until more and better varieties are known and their merits established, that portion of the country lying north of the pecan belt and east of the Rocky Mountains must await the development and trial of new varieties. Seedlings must be planted in large numbers from which to select varieties. The process is too slow and the percentage of varieties which may be expected to be worth while too small for it to be possible for the individual to make much headway during an ordinary lifetime. Our present system of national highways by which all parts of the country are being connected is perfecting the opportunity. The general planting along these great national highways of elm, oak, poplar, tulip, cedar, hemlock, magnolia, pine or any other species which, unless cut, are capable of producing no crop other than that of shade, would hardly be in keeping with the present need for utility. It would be giving a questionable degree of thought to the welfare of future generations.

To the list of nut trees as utility trees there might be added the sugar maple, and certain species of prolific-bearing oaks. The former could be drawn upon for the making of syrup and sugar, and the acorns from the latter could be put to good use as hog and turkey feed. In wet sections, willows might prove useful from which to cut material for furniture or tying bundles.

A way of overcoming the objection of slow growth of some of the nut species might be the alternate planting of quick-growing species which would furnish shade in a minimum length of time and which could be cut for pulp or other purposes by the time the nut trees reach maturity.

A practical objection to highway planting of nut trees is that unless cared for, such trees are in danger of becoming breeding places for disease and insect pests which would quickly spread to nearby orchards. However, such planting in numbers too small to be worth caring for is not to be considered. Already the country is agreed that the maintaining of the middle of the road in such condition that it can render maximum service is a paying investment. The suggestion here made is only as the next step in highway investment. It is a proposition to make more comfortable and attractive the present system of roadways, and at the same time to help develop new varieties of nut trees for orchard planting. Unless new varieties are soon to become available, a large part of the country will find itself de-

pendent upon outside sources for its principal substitute for meat and its main supply of vegetable fats.

A little thought should be able to work out a sound program for the planting of utility trees on practically every highway in this country.

## THE TOTEM TREE

By H. E. Zimmerman

A Civil War veteran of Union Springs, New York, made this unique totem tree, which is eighteen feet high and six feet in circumference. Thirty-four figures are



carved on it. Unlike the idea in an Indian totem pole, this was not intended as a family tree. The gentleman made it after his own fancy, spending two summers in decorating it with animals, birds, portraits and other figures. At the top he built cute little bird houses, and to heighten the artistic (?) effect, he painted the objects in a variety of colors.



# THE THRUSHES

(Family Turdidae)

By A. A. ALLEN

Assistant Ornithologist, Cornell University

**I**N the noisy parks and gardens of the large cities, in the silent spruces of the mountains, from the steaming forests of the equator to the rocky coasts of the Arctic Sea, there is always a bird of the thrush family to welcome the traveler. In the cities it is the robin, the bluebird and the wood-thrush; in the woodlands, the veery, the hermit and the olive-backed species; in the far north, the wheatears, and in the tropics the solitaires and the "thrush-robins." When we make the term thrush broad enough to include the ground thrushes, the accentors, the redstarts, the nightingales and the chats, of the Old World, the family includes between five and six hundred species, but of these, only about 240 are true thrushes. These are widely distributed throughout the world, eighty of them being confined to the New World, of which a dozen species are found north of Mexico.

As a family, the thrushes are medium-sized birds, usually under twelve inches in length, with strong wings and legs and with bills slightly notched near the tip and supplied with strong bristles at the base. They are uniformly colored, rather than streaked, the majority brownish or grayish, although blues, yellows, or even reds are found in the plumages of some. The underparts are white or at least lighter than the backs and, in typical species, are more or less spotted. In species having unspotted breasts, the young in their juvenal plumage

show the spots that have been lost by the adults, as with the robin and the bluebird, interesting examples of ontogeny, for the individuals pass through the stages by which the species have progressed in the course of their evolution.

But it is not for the brilliancy of their plumage that the thrushes are noted, it is for the richness and beauty of their songs. The world over, some member of this family surpasses all others in the appeal which it makes to the human ear. In Europe, it is the nightingale, in eastern United States it is the hermit thrush, and in the West it is the solitaire. The wonderful songs of the mockingbird and the thrasher, discussed last month, appeal to us by their marvellous technique, but the songs of the thrushes by their depth of feeling. Listening to the mockingbird, one is thrilled; listening to the hermit thrush, one feels exalted.

Except during the nesting season, the thrushes travel in scattered flocks, frequenting the borders of woodlands but coming into gardens if they can find food. During the spring and summer, this consists almost entirely of insects and worms, but during the late summer and fall, the various wild fruits form an ever increasing percentage. Gardens, where the dogwoods or the Virginia creeper grow, are sure to attract the passing flocks of thrushes in late September or October, and in the South, the mistletoe and holly sustain some species through-



A HOT DAY IN BIRDLAND

The veery is sheltering its young from the hot rays of the sun. The veery can be told from the other thrushes by the fewness and faintness of the spots on its breast.



THE FIRST TIME OUT

Young blackbirds just out of the box—they seem somewhat alarmed at the bigness of the world. Notice the spotted plumage of the young as compared with that of the adult bird.

out the winter. The robin, the bluebird, and the hermit thrush remain in Southeastern United States and the solitaire and the varied thrush in the Southwest, but the veery, the olive-backed, gray-cheeked and the wood



EVERYWHERE A FAVORITE

Except with the gardener, who is unwilling to lose the toll of cherries or berries which is exacted in payment for the insects destroyed at other times of the year. The robin is the commonest bird in the United States and has increased more rapidly than any other native species.

thrush continue their journeys to Central America and Northern South America.

Of all the thrushes the robin is, of course, the best known, but in coloration it is quite an aberrant member of the family. It was christened the "robin" by the early settlers because of its general resemblance to the European robin, although the latter is a much smaller bird. It was probably originally a forest dweller, as it still is in some places, but like its European cousin, it has adapted itself to human occupation of its haunts and now builds its nest wherever it can find a sheltered ledge about the house. Its numbers have increased probably more than those of any other native bird in the United States so that today it is regarded as the most abundant species throughout the country. It is beloved by everyone except the gardener, who is unwilling to lose the toll of cherries, berries or grapes in payment for the insects destroyed at other times of the year. It may well be, however, that as the robin increases and the native fruits give way before the cultivated varieties, the robins will become a great nuisance, for fruit they must have, and with no native fruit to satisfy their appetites, the cultivated varieties must, of necessity, suffer. It is a wise plan, therefore, to make provision for the increase of robins and other thrushes by extensive planting to furnish natural food for them. Not only should individual agriculturists do this, but the States, in planting along highways, in parks and reservations,

should include many trees of mulberry, mountain ash, wild cherry or even the sweet cherry to provide for these beneficial birds, to furnish the much needed fruit, and thus help protect the cultivated varieties in the vicinity.

The nest of the robin and indeed that of most other thrushes is a rather bulky structure made of grasses and straws, lined with finer grasses, and having an inner layer of mud. The band of mud across the breasts of all female robins for a short time in the spring is made when the bird is shaping its nest, for when the nest has been roughly plastered, the bird gets into it, as if to incubate, and then by turning around and around, shapes it and makes it perfectly symmetrical. Three to five blue eggs are laid, which require about two weeks to hatch. The young remain in the nest another two weeks so that inside of a month the nest is again empty and ready for a second brood. The same nest, if in good condition, is used for the second brood and, indeed, if it is in a sheltered spot, again the following spring, merely being repaired with enough new material to make it strong.

When the young are able to shift for themselves, they often congregate every night in large flocks at a common roosting spot, perhaps led by the old males. By fall, these roosts, which are usually in a dense swamp or in a clump of oaks or other thick foliaged trees, are very large, containing thousands of birds.

The immature plumage of the robin, in which the breast is orange-brown spotted with black and the back



NOTICE THE SPOTS

These are young robins and in their juvenal plumage show a color pattern through which the species has passed in its evolution. All true thrushes are spotted in the immature plumage if not in the adult.

brownish-gray spotted with rusty, is worn until September or October, when it is replaced by the plumage of the adult. Males and females are colored alike but it takes several years to acquire the rich chestnut breast

and black head of the adult. Females are inclined to be somewhat duller than males, but this difference is more one of age than of sex, and vigorous, mature females are brighter than young males. The western robin differs from the eastern bird principally in the absence of the white tips to the outer tail feathers.

Another aberrant member of the thrush family is the familiar bluebird. With its blue back and chestnut breast, it is indeed one of the most beautiful birds of the countryside and well worth every effort to increase its numbers. It is quick to respond and in many localities has greatly increased because of the nesting boxes which have been put up for it. Indeed, in most places, it has now regained the numbers lost in the devastating storms of the winter and spring of 1911 and 1912 when thousands were starved and frozen, and is once more a familiar bird. A similar catastrophe occurred also in 1895 when so many were killed that they did not regain their hold for over ten years.

The female bluebird is much duller than the male and the young are grayish, obscurely spotted above and below, and showing blue only in the wings and tail.

The blue eggs, so typical of the thrush family, have, with the bluebird, become very pale, perhaps owing to its hole-nesting habit, for the majority of birds that nest in holes lay pure white eggs.

The most suitable nesting box for the bluebird is one



MORE SPOTS

The wood thrush has more conspicuous spots on its breast than any other thrush in this country. Notice the paper napkins with which this bird has endeavored to disguise its nest—"camouflage" in birdland!

that measures 5x5x8 inches inside with a two-inch hole four inches from the bottom on one side. It is best placed on a pole in the garden or above a fence post, six to ten feet from the ground, in bright sun or light shade.

Both the robin and the bluebird spend the winter in southern United States and are among the first birds to push northward in the spring, arriving in northern



AN EGG IS AN EGG TO A VEERY

The speckled egg, that of the parasitic cowbird, is cared for with equal solicitude to one of its own. The veery nests on or near the ground in moist woodlands.

United States early in March or even in late February. Occasionally individuals of each species find food and shelter and spend the winter in protected spots as far north as New York or New England.

The western bluebird differs from the eastern in having the throat blue, instead of chestnut, and in having a brownish spot on the back. The mountain bluebird of Alaska and the higher Rocky Mountains has the entire underparts light blue, but is quite similar in habits to the other species.

After the robin and bluebird, the next thrush to arrive in the spring, while the leaves are still bare, is the hermit thrush. Being of a retiring disposition and frequenting woodlands rather than gardens, it is less often seen, although during cold wet spells, when food is scarce, they venture close about the house and come to feeding shelves with the chickadees and juncos. The hermit is a typical thrush with uniform dark brown upperparts and whitish underparts with dark spots on the fore breast. The breast is less spotted than that of the wood thrush and more so than that of the veery, and it is easily distinguished from all of them by its rufous tail which it has the habit of lifting slightly when it alights or when it utters its call, a low *chuck*. It nests in the hills and mountains of northern United States and Canada above an altitude of 1,500 feet, placing its nest of mosses and grasses on the ground beneath a sheltering branch.

It is only on its nesting ground that its full song is heard and there usually early in the morning, toward dusk, or even in the dead of night. Then, when the

woodland is silent save for the occasional ecstatic outburst of an ovenbird, hurling itself above the trees, the clear tranquil notes of the hermit will move even the most stolid. Beginning low, like the distant dripping of some cool spring, the singer runs lightly up the scale



A BLUEBIRD IN THE ORCHARD

Bluebirds and apple blossoms are always associated. It is well that they should be—well for us, well for the birds, and well for the orchard.

until it touches the highest chords; a still higher note, a trill, and then silence. Soon the low, liquid notes are heard once more, as the bird moves nearer, and the song is repeated again and again, not hurriedly, but with all the leisure and solemnity that a finished production requires. All nature is hushed and seems to listen to the voice that expresses so well the purity, the serenity, the mystery of the twilight in the forest.

The wood thrush and the veery are but slightly inferior to the hermit in their songs and in most places are much better known, for they often take up their abodes in city parks or about shaded lawns. The veery requires moist woodlands with undergrowth in which to place its nest, but the wood thrush is often content in an orchard or along shaded streets like the robin. The song of the wood thrush is somewhat like that of the hermit, but the phrases are shorter and the notes less clear. The veery's song, on the other hand, is quite different. Rich and clear like the songs of the other thrushes, it consists of a single continuous warble like the syllables, wee-o, wee-o, wee-o, given on a descending spiral. The veery has fewer and less conspicuous spots on its breast than the hermit, but the wood thrush has its clear white breast covered with large dark spots. Moreover, it can be distinguished also by the fact that its head is much brighter than its back. The veery winters in northern South America, but reaches the northern United States the last of April, somewhat earlier than

the wood thrush, although the latter winters from southern Mexico to Central America.

The olive-backed and gray-cheeked thrushes are less well known than the others. Wintering in South America and nesting in the coniferous forests of the North, they are seen in the United States only as transients in the spring and fall, except in the mountains of New York and New England, where they nest at altitudes over 2,500 feet. They are both uniformly darker than the other thrushes and can be distinguished from each other, in good light, by the fact that in the olive-backed, the eye ring and cheeks are washed with buffy. The sub-species of the gray-cheeked thrush which nests south of the St. Lawrence, is somewhat smaller than the northern bird and has been named the Bicknell's thrush.

The Townsend's solitaire of the Rocky Mountain region is similar to the hermit thrush in its habits, living alone in the coniferous forests whose silences are broken only by the beautifully clear notes of this bird. The solitaire is a dark gray bird, about the size of a bluebird, with a white eye ring, white wing bars and white tips to the outer tail feathers. It builds a rough nest under a shelving bank and, unlike the other thrushes, lays grayish-white eggs spotted with brown.

The varied thrush is a strikingly marked bird of the Northwest, ranging in summer from Alaska to the mountains of northern California and wintering from Washington to Lower California. It is a bird about the size of a robin, rusty brown beneath, the throat crossed



AN INSECT ELIMINATOR

A box full of bluebirds will do a great deal toward ridding the garden of pests. The box should measure 5x5x8 inches, with a 2-inch hole four inches from the bottom on one side.

by a blackish necklace, and dark bluish-slate above. It is ordinarily a rather shy bird, but on its winter journeys it frequently comes into gardens where it can find the berries of the California holly or of the manzanita.

# EDITORIAL

## HOW WE STAND FOR EFFICIENT STATE FORESTRY

**A**N editorial in *AMERICAN FORESTRY* for June, 1917, stated the facts regarding the recent reorganization of the forestry department of Vermont. It told how the state forester, a capable, experienced man with long recognized ability and a first class reputation as an efficient forester, resigned rather than be legislated out of office. He did so because, like many another good citizen, he found it impossible to serve the best interests of the public and at the same time comply with the wishes of certain influential people of the state.

This frank, straightforward editorial expression regarding a situation, in which Vermont has no monopoly, has inspired some of the newspapers of the state to not only continue their attacks upon the former state forester, but to challenge the integrity and the independence of the American Forestry Association as well as implying that the editorial was published at the behest of the former state forester, who is now employed in the United States Agricultural Department.

Such charges are not in themselves worthy of answer, but they do suggest a further statement clinching the argument which was previously made.

One newspaper says: "It is about time for the head of the Forest Service of the United States, or the Secretary of Agriculture, to tell their underlings to refrain from political activities."

This is amusing in view of the well-known fact that for the past twenty years the American Forestry Association has exerted itself with considerable success in building up and protecting efficient and non-political state forestry departments, in charge of trained experts, who know and understand what forestry is, and who mould and develop a progressive forest policy for the states which employ them.

The Vermont newspapers need not assume that the association has singled out their state for special attention. Far from it. In many states in the last few years efforts have been made to overthrow efficient forestry departments which have become popular and important parts of the state machinery. These efforts have been inspired primarily by selfish motives. The usual method by which control of these efficient departments has been sought has been by reorganization and consolidation with other departments under the guise of economy. The real end sought was the placing of the trained and efficient heads of these forestry departments under political direction and dictation.

Efforts similar to those which succeeded in Vermont

and in Wisconsin have been met and defeated in New Hampshire, Maryland, Minnesota and Oregon and have been prevented in other states by the knowledge that they would be vigorously opposed.

Efficiency in state as well as national government departments, where technical men are required, demands the substitution of the trained executive for the political appointee and the elevation of public service into a career sufficiently stable to attract men of real ability.

It is apparent that neither state nor national forestry can measure up to the demands made upon it without the adoption of a system by which men of merit will be retained without political interference. The National Forest Service has such a system and much of its success is due to it. States, too, must have it if their forestry administrations are to be successful and if they are to give their citizens the kind of state forestry management best suited to their needs.

How shall an efficient, non-political forest administration be supported against the onslaughts of private greed and the hostility of the believers in partisan management? The employes upon whom rest the burden of the work are comparatively helpless to defend themselves against attacks which are based upon the assumption that anything they say is inspired by self interest, and that their real purpose is not so much to serve the public honestly and faithfully as to hold their jobs. The average citizen is still of the opinion that most state jobs are sinecures and that the appointments are made and salaries paid as rewards for political work or influence.

As a matter of fact, men of equal training, education and ability to those required for the successful administration of technical positions under state and national governments can and do command salaries, when in private employ, largely in excess of those paid them in public service.

In calling public attention to the outcome of the struggle in Vermont the *AMERICAN FORESTRY* Magazine published facts of common knowledge and what it did was fully in keeping with the policy of the Association in striving for the best possible forestry administration for every state in the Union. Its utterances were not inspired by any government or state official or by the former forester of Vermont, and it will continue to speak plainly and forcibly in favor of the establishment, continuance and protection of competent and efficient forestry departments, as it has done in the past, with the knowledge that it has the full support of its members and of all who believe in good government

# BUILDING AN ATMOSPHERE OF STABILITY INTO THE HOME

BY RAWSON W. HADDON

**R**ECENT commission has decided that not more than a fraction of the people of one large American city can be called really native American, and that the rest—nearly ninety per cent of the total population—remain so purely and hopelessly alien that immediate steps were thought necessary to bring this foreign population, or at least some part of it, into touch with our own American ideals in more effective ways than have yet been attempted.

While no statistics are available in the case of our suburban population, carefully arranged figures would probably show the population there less migratory than one might suppose.

It is certain, however, that until very recently the typical suburban house has carried with it no suggestion of stability or permanence. The average house within commuting distance of large cities has been, and still is, in appearance, an extremely haphazard and informal affair, more suggestive of hurried erection than of anything else and entirely lacking in those marks of long residence which one sees, or unconsciously feels, in the recent suburban developments outside of London or other English cities.

The American suburbs are in many instances older than the English ones. It is not a matter of actual occupancy at all, but of architectural design. And while

English architects seem always to have known instinctively how to put into their work a feeling of dignified stability, the ability to put a similar feeling into their designs is one that has but recently been acquired by architects in the United States.

But some of our architects undoubtedly *have* the knack, and it would probably puzzle most visitors to Cranford, New Jersey, to explain why the Bush house, built only a few years ago, possesses so subtle and definite an appearance of age and carries so much more distinct an impression of containing within itself those best traditions of American home life in which its neighbors—even those of undoubtedly greater age—seem most lacking.

The explanation is simple. Mr. Joy Wheeler Dow, the architect of some delightful houses, of which a few have been illustrated in this magazine, has worked out the following explanation which appears in his book, "The American Renaissance."

In an average, modern house of that western type of design which has been widely heralded from time to time as a "new American style" of architecture, Mr. Dow found the following elements suggested:

Moresque Spain.....	10 per cent
Moresque Algiers.....	10 per cent
Moresque California Mission.....	10 per cent
East India .....	5 per cent
Newly reclaimed land	10 per cent
Chinese Ornament.....	5 per cent
Modern invention, pure	50 per cent
Anglo-Saxon Home	
Atmosphere .....	00 per cent
On the other hand, a distinctly homelike looking house of American Renaissance or Colonial design consisted, according to the same analysis, of:	
Moresque Spain.....	00 per cent
Moresque Algiers.....	00 per cent
Moresque California	
Mission .....	00 per cent
East India .....	00 per cent
Newly reclaimed land	00 per cent
Chinese ornament.....	00 per cent
Modern invention, pure	00 per cent
Anglo-Saxon Home	
Atmosphere .....	100 per cent
The secret of the Cranford house consists, also, of its possession of that single important	



The house of Mr. Charles H. Bush, at Cranford, N. J., looks for all the world as though it might have been put up by one of the "earliest settlers." But it was built only a few years ago. Hollingsworth and Bragdon, Architects.

item, the 100 per cent Anglo-Saxon home atmosphere. And assuming that the house does possess an atmosphere that is a desirable one, the question naturally is, "How was this secured?" This also will be easy, in the present instance, to explain.

For, if you will look back on your own experience, you will probably discover that some one house, one in which you lived or where you visited, and which remains connected most firmly in your mind with the pleasant memories of cheerful home life, was a house somewhere in the country, surrounded by broad fields and great trees—or it may have been a house in a country or suburban village or town surrounded, but to a smaller extent, with the same things.

Certainly, the chances are, it was a frame house, rather large, and there were trees around it and flowers near the walls and down at the road there was a fence. Now, if you are a true American, and possess the memory of that particular house, you may be sure that the memory has been lingering around in your head and has, unknown to you, been standing as your measure of comparison in all your thoughts of what *home* ought to be.

For this reason it will be plain that there is no cause for surprise when you fail to respond to some houses as readily or entirely as you do to others. Or that a grandiose stucco house or an imposing stone one does not measure up to your ideals in the same way that a little white frame house nestled down among autumn tinted leaves and bright flowers will seem to touch certain chords that tell you at very first sight that you *would* be happy in that house, that it would be a home for you and for your children, and—if you look into the matter as far as that (which you should)—a home for your children's children, or at least, some, or one, of them as well, and not simply, as too many houses are, a mere sheltering roof and nothing more.

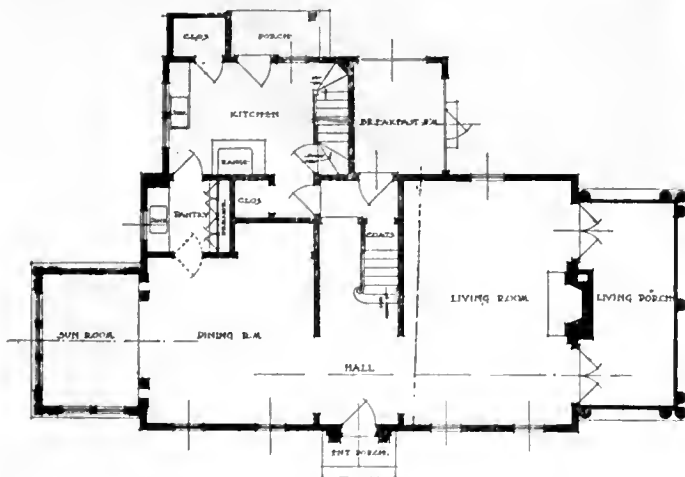
So there are psychological reasons why you, as a real American with a love and respect for good American traditions, must respond to this house in Cranford that I have chosen as an example of how an architect may compel our interest in his work by appealing to mental apparatuses of which we are entirely unconscious.

Our interest, of course, is aroused more by the echo of that house that we knew long ago, but the appeal to it is through the house before us and this house in turn takes on an interest as a "visible memory" of the other one.

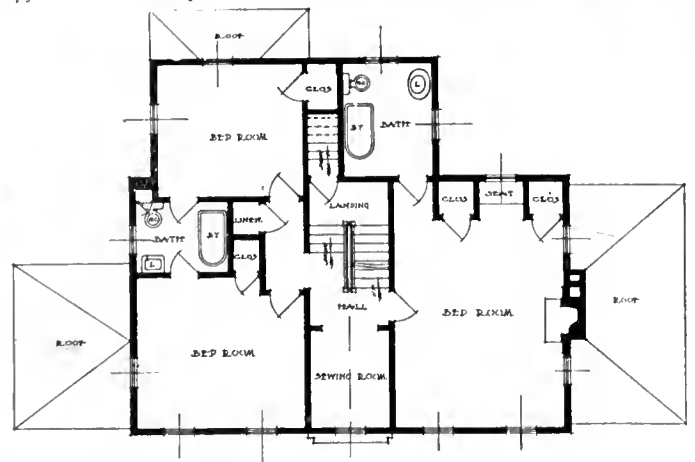
Not by the house alone is the interest brought about, but by it in connection with the other details that the architect has arranged: The trees, for instance, and the hedge, and the dormer windows (to remind us of old-time sport in attics) and chimneys that guarantee fire-places to sit around on winter nights. All these things go to make up the impression and one without the others



A near view of the door shows us that in order to get Colonial atmosphere it is not necessary to go out with a pencil and rule and make an exact copy of an old example.



FIRST FLOOR PLAN.  
First Floor Plan, House at Cranford, N. J.  
Hollingsworth and Bragdon, Architects.



SECOND FLOOR PLAN.  
Second Floor Plan, House at Cranford, N. J.  
Hollingsworth and Bragdon, Architects

would probably appeal to us as little as the stucco house or that "imposing marble mansion" did.

To say that architectural style alone gives the house its atmosphere of stability and of "having-been-lived-in-iness" is as one writer has said, "the veriest punk and rot." Witness the perfectly designed (from an archaeological viewpoint) Colonial houses, or English villas that leave us quite untouched.

One cannot say, for instance, that this Cranford house is Colonial because it has such and such details. You will find none of the favorite Colonial details employed in its making. Rather it is in the elimination of them that the architects have shown their greatest ability. It is that they have made us acknowledge that this house has that "100 per cent Anglo-Saxon home feeling" and not that they have forced us to admire a perfectly designed "Colonial sampler" simply as such or that they have made a design that overwhelms us with its cleverness so that no room is left for consideration of the homelike qualities of the building.

We who belong to the Anglo-Saxon race must bow down to the Latin theory of cities insofar as our business life is concerned. But your true Anglo-Saxon is a country born man with a soul that develops best among trees and fields and flowers and plants.

Naturally, then, the house that suggests these things, and all of them, and the architect who arranges such houses for us, are points toward which we turn in escaping from our life in cities of Latin inspiration.

Therefore, in the final ideal arrangement of our lives, these things are among the necessities to our happiness; a house like the one we knew somewhere a long time ago, a certain number of trees around that house, some flowers, a garden, and a stretch of green, open field or lawn.

In America the house that measures up to our standard is more often a frame one and perhaps, if we were very fortunate in our antecedents, a Colonial frame one.

The Cranford one is Colonial. It is frame. Parenthetically I might add for your information, should you attempt the erection of a similar house, that the clapboards are white pine, the shingles cypress and the frame is spruce.

The grounds are supplied with a certain number of trees, and we have a hedge at the street and flowers and vines in a little strip of garden immediately at the foundation of the house. It is for these reasons that the house interests us and stands out from its neighbors in the possession of that subtle appearance of age and homelikeness.

In your house, if trees are not already grown on the land, they may be transplanted, fully grown, by certain scientific methods of removal and transplantation so that you will not have to wait for years before your shade is an accomplished fact.

I might have added, also (had I not been

too enthusiastically engaged in other interests), that the exterior of the house was painted with especially prepared white lead and linseed oil and that the roof shingles were stained.

You may wonder what the cost of building all this psychological inspiration was. Exclusive of the trees, and gardening, of course, the cost of the house was \$10,000.

You see then, how important to our full enjoyment of life, socially, psychologically and domestically, a proper development and understanding of forestry must be. And how important it is for you, when you build, to have your house designed by an architect who understands it, and who knows the value of white clapboard walls and fences and green trees and shrubs and enough flower garden space to provide just the right amount of bright color—but not too much—to complete the outward representation of the domestic happiness that maintains within.

## BOOK REVIEWS

*The Development of Forest Law in America*, by J. P. Kinney. John Wiley & Sons, Inc., New York.

As chief supervisor of forests, United States Indian Service, Mr. Kinney has been brought into intimate relationship with the forest resources of the country and the great mass of laws pertaining thereto. In this book he has collated a mass of useful information on this subject, the whole comprising a historical presentation of the successive enactments by the Federal Congress and by the legislatures of the states directed to the conservation and administration of forest resources. He has sought to confine himself to a logical presentation of the chronological development of legislation. The field covered includes the preservation of existing resources, the reforestation of cut-over or burned areas and the systematic management of forests for productive purposes. For the sake of completeness he has deemed it wise to include references to a number of laws regarding forest fires, shade trees and other related subjects which were not strictly laws on forest conservation or administration. For convenient reference the author has in most cases given both the date of the individual act cited and the chapter number, and to facilitate a ready finding of the law he has often given the page in the session laws as well. The work is important for all who are in any way interested in forestry laws.

*A Nursery Blight of Cedars*, by Glenn G. Hahn, Carl Hartley and Roy G. Pierce. Government Printing Office, Washington, D. C.

*A Nursery Blight of Cedars* is a treatise by Glenn G. Hahn, scientific assistant; Carl Hartley, forest pathologist and Roy G. Pierce, forest assistant, investigations in forest pathology, in the bureau of plant industry of the United States Department of Agriculture. The treatise was originally

published in the *Journal of Agricultural Research* and is republished by authority of the Secretary of Agriculture, with the co-operation of the Association of American Agricultural Colleges and Experiment Stations. It deals with a disease through which nurserymen have for fifteen years lost large quantities of red cedars. To such extent has the damage manifested itself that several of the largest growers have been forced to abandon the raising of trees of this type, despite the fact that the demand for them is sufficient to make their propagation of considerable importance in some of the nurseries of the middle west. The authors of the booklet have conducted extensive experiments in inoculation and treatment of the parasitic growth. The fungus has been obtained from Kansas, Nebraska, Iowa, Illinois and Pennsylvania. Incomplete tests so far made in spraying with commercial lime sulphur solution and Bordeaux mixture have given little indication of value as to control.

Those interested in wood preservation cannot fail to be impressed by a new booklet on "How to Make Farm Timbers Rot-proof," just issued by the Barrett Company. This work treats of the treatment of timbers for general construction purposes, fence posts, shingles and silo staves and foundations and deals with the use of Carbosota creosote oil as a substitute for paint for the checking of decay and because of its qualities for the destruction of germs and insects. Emphasis is placed on the value of creosoted wood for excluding insects and vermin, the eradication of chicken mites in chicken-houses, for keeping ants and spiders away from beehives and for checking the development and spread of disease germs such as those of hog cholera. Detailed discussion is given of the open tank treatment of timbers, the brush treatment, dipping and spraying.

Under the title of "The Sport Alluring," the DuPont Company of Wilmington, Del., has just issued a very attractive book dealing with trapshooting. The book is attractively printed and handsomely illustrated with thirty or more pictures that will be of interest to all sportsmen. In its unfolding of the possibilities of trapshooting the book throws much interesting light on the subject. The book may be had on application.

As a companion to "Handbook of Explosives," the DuPont Company of Wilmington, Del., has issued "The Giant Laborer." This booklet deals entertainingly and completely with the application of explosives to various agricultural and miscellaneous uses. It details the advantages of explosives in land clearing, ditching, drainage work, subsoiling, tree-planting and orchard cultivation. "The Handbook of Explosives" gives full instructions as to the handling of explosives for these and other purposes. Both books may be had on application.



**CANADIAN DEPARTMENT**  
**ELLWOOD WILSON, SECRETARY,**  
**CANADIAN SOCIETY OF**  
**FOREST ENGINEERS**

On the 31st of August a most interesting meeting took place at Tupper Lake. Dr. Fernow invited a few foresters to met him there and look over the plantations which were made at Axton by the first Cornell Forestry School between 1898 and 1904. A number of Canadian Foresters went down by motor, Clyde Leavitt, C. D. Howe and R. D. Craig of the Dominion Conservation Commission, and Ellwood Wilson of the Laurentide Company. The Cornell forestry students with Professors Spring and Bentley came over from their camp, Professor Bryant of the Yale Forest School and Professor Recknagel, Forester to the Empire State Forest Products Association and Messrs. Gaylord and Stubbs from Nehasane Park together with Dr. Fernow made up the party. The plantations were thoroughly studied and in the evening a discussion of the best methods of handling cut over lands in the Adirondacks took place. The chief lesson to be learned from the work done by Dr. Fernow, is, as seen by the writer, that indiscriminate planting, just for the sake of planting something, is a waste of time and money, whether done by the State or anyone else. The object to be attained should be carefully considered, trees best suited to the soil conditions should be chosen, seed should be carefully selected, only the very best transplants should be used and these should be as large as can be conveniently handled. Considering the length of time needed to produce a crop of timber and the investment involved anything less than a fully stocked area falls short of the end desired. Ragged, uneven sized stands are a waste of time and money. Probably the only way in which results can be hastened is by planting on the largest possible sized and most vigorous stock. British Columbia and western trees do not seem to be worth planting in the east, Norway spruce has shown that it is an excellent tree for fair to good soils and Scotch Pine certainly does splendidly, and for a first crop on poor and burnt over lands and where quick results are desired has no equal. The planting up of the waste and burnt over lands in the Adirondack Preserve should be continued, but on a much larger scale and some planting plan should be developed and put in practice at once.

One of the most interesting developments in Canada is the change in public opinion in regard to its forest resources. A prominent lumberman and senator, who a few years ago pooh-poohed forestry methods as unpractical, and

thought that timber would grow fast enough to reproduce the stand every thirty or fifty years, now declares on the floor of the Senate that Canada has only enough timber to supply the United States for eight years and that our ideas of our timber resources are greatly exaggerated. Paper manufacturers have stated before the Commission at present investigating their business, that they have only pulpwood enough for fifty years more. It is to be hoped that the public and those interested in timber lands will awake completely to the dangers of the situation and will help to improve the systems of fire protection, force the various provincial governments to reorganize their colonization policies and will eliminate the logging wastes and inaugurate practical and rational silvicultural and planting operations. The Dominion Forest Products Laboratory is doing splendid work along these lines, but we need a real forest laboratory in the open, where questions of vital importance to our forest can be studied out. A few of these may be stated. The best ways of logging and utilizing our different forest types, so as to make the most out of them and at the same time to leave them in the best possible condition for the future. How to handle our burnt over areas, what species of trees to plant on different soils and under different conditions. How best to encourage natural reproduction, how to drain and plant our large areas of swamp lands, and how we can most economically transform our wild forests, containing a large admixture of species of no commercial value, into well stocked areas producing the largest possible number of the most valuable trees and at the same time keep our industries dependent on the forest supplied with a sufficient quantity of raw material at a profitable price. These are some of our most important problems and they should be scientifically and systematically attacked by trained men, for the results would be of untold benefit to the whole country.

The Canadian Forestry Association has obtained a very good moving picture film which will be shown at moving picture houses throughout our forested districts. It shows the beginning and progress of a forest fire, the result of carelessness, and the terrible destruction caused by it. The educational campaign of the Association is progressing favorably and is doing a great deal of good.

In British Columbia the season has been a bad one for fires and anxiety still continues. In Spruce Valley ten lives are thought to have been lost and three camps of the Elk Lumber Company, together with large quantities of logs and

supplies, have been wiped out. The Crow's Nest Valley in Alberta also had a bad fire in the district operated by the McLaren Lumber Company. This was promptly taken in hand by Mr. R. M. Brown, the Forest Supervisor, and Mr. E. H. Finlayson, the District Inspector, who managed to keep the fire under control. It is reported that the fires which took place in Northwestern Ontario earlier in the season were much exaggerated. In Quebec, New Brunswick and Nova Scotia only a few insignificant fires have been reported.

At the auction sale of timber limits by the Province of Quebec, several limits were sold at a price of \$400.00 per square mile. These were along the line of the National Transcontinental Railway about 225 miles northwest of Quebec.

The Quebec Forestry Branch has put a party in the field to study the condition and the amount of growth and reproduction on cutover lands and will soon follow with two other parties.

Mr. R. H. Campbell, Director Dominion Forestry Branch, recently inspected the plantations on drifting sands at Lachute, Quebec, and also the Government Nursery at Berthierville in company with Mr. G. C. Piche, Chief Forester.

Mr. J. H. Cunningham of the Laurentide Company, Ltd., has just completed a very complete and practical adaptation of the Dewey System of Decimal Classification to the needs of the Pulp and Paper industry.

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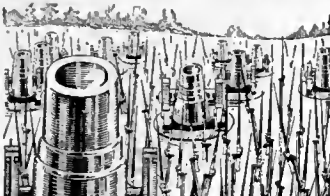
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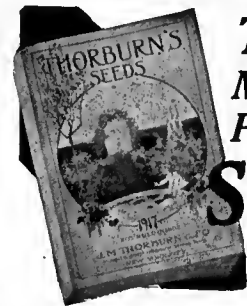
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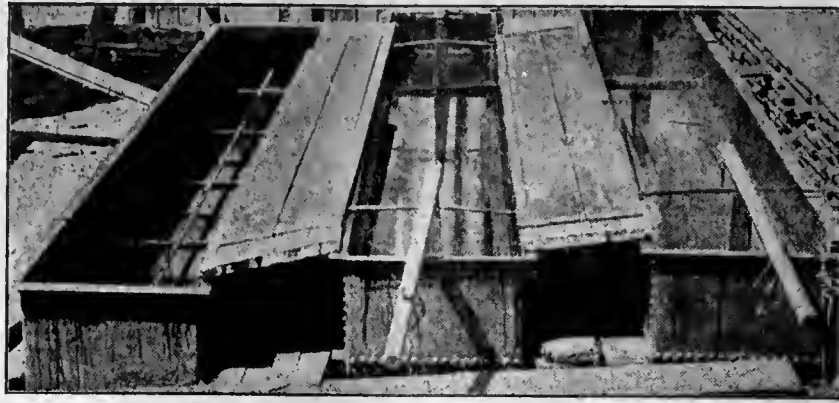


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# AMERICAN FORESTRY

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PERCIVAL SHELDON RIDSDALE, Editor

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# AMERICAN FORESTRY

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## RELIEF FUND FOR THE FORESTRY REGIMENTS

**T**O meet the needs of individual members of the American Forest Regiments in France and their dependent families, it is essential that prompt response be made to the financial requirements of the Lumber and Forest Regiments' Relief Fund. The American Forestry Association, in making earnest appeal to its members and its friends for contributions for this splendid cause, does so with an assurance and confidence based on the intimate relationship which exists between forest lovers and the men who are risking their lives in the French war zone for the sake of the American flag.

In a peculiar sense this Association has deep interest and responsibility in the success of the fund. The plan for relief for the men of the Forest Regiments found its inception within the Association. Conceived as the American Forestry Relief and Comfort Fund, the project found rapid expansion until it was deemed desirable to broaden its scope and influence as indicated by the name with which it has been rechristened, the Lumber and Forest Regiments' Relief Fund. In this form and under its present scheme of organization it co-ordinates the forces of various interests affiliated with forestry, lumbering and kindred industries. These allied influences are equally impressed with the vital importance of the undertaking and equally concerned with its successful achievement.

The need for a fund of this nature speaks for itself. With the 10th Engineers (Forest) already in France, and with the 20th Engineers (Forest) preparing to enter the service, the United States will have more than 9,000 foresters and woodsmen in the French forests. These men go oversea for a purpose in no degree less vital to military success than that which takes our trench fighters and other armed forces into the foreign zone of battle. Without the Forest regiments the fighters would be of little avail. These men have not gone to France to serve personal ambition or to pursue any fanciful occupation of doubtful worth. They are there because of the urgent needs of the Allied armies for trench timbers and other building material requisite to modern warfare. These needs are universally recognized by the army leaders of the Allied nations. It is at the insistent demand of these leaders that the regiments have been ordered to the war zone.

In their voluntary enlistment in the Forest Regiment thousands of red-blooded Americans have answered the call of duty at great personal cost. The regiments are made up of foresters, practical lumbermen and sawmill operators, men of engineering or military training,

picked woodsmen, sawmill workers, skilled axmen, wood-sawyers, crosscut-saw filers, tie-hewers, skidders, teamsters, blacksmiths, millwrights, mill sawyers, circular-saw filers, millhands, carpenters, machinists, charcoal burners, motor truck and motorcycle operators and repair men. These men are all trained workers. As such they are capable of commanding high wages in their daily work. In the service of their country privates in foreign service draw monthly pay ranging from \$33 to \$36.60 each. It involves no task in figures to realize the sacrifice these men make in accepting the pay of private soldiers at a time when home wages are higher than at any time in the history of the world; and it requires no flight of the fancy to realize that the pay given them for their work in the French forests will be sadly deficient for the needs of such families as may be left behind.

It is in recognition of this condition that the relief fund is created. That many of the men should leave their families illy prepared to provide for themselves is inevitable. This circumstance makes it imperative that generous help should be swiftly given, to the end that no suffering or hardship which could be prevented is permitted to exist. The logical source of such helpfulness is with the people of America who are interested in these men through the kinship arising from mutual interest in the woodland and lumber resources of the country. Those whose interest in the forests is sentimental have common cause with those who are concerned with the economic wealth of the timberlands. Whether one's love for the trees is based on the lure of the great outdoors or whether it is purely commercial, the sacrifices of the men of the woods and lumber camp must necessarily make direct appeal. The cause is as broad as humanity; the results will be both human and practical.

As a part of the work a committee of women has been organized by Mrs. Henry S. Graves, wife of United States Forester Graves, who is now Lieutenant Colonel in charge of forest work with the United States Expeditionary Forces. This committee will assume the duty of providing sweaters and other knitted garments for the men of the Forest Regiments. Shortly letters will be sent to women of America known to be interested in forestry, requesting co-operation in the knitting of these garments. Wool will be furnished at cost to those workers who prefer to pay for it and, as far as possible, without charge to those who prefer to give their time only.

Contributions for the Lumber and Forest Regiments' Relief Fund should be sent to the American Forestry Association, Maryland Building, Washington, D. C.

# FORESTERS IN WORLD'S LARGEST REGIMENT

AS the largest regiment in the world the 20th Engineers (Forest) will command the respect of Allies and enemy alike. This regiment is now in advanced stages of organization. Its ten battalions of foresters, woodsmen and lumbermen will have a strength of 7,500 enlisted men. In addition there will be nine service battalions with a strength of 7,250 enlisted men. The men in the service battalions will be laborers, for use in connection with the operations of the regiment. The total strength of the regiment will approximate 17,000 officers and men, which will establish a new record for military formation. It was announced early in November that two battalions of 750 men each were completely organized and would proceed to France at once. Two more battalions were to be organized immediately and the others will follow in close succession until the entire strength is in the French forests.

Col. W. A. Mitchell is commander of the regiment. He is a native of Georgia and a regular army man, who graduated from West Point with first honors. Colonel Mitchell has been in command at the encampment at the American University, District of Columbia, where the organization of the regiment has been taking place. Officers at regimental headquarters are:

Regimental surgeon, Major W. C. Moore, National Army, Virginia, graduate of the University of Virginia; regimental adjutant, Capt. H. L. Bowlby, National Army, Oregon, West Point graduate and State Highway Engineer for Oregon; regimental Engineer officer, Captain F. M. Bartelme, National Army, Minnesota, president of the Bartelme (Lumber) Company, Minneapolis; regimental supply officer, Captain P. E. Hinkley, National Army, Maine, assistant general manager of S. D. Warren & Company, Boston, Massachusetts.

For the First Battalion the officers are as follows:

Major E. E. Hartwick, president Hartwick Lumber Company, Detroit, Michigan, first vice-president Guaranty Trust Company, Detroit.

Captains: Leon M. Pill, division engineer Mobile & Ohio R. R., Mobile, Alabama; Harry V. Campbell, engineer officer, sawmill owner and operator; Arthur W. Elam, president A. W. Elam Company, logging engineers, San Francisco, California; Andrew J. Fisk, consulting civil and mining engineer and general contractor, Montana; H. W. Bostzkes, district engineer, Washington State Highway Department.

First Lieutenants: L. J. Freedman, supply officer, pulpwood

buyer and contractor for International Paper Company; Germain P. Graham, consulting municipal engineer, Albany, New York; J. C. Williams, Jr., assistant general manager, Geneva Lumber Company, Eleanor, Florida; Duncan P. Shaw, sawmill owner and operator, North Carolina; Harold C. Lyons, consulting efficiency engineer, New York City; William A. Clark, manager Walter D. Noyes Lumber Company, Boston, Massachusetts; T. W. Poindexter, municipal engineer, New York State; R. N. Benjamin, director of vocational training, Fitzgerald High School, Fitzgerald, Georgia; W. J. Wilson, district engineer, port of Seattle, Seattle, Washington; J. L. Wood, sawmill operator.

Second Lieutenants: John B. Cuno, forester, West Virginia; R. L. Chaffin, consulting engineer, West Palm Beach, Florida; Arthur N. Drips, efficiency engineer for lumber industry, Western Washington; L. B. McDaniel, district manager for lumber interests, Georgia; Hollister Johnson, junior engineer, New York State Conservation Commission; H. T. Hopkins, wholesale and retail dealer in finished pine lumber, Hortsville, South Carolina.

For the Second Battalion the officers are as follows:

Major S. O. Johnson, vice-president Weed Lumber Company, Weed, California.

Captains: F. F. Spencer, assistant to the president of the McCloud River Lumber Company, McCloud, North Carolina; F. A. Horstkotte, master mill builder and inventor of sawmill machinery, formerly connected with W. A. Wilkinson; W. V. Brookings, vice-president of the California-Oregon Lumber Company; J. C. Perry, connected with the Diamond Match Company, the McCloud River Lumber Company and the Weed Lumber Company; J. C. Long, civil engineer, connected with the Milwaukee Lumber Company.

First Lieutenants: M. R. Ethell, civil engineer, with general engineering experience; E. D. Woodruff, civil engineer, with experience in timber work and general engineering work, a brother of Col. James A. Woodruff, of the 10th Engineers (Forest); W. O. Crosby, superintendent of the mills of the Holmes Lumber Company, of Oregon; Marion Nine, owner and operator of sawmills and president of the Nine Lumber Company; Frank R. Prince, assistant manager of the Shevlin Hickson Company; P. D. Mackie, civil engineer, with five years' experience in shingle mills in Washington; W. H. Crosson, civil engineer, with special experience in bridge building; R. W. Pilling, general superintendent of the Rogers Lumber Company; L. R. McCoy, assistant manager of the Edward Rutledge Timber Company; W. E. Volk, civil engineer, with railroad experience on the Pacific Coast and in Alaska and Panama.

Second Lieutenants: M. L. Johnson, assistant engineer with the Weed Lumber Company, Weed, California; E. S. Brush, thoroughly versed in lumber operations, connected with the Loop Lumber Company; W. H. Grover, assistant engineer with the Fruit Growers' Supply Company, on the Pacific Coast.

Since the first American Foresters went to France several important changes have taken place in the personnel. The Forest Service has received word that United States Forester Henry S. Graves has been promoted to lieutenant colonel. Forester Graves was one of



COL. W. A. MITCHELL, U. S. A., COMMANDING 20TH ENGINEERS (FOREST).



CAPT. H. L. BOWLBY, REGIMENTAL ADJUTANT, 20TH ENGINEERS (FOREST).



CAPT. F. M. BARTELME, REGIMENTAL ENGINEER OFFICER, 20TH ENGINEERS (FOREST)



CAPT. P. E. HINKLEY, REGIMENTAL SUPPLY OFFICER, 20TH ENGINEERS (FOREST).

the first Americans to go into the war zone after the opening of hostilities with Germany. As director of the division of forestry with the American Expeditionary forces his duty has been to work out problems in connection with the general forestry situation in France, with reference to military needs and future development. He



MAJOR E. E. HARTWICK, 20TH ENGINEERS (FOREST)



MAJOR S. O. JOHNSON, 20TH ENGINEERS (FOREST).

is assigned to no regiment and appears on the records of the service as on temporary detail to the War Department. His original commission was as a major.

Word also comes from France that Major William B. Greeley has been assigned as deputy director, headquarters, division of forestry, American Expeditionary Forces. He is in charge of lumber operations and has supervision of the entire work in France. Major Greeley went to France early in August. Major Coert DuBois, who was district forester in charge of the National Forests of California, is on the regimental staff of the 10th Engineers (Forest). Donald Bruce (Yale, 1910), professor of forestry at the University of California, has been assigned in charge of timber reconnoissance in

France, over a party of six men. Swift Berry, who went as a civilian from the district office of the Forest Service at San Francisco, has been assigned as logging engineer. Theodore S. Woolsey, Jr. (Yale, 1902), who was formerly with the Forest Service and who went to France as a civilian, from Albuquerque, New Mexico, has

been assigned to special work and designated as timber negotiator.

The need for skilled workers in the French forests is considered urgent and vital by the army authorities of the United States and the allied nations. Their work will be to provide the timbers and lumber which are essential to military success and which cannot be provided through other channels. To ship the material from America is out of the question because of a lack of transportation facilities.

If the commander of any one of the 30 or more army camps in the United States wants to build a new warehouse or determines that a new bridge is a military necessity he has no difficulty in setting in motion the forces



## FIRST AND SECOND BATTALIONS OF

This interesting picture of the initial units of the second regiment to be prepared for service in the French forests was taken at the regimental encampment at American University campus, Washington, D. C. The first regiment to go into the French forests as representative of the United States was the 10th Engineers (Forest), which has been in service since early in the autumn. The 20th Engineers (Forest) has already provided two battalions of 750 men each. The new regiment will be the largest regimental

organization in the world. When completed it will have ten battalions of foresters, lumbermen and sawmill workers and nine battalions of laborers for use in connection with the forest operations. This will give it a strength of upward of 17,000 men. The regiment will be un-







## THE TWENTIETH ENGINEERS (FOREST)

der the command of Col. W. A. Mitchell, U. S. A. The work of the two regiments, insofar as concerns forestry, lumbering and sawmill operation, will be under the general supervision of Lieut.-Col. Henry S. Graves, who is on leave of absence from his duties as United States Forester. He is director of the division of forestry with the American Expeditionary Forces. Major William B. Greeley, assistant United States Forester and a director of the American Forestry Associa-

tion, is deputy director of the division of forestry.

Recruiting of the third battalion of the 20th was well under way early in November and this organization will soon be ready for service. The first and second battalions were reviewed by Secretary of War Baker and Chief of Engineers Black on November 10 and received warm praise for their appearance and condition. Some idea of the work the regiment will do in France is given by pictures in this issue.





LUMBERING OPERATIONS WITH THE BRITISH ARMY

In this picture is shown some of the work of the Canadian Forest section on the western front. The men are engaged in bringing in the timber from the forests, ready for sawmill operations. The character of the logs shows the care exercised by the foresters in making selections, while the trees in the background show possibilities for the future of French forestry.

necessary to its construction. The machinery for his purpose is all ready for its work. Through the agencies concerned with army supplies his material is provided by a businesslike organization geared to high measure of efficiency. The Council of National Defense, through its lumber director, designates the lumber that may be delivered with least loss of time and minimum strain on congested transportation facilities. This lumber is promptly acquired through the War Department's purchasing agencies and quickly delivered by railroads trained to giving war-time priority to military shipments.

Suppose, however, that this same commander were in the French war zone where there are no sawmills and no railroads, no Council of Defense and no transportation. His one resource is the native forest. For his lumber he must depend on the trees nearest at hand. To make these trees available is not a problem for the man at a mahogany desk in Washington. It is a job for trained foresters and trained lumbermen on the spot, for experts skilled in the selection of timbers and their swift and workmanlike conversion into building material. It is a task for the ax and the sawmill rather than for the council table and the issuing of typewritten orders. The machinery which makes for efficiency in the United States could not be utilized even if it were available. The one thing that will solve the problem is the immediate activity of such military units as the Forest Regiments, contributed to the allied cause by the American Government.

It is to handle such needs of war that the 10th Engi-

neers (Forest) has already been sent to France and the 20th Engineers (Forest) is being prepared to go across. These organizations will provide lumber for the almost endless needs of the allied armies. Modern warfare demands the construction of wharves, warehouses, storehouses, hospitals, depots, shops and other buildings necessary to shelter the army and its ammunition and supplies. The corps of engineers must build and operate railroads connecting the wharves and shops with the storehouses and depots and the latter with points as close as possible to the scene of fighting. Roads must be constructed and repaired, bridges built, repaired and strengthened and fortifications and other defensive works constructed. For these purposes the trees of the French forests must be felled and converted into railroad ties and other timbers and much of this work must be done by the engineer regiments of American foresters, woodsmen and sawmill men.

The work that takes these men to France is essentially the work of wartime emergency. Military leaders agree that the man who provides lumber for use in the war zone is performing a duty as essential as that of the man on the firing line. This completely disposes of the criticism in some quarters that the expense of sending these regiments to France and maintaining them there makes the cost of their lumber output from \$300 to \$400 a thousand feet. The absurdity of such criticism is as obvious as its lack of patriotism. Similar reasoning might be applied to the work of the Red Cross and the ambulance service. It might be pointed out that it is much cheaper to let men

be injured here at home than to send them into foreign battlefields, on the theory that a man who becomes ill or injured in an American city may procure hospital treatment at much less cost than is involved in the same treatment in a zone of war. So far, however, no earnest critic has come forward with any such suggestion. Nor has it been urged that the relief agencies be abolished because of the expense involved. Perhaps all of the possibilities in the line of such criticism are not yet exhausted. The further progress of the war may be illumined by many thoughtful suggestions of this nature. In common with the pacifists such profound economists have ideas that are prolific as well as picturesque and we may yet hear them urging that it is cheaper for the soldiers to stay at home than for the government to go to the expense of sending them across the seas. The subject is limitless.

One of the important duties of the trained foresters is the selection of those trees which may be best harvested without ruining the forests. The woodsmen and sawmill workers include men skilled in the handling of lumber from the time the tree is marked for cutting until the log passes through the mill and the material is ready for use in the building of trenches or otherwise.

A constant problem of the American lumber worker in the French forests is the handling of trees in which fragments of shell are embedded. The German spirit of destruction in the enemy's country has left large sections of woodland in which serious damage has been done. Chunks of shell have found lodgment in the bodies of trees and in the course of months these pieces of metal have in many cases become overgrown and difficult of detection through superficial inspection. Consequently there is trouble when the log comes under the saw and this makes the work of producing lumber especially difficult and an undertaking requiring much care.

Another phase of destructiveness practiced by the invaders has been the damage done to orchard trees. Vast areas of the trees were cut down completely and in other vast areas, where pursuit left no time for this process, German "Kultur" expressed itself in cutting off a circle of bark around each tree. By this latter process it was sought to kill apple, peach, plum, apricot and cherry trees which had been growing for years. Trained workers succeeded in saving trees of both classes. Those which had been cut down were grafted to their own stumps by careful treatment and during the recent summer they again blossomed and bore fruit. Those which had been ringed were treated with grafting cement and the wounds carefully bandaged. In this work not only French soldiers were engaged under officers familiar with forestry and tree surgery, but army surgeons and Red Cross workers gave assistance. Frequently use was made of bandages that had been prepared for human wounds. When supplies ran short tar and clay were used instead of cement and twisted moss was tied around the dressed wounds instead of bandages. By these methods years have been saved in restoring the otherwise ruined orchards.

Late in October French aviators found that in the Laon sector the German troops were again resorting to the destruction of villages and trees, indicating another "strategic retreat," similar to that which took place earlier on the Arras Camines front.

Vivid pictures of the ruin that has been wrought is given by German papers. The Berlin Lokal Anzeiger describes a strip of country from six to eight miles in width and extending along the whole of the new German position as having been turned by the Imperial army into dead territory, "presenting a terrible barrier of desolation to any enemy hardy enough to advance against our



WHERE THE SOUND OF THE SAWMILL BLENDS WITH THE ROAR OF ARTILLERY

This is a picture of a sawmill somewhere near the French battle front. Some of the sawmill units are located so near to the fighting lines that they hear the booming of cannon and the bursting of shells as a part of their daily routine. Shells embedded in tree trunks are a frequent source of trouble in the operation of the sawmills, but in spite of the handicaps the output of each unit is constant and indispensable to military operations. The mill here pictured is typical of the environment of the sawmill men who go with the Forest Regiments.



DELIVERY SYSTEM FOR FINISHED LUMBER IN FRANCE.

After the foresters, woodsmen and sawmill workers have finished their share of converting the French forests into construction material the lumber is loaded on powerful trucks for distribution to such building operations as may be going on. This section of the war zone lumber yard is devoted to finished sleepers. No time is lost between tree felling and delivery of lumber, as all the work is done under military discipline.

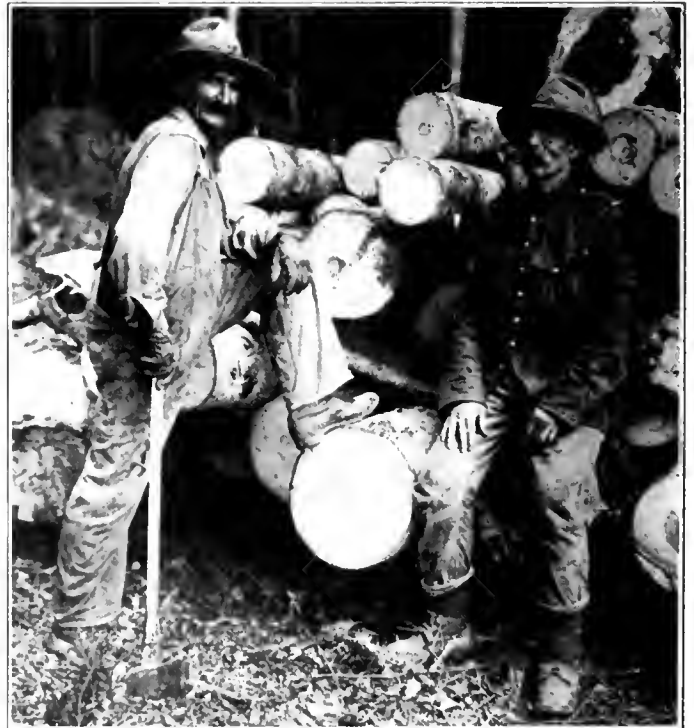
new lines. No village or farm was left standing on this glacier, no road was left passable, no railway track or embankment was left in being. Where once were woods there are gaunt rows of stumps; the wells have been

blown up; wires, cables and pipe lines destroyed. In front of our new positions runs, like a gigantic ribbon, an empire of death." This is typical of the situation that has been created by the enemy and which must be over-



WAR ZONE FORESTERS BUILDING RAILROAD

The Canadian Forest Section by no means confines itself to lumbering and sawmill work. Railroads are essential to modern warfare and these men are constructing a line through a French forest. The Forest Section is doing the entire job, from cutting ties to grading and tracklaying.



CANADIAN WOODSMEN IN THE WAR ZONE

These men are types of the forest workers sent overseas as a part of Canada's contribution to the cause of the Allies. The sergeant on the right has three sons serving in France, one of them a captain and the others lieutenants.

come by American forest regiments and engineers. Canada has already sent more than 10,000 men overseas in forest battalions and additional large numbers who had already crossed with the army have been organized into forest companies.

Recruiting of the 20th Engineers (Forest) has been going on throughout the country. Listing offices were established in each state to receive applications for enlistment from men willing to take service in the regiment. These listing offices were in addition to the regular army recruiting offices, through all of which applications are received. As rapidly as accepted and enlisted for service in the regiment the men were gathered at the American University in the District of Columbia, on the campus of which institution the regimental camp is located. In this camp they are immediately placed under military discipline and training, with a routine of daily work calculated to put them into trim for organized work as soon as they reach their destination in Europe. In addition to the men received through the various listing offices and recruiting stations the roster included a large number of men from the drafted army. At the various encampments of the National Army men who are found to have had woods and lumber experience are detailed to the forest regiment and this will doubtless continue to be an important factor in quickly filling the ranks of the organization.

For the new regiment three hundred and nine commissioned officers are required. These officers are men of technical training in various lines. Two-thirds of them



HOUSING THE FOREST REGIMENT

The type of barracks in which the men live at American University while undergoing the necessary training before being shipped to France to work in the forests of that country.

are practical lumbermen or sawmill operators and one-third technical foresters with long woods experience. In the selection of these officers the Forest Service had the co-operation of fourteen committees of lumbermen representing districts throughout the country. These nominating committees included some of the best-known lumbermen in the United States. Almost every man selected was interviewed by a lumberman's committee or by the Forest Service officials. Many private foresters and forest schools assisted in finding technical men suitable for appointment and it is declared that all the men selected have proved by experience their qualities of leadership and their ability to handle men in large numbers.

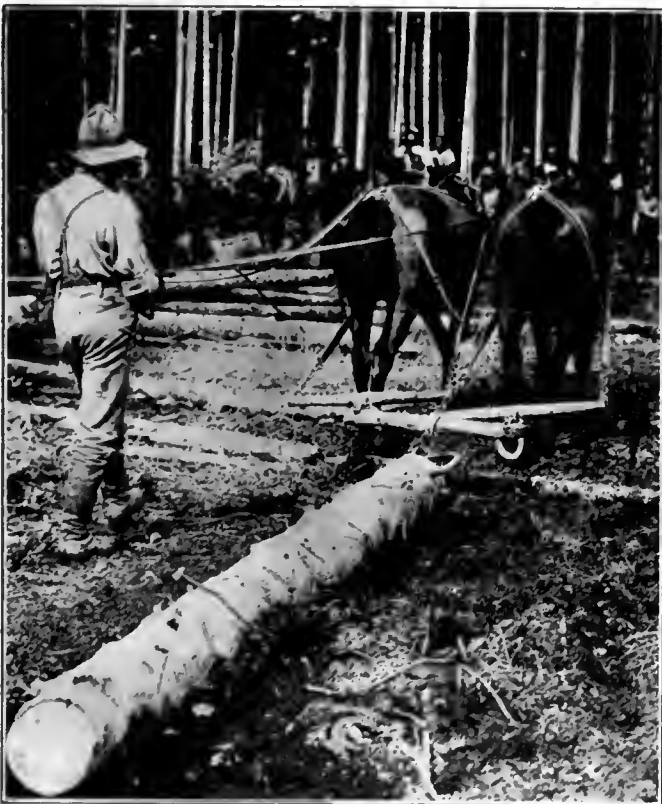
The age limits set at the beginning of the undertaking required that all officers of the forest battalions should be not less than 31 years of age. Because of the difficulty of finding enough men suitable for lieutenants the age limit was later lowered to 25. The bulk of the men recommended for lieutenantcies range in age from 25 to 35, as captains from 30 to 40 and as majors from 40 to 50. The men who have been recommended have been notified that all further steps, as to physical examination, the issuance of commissions and the order in which successful applicants will be called for service, rest with the War Department. Not all of the men accepted will be called into service at once. In order to provide for future contingencies it was decided to commission at the present time enough officers to care for the other battalions yet to be raised.

Late additions to the roster of officers of the 20th Engineers (Forest) were announced as follows:

Regimental Headquarters—Major E. H. Marks, acting lieutenant colonel; Lieut. J. W. Herbert, veterinary detachment; First Lieut. C. W. Smith, chaplain.

First Battalion Headquarters—First Lieut. R. B. Hill, medical officer; First Lieut. R. F. Roudybush, dental officer.

First Battalion (Company B)—Capt. C. B. Cutting, commanding; Second Lieut. C. B. Bradley.



NOT MUCH SUGGESTION OF WAR HERE

Skidding logs is the same thing, whether in a peaceful western logging camp or in the war zone. These men are operating on the western front in France and the timbers are used in trench building and other forms of defense construction.

Second Battalion Headquarters—First Lieut. J. B. Swafford, medical officer; First Lieut. C. P. Hatrick, dental officer.

Second Battalion (Company B)—First Lieut. Charles C. Kelley.

Third Battalion Headquarters—Major B. F. Wade; Capt. E. H. Sargent, adjutant; Capt. O. H. Todd, acting adjutant; Capt. W. H. Estabrook, supply officer, and First Lieut. A. H. Ellison, engineer officer.

Company A—Captain, C. E. Clark; first lieutenants, W. G. Conklin, P. D. Mackie, C. M. Jenkins; second lieutenants, E. B. Birmingham and Harold M. Power.

Company B—Captain, E. P. Dudley; first lieutenants, G. C. Eastman, L. W. Jacobs, M. Vanmeter; second lieutenant, L. B. McDaniels.

Company C—Captain, S. C. Phipps; first lieutenants, C. C. Abbott, H. H. Miller, F. B. Judge; second lieutenants, O. J. Davis, A. L. Hyde and John Summerset.

The district committees of lumbermen for nominating officers were made up as follows:

District No. 1 (Maine, New Hampshire, Vermont, Massachusetts, Connecticut and Rhode Island)—H. B. Stebbins, chairman, H. B. Stebbins Lumber Company, Boston, Mass.; M. A. Brown, Parker & Young Co., Boston, Mass.; F. B. Cutler, Stetler-Cutler Company, Boston, Mass.; H. G. Philbrook, Connecticut Valley Lumber Company, Boston, Mass.; H. W. Blanchard, H. W. Blanchard Lumber Company, Boston, Mass.; C. W. Whitney, Perry-Whitney Lumber Company, Boston, Mass.

District No. 2 (New York)—Ferris J. Meigs, chairman, Santa Clara Lumber Company, Tupper Lake; W. L. Sykes, Emporium Lumber Company, Buffalo; Frank L. Moore, Watertown; Maurice Hoopes, Finch, Pruyn & Co., Glens Falls; J. M. Gamble, Brownville Board Company, Brownville; W. C. Hull, Oval Wood Dish Company, Tupper Lake.

District No. 3 (Pennsylvania and New Jersey)—N. P. Wheeler, Jr., chairman, Wheeler & Dusenbury Lumber Company, Endeavor, Pa.; A. W. Mallinson, Central Pennsylvania Lumber Company, Williamsport, Pa.; R. R. Chaffee, Wheeler & Dusenbury Lumber Company, Endeavor, Pa.

District No. 4 (Delaware, Maryland, Virginia, West Virginia, North Carolina and South Carolina)—C. L. Millard, chairman, John L. Roper Lumber Company, Norfolk, Va.; W. M. Ritter, W. M. Ritter Lumber Company, Columbus, Ohio; J. S. Holmes, State Forester, Chapel Hill, N. C.; George L. Forrester, secretary Western North Carolina Logging and Lumber Company, Asheville, N. C.; E. W. Durant, Jr., E. P. Burton Lumber Company, Charleston, S. C.

District No. 5 (Georgia, Florida and Alabama)—M. L. Fleischel, chairman, Carpenter-O'Brien Lumber Company, Jackson-

ville, Fla.; R. H. Paul, Watertown, Fla.; M. M. Bond, Bond Lumber Company, Lake Helen, Fla.

District No. 6 (Ohio, Indiana, Illinois, Kentucky and Tennessee)—W. E. DeLaney, chairman, Kentucky Lumber Company, Lexington, Ky.; J. M. Pritchard, secretary, Gum Manufacturers Association, Memphis, Tenn.; R. R. May, Southern Hardwood Traffic Association, Louisville, Ky.

District No. 7 (Michigan and Wisconsin)—John W. Blodgett, chairman, Grand Rapids, Mich.; R. S. Kellogg, National Lumber Manufacturers' Association, Chicago, Ill.; H. C. Hornby, Cloquet, Minn.; Benjamin Finch, Finch Bros., Duluth, Minn.

District No. 8 (Minnesota)—H. C. Hornby, Cloquet, Minn.; F. W. Wilhelm, Cloquet Tie & Post Co., Cloquet, Minn.; Benjamin Finch, Finch Bros., Duluth, Minn.

District No. 9 (Mississippi and Louisiana)—C. S. Williams, chairman, Patterson, La.; S. T. Woodring, Lake Charles, La.; E. A. Frost, Shreveport, La.; R. B. Carrier, Sardis, Miss.; F. W. Pettibone, Kiln, Miss.

District No. 10 (Missouri, Arkansas, Oklahoma and Texas)—Chas. S. Keith, chairman, Kansas City, Mo.; R. A. Long, Kansas City, Mo.; J. B. White, Kansas City, Mo.; W. R. Pickering, Kansas City, Mo.; L. L. Seidel, Kansas City, Mo.

District No. 11 (Montana, Idaho and Wyoming)—A. W. Laird, chairman, Potlatch, Id.; P. M. Lachmund, Potlatch, Id.; R. M. Hart, Couer d'Alene, Id.; J. A. McCann, Libby, Mont.; Kenneth Ross, Missoula, Mont.; E. H. Van Ostrander, Winchester, Id.

District No. 12 (Washington and Oregon)—George S. Long, chairman, Weyerhaeuser Timber Company, Tacoma, Wash.; J. J. Donovan, Bloedel-Donovan Lumber Mills, Bellingham, Wash.; E. G. Ames, Puget Mill Company, Seattle Wash.; George M. Cornwall, "The Timberman," Portland, Ore.; A. L. Paine, West Coast Lumberman's Association, Hoquiam, Wash.; Henry Kirk, Beaver Lumber Company, Portland; Ore.

District No. 13 (California and Nevada)—S. O. Johnson, Weed Lumber Company, San Francisco; E. H. Cox, Weed Lumber Company, San Francisco; O. C. Haslett, California Pine Box and Lumber Company, San Francisco; W. P. Johnson, Weed Lumber Company, San Francisco; C. Stowell Smith, secretary California Sugar and White Pine Manufacturers' Association, San Francisco.

District No. 14 (Colorado, Utah, Arizona and New Mexico)—William P. McPhee, chairman, McPhee and McGinnity Lumber Company, Denver; Col.; Smith Riley, District Forester, Denver, Col.; T. A. Shonberg, Continental Tie and Timber Company, Denver, Col.; B. Coldren, Hallack and Howard Lumber Company, Denver, Col., assisted by M. J. Riordan, Saginaw and Manistee Lumber Company, Flagstaff, Ariz.

## AMERICAN FORESTERS IN MILITARY SERVICE

This list 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 will be reprinted and increased from month to month. All foresters and others who can supply additional names 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** GEE, Fred B., Deputy Forest Supervisor, U. S. F. S.  
 Albano, Jack, forest ranger, U. S. F. S.  
 Aldous, Tura M., grazing, U. S. F. S.  
 Alexander, J. B., 1st Lt. Aviation Corps, (Uni. of Wash., '17).  
 Ames, F. E. (Yale For. School '05).  
 Anderson, A. C., 2nd Lt. U. S. A. (Uni. of Wash., '17).  
 Anderson, Emil A., deputy forest supervisor, U. S. F. S.  
 Archer, Frank L., forest clerk, U. S. F. S.  
 Atkinson, E. S., (Yale For. School, '16).  
 Avery, B. F., commissioned in Eng. (Forest) forces; (Yale For. School); Spanish River Pulp and Paper Mills.  
**B** ADERTSCHER, Ed., temporary clerk, U. S. F. S.  
 Baker, Hugh P. (Yale For. School, '04), N. Y. State Col. of Forestry.  
 Baldenburg, Max B., clerk, U. S. F. S.  
 Barr, John B., forest ranger, U. S. F. S.  
 Barlow, Harold (Yale For. School, '14).  
 Bastian, Clyde E., Corp. 20th Eng. (Forest), (Uni. of Mich., '16).  
 Batten, R. W. (Yale For. School, '16).  
 Beaman, Clarence W., messenger, U. S. F. S.  
 Bedwell, Jesse L., forest ranger, U. S. F. S.  
 Bell, George R. (Yale For. School, '18).  
 Benedict, M. S., 1st Lt. 10th Eng. (Forest), for. sup., U. S. F. S.  
 Benedict, Raymond E., Major 10th Eng. (Forest), For. Br. B. C.  
 Bentley, George A., Capt. Quartermaster's Dept., purchasing agent U. S. F. S.  
 Bennett, Edwin L., forest ranger, U. S. F. S.

Bernhardt, Carl L., (Uni. of Wash., '18).  
 Berry, John K., scaler, U. S. F. S.  
 Berry, Swift, forester, U. S. F. S.  
 Betts, Fred H., forest ranger, U. S. F. S.  
 Bevan, Arthur (Uni. of Wash., '17).  
 Billingslea, James H., Jr., Top Sergeant (Uni. of Wash., '14), forest ranger, U. S. F. S.  
 Bird, R. J., Corp. 20th Eng. (Forest), (Cornell, '16).  
 Bird, Vern A., forest ranger, U. S. F. S.  
 Bloom, Adolph, Ensign U. S. N. Train. Sta. (Uni. of Wash., '16).  
 Bonney, Parker S., Sub. Lt. British Navy (Uni. of Wash., '13).  
 Bowen, Jos. B. (Yale For. School, '17).  
 Bradley, Tom O. (Mt. Alto), Pa. Dept. For.  
 Brady, Charles C. (Uni. of Wash., '18).  
 Breneman, Howard E. (Mt. Alto For. Acad., '17), Co. C., 10th Eng. (Forest), Pa. Dept. For.  
 Brewster, Donald R., forest examiner, U. S. F. S.  
 Brindley, Ralph, 2nd Lt. R. O. T. C. (Uni. of Wash., '17).  
 Brooks, James F., forest ranger, U. S. F. S.  
 Brown, Bascom H., forest ranger, U. S. F. S.  
 Brown, Vance, scaler, U. S. F. S.  
 Browning, Harold A., asst. forest ranger, U. S. F. S.  
 Broxon, Donald (Uni. of Wash., '14).  
 Bruce, Donald, Prof. of For., Uni. of Cal. (Yale For. School, '10; assigned in charge of timber reconnaissance in France).  
 Bryant, Edward S., Capt. 10th Eng. (Forest), for. ins., U. S. F. S.  
 Buch, John Edward (Mt. Alto For. Acad., '17), Co. C., 10th Eng. (Forest), Pa. Dept. For.

- Buck, Shirley, National forest inspector, U. S. F. S.  
 Burgess, John, surveyor draftsman, U. S. F. S.  
 Burnham, R. P. (Uni. of Wash., '17).  
 Buttrick, P. L., Amer. Ambulance Serv. (Yale For. School, '11).
- C**ALKINS, Hugh G. (Yale For. School, '09), forest supervisor, U. S. F. S.  
 Calloway, G. A. (Uni. of Mo.).  
 Calvert, Gerald F. (Uni. of Wash.).  
 Cameron, J. F. (Uni. of Wash., '19).  
 Cappel, Frederick, forest clerk, U. S. F. S.  
 Cassidy, Hugh O., forest ranger, U. S. F. S.  
 Cecil, Kirk P., surveyor, U. S. F. S.  
 Chudderdon, Harold A., forest ranger, U. S. F. S.  
 Chamberlain, Harry A., forest ranger, U. S. F. S.  
 Chapman, Charles S., Major 10th Eng. (Forest), (Yale For. School, '02), forestry assistant, U. S. F. S.  
 Charlson, Alex., (Uni. of Wash., '16).  
 Christensen, Alfred C., forest clerk, U. S. F. S.).  
 Clark, Donald H., 1st. Lt. R. O. T. C. (Uni. of Wash., '17).  
 Clark, E. V., forest supervisor, U. S. F. S.  
 Clemmons, Walter C., forest ranger, U. S. F. S.  
 Condon, H. R., 2nd. Lt. 10th Eng. (Forest), Pa. R. R. forester.  
 Conklin, W. Gardiner, 1st. Lt. 20th Eng. (Forest), (Pa. State For. Acad., '08), Pa. Dept. Forestry.  
 Cook, A. M. (Yale For. School, '08).  
 Cook, John W., clerk, U. S. F. S.  
 Cook, Samuel, forest ranger, U. S. F. S.  
 Cookston, Roy, Capt. 10th Eng. (Forest).  
 Cope, H. Norton, forest ranger, U. S. F. S.  
 Cownan, Talmadge D., forest ranger, U. S. F. S.  
 Critchley, Horace F. (Mt. Alto, '13), Rés. Off. Tr. Campy Ft. Niagara, Pa. Dept. For.  
 Crumb, Isaac J. (Uni. of Wash., '20).  
 Cuff, Ivan A., forest ranger, U. S. F. S.  
 Culley, Matthew J., forest ranger, U. S. F. S.  
 Cuno, John B., 2nd. Lt. 20th Eng. (Forest).  
 Curwen, William H., surveyor-draftsman, U. S. F. S.
- D**ALLENBACH, Emil, messenger, U. S. F. S.  
 De Camp, J. C., grazing assistant, U. S. F. S.  
 Deering, Robert L., 1st Lt. 10th Eng. (Forest), forest examiner, U. S. F. S.  
 Deutsch, Henry C., forest ranger, U. S. F. S.  
 Doggett, William H. (Yale For. School, '17).  
 Dorrance, John Gordon, 2nd. Lt. E. O. R. C.  
 Dorward, D. L. (Yale For. School, '14).  
 Douglass, C. W. H., Aviation Corps (N. Y. State Col. of Forestry, '15), American Forestry.  
 DuBois, Coert, Major 10th Eng. (Forest), dis. forester, U. S. F. S.  
 Dubuar, James F., forest assistant, U. S. F. S.  
 Dunn, Beverly C., Adjutant 10th Eng. (Forest).  
 Dunning, Duncan, forest assistant, U. S. F. S.  
 Dunston, Clarence R., 1st. Lt., U. S. Indian Service.  
 Dunwoody, W. B. (Yale For. School, '16).
- E**LDREDGE, Inman F., Capt. 10th Eng. (Forest), forest supervisor, U. S. F. S.  
 Elliott, Harry R., forest ranger, U. S. F. S.  
 Emerick, Lloyd P., forest clerk, U. S. F. S.  
 Emerson, J. Ward, forest ranger, U. S. F. S.  
 Evans, Vincent (Uni. of Wash., '16).  
 Ewing, Robert B., forest ranger, U. S. F. S.
- F**AIRCHILD, Rollin A., forest clerk, U. S. F. S.  
 Fifer, Charles (Uni. of Wash., '20).  
 Fish, Harold (Uni. of Wash., '18).  
 Fisher, David (Uni. of Wash., '14).  
 Foess, Jacob E., 20th Eng. (Forest), (Mich. Ag. Col., '17).  
 Foley, A. C., Corp. 20th Eng. (Forest), (Uni. of Mich., '18).  
 Foran, Harold (Uni. of Wash., '16).  
 Fowler, Frederick H., district engineer, U. S. F. S.  
 Frankland, James, forest ranger, U. S. F. S.  
 Fritchle, C. R. (Uni. of Mo.).  
 Fritz, Emanuel (Yale For. School, '14), forest asst., U. S. F. S.  
 Fuller, Francis S., forest assistant, U. S. F. S.
- G**ALER, George E., forest ranger, U. S. F. S.  
 Gallaher, W. H., 2nd Lt. (Yale For. School, '10), U. S. F. S.  
 Garrett, C. B. (Uni. of Wash., '16).  
 Gaylord, Donald (Yale For. School, '15).  
 Gebo, L. W., 20th Eng. (Forest), (Cornell, '16).  
 Gibbons, William H., 2nd. Lt., forest examiner, U. S. F. S.  
 Gill, Thomas H. (Yale For. School, '15), forest ranger, U. S. F. S.  
 Gilman, John, forest ranger, U. S. F. S.  
 Gilson, R. M. (Yale For. School, '17).  
 Girk, Royal J., forest clerk, U. S. F. S.  
 Godwin, D. P., 1st Lt. 10th Eng. (Forest), forest exam., U. S. F. S.  
 Goodman, Walter F., forest ranger, U. S. F. S.  
 Graham, Paul (Uni. of Wash., '13).
- Granger, C. M., assistant district forester, U. S. F. S.  
 Graves, Henry S., Lt. Col., director, division of forestry headquarters, American Expeditionary forces; United States Forester.  
 Greeley, William B., Major, deputy director, division of forestry headquarters, American Expeditionary forces; assistant United States Forester.  
 Grefe, Raymond F., forest ranger, U. S. F. S.  
 Guthrie, John D. (Yale For. School, '06), forest sup., U. S. F. S.  
 Guthrie, Richard T., forest examiner, U. S. F. S.
- H**AASIS, F. W. (Yale For. School, '13).  
 Hackett, William, forest ranger, U. S. F. S.  
 Hall, R. C. (Yale For. School, '08), forest examiner, U. S. F. S.; assigned to timber reconnaissance in France.  
 Hansen, Thorvald (Yale For. School, '17), forest asst., U. S. F. S.  
 Hansson, Arnold (Yale For. School, '17).  
 Harding, Charles C. (Yale For. School, '16).  
 Harlacher, Josef (Mt. Alto, '17), 20th Eng. (Forest), Pa. Dept. For.  
 Harley, Percy H., forest clerk, U. S. F. S.  
 Harmelling, H. (Uni. of Wash., '12).  
 Hendrickson, Guy C., forest clerk, U. S. F. S.  
 Hendrix, Albert W., forest ranger, U. S. F. S.  
 Hicock, Henry W. (Yale For. School, '15).  
 Hicks, L. E., forest ranger, U. S. F. S.  
 Hill, F. C., forest ranger, U. S. F. S.  
 Hirst, E. C. (Yale For. School, '09), state for., New Hampshire.  
 Hogentogler, Joseph R. (Mt. Alto, '12), Pa. Dept. For.  
 Holt, Felix R. (Yale For. School, '02).  
 Hotze, E. B. (Uni. of Mo.).  
 Hope, L. S. (Yale For. School, '16).  
 Houpt, William E. (Mt. Alto, '09), 20th Eng. (Forest), formerly Pa. Dept. For.  
 Houtz, Jesse (Mt. Alto, '13), Field Artillery, formerly Pa. Dept. For.  
 Huff, Rolland, forest ranger, U. S. F. S.  
 Hull, J. H. (Yale For. School, '11).  
 Humphrey, J. C. H. (Yale For. School, '09).  
 Hussey, Ralph W., forest ranger, U. S. F. S.
- I**NGALLS, E. E. (Yale For. School, '17).  
 Inskip, Raymond P., forest ranger, U. S. F. S.  
 Isola, Vico C. (Yale For. School, '14).  
 Irwin, James A. (Mt. Alto, '12), Sergt. 10th Eng. (Forest), formerly Pa. Dept. For.
- J**ANOUGH, Karl L., forest ranger, U. S. F. S.  
 Johnson, O. S., Sgt. 20th Eng. (Forest) (Uni. of Minn., '16).  
 Jones, E. F., forest examiner, U. S. F. S.  
 Jones, Luther G. (Yale For. School, '16).  
 Judson, Luchard (Yale For. School, '17).
- K**ELLEY, Evan W., Capt. 10th Eng. (Forest), forest examiner, U. S. F. S.  
 Ketcham, Louis, forest ranger, U. S. F. S.  
 Keyes, John H., 20th Eng. (Forest), (Yale, '14).  
 Ketrledge, John C., forest examiner, U. S. F. S.  
 Kiefer, Francis, Capt. E. O. R. C., asst. dist. forester, U. S. F. S.  
 Kimball, George W., forest examiner, U. S. F. S.  
 King, Robert F., 2nd. Lt. Coast Artillery (Uni. of Wash., '19).  
 Kingsley, Ray M., forest ranger, U. S. F. S.  
 Kittredge, Joseph, Jr., forest examiner, U. S. F. S.  
 Klobucher, F. J. (Yale For. School, '16), forest ranger, U. S. F. S.  
 Knowlton, H. N., engineer in forest products, U. S. F. S.  
 Kobbe, William H. (Yale For. School, '04).  
 Koomey, L. H. (Yale For. School, '12).  
 Kraebel, Charles J., forest assistant, U. S. F. S.  
 Kraft, F. G. (Uni. of Mo.).  
 Krause, John E., forest ranger, U. S. F. S.
- L**AFON, John, Capt. 10th Eng. (Forest), Forest Branch B. C.  
 Larzon, Arthur K. (Uni. of Wash.).  
 Lee, Chester A. (Yale For. School, '17).  
 Leach, Walter (Mt. Alto, '14), 314th Inf., Pa. Dept. For.  
 Lentz, Gustav H. (Yale For. School, '17).  
 Lewis, Ferry D., forest ranger, U. S. F. S.  
 Lindsey, Eugene L., 1st Lt. 10th Eng. (Forest), (Yale For. School, '19), forest examiner, U. S. F. S.  
 Littlefield, Theron R., forest ranger, U. S. F. S.  
 Loveman, A. M. (Yale For. School, '16).  
 Lowermilk, Walter C., forest ranger, U. S. F. S.  
 Lundgren, Leonard, Captain, engineer, U. S. F. S.  
 Luther, T. F., 20th Eng. (Forest), (Cornell, '17).
- M**ACKECHNIE, A. R., 2nd Lt. U. S. A. (Uni. of Wash., '18).  
 Malmstein, Harry E., grazing assistant, U. S. F. S.  
 Mackworth, G. D. (Yale For. School, '17).  
 Marsh, A. Fletcher (Yale For. School, '11).  
 Masch, Walter (Mt. Alto), 20th Eng. (Forest), Pa. Dept. For.  
 Mason, David T., Capt. 10th Eng. (Forest), Uni. of Cal. (Yale For. School, '07).

- McCullough, Thomas E. (Yale For. School, '11).  
 McGillicuddy, Blaine (Uni. of Wash.).  
 McGlaughlin, Eugene R., 20th Eng. (Forest), (Ohio State Uni.).  
 McKnight, Roscoe, 1st Lt. 10th Eng. (Forest), U. S. F. S.  
 McNulty, L. Edgar (Mt. Alto For. Acad., '17), Co. C., 10th Eng. (Forest), Pa. Dept. For.  
 McPherson, Benj. D. (Mt. Alto For. Acad., '16), 10th Eng. (Forest), Pa. Dept. For.  
 Meek, Chas. R. (Mt. Alto, '12), 20th Eng. (Forest), Pa. Dept. For.  
 Mendenhall, Fred D., surveyor-draftsman, U. S. F. S.  
 Meyer, Leo. W. (Yale For. School, '17).  
 Middour, Joseph C. (Mt. Alto For. Acad., '16), Co. C., 10th Eng. (Forest), Pa. Dept. For.  
 Miles, Clark, forest examiner, U. S. F. S.  
 Millar, W. N., Capt. 10th Eng. (Forest), (Yale For. School, '08).  
 Miller, Edwin B. (Mt. Alto For. Acad., '17), 10th Eng. (Forest), Pa. Dept. For.  
 Miller, Fred H., forest ranger, U. S. F. S.  
 Minner, Clifford R., forest ranger, U. S. F. S.  
 Moir, W. Stuart (Yale For. School, '17).  
 Montgomery, Ray C., forest ranger, U. S. F. S.  
 Montgomery, W. E. (Mt. Alto, '13), Res. Off. Tr. Camp, Augusta, Ga., Pa. Dept. For.  
 Moore, Barrington, Capt. (Yale For. School, '08), U. S. F. S.  
 Moore, W. M., forest examiner, U. S. F. S.  
 Morton, J. Newton (Mt. Alto For. Acad., '16), Co. C., 10th Eng. (Forest), Pa. Dept. For.  
 Mosch, Walter (Mt. Alto) 20th Eng. (Forest), Pa. Dept. For.  
 Murphy, E. C., 2nd Lt., U. S. A. (Uni. of Wash., '20).  
 Murphy, R. A. (Yale For. School, '17).  
 Mutz, George, forest ranger, U. S. F. S.  
 Myers, Frank B., forest assistant, U. S. F. S.
- N**ELSON, Enoch W., grazing assistant, U. S. F. S.  
 Nelson, Oscar L., forest ranger, U. S. F. S.  
 Nevitt, John V., forest ranger, U. S. F. S.  
 Neasmith, John J., 20th Eng. (Forest), (Syracuse, '17).
- O**AKLEAF, H. B., forest examiner, U. S. F. S.  
 Odell, W. T. (Uni. of Wash., '12).  
 Oliver, J. Earl, forest ranger, U. S. F. S.  
 Oles, W. S., 20th Eng. (Forest), (Cornell, '16).  
 Orr, Ronald H., 20th Eng. (Forest), (Biltmore For. School, '09).
- P**AETH, William J. (Yale For. School, '12), forest assistant, U. S. F. S.  
 Paine, F. R. (Yale For. School, '14).  
 Paine, Topliff O., forest ranger, U. S. F. S.  
 Paxton, Percy J. (Yale For. School, '09), forest exam., U. S. F. S.  
 Peck, Allen S., Major, 10th Eng., '09), forest insp., U. S. F. S.  
 Peck, E. C. (Yale For. School, '18)).  
 Pilcher, Rufus J., forest ranger, U. S. F. S.  
 Plummer, Donald (Uni. of Wash., '20).  
 Port, Harold F. (Mt. Alto For. Acad., '16), Co. A., 10th Eng. (Forest), Pa. Dept. For.  
 Porter, O. M. (Yale For. School, '15).  
 Powell, Harry A., British Army, (Uni. of Wash.).  
 Powers, James E. (Mt. Alto, '15), Artillery, Pa. Dept. For.  
 Powers, Victor S. (Uni. of Wash., '18).  
 Prichard, R. P. (Yale For. School, '09).  
 Pryse, E. Morgan, forest assistant, U. S. F. S.
- R**AINSFORD, W. K. (Yale For. School, '06).  
 Ramsdell, Willett F., deputy forest supervisor, U. S. F. S.  
 Rase, Frederick W., surveyor, U. S. F. S.  
 Rand, E. A., 1st Sgt., 20th Eng. (Forest), (Uni. of Me., '14).  
 Riblett, Carl H., forest ranger, U. S. F. S.  
 Richards, E. C. M. (Yale For. School, '11).  
 Ricketts, Howard B., clerk, U. S. F. S.  
 Ringland, Arthur C., Capt. 10th Eng. (Forest), (Yale For. School, '05), forest inspector, U. S. F. S.  
 Rixson, C. L., forest clerk, U. S. F. S.  
 Roberts, Wesley K. (Uni. of Wash., '18)).  
 Robertson, Colin C. (Yale For. School, '07).  
 Robinson, S. E. (Yale For. School, '12)).  
 Rockey, K. E. (Yale For. School, '12).  
 Roeser, Jacob, Jr., forest assistant, U. S. F. S.  
 Root, Lloyd (Mt. Alto For. Acad., '17), Co. C., 10th Eng. (Forest), Pa. Dept. For.  
 Rowland, Arthur L. (Mt. Alto), Pa. Dept. For.  
 Rowland, Horace B., Jr. (Mt. Alto For. Acad., '15), Co. F., 10th Eng. (Forest), Pa. Dept. For.  
 Rush, William M., forest ranger, U. S. F. S.  
 Russell, Joseph P. (Uni. of Wash.).
- S**ADLER, George M., forest ranger, U. S. F. S.  
 Salton, Robert C., forest ranger, U. S. F. S.  
 Sanford, E. C., 1st Lt., 10th Eng. (Forest), forest supervisor, U. S. F. S.
- Sanger, Owen J., 1st Lt. Canadian Contingent (Uni. of Wash.).  
 Schaefer, Oscar F., forest ranger, U. S. F. S.  
 Schmaelzle, Karl J. (Uni. of Wash.).  
 Schmitz, Henry (Uni. of Wash., '15).  
 Schowe, William A., forest ranger, U. S. F. S.  
 Scofield, William L. (Yale For. School, '13), for. rang., U. S. F. S.  
 Segur, Lewis L., forest ranger, U. S. F. S.  
 Seltzer, J. W., 2nd Lt., 10th Eng. (Forest), (Pa. State For. Acad., '09), forester N. J. Zinc Co.  
 Senft, Walter M. (Mt. Alto), Pa. Dept. For.  
 Sheeler, George W. (Mt. Alto, '12), Co. C., 502d Service Bat., Pa. Dept. For.  
 Shepard, H. B., 2nd Lt., 10th Eng. (Forest), forester Lincoln Pulp Co.  
 Shenefeldt, Ira Lee (Mt. Alto, '16), Co. C., 502d Service Bat., Pa. Dept. For.  
 Siggins, Howard W. (Mt. Alto For. Acad., '14), Co. C., 10th Eng. (Forest), Pa. Dept. For.  
 Silcox, F. A. (Yale For. School, '05), district forester, U. S. F. S.  
 Skeels, Dorr, Capt. 10th Eng. (Forest), Uni. of Montana.  
 Slomaker, L. Vernon, telephone engineer, U. S. F. S.  
 Smith, A. Oakley (Yale For. School, '14).  
 Smith, Edwin F., forest ranger, U. S. F. S.  
 Smith, E. H., 1st Lt. 316th Inf., Pa. State Forestry Dept.  
 Smith, Edward S. (Mt. Alto, '16), Nat. Army, Camp Meade; Pa. Dept. For.  
 Smith, H. A. (Mt. Alto, '16), Field Hospital Ser., Pa. Dept. For.  
 Stadden, Robert W. (Mt. Alto, '14), 20th Eng. (Forest), Pa. Dept. For.  
 Speers, Vincent E., forest clerk, U. S. F. S.  
 Speidel, H. A. (Yale For. School, '14).  
 Staebner, R. C.; eng., Little River Lumber Co., Townsend, Tenn.  
 Stanton, L. G. (Uni. of Wash., '18)).  
 Stevens, Carl M. (Yale For. School, '12).  
 Stewart, Clifford H., forest ranger, U. S. F. S.  
 Stewart, Jefferson M., clerk, U. S. F. S.  
 Stone, Everett B. (Yale For. School, '17).  
 Stuart, R. Y., Capt., forest inspector, U. S. F. S.  
 Stults, Hal L., forest ranger, U. S. F. S.  
 Swapp, Roy, forest ranger, U. S. F. S.  
 Sweeney, Joseph A., forest ranger, U. S. F. S.  
 Sweeney, Michael J., forest examiner, U. S. F. S.
- T**HOMPSON, Jackson (Uni. of Wash., '16).  
 Thompson, Raymond H., forest ranger, U. S. F. S.  
 Tweedy, Temple (Yale For. School, '14).  
 Thomas, Harry L., Co. C., 10th Eng. (Forest), for. rang., Pa. Dept. For.  
 Thomas, John, 10th Eng. (Forest), for. rang., Pa. Dept. For.
- V**AN WICKLE, J. M. (Uni. of Wash.).  
 Van Arsdall, Howard (Mt. Alto), Pa. Dept. For.  
 Voight, Alfred W., forest ranger, U. S. F. S.  
 VanHorn, Harry E. (Mt. Alto For. Acad., '14), Co. A., 10th Eng. (Forest), Pa. Dept. For.
- W**AGNER, G. C., Jr. (Yale For. School, '18)  
 Walsh, Harry A., Capt. Quartermaster's Dept., U. S. F. S.  
 Ward, Herbert S., clerk, U. S. F. S.  
 Weitknecht, Robert H., forest assistant, U. S. F. S.  
 Wells, Arthur B. (Mt. Alto, '11), 18th Machine Gun Co., Pa. Dept. For.  
 Westfeldt, W. O. (Yale For. School, '16)).  
 White, Martin E., forest ranger, U. S. F. S.  
 White, William E., forest examiner, U. S. F. S.  
 Wilcox, J. M., Corporal Inf. (Uni. of Wash., '20).  
 Williams, Hubert C., 1st Lt. 10th Eng. (Forest), (Yale, '08).  
 Wilson, Stanley F. (Yale For. School, '14), for. rang., U. S. F. S.  
 Wirt, William (Uni. of Wash., '18).  
 Wisner, —, Corp. 20th Eng. (Forest), (Syracuse, '17).  
 Wohlenburg, E. F., 2nd Lt., 10th Eng. (Forest), forest examiner, U. S. F. S.  
 Wolfe, Kenneth, forest ranger, U. S. F. S.  
 Wolfe, Stanley L., 1st Lt., U. S. F. S.  
 Woolsey, Theodore S., Jr. (Yale, '02); designated as timber negotiator in France.  
 Woodruff, James A., Lt. Col. 10th Eng. (Forest).  
 Woods, J. B., 1st Lt. 10th Eng. (Forest).  
 Work, Herman, 1st Lt. 10th Eng. (Forest), deputy forest supervisor, U. S. F. S.  
 Wulff, Johannes (Yale For. School, '17).
- Y**EOMANS, E. J. (Yale For. School, '12), for. rang., U. S. F. S.  
 Young, L. P., 2d Lt. Inf. (Uni. of Wash., '17).
- Z**ELLER, R. A., forest assistant, U. S. F. S.  
 Zieger, Robert H., forest ranger, U. S. F. S.  
 Ziegler, E. A., Capt. Coast Art., Direc. Pa. State For. Acad.



## FORESTRY AT BATES COLLEGE

UNDER the will of Benjamin C. Jordan, of Alfred, Maine, Bates College, of Lewiston, Maine, received a legacy for the development of a Department of Forestry. There were conditions under the will, as there were various legatees, including daughters of Mr. Jordan, and there were numerous obligations to be met before any part of the legacy would be available. The various outstanding obligations have now been met. A daughter of Mr. Jordan, under the terms of his will, was to be the recipient of all the income of the estate that might accrue when all debts had been paid. She is a graduate of Bates and in loyalty to her alma mater has relinquished a share of her income in order that her father's wishes might be carried out as early as could be found practicable.

Mr. Jordan had been for many years a trustee of Bates and one of his brothers is the head of the Department of Chemistry at the college. The college will ultimately have large resources for its forestry work, but for a few years the amount available will be only moderate. It does, however, permit the college to employ a thoroughly prepared man to take charge of the department. It also affords the requisite laboratory facilities. The amount available for this department is likely to increase from year to year. The estate of Mr. Jordan included some 14,000 acres of good timber land, situated in different counties in Maine.

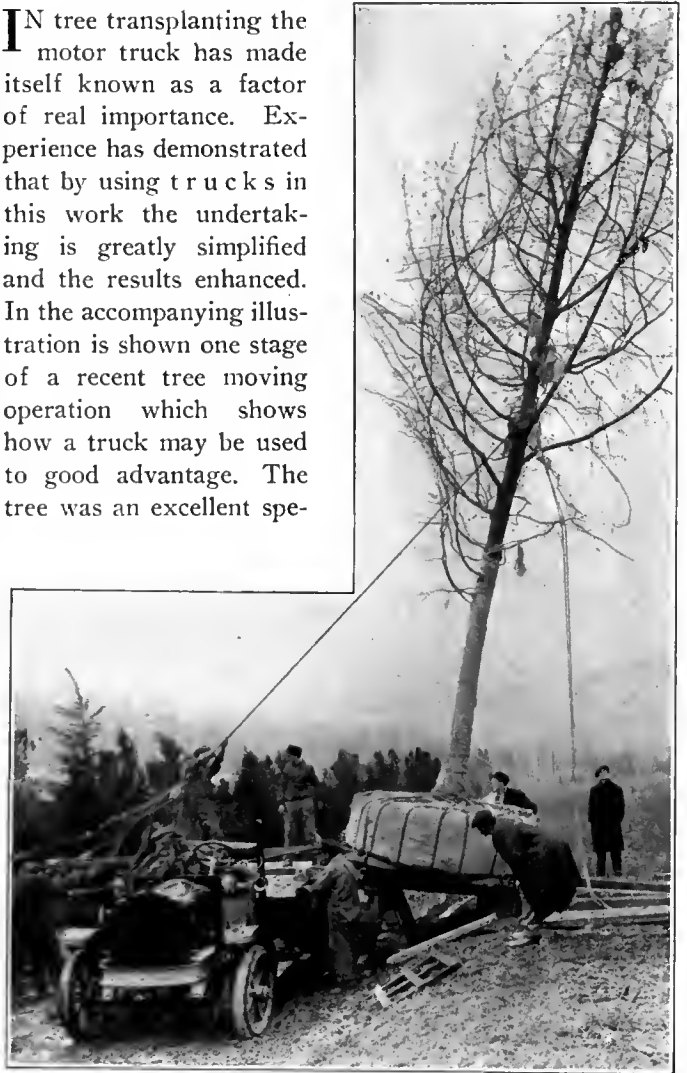
President George C. Chase writes AMERICAN FORESTRY that Bates is now endeavoring properly to correlate her educational work in forestry with other work in such a way as to give a good knowledge of forestry to students interested in this subject and, at the same time, to assure to them a reasonable degree of culture and breadth of knowledge.

## CHANGES AT THE GEORGIA STATE FOREST SCHOOL

SINCE it was necessary to divide the work left by the men who had been called under the draft at the State Forest School of the University of Georgia, at Athens, the Forest School has been combined with the division of plant pathology. Most of the efforts at the school during the period of the war will be directed toward a control of plant diseases, supplemented, of course, by a certain amount of work in forestry. Two projects have been approved, one of which provides for a field agent in forestry and plant pathology, and the other for a specialist in plant pathology. Under the first, Mr. James Godkin, who had his undergraduate work at Connecticut and his graduate work at the Michigan Agricultural College, has been appointed. An arrangement has been made with Dr. Humphrey, of the Office of Cereals, for the stationing of six specialists within the State, whose sole work will be the control of cereal diseases, and there will be full and cordial co-operation between the State and the university in the conduct of this work. It is now confidently expected that the coming year will see at least a dozen men specializing in plant pathology at work within the State, the result of whose labors will be of great benefit and value.

## TREE'S LONG JOURNEY ON TRUCK

IN tree transplanting the motor truck has made itself known as a factor of real importance. Experience has demonstrated that by using trucks in this work the undertaking is greatly simplified and the results enhanced. In the accompanying illustration is shown one stage of a recent tree moving operation which shows how a truck may be used to good advantage. The tree was an excellent spe-



cimen of oak, forty feet in height and 13 inches in diameter. The trip made by this oak was from its native nursery, near Philadelphia, to the estate of Eugene Du Pont, at Greenville, Delaware, a distance of  $42\frac{1}{2}$  miles. The tree was lifted from the ground with its roots encased in a ball of earth weighing approximately 8,500 pounds. The weight of tree and rigging was estimated at 2,000 pounds, making a total weight of 10,500 pounds. The tree was loaded and unloaded without injury and the trip was made without mishap of any kind. The success of the undertaking has convinced those concerned that the use of the motor truck in tree removal opens up new possibilities for transplanting.

AN Omaha chemist is experimenting with the roots and stems of manzanita, a common shrub which forms a part of the chaparral on the Pacific Coast, as a source of dye. A carload of the wood has recently been shipped from Northern California for this purpose.

THE annual value of the farm woodlot products of the United States is \$195,000,000.

# T H E P I N E

BY MABEL  
P O W E R S

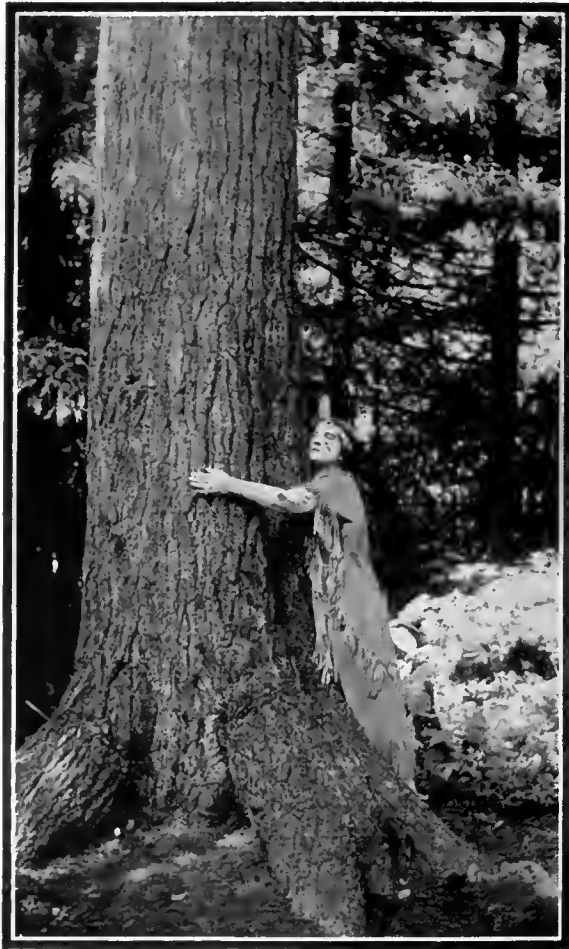
(Y e h s e n n o h w e h s --- O n e W h o T e l l s t h e S t o r i e s)



**A**ND thus spake Osoah, the Pine, unto me in the Land of the Mohawks.

In Nature's law only is there freedom, strength, content. I know for I have kept Her Law.

I am Osoah, the Pine, Myself--the Guide of the Forest. I point the way to men. Hearken unto my voice, observe my signa and take to the Great Sky Road.



From my topmost branches thou may'st determine thy direction and keep the needle of thy soul pointing true north.

When the sun sleeps and the cloud blanket drops low, from me can'st thou learn where the east trail winds and the west trail leads. Look to my towering crest.

Wound me, bruise me and I will pour the balm of my love upon thee. In the breath of my spirit may'st thou find healing and peace.

Always my arms are outstretched to welcome and bless thee, the great heart of my tree trunk yearneth for thee.

Summer and winter, in sunshine and storm, yea in all seasons and weathers, I stand strong, steadfast, unchanged, the same.

In cities distant, in the maddening whirl of self and things, my call ever com'st to thee.

As in a dream thou hear'st my low-breathed love murmurs and seekest me as the young the brooding mother bird.

Again and again shalt thou return, sit at my feet--and listen until thou too become steadfast, true, Thyself, in love and truth fulfilling the law.

The Sky is not far! Osoah the Pine hath spoken, and hath pointed thee, the Great Sky Trail!

# "DOCTOR MOUNTAIN"

BY MARK DANIELS

FORMER GENERAL SUPERINTENDENT OF NATIONAL PARKS

SOME true friends of old Daniel Grogan, whose machine shop had of late been failing to pay dividends, finally persuaded him to take a trip to the mountains. They had called at his office one day and told him he was going with them to the Sierras, where health and happiness lie.

"Go on wid ye! It's you boosters that do most av the lyin'," he said, and slid farther down into his chair thereby bringing a recently acquired embonpoint into more or less violent contact with the corner of the table.

Perhaps it was the whispered expletive which gave them the cue, for they finally succeeded in persuading Mr. Grogan that a trip to the mountains would not only take a load off his feet but off his mind as well, for he had been failing to outwit his competitors for some time, and it worried him. A few

days later, three of them emerged from a grove on the north side of the Valley and stood, breathless, before the indescribable majesty of the Falls of the Yosemite.

Grogan slowly removed his hat and above the roar of the Falls were heard the words, "Great God Almighty!" in Grogan's ringing bass. The three

stood reverently for several minutes before those crashing falls, that towered like a pillar of purity a half mile above them—and then silently walked away.

For the next ten days Daniel Grogan was seen in early morning and at sunset on the trails and in the canyons, on the mountain peaks and below the roaring falls, by the placid lakes and beneath the towering sequoias; a silent and thoughtful man.

When the time came to leave he wrung the Superintendent's hand.

"I've seen but a bit of Yosemite Park. But I've seen yure river on ind, yure half dome skyscraper, and yure trees that are so big ye can only see 'em in yure dreams, and

I've got more inspirations out av thim than are in two ingine boilers full o' highballs. I'm going back to Frisco, too, an' build a machine shop that'll make more noise



THE GLORIOUS BEAUTY OF THE YOSEMITE NATIONAL PARK—THE UPPER FALLS

Truly has it been said: "I will open rivers in high places and fountains in the midst of the valleys"—and many there are who can bear witness to the wonderful healing brought to sick bodies and jaded nerves through the medium of inspiration found here.

than yure upinded river, the difference bein' that there'll be no wather in it, save for me own drinkin', which same'll be all I'll be drinkin' this day forth."

As to his success in fulfilling his promises, it may be said, in passing, that upon his death he left an estate of such size that the income from it pays the traveling and other expenses of his two progeny, who annually go abroad for mountain scenery.

Mr. Grogan found, as others have found and others will ever find, that health of body is only one of the rewards of travel in the rugged mountains. There is the effect upon the mind, the imagination—upon the soul, as well.

The statements of the doctors, that a trip to the mountains each year will keep us in better health, has lost its punch. The fact that the capacity to resist the inroads of disease and the lure of the fleshpots decreases inversely, as the square of the waist measure has lost its terrors. So long as the business is running along smoothly and the tango tea is popular, why worry about the increasing pressure of the waistcoat? Why heed the cry of wolf? But it frequently occurs that the business ceases to run so smoothly, and all efforts fail to bring imagination, inspiration and ingenuity to the rescue. Here is a pure case for the mountains.

There is no doubt that certain of our mental faculties become sluggish through disuse. Few men can follow, for many years, the humdrum existence of daily business life, and retain all their mental faculties in healthy, active condition. Generally it is the imagination which flags first. When this condition comes on, what is needed is a

shock, such as Mr. Grogan received when Yosemite Falls burst upon his view. It is a sort of mental shower, acting upon the mind much as a cold plunge after the steam room acts upon the body.

The high mountains give you just this, and more. After your dormant faculties have been shocked into life by their stupendousness, they present you, on every side, with sublimity, magnificence and grandeur that stimulate the imagination and rejuvenate ambitions. It is a serious case, indeed, which does not return, after a three-week treatment with Nature's mental glove stretcher, filled with new ideas and fired with the ambition to carry them out.

I was once working up the trail that leads along Bubbs Creek from King's River Canyon to Kearsarge Pass, on the summit of the high Sierra of California. There is a climb of about 8,000 feet from the floor of the canyon to the summit, but the view from the top is worth the climb. The crest of the Sierra Nevada in this vicinity is an endless line of jagged peaks and minarets which, silhouetted against a sapphire sky, appear as sharp as saw teeth. These mountains rise more or less gradually from the west to an elevation between 13,000 and 14,000 feet, and, as if satisfied



HERE IS FOUND REST AND PEACE—THE STILLNESS OF THE WATER AND THE QUIET OF THE HILLS

Not all the Alpine scenery of this continent is to be found in the Northwest. Colorado and the Rocky Mountain National Park boast of some of the best that we have, which claim attention on the ground of propinquity as well as for their native beauty.

with having reached the highest elevation in the United States, drop off abruptly to an elevation 3,000 to 4,000 feet above sea level.

As we approached the summit, a motionless figure was distinguished, sitting upon a rock on the very edge of the Divide. He was so still that he seemed a part, as he was in color, of the brownish-grey rocks of this edge of

the earth. Ignoring me in a manner that stamped me as a tenderfoot, he asked Pete, the packer, if he had any "chewin'."

Pete silently handed him a plug of tobacco, that all but disappeared behind the hairy front, which immediately and silently began working upon the biggest chew of tobacco I have ever seen taken. He deigned no reply to Pete's remark that he might better have kept the plug and returned the chew, nor gave any sign of gratitude, save by a slight moisture in his sun-reddened, grey eyes. The silence, for some minutes, was broken only by the hiss of tobacco juice as he spat at a small rock that seemed particularly placed by nature as a target. Finally, this sort of chewing sphinx apparently felt that he had reduced his hunk of "miners' candy" to a constituency that justified letting up on the helpless thing for, as I was about to frame a question, he turned to me and said:

"Son, I've got a mine about a mile lower down and it's good, if anyone can figger a way to git machinery in and ore out of 'er. On my way up, I lost part o' my pack and all o' my terbaccy. While I was a-sittin' here, tryin' ter decide whether ter go back for terbaccy an' another whirl at the old mine, a idea struck me. Settin' on top o' the world here, where you kin look straight

down about two mile, sorter wakes a feller up an' a settin' here, I figgered how I could work that ole mine. All I needed then ter make this view perfect, was a plug o' Honey Dip Twist."

Pete reminded him that he was chewing on a hog's share of one at that moment.

"Sure," he said. "I guess this is my lucky day. If those desert rats 'd run up here oncet in a while, I b'lieve they'd git enough ideas ter make them Bodie Mines pay big. You see, up here, you're two or three mile nearer God," (pointing to the Owens River, 10,000 feet below, which looked like nothing so much as a fine silver thread reaching toward Death Valley, over 14,000 feet below us), "and mebbe that's how come these idees so fresh and easy like."

We talked about mines and mountains, and left him adjusting the pack to a tiny burro which had been nodding in the shade of a huge boulder. All thoughts of this curious philosopher were banished by the glorious scene over the Owens River Valley, as we followed the trail that led down, down, down, to the little town of Independence.

During the last half mile of descent the rays of the setting sun and the shadow of the range we were on slowly crept up the Panamints until only the tops were



FISH CREEK CANYON, APACHE TRAIL, ARIZONA

The canyons of Arizona seem to have supplied the colors of the world in making. Purples, greens, blues, scarlets and tawny browns shift and play with kaleidoscopic variety as the sun passes overhead.



THE WONDERFUL COWLITZ GLACIER, IN RAINIER NATIONAL PARK

This spot, one of the best-loved by the tourist in the National Parks, shows the Cowlitz Glacier, one of the few presenting the actual appearance of having flow lines. It is one of a system of ninety or so glaciers that mantle one of the most noble mountains of the earth.



HERE WE FEEL THE VEIL OF MYSTERY SHROUDING THE LIVES OF A FORGOTTEN RACE

These are the Tonto Cliff Dwellings in Arizona. About three miles from the Roosevelt Dam are two groups, one of which is shown in this photograph. An automobile may be driven to within a few hundred yards of them. Nothing that the Forest Service has taken up in the way of preservation in this vicinity has met with more approval on the part of the residents of the district than its announcement that these ruins are to be repaired and set aside.

bathed in a russet glow which seemed to remain for a spell, to be suddenly snuffed out, leaving us, as we emerged onto the valley floor, to follow the trail by the moon's pale light.

Four years later, as I was walking along the Beach Drive in San Francisco, I noted an automobile of considerable wheel base and style standing beside the road. Approaching it, I recognized the old miner, though his flowing white beard was now neatly trimmed a la Van Dyke, and his battered Stetson had given way to one with a pretentious brim and neatly creased top. He recognized me at once and extended a cordial hand which had lost little of its grip. We chatted a while, and I finally asked him if his mine worked out as a result of his inspiration on the summit.

"Son," he said, "this outfit is mine. I'm payin' that driver by the month an' I've got a diggins on Blank ave-

ue, with two wranglers an' a cook. Some day I'm goin' back on them mountains to see if I kin git another idee how to spend some o' the money I'm gettin' from that mine."

Why do not more people take the soul cure in the mountains?

Perhaps it is because they do not believe in it or do not approach the mountains in the spirit of appreciation.

It is as necessary that one be in a receptive frame of mind in traveling on the top of the world as elsewhere, to get the benefits from association and contemplation. The chances are, however, that comparatively few know what they are, where they are, or where to get to them. If our

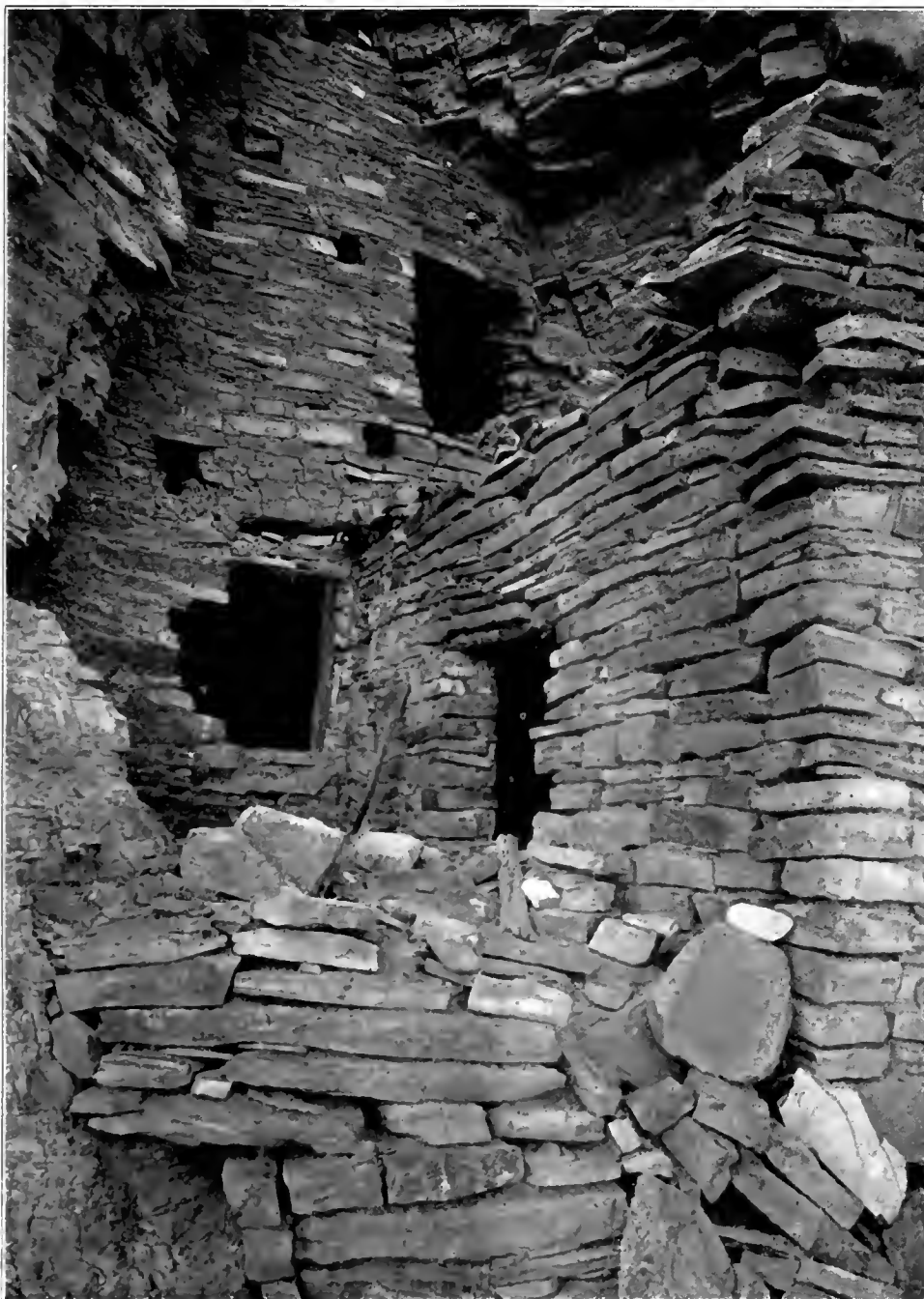
National Parks were within the borders of an European country, their glories would be emblazoned upon the waiting-room walls of every railroad station on the continent, and many in this country; for, in Europe, they have learned that scenery is a natural resource, like many other of nature's products.

It might further be stated that the several hundred millions of dollars which under normal conditions leave this country annually with the tourist travel to Europe, would very likely be doubled.

It is true that many go to Europe to acquaint themselves with the habits and customs of a foreign people;

but not all that go there. Nor is this the cause of so few visiting our own unequalled scenery.

Most people simply do not know what we have here. How many have heard of Sequoia National Park, with the bluest sheet of water in the world nestling in the great crater of an extinct volcano, or of Mesa Verde National Park, with its canyons and mysterious cliff dwellings, each one an elixir of life for a sinking spirit?



CLIFF DWELLINGS, CHERRY CREEK, SIERRA ANCHA, APACHE TRAIL, ARIZONA

The great Southwest adds the lure of mystery, antiquity and romance to her scenic attractions. The remaining ruins of three distinct races are scattered throughout central Arizona. The Cliff Dwellings in the Cherry Creek Canyon country in the vicinity of Roosevelt are amongst the finest in the United States, and have attracted many noted archaeologists.



THE SPIRIT OF A LONG GONE AGE STILL INVESTS THIS SPOT WITH BEAUTY AND ROMANCE

In Apache land, near Roosevelt, there is a canyon named Pueblo, which is a thousand feet deep or more. Near its source the gorge is so narrow that a stone can be thrown from one wall to another, and here the ancient Cliff Dwellers built their homes in great caverns that gave out on similar caves across the canyon. Among these crumbling ruins, which still speak strongly of the lives they sheltered, one feels most keenly the mystery of a race forgotten, long vanished from the earth.

We struggle for gain and advancement, and the success attained is generally at the expense of bodily health and spiritual vision. "What shall it profit a man, if he shall gain the whole world and lose his own soul?"

And yet, if there is merit in the contention that environment is a potent factor in man's development, how shall he save it from shrinking unless he sometime walks out of the sordid city streets into the open spaces where he can see and think in three dimensions?

If the body is afflicted with disease we may have re-

course to the family physician; but if the soul is sick go to the mountain. He is a soul doctor. He will purge you with the sight of yawning chasms, lofty towering peaks and cliffs, and when your reeling senses have settled down to the correct realization of proportion and the relative importance of things, he will nurse you through spiritual convalescence with azure skies, sapphire lakes, scented forests, mountain meadows, tumbling cascades, and the health-giving ozone that God gave, to be breathed by man created in His image.

**S**TATISTICS compiled by the National Lumber Manufacturers' Association show that during the 12 months ending July 31 the mills reporting cut 15,602,000,000 feet of lumber and shipped 15,741,000,000 feet, or 8.9 per cent more than production. Shipments for the first seven months of this year were 7.7 per cent more than last year, with no increase in cut. During July of this year 732 mills in all parts of the country and operating in all kinds of timber, cut 1,339,000,000 feet and shipped 1,566,000,000 feet, or 12.7 per cent more than production. The cut in July this year was 1.3 per cent less than July last year, with shipments 19.5 per cent greater.

**A**FTER generations of protection from the ax of woodsmen, thirty-five acres of fine old oak trees near Whig Lane, New Jersey, have been dedicated to the building of the Government's Emergency Fleet. Many of the trees reach a height of 60 to 70 feet and they are supposed to be from 150 to 200 years of age. The land on which they grow has been in the Richman family since the early settlement of Western New Jersey. It was only with the need of the United States for timber for shipbuilding that the consent of the family was obtained for cutting the trees. The largest oaks are cut into big beams and material for keels. A yield of 2,000,000 feet of lumber is expected.



# THE NUTHATCHES AND THE CHICKADEES

(Families Sittidae and Paridae)

BY A. A. ALLEN, PH.D.

Assistant Professor of Ornithology, Cornell University.

CLOSELY related and formerly placed in one family (*Paridae*), the nuthatches and the chickadees are associated in more than name, for after the nesting season, they gather in loose flocks and spend the cold winter months together. Seeming to enjoy their company, other winter birds often follow them, so that when one hears the *yank-yank* of the nuthatch and the scolding *chick-a-dee-dee* of the chickadee, he may look also for the slender brown creeper winding its way up the bole of the tree, the downy and hairy woodpeckers, the golden-crowned kinglet, and often for a merry troop of tree sparrows. Not only are they sociable among themselves, but for mankind they seem to have little fear, and gather about suburban dwellings wherever food is offered them. Except in northern Canada, most species are non-migratory and spend the winter in the vicinity of their summer homes. If one wishes to have them about the garden all through the winter, he should begin putting out sunflower seed and pieces of suet, as direct-

tions during winter, and have recaptured the same birds in the same traps the following winter. The author has placed bands upon the legs of chickadees and nuthatches coming to his window during the winter and has had the same birds nesting in the vicinity the following spring and bringing their young for food to the same window the following fall.

The garden in which sunflowers have been planted will do more than anything else to attract the nuthatches and chickadees because both are more fond of these seeds than anything else. The sunflowers can be left standing or the seed can be used at the window shelf

with equal effective results. The oils in the sunflower seed and the fat of the suet seem to take the place of insects, for both birds are insectivorous, and when not actually at the feeding shelf spend their time gleaning about the trees for hibernating larvae and insect eggs. During the summer they feed almost altogether upon insects and it is, therefore, very much worth while to expend the little



• A WINTER CHICKADEE

If you'd like to have them stay with you all winter, just provide plenty of seed and suet, for snow and ice hold no terrors for this winter sprite, but food must be provided.

effort necessary to entice them to the home grounds.

There are 241 species in the chickadee family, found in most parts of the world except South America and the Pacific Islands, but most abundant in the northern hemisphere. In North America there are but fifteen species represented, extending southward into the mountains of Mexico. Of these, six species are known as chickadees, four as titmice, three as bush-tits, one as a wren-tit, and one as a verdin, but all are alike in being small fluffy birds with long tails and sharp, pointed bills. The chickadees are dull grayish birds, lighter below, with conspicuous black crowns and throat patches. The Hud-

ed in *AMERICAN FORESTRY*, December, 1915, in October or November, because it is at this time that their numbers are increased by the visitors from the North, and where they find an abundant food supply they are apt to remain all through the winter. When one has been feeding the birds for several seasons, there is every reason to believe that the same birds return year after year to the same feeding stations, just as it is known that they return to the same nesting spots. Members of the American Bird Banding Association, as reported by the secretary, Mr. H. H. Cleaves, have placed bands on the legs of several species of birds trapped at feeding sta-

sonian chickadees, of the Far North and the mountains of Northern United States, which come southward in winter irregularly, have the top of the head brown rather than black, and the mountain chickadees of the Rocky



"IN UNION THERE IS STRENGTH." MORE POWER TO 'EM!

Chickadees and nuthatches are associated in more than name. After the nesting season they assemble in loose companies and make common war upon hibernating insects—and here they are, hard at it.

Mountain region have a white stripe over the eye, but all six species are easily recognized by anyone familiar with the common chickadee. In fact, the Carolina chickadee, of the Southern States, is so similar in appearance to the common chickadee that it can scarcely be distinguished from it in the field. The songs and call-notes of the different species vary considerably but all have a common likeness. The scolding call of the common species gives the name to the family, for it is a clearly enunciated *chick-a-dee* or *chick-a-dee-dee*. In other species it is less clear, more highly pitched, or more nasal. In addition to this note, the chickadee has a song of two or three sweet whistles resembling the syllables *phe-be* or *phe-be-be*, so exactly that amateur bird students are often led to believe that it is a phoebe calling. Also, as the chickadees troop through the woods, they have a variety of conversational notes rather difficult to describe. When protecting its eggs or young, the chickadee utters a hissing or sputtering sound, if disturbed, which is sufficient to discourage any unsophisticated

squirrel from further investigation of the contents of the hole.

During March and April the flocks break up and pairs of chickadees can be seen prying about decaying stubs or old woodpecker holes looking for a place to build their nests. Even though their small bills do not seem adapted to chiseling, they usually find a stub sufficiently decayed for them to excavate their own cavities. During recent years, however, they have come more and more to accept bird houses such as those built for wrens. At the bottom of the cavity they build a warm nest of vegetable fibers, moss, plant down, wool, etc., and lay often as many as nine tiny speckled eggs. What is more remarkable, they often succeed in rearing all nine youngsters.

In spite of the fact that they begin selecting their nesting site in March or April, the eggs are not laid until May, but the young are out of the nest early in June, giving them time for another brood, which, however, is usually smaller than the first.

The chickadees are friendly, inquisitive birds and it is not only at the winter feeding stations that they become



BRACELETS FOR BIRDS

Aluminum bands, such as this one on the leg of the nuthatch, are proving that some birds winter in the same spot every year as well as that they return to the same place to nest. Likewise, they have shown that in most places chickadees and nuthatches do not migrate.

tame. They are always ready to answer an imitation of their *phe-be* call and will come flying through the woods to greet the traveler, perching on the branches above his head, sometimes even dropping to his shoulder or hover-

ing a few inches in front of his face in a vain endeavor to discover the whereabouts of the other chickadee.

The titmice, as the name is now restricted, differ from the chickadees in having the crown feathers elongated in the form of a crest. The tufted titmouse of the East and the plain titmouse of California and Oregon are the best known species, the other two being Mexican, and coming into the United States only in Texas and Arizona. The tufted and the plain titmice are uniformly gray, a trifle larger than the chickadees, but with the same cute ways

of flitting about the outer branches, hanging upside down, peering under leaves, and ex-

Like the chickadees, the nuthatches are largely confined to the Northern Hemisphere. There are about seventy species, of which only four are found in North America. They are bluish-gray birds, brighter than the chickadees, with white or rusty underparts, and with the top of the head brown or black. The chief characteristic of the nuthatches is their habit of climbing the trunk and larger branches of trees in search of insects, upward or downward with equal facility. Unlike the woodpeckers, they do not use the tail as a prop, nor are their feet arranged with two toes forward and two backward. Instead they have the ordinary perching type of foot with three toes forward and one backward. Both the toes and claws, however, are, of necessity, much better developed than in ordinary perching birds. Certainly they seem to have no difficulty in spiraling about the trunks of trees and, in fact, they have been known to sleep hanging head downward, clinging to



WILL IT DO?

A prospective tenant inspecting a nesting box. He seems to be somewhat in doubt.



HIDDEN TREASURES

Inside the knot-hole are seven young nuthatches, jealously guarded by the mother.

aming the crevices of the bark. The loud whistled call of the tufted titmouse, *peto-peto-peto*, is one of the familiar sounds of the southern woodlands, while the *tu-whit, tu-whit, tu-whit*, of the plain titmouse is always associated with the live oaks of California.

The wren-tits and the bush-tits are browner birds than the chickadees, the wren-tit being more or less wrenlike in its brown garb and its habit of holding its tail tilted upwards. The bush-tits are mere sprites of bird life, over half of their length of four inches being tail, so that their bodies seem scarcely larger than the end of one's thumb. In habits they resemble the chickadees with the exception that they build long purse-like nests of soft materials, hanging them usually in thickets of ash and willow.

The verdin is quite similar to the bush-tit in size and habits, but its whole head, neck and chest are bright yellow. It lives in the mesquite valleys of the Rio Grande, the Colorado, the Gila and the Pecos Rivers of the Southwest where, from the thorny bushes, it scolds and sputters at every intruder.



HE LIKES SUET

Some good friend has remembered that this is the favorite dish of the red-breasted nuthatch.

the bark beneath a jutting limb. They are lively little creatures, always on the move, peering at one from strange angles, and their contented *yank-yank* adds much to the cheerfulness of the northern winter. The name nuthatch is supposed to be a corruption of *nut-hack*, derived from their universal habit of wedging the bark and then hacking them open. The white-breasted



A CAREWORN MOTHER

There are nine young hopefuls inside this hollow stump, and they demand so much attention that they allow her little rest.

nuthatch is the commonest species and is found throughout United States and Canada from the Gulf States to Central Ontario, preferring open woodlands, roadsides and gardens. It is pure white beneath, except for the under tail coverts which are reddish brown, and bluish-gray above, the top of the head and neck being shining black. In the female the black is more or less veiled with gray.



A PERKY MEMBER OF A FAMILY OF NINE

There is no danger of race suicide among chickadees, for large families are the rule, and this one looks fully able to paddle his own canoe.

The red-breasted nuthatch nests only in the northern part of its range from northern United States to Alaska, but, in winter, it wanders as far south as the Gulf States. It is somewhat smaller than the white-breasted species, having the entire underparts, except the throat, rusty, and having a white stripe over the eye. It has a partiality for pine trees but, like its white-breasted cousin, it comes freely to the window for suet and sun-



PLANT SUNFLOWERS IF YOU WOULD ATTRACT THE FRIENDLY CHICKADEE

The chickadee is very fond of the seed and the flowers may be left standing, or the seed removed for use at the window feeding shelf.



AN UPSIDE-DOWN NUTHATCH

Nuthatches travel upward and downward with equal facility and never use the tack as a brace, as do the woodpeckers.



CHICKADEES ALWAYS SHOW THEIR APPRECIATION

"Give us a hand for friendship's sake"—and feed the birds this winter. You'll be well repaid for your trouble.

flower seed. Its notes are very similar but higher pitched and more nasal like the syllables, *yna-yna*.

The brown-headed nuthatch is confined to the southeastern United States from Delaware and Missouri to Florida, frequenting the extensive pine forests. It is smaller even than the red-breasted species, and its notes are different from either of the preceding, a conversational *pit-pit* and a scolding *dec-dec-dee*, being the most familiar.

Similar in appearance and habits but still smaller, measuring sometimes less than four inches in length, is the pigmy nuthatch of the Rocky Mountains.

The nesting habits of the North American nuthatches are much alike. They usually select a knot hole in the trunk of a tree, occasionally a woodpecker's hole, and line it with feathers, leaves, wool, etc. They lay from four to nine white eggs, which, differing from the majority of hole-nesting species, are heavily marked with brown. The common European nuthatch has the curious habit of plastering up the entrance to its nest with mud until the opening is just the right size, and the American red-breasted nuthatch usually decorates the entrance with nodules of pitch as if to make the entrance less attractive to squirrels and other enemies.

## A TRAIL MARKER

BY LENA B. HUNZICKER

AT Old Town, San Diego, California, at the foot of Presidio Hill, stands a venerable palm tree, the Plymouth Rock of the Pacific Coast, the oldest living object to tell the story of the coming of the Spanish to Upper California in 1769.

The seed from which this remarkable old tree grew was brought with the provisions and supplies of the Spanish expedition and is said to have been planted by Padre Junipero Serra in 1769. Until some five years ago two palms of this first planting were still growing.

It is said that the only time the trees bore fruit was



THE "PLYMOUTH ROCK" OF THE PACIFIC COAST  
The palm at Old Town, San Diego, California, a landmark and still beautiful, said to have been planted by Padre Junipero Serra in 1769.

in 1869, one hundred years after their planting. Fronting a public highway they became much scarred, until in 1887 they were enclosed in a fence to protect them from further injury. A severe windstorm some five years ago so badly damaged the smaller one that it had to be cut down. A portion of the old trunk has been placed in the museum at Ramon's Marriage Place, at Old Town. The other tree has been braced and bids fair to live many more years.

HARRY C. HYATT, city forester for Cleveland, Ohio, warns the people of Cleveland that constant vigilance is necessary for successful tree culture in a congested city. His department has the care of more than 125,000 street trees and the trees in over 2500 acres of parks.

## A QUAIN BIT OF SENTIMENT

BY GAYNE T. K. NORTON

UP in the woods near Tuckahoe, N. Y., are two saplings, growing side by side, tall and straight. About eight feet from the ground they are joined, and in that joining lurks a bit of mythology and sentiment, for it is a true lover's knot, unknown and unnoticed by many who tread the path below.

It was the custom in old Arcady for a man and a maid upon their betrothal to go alone into the woods. There, two very young saplings, growing side by side with branches intermingled, were selected and in some way fastened together, by grafting, tying or splicing, so as the years passed, they would become as one. If the trees grew tall and straight above the knot all would be well in the lives of the couple; but woe to the unhappy pair did they grow apart. Great care was used in the selection, to see that no other tree would interfere with growth, and saplings sheltered from storms were sought for; and, once chosen, the young trees were carefully tended and watched. So the legend ran.

We, my companion and I who had found and photographed the knot, walked on, aglow with imagining the story it held, noticing not at all the chill of the January afternoon. A bit further on was a lad of eight, in sweater and rubber boots, brown and healthy, "discovering" his whistle.

Making ourselves heard we asked where a spring might be found. He led us to his home, showing the way to two chairs before a crackling log fire in a cozy New England kitchen. Behind us bustled a fat and smiling, middle-aged, motherly person, who, paying no heed to our protestations, set before us two steaming mugs of coffee, with sugar and cream—not the doctored, delicatessen kind, either—and a heaping plate of doughnuts, the specie with the hole in the middle. She talked while we ate; and what a treat it was! Then her husband came in, a big, strapping fellow in boots and furs, who bayed a welcome that made the tea-kettle cover vibrate. The motherly person brought him slippers and pipe, seated herself and knit-

ting at his side (she was doing socks for Canadian "boys" at the front) while "Tow Head," as he called our young guide, climbed to his lap. For minutes we listened to the fire, perfectly happy as the pipe smoke curled and the doughnuts settled. Then our host startled us.

"I expect you chaps are wondering about 'the knot?'" A contagious chuckle rumbled out as he noted the surprise. "I'm a bit of a woodsman," he explained, "and I saw you without bein' seen."

"May we have the story?" my companion asked.

The big fellow settled comfortably. His wife smiled happily, edging closer. "Tow Head" yawned.

"'Tain't much of a story," he began, "but here it is. You see my Granddad and Dad both lived long and happily up in Canada. They were both married over the 'knots' they'd tied, and swore by them. 'Twas only natural I should believe in the custom, too. So when I came down here—South, we call it—I brought it with me and when we became engaged," here he simply took the ready hand of his wife, "why we 'tied a knot.' That's longer ago than my wife cares to remember, so we'll forget the date. The end of the tale you see. The trees grew straight, that's all."

To give his name would be a sacrilege, but the knot-bound trees are there, by a path in the Tuckahoe woods, and the New England kitchen is not far distant.



A "TRUE LOVER'S KNOT" NEAR TUCKAHOE, NEW YORK

By an old custom a newly betrothed couple spliced two growing saplings together so they would become one. Such splicing caused the growth shown in this picture.

**I**N BUILDING the government fleet of standardized wooden ships one item is the use of creosote to prevent decay of exposed surfaces. The instructions to district officers of the Emergency Fleet Corporation provide that during the building of the hulls of these ships the joined surfaces of timbers and planking shall be treated with a coal tar distillate of the physical and mechanical characteristics required by the specifications for the brush treatment of poles adopted by the National Electric Light Association.

# FLOWERS, FEATHERS AND FINS

BY R. W. SHUFELDT, M. D., C.M.Z.S.

SOME of the handsomest and most showy flowers we have in our flora are not those that blossom on plants in the meadows, fields and marshes, but are to be seen, as spring opens, on some of the grandest trees of the forests. A conspicuous example of this is to be noted in the tulip tree.

Few there are among us who give any thought to the ancestry of trees, that is, to the evolution of trees in time—geologic time. For example, it is now known that our present-day tulip-tree is, as a species, the last of an extinct type which, ages upon ages ago, was extremely abundant. There are some seventeen species of tulip-trees, all extinct, in the Cretaceous formation alone. They have been discovered in Kansas, New Jersey, Wyoming and Nebraska, while other fossils of them have come from Greenland and Bohemia. Still other types have been discovered, mostly in Europe,

in the Tertiary formation. The flowers of the tulip-tree are well known, as they are large and very showy.

Throughout the Middle Atlantic States we have, in suitable localities, some shrubs and plants that do not flower until far into the autumn months. Some of these have already been figured and described in AMERICAN FORESTRY, while others were set aside to have attention drawn to them here. Among the shrubs there is the well-known and favorite sassafras and its beautiful berries, or what might better be designated as its fruit. It has been described as *Sassafras verifolium*, likewise as *S. officinale*, and it is the only species known to the botanist, occurring, as it does, principally east of the Mississippi and southward; it is also found in southern



THIS OLD TULIP TREE COULD TELL AN INTERESTING STORY

Fig. 1—Under certain favorable conditions, the Yellow Poplar or Tulip-tree (*Liriodendron tulipifera*) may come to be of a great age, attaining a height of an hundred feet or more. The one here shown is considerably higher than that, and it may be a century old. It is on a hill south of the National Zoological Park, Washington, D. C., and it is now on the decline.

Canada. As all know, its bark and roots are aromatic; and not only are its leaves green, but also its bud-scales, flowers and its small branches and twigs. One of the most curious things about this sassafras tree is, however, the form of its leaves; they are dimorphous—that is, the earlier ones are oval in outline and entire, while those coming out later are irregular in outline and three-lobed. In Australia there are other shrubs called sassafras, but they do not belong in the same group as our United States form. Still other shrubs bear the same name in South America, and some of these are magnolias.

Passing to the more humble plants of the fall months, there is a very interesting one in the Turtle-head, also known as the Shell-flower and Cone-head in some localities. It is found growing along streams and on the



A GLANCE AT THESE FLOWERS WILL EXPLAIN WHY THIS PLANT IS CALLED TURTLE HEAD

Fig. 2—There are three species of this Turtle Head (*Chelone glabra*), also called Snake Head and Balmoney, and all, with the exception of *C. lyoni* of the South, are prone to grow in wet and damp places. The flowers of this Turtle Head are white, tinged with rosy pink; while in *C. lyoni*'s Turtle Head the corolla is of a rich purple, with a decidedly rosy hue

edges of big swamps and marshes. Sometimes you will run across a fine plant of this species, doing beautifully among the rank vegetation springing up in an old ditch containing clear water. It occurs almost anywhere east of the Mississippi, flowering from July to September, according to locality. The plant is rarely seen north of Newfoundland, and it is not especially abundant anywhere. Regarded upon side view, one of the flowers rather reminds one of the head of a small turtle with its mouth open. Big bees, in serving it, have a hard time squeezing in past the pseudo lips of the matured blossom. Once inside, however, the insect's movements are communicated to the whole flower, while the former is entirely out of view. The "head" and "jaws" now seem to simulate those of a masticating turtle—in fact, an eyeless, white-headed turtle, tinged with



FEW TREES BEAR HANDSOMER FRUIT THAN THE COMMON SASSAFRAS (*Sassafras variifolium*).

Fig. 3.—This tree has been placed in the Laurel family (*Lauraceae*). The ovoid drupe or fruit of the Sassafras is at first a bright green or yellowish green; it then turns a deep bluish or purplish black, and has the form which is so well shown in the cut. The pedicels are of a reddish flesh color, cupped at their extremities. The early French settlers in Florida gave this tree its name, and it is generally found growing on the limits of rich woods.



IRONWEED IS ONE OF THE GLORIES OF THE FLOWER WORLD IN AUTUMN

Fig. 5.—This plant is also known as Flat Top (*Vernonia noveboracensis*), and it is a member of the *Compositae*. Its flowers are of a rich purple, and some thirty or forty of them make up a head. Sometimes it grows to be six feet high, and is then very conspicuous in the old fields and damp places.

pale pink, deliberately chewing and chewing a bumble-bee. The resemblance, which may last for an entire minute, is quite ludicrous.

The one who gave the vernacular name of "Elephant's foot" to the plant of that name must have been endowed with an unusually keen imagination—in fact, with a far-fetched faculty of seeing resemblances in forms as utterly unlike in every particular as those of a tea kettle and a crooked pin.

Elephant's foot is easily recognized either by its flowers or by the triangle of leaves or bracts that encircle them at their bases. Each head of this plant is composed of a cluster of several flowers. It blooms rather late in the season, and is generally found in dry places in the open woods—sometimes in great masses extending over from ten to twenty square feet. The thin, ovate-oblong leaves are somewhat hairy, and the plant is a perennial—that is, it appears year after year in the same localities.

When the autumn days come around, the flower world is represented by some very distinctive and conspicuous plants in the entire northeastern section of the United States. Some of these bear a certain resemblance to each other—at least some people seem to think so—such as the Iron-weed, the Joe-Pye weed, and the larger species of the purple asters. At the same time of the year, and pretty much in the same places—that is, in old fields and along country roadsides—are also seen in all their glory, several species of thistles; the milkweeds all in pods; the boneset, black-eyed Susan, and everywhere the coming goldenrods of several kinds. Of all these none is richer in color, or more conspicuous in size and massing than the elegant Iron-weed or Flat-top. Many species of big butterflies are now in evidence, and the well-known tiger swallowtail seems to be partial in its attentions to the flowers of this well-known plant. The one shown in the illustration, however, is a Viceroy butterfly, seen on side view (*Basilarchia archippus*); it does not show up very well for the reason that it lit within the shadows of the flowers and upper leaves of the plants. The former are tubular and the latter are alternate, nearly lanceolate, and have finely serrated margins, being withal very rough on both surfaces. *Vernonia* has its name from William Vernon, an English botanist of long ago, who, at one time, botanized in this country.

Passing to the thistles, this is a numerous and a sometimes puzzling group of plants, though not quite as much so as the goldenrods or the asters. Our common burdock is more or less nearly related to any typical thistle; and the bur of a burdock, when the purplish flower-head appears, quite closely resembles the corresponding parts in a thistle. The thistle shown in Figure 6 is one of our most abundant species; it is widely known as the Common or Bull Thistle. Its flowers are reddish purple, passing almost to a pink shade in some plants. In still other thistles they may be white, or even of a yellow tint. As in the case of so many other undesirable plants, the majority of our thistles found their way over from Europe.

"When the Danes invaded Scotland," says Neltje Blanchan, "they stole



THIS IS ELEPHANT'S FOOT (*Elephantopus*), AN INTERESTING PLANT THAT BELONGS IN THE GREAT COMPOSITE FAMILY (*Compositae*)

Fig. 4.—Three species of Elephant's Foot have been described, the one here shown being *E. carolinianus*,—a plant growing in dry soil from Pennsylvania to the Lakes and southward. The flowers, well shown here, are of a purplish color.



a silent march upon the Scottish camp by marching barefoot; but a Dane inadvertently stepped on a thistle and his sudden, sharp cry, arousing the sleeping Scots, saved them and their country; hence the Scotch emblem."

Thistle flowers are most attractive to some species of big bumblebees; but they pay well for their over-indulgence in their sweets. The latter are very abundant and unusually fragrant, so that these flowers are great honey producers of the finest quality. This induces the bumblebees to partake unduly of the generous supply so readily secured at each visit, and a species of intoxication is speedily produced in them, greatly interfering with their locomotory powers, as well as with their power to fly.

The largest thistle we have in our flora is probably the Pasture or Bull Thistle (*Cirsium pumilum*), while among the smaller stands the Canada Thistle (*C. arvense*). Then, as stated before, many others belong to several genera, including the Milk Thistle, the Star Thistles, the Cotton or Scotch Thistle, and the rare Blessed Thistle (*Cnicus benedictus*).

Almost without exception, all these plants have been introduced into this country from Europe. The study of the seeds of thistles and the fertilization of the flowers is an extremely interesting story; but it is too long to touch upon in the present connection.

In old fields and along the roadsides throughout the autumn months, when we find the various plants enumerated in the foregoing paragraphs, we will be sure to meet with the widely known garden spider. It also constructs its interesting web in our gardens, and sometimes among the shrubbery of the big city parks, as in Central Park in New York City, and in similar localities throughout eastern United States. When a field covers many acres and becomes overgrown with rank vegetation of many kinds, you will sometimes find this beautiful spider in hundreds, their webs being built as shown in Figure 7. Some of the old ones are much larger than the one here shown—so large, indeed, that their webs will hold a cicada,



A SPIDER THAT WEAVES A MAT TO REST UPON IN IDLE MOMENTS

Fig. 7—This is the common Garden Spider (*Argiope*) so familiar to everyone living in the country where it occurs. Moreover, it is also to be found in city gardens, which was the case with the one here shown in the cut. Note the curious zigzag web it has woven down from its central resting place.

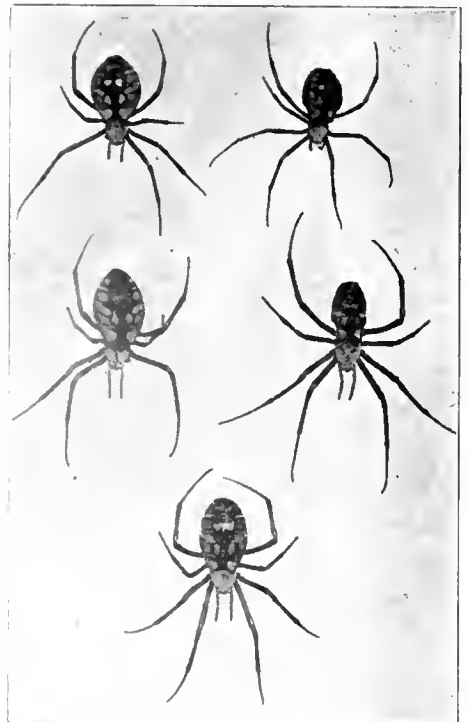
or the humming insect which most people call a locust. We will also find katydids and big grasshoppers in the strong, silken strands forming the web of this famous black and yellow arachnid; for spiders belong to the *Arachnedia* and are not insects at all. If the spider's captive has been recently caught, it may be in its death struggle, with its cold-blooded captor deliberately finishing his victim and applying the first layer of silken wrappings to his body and wings; while, if dead and partly used up, the silken envelope will be very complete and dense, fitting the entire body and wings and limbs of the unfortunate insect with the greatest accuracy and snugness. It is a terrible death, when one comes to think of it, for all such insects can both realize and appreciate the hopeless predicament they are in; moreover, they do suffer real pain.

There is some difference in size of the male and female garden spiders, and they also vary in this particular according to age. Sometimes you will



THIS PARTICULAR THISTLE IS CALLED LANCEOLATUM FROM THE SHAPE OF ITS LEAVES

Fig. 6—There are about a dozen different species of thistles in our flora, and no one of them is better known or more heartily detested by the farmer than the one here shown. Gray calls it the Common or Bull Thistle (*Cirsium lanceolatum*). Its purple flowers are very conspicuous in the fields and along the roadsides, from midsummer until late in the autumn.



VARIATIONS IN THE FORM OF COMMON GARDEN SPIDER

Fig. 8—These five specimens were collected near Great Falls, Maryland, in an old, deserted field having an area of some fifteen acres. It was in mid-autumn, and many plants and grasses flourished there—chiefly Milkweeds, Pokeberry, Bonset, both blue and white; Black-eyed Susans, Joe-Pye Weed, and a great many others.

come across a bouncing, big male—larger than any of those shown in Figure 8. When on their webs, this species always rests with its head toward the ground. It will be noted that the yellow or pale orange markings on different individuals vary a little, while being, invariably, after the same

general pattern. You may collect thousands of garden spiders; and, in so far as color-pattern goes, you will not meet with any greater variation than is here shown in Figure 8. Ernest Ingersoll, in his work "The Animal World," says that this species of spider has a "white cross upon its back." In this he is surely incorrect, and must have had at hand some other species when he wrote his account of "The Garden Spider." He does not even refer to the chief



HERE WE HAVE A RELATIVE OF THE COMMON GARDEN SPIDER

Fig. 9—Mr. Nathan Banks examined the specimens shown in this cut, and he said of them that "These spiders are the *Argiope trifasciata*, Forsk., both females. They are commonly called the 'Silver ladder spider.' The species is fairly common in the Eastern States from Massachusetts south to Florida, and into the West Indies and Central America." To this we may add that they were collected at Bradley Hills, near Washington, D. C., being found on a head of a common Golden Rod.

distinguishing character of the garden spider's web—the peculiar zig-zag, dense sort of pathway it spins above and below its central mat or resting place (Fig. 7). The true use of this has not as yet been made out; it appears to be simply added to the web, in many instances, for the purpose of adornment. A close relative of the garden spider is shown in Figure 7; probably both species built a nest quite like the one shown in Figure 10.

Spiders form an enormous group in the animal world, and many thousands of species have been described; doubtless a legion of them are still to be discovered by naturalists. How many have become utterly extinct in geologic time we can never know—probably many times the number, with respect to species, now represented in the world's existing arachnid fauna. Men have lived who have devoted their entire lives to the study of spiders, their researches occupying many hours every day of the week. In a few instances of this kind, only a few genera have thus been studied and worked up. In these war times such devotion is extremely rare.

It is a long span from spiders to owls, and in making it we pass over a great many thousands of animal forms—vertebrate as well as invertebrate. One would be surprised when told of the number of species and subspecies of owls we have in the avifauna of the United States; perhaps not one person in a good many thousand, as people go, would guess anywhere near the correct number. When the American Ornithologists' Union published its

"Abridged Check-List of North American Birds" in 1910, no fewer than forty-four different kinds of these birds occurred in North America, north of the Mexican boundary. Some of the species are very large and handsome, while some of the little pygmy owls are no bigger than a sparrow—beautifully plumaged and having very interesting life histories. Our Saw-whet owls are considerably larger than these, but none the less worthy of admiration and study. In Figure 11 of the present article we have a reproduction of a life photograph of the Saw-whet of the East. Early in the last century this species was quite abundant throughout the Middle and New England States, while at the present writing the bird is comparatively rare. This little fellow is quite nocturnal in its habits; in fact, so poor is its eyesight in the daytime that there are many instances on record where it has been caught by the hand when found perching somewhere in the bright sunlight. The darker part of the plumage is of a rather deep ashy brown, and the lighter part a creamy white, tinged with ash, some of the head and

tail markings being almost pure white. As is the case with nearly all owls, the female is fully an inch larger than the male, and measures about eight and a half inches in extreme length. All owls lay pure white eggs, noted for their unusual approach to sphericity; sometimes an owl's egg will be met with which is almost a perfect sphere. They are extremely useful birds with respect to man's interests, for they destroy on farms and in agricultural districts generally thousands upon thousands of field mice and field mice stand among the greatest grain consumers that the farmer has to deal with throughout



GARDEN SPIDERS BUILD A ROUND AND DENSELY WOVEN NEST

Fig. 10—You will find these nests in the old fields and elsewhere in the autumn. Generally they are attached to the stems of the coarse grasses and other vegetation. A small opening is left at the top, while they are held in place by silken strands leading to the supports on all sides. The butterfly on the ground is a beautiful specimen of a male Buckeye (*Junonia coenia*), an abundant species in certain localities throughout the Southern States. They are very pugnacious and fight other species of butterflies.

the year. Some of our large species of owls may from time to time destroy poultry on the farm; but they are also the eternal enemies of many of the farm vermin and pests, while the smaller species of these valuable birds stand among the best friends the husbandman has upon his estates. They

should be protected in every way—even introduced, and encouraged to breed upon every grain farm in the country.

In studying various animals and living things in nature, one is often confronted with what has been aptly described by naturalists as cases of "protective resemblance." Some interesting instances of this are met with among owls, as for example in the "gray phase" of our common screech owl, which, when perched upon a mossy, dead limb of no great size, with its body drawn up in an elongated fashion, and with its feather-horns fully erect, closely resembles a dead and broken branch, and many a screech owl has owed its life to this remarkable resemblance. To study some of the most extraordinary examples of this protective resemblance, however, we should turn to the insect world. Cases are to be met with among insects in every quarter of the globe, and a very noteworthy one is to be seen in our common stick insect of the Eastern States. In Figure 12 one of these is shown reproduced from a photograph from life. It is extremely difficult to recognize one of these fellows among the small green twigs of the tree or plant upon which it may be resting, especially if it extends its fore-pair of limbs to the front,

bringing them close together, as it often does. Its resemblance then to a small, green and leafless twig is almost perfect, and its enemies—or would-be tormentors and destroyers—almost invariably pass it by unnoticed.

In some of the books these insects are called "walking-sticks" from the deliberation of their movements and locomotion (*Phasmidae*). Belle Cragin says of them: "The insects have so strong a resemblance to brown and green twigs and stems that it takes a sharp eye to detect them when they are at rest. The body, legs, and antennae are long and slender. Our one common species has no wings, but the tropical species have wings that look precisely like leaves. They walk slowly and awkwardly. The middle pair of legs is the shortest. They feed on the leaves of trees and plants."



THIS IS ONE OF THE MOST INTERESTING OF ALL THE SMALLER OWLS IN OUR AVIFAUNA.

Fig. 11—In the southwestern parts of the United States there are found various species of elf and pygmy owls that are little hits of fellows. The one here shown is considerably larger, and is an eastern species. It is called the Saw-whet, as its call sounds like the noise made when sharpening a saw.

The body, legs, and antennae are long and slender. Our one common species has no wings, but the tropical species have wings that look precisely like leaves. They walk slowly and awkwardly. The middle pair of legs is the shortest. They feed on the leaves of trees and plants."

This protective resemblance occurs throughout nature but more especially in the animal world. It must not be confounded with "protective mimicry," which is quite a different thing. Then, some forms are capable of more or less suddenly changing the color of their skin, and by so doing



AMONG INSECTS THE WALKING STICKS PRESENT THE MOST REMARKABLE EXAMPLES OF PROTECTIVE RESEMBLANCE.

Fig. 12—The life history of our "stick insects" is wonderfully interesting, and there is considerable literature on the subject. Dr. L. O. Howard tells us that "in 1898 this insect appeared in extraordinary numbers in a black-walnut forest in western New York, so that in the autumn the dropping of the eggs on the leaf-covered earth sounded like a heavy shower of rain." The specimen here shown is of a bright green color.

match, to a greater or less extent, their surroundings, which at once render them far less easy to be seen by an enemy or other observer. A good example of this is to be noted in our common American chameleon of the Southern States (*Anolis principalis*). It possesses the power of assuming a variety of colors, ranging all the way from a deep snuff-brown to a pale pea-green—the desired change being accomplished with more or less celerity. This lizard often attains a length of seven or eight inches; and along the bayous in

lower Louisiana, it is interesting to observe a big one cautiously creep down the dark trunk of a cypress tree, which latter has some of its roots extending into the waters of the bayou. Should one make a pass at this lizard with the intention of capturing it, and miss it, the fellow will dart down the trunk spirally as quick as a flash, and, quitting the tree, leap onto one of the stems of the pickerel weeds growing in the water. Then, cautiously creeping up on the further side of this, it rapidly changes, as it does so, to a shade of green which more or less closely matches that of the stem of the plant. The fact that the fellow quickly comes to a dead rest still further enhances its safety; for, being of a decidedly elongate form, from the tip of his nose to the end of his tail, he simulates the green, rod-like stem of the pickerel weed upon which he rests.

Remarkable examples of protective mimicry are likewise to be seen among fishes, and no form presents a better exemplification of this than the peculiar little sea-horse of the Australian seas (*Phyllopteryx*). Its body and fins, in color and otherwise, have come to be so modified that it, as a whole, looks like a crooked bit of stem of oceanic seaweed, with the delicate, slender and wavy branchlets floating from it. As it lives among the very

vegetal growths of the ocean which it closely resembles, the chances of being observed in its natural habitat are quite remote under any conditions, and it thus frequently escapes its enemies, should it have any that prey upon it. Most fishes, however, offer no such remarkable peculiarities; they are just plain fishes, like the common

American Yellow Perch. This is a very handsome inhabitant of fresh-water ponds, lakes and streams, being extremely abundant in some sections. It is considered to be entirely typical of the true bony fishes in all particulars, with respect to its structure, and its skeleton has long been used as the type for the osseous fishes.

## WOMEN HELP TO FIGHT FOREST FIRES

**T**HREE Arizona women have received the official thanks of the Forest Service, in the form of a letter from the Acting Forester, for

men were needed on the fire line, officials of the Forest Service say that Mrs. Schoenberg, who is the wife of Forest Ranger O. P. Schoenberg, took over the work of securing labor, handling the telephone exchange, and thus keeping

that her excellent judgment and initiative were of material assistance in extinguishing the fire.

The Misses Erickson, daughters of a Forest Ranger, took an active part in the fire fighting. They organized and set to work one crew of men and aided in securing others. On one occasion, by actually fighting fire all night, they



MISS LILLIAN ERICKSON.

services rendered in fighting forest fires. They are Mrs. O. P. Schoenberg, of Portal, Arizona, and the Misses Lillian and Hildegard Erickson, of Cochise, Arizona, who last June and July assisted forest rangers in suppressing serious fires which burned over about 24,000 acres in the Chiricahua division of the Coronado National Forest, in Arizona.

At a time when all the available



MRS. O. P. SCHOENBERG.

the various crews in touch with each other, and running the commissary for the large force of laborers employed on the fire. She also arranged for the disposition of the men at the different fire-fighting crews and fed the newcomers on their way to the fire. It is stated



MISS HILDEGARDE ERICKSON.

relieved a crew which was urgently needed at another fire. In addition they carried food and water to the men on the fire line, who otherwise would not have had anything to eat.

**E**LOQUENT testimony as to the value of proper care for trees in city parks is afforded by the statement of Park Commissioner Cunliff, of St. Louis, as to the decrease in tree mortality in Forest Park, in that city. Forest Park contains approximately 50,000 trees. The number of trees dying during the last twelve months was only 453. During a similar period four years ago the number of deaths was 1200. Last year it was 600. The lower death rate of the trees is attributed to improved methods of care and repairs applied during recent years. The trees removed will this fall be replaced by planting 10,000 saplings.

**J**OHAN GORDON DORRANCE, first assistant forester of the Maryland State Board of Forestry, has entered the Engineer Officers' Reserve Corps of the United States Army, with a commission as second lieutenant. He is the first man to represent the forest engineers and professional foresters of Maryland in the forest regiments organized by the War Department. As a part of his training Mr. Dorrance studied in the Black Forest of Germany and at the University of Hesse-Darmstadt and Heidelberg. He holds the degrees of bachelor of forestry and forest engineer from Biltmore College of Forestry.

## CONSERVATION IN AUTUMN LEAVES

**I**N the autumn tints of the woods there is no evidence that nature is practicing conservation in her use of coloring matter. The lavishness with which she has painted the landscape red, yellow and brown suggests to the layman that she is altogether reckless in her desire to make the country attractive and that she has a fine disregard for the war-time supply of pigments.

To the dendrologist the rich coloring tells a story of true conservation, and gives additional proof that nature never wastes her resources. The brilliant hues of the forests are a manifestation of a plan to use everything to the best possible advantage. The change in coloring which takes place in the leaves during the autumn is the result of chemical processes which are at work in nature's laboratory. It is a part of nature's preparation for winter. Science explains that during the spring and summer the leaves have served as factories for the making of the foods necessary for the growth of the trees. This process of manufacture takes place in numberless tiny cells of each leaf and is carried on by small green bodies which give the leaf its color. These are known as chlorophyll bodies. By taking carbon from the carbonic acid gas of the air and combining it with hydrogen, oxygen and various minerals supplied by the water gathered by the roots these bodies make the necessary food.

In the fall, when cool weather causes a slowing down of the vital processes the manufacturing ceases and the chlorophyll is broken up into the various substances of which it is composed and the food is sent to the body of the tree to be stored up for use in the spring. All that remains in the cell cavities of the leaf is a watery substance containing a few oil globules and crystals and a

small number of yellow, strongly refractive bodies which give the leaves the yellow coloring so familiar during the months of the autumn. For the reds and browns sugar is responsible. When there is more sugar in the leaf than can readily be transferred back to the tree its chemical combination with the other substances produces various tints, ranging from the dogwood's red to the reddish brown of the oak.

The feeding of the tree itself is only a part of the duty of nature's chemical laboratory. The entire vegetable kingdom depends to a large extent on the food supply created by the leaves. Chlorophyll green is the only substance which has the power to break up rocks and convert them into starches and sugars. As the tree drinks in water from the soil the flow carries small particles of rock into the trunk of the tree. When the chlorophyll is returned to the parent stem by the leaves it works on these particles and through chemical reaction converts them into sugars and starches for sustaining the life of the tree. Nature's fine adjustment of things is evidenced in the circumstance that the chlorophyll all disappears from the leaf before the leaf falls and thus protects the surface rocks from any danger of disintegration such as might occur if the leaves which are deposited on them carried this chemical substance.

With the return to the tree of the food substances the leaves retain relatively large amounts of nitrogen and phosphorus which were originally a part of the soil. Through decomposition the fallen leaves enrich the soil and it is because of this and the accumulation of humus that the black earth of the forest floor is so fertile. For this reason the burning of leaves on the forest floor robs the soil of much of its fertility.



A BEAUTIFUL "MONKEY-POD" IN HONOLULU.

By an official order given by ex-Governor Sanford B. Dole, this tree was left standing in its original place when the street was improved.

### TREE SAVED BY A GOVERNOR

BY ALLEN H. WRIGHT

**W**HEREVER one may go, he will always find something of interest in connection with the trees which may grow there.

In the city of Honolulu, Hawaiian Islands, for instance, one will see in Vineyard street a beautiful specimen of the monkey-pod tree, standing squarely in the center of the thoroughfare, its great branches extending far over the property-line on either side of the street.

The interesting story about this tree is that former Governor Sanford B. Dole, who was at one time the president of the short-lived republic which followed the end of the rule by native kings and queens, gave an official order that this tree should be left standing when the street was improved, and so it stands today unharmed, beautiful in its natural spread of branch and shade, acting as a guide for autoist or driver to keep to the right side of the highway.

# URBAN AND SUBURBAN FOOD PRODUCTION---ITS PAST AND ITS FUTURE

BY CHARLES LATHROP PACK

President of the National Emergency Food Garden Commission and President of the American Forestry Association.

THIS is the time for stock taking in connection with the food situation. We have had a growing season which broke all records and was generally beyond expectations. The work of gardening, of canning and of drying vegetables and fruits has been under way in the land, from Maine to California, and from the Lakes to the Gulf, and has justified all belief as to success. It is important to consider what this means. It means one million one hundred and fifty thousand acres of city and town land under cultivation the past season for the first time. Urban and suburban America became a vast garden as the result of the impulse given to the nation by the National Emergency Food Garden Commission. This area of productiveness embraced back yards, vacant lots and hitherto untilled tracts of land in and around nearly every city, town and village. Our nation-wide survey located nearly three million such gardens. This is only a beginning. What shall the harvest be next year? What have we learned this year?

Germany reports that its town war gardens produced more in 1917 than any year since the war started. This shows the value of experience. In our one year of experience, it is conservative to state, that by the planting of gardens the nation's food supply has been increased to the extent of more than \$350,000,000. Next year we will do even better. We will then have more war gardens and the average production will be larger. With a better knowledge there will be fewer failures.

Any inventory of the food situation must reckon this great garden fruitfulness as a vital factor. As its first duty, already accomplished, it has been of great value in keeping down the cost of living for the people of America. Household expenses have been bad enough as it is. That they would have been far worse without this garden crop is obvious. There is much evidence that our food gardens are helping our people to feed themselves more reasonably. The editor of the North American Review, in the issue for September, 1917, says: "Last spring at garden planting time we urged the increase of production, partly through intensified culture, to increase the yield per acre, and partly through the increase of acreage by the cultivation of neglected fields and even small plots in suburban and urban areas. How well this policy was executed is seen in the report of the National Emergency Food Garden Commission that the gardens of the country were this year more than trebled in area. Beyond question, this garden achievement has much to do with the fact that the increase in price of garden products in the year was only 22 per cent, or less than one-fifth the increase in the price of breadstuffs."

The war gardens of America have been extensively referred to as a valuable economic agency by the news-

papers of England, France, Italy and South America. The significance of this planting does not end with the summer season. The war gardens will exert their influence on the cost of living during the winter months. Their value is a thing of the future as well as the past. Conservation has been practiced on a national scale. In the homes of America there has been earnest recognition of the importance of looking ahead. The individual citizen has realized that the over-supply of the growing season must be translated into terms of abundance for the winter. This realization has brought about such activity in household conservation as America has never before known. Food saving and food conserving are becoming national characteristics. From a wasteful nation America is being transformed into a nation alert to the needs of the future. The keynote of this new national spirit has been that nothing should be allowed to go to waste—that nothing useful should be thrown away.

The result will mean much for food F. O. B. the pantry shelves in the homes of America this winter and help us, by feeding ourselves, to feed our boys of the Army and Navy and to feed our Allies. Our soldiers must all be fed and the soldiers and civilians of France and England must be fed, and to a large extent fed by us, and we are going to see that this is done. The gardens of next year will exceed those of the past season. In the canning and drying of vegetables and fruit our women have been contributing their share. The canning and drying movement has brought back to thousands of American households an art almost forgotten since our grandmothers' day. This will be continued next year on an even larger scale.

War has made Uncle Sam the biggest buyer of food in this country. The board bill for his soldiers will soon be at least \$1,000,000 a day. We are to have 2,300,000 or more men under arms shortly according to Secretary Baker. At forty cents a day food cost per man it will be seen what that means. True, these men ate before becoming soldiers to make the world safe for Democracy. Each of them doubtless ate more than forty cents' worth daily. But you must remember that these men have suddenly become non-producers, and they must be fed by the rest of us. The army is making great plans for camouflage to deceive the eyes of the enemy, but you cannot deceive a soldier's stomach. He must have real food.

I am told that the reserve stock of foodstuffs at each camp is worth \$125,000, and there are 33 camps in the country today. This means that food valued at \$4,125,000 is taken out of the regular channels of trade production and consumption. These figures give but a small idea of the need of food conservation on the part of the

individual at this time and the need will be greater next year. The National Emergency Food Garden Commission urges every soldier of the soil to at once promote himself to a Colonel of Conservation and to make plans for gardening and for conserving garden food in 1918 as never before.

The glass jar manufacturers of this country have delivered during the season of 1917 about 119,000,000 glass jars. A survey of the household supply of jars used for canning and preserving in some twenty typical towns throughout the country showed that the housewives of America in 1917 used but one new jar to over three and one-quarter old glass jars which were already on hand. Thus you see that in conservative terms the home women of our country put up nearly five hundred million quart jars of vegetables and fruits, certainly three times what had been accomplished in any season before. Next year, profiting by their experience of this year, they will can, I believe, millions more, and more will be needed.

The Commission is, of course, gratified at the success of its work in behalf of food thrift, and congratulates all who have had a part in this patriotic effort. Great credit is due to the newspapers of the country for their splendid and liberal co-operation in aiding to arouse popular interest in gardening, canning and drying, the interest which is so significant of the American determination to neglect no opportunity to strengthen the nation's war-time position.

Much has been learned this year by town and city people about the cultivation of the soil in the interest of thrift and health, and also about the conservation of its products, so that we may look with faith and courage to still greater results for 1918 when the need will be more urgent. I wish to emphasize the fact that there will be a greater demand for food for exportation next year than there has ever been before, and we must fill the demand.

The necessity for this is well expressed by Lord Rhondda, the British Food Administrator. He has said: "I hope the exportable surplus of American primary foodstuffs will be much larger than the present estimates, as the result of food economies by which the United States and Canadian homes are helping to win the war, just as surely as is the production of munitions. Every American woman is in a position to bring nearer the inevitable atonement for the brutal outrages in Belgium, Armenia and Serbia, the sinking of the Lusitania and other horrors, by her day-by-day economies. There need be no fear that the sacrifices will be wasted over here. Unless the Entente Allies are able to import the supplies necessary for the army and the population, victory may slip from our united grasp."

If 25 per cent of the new war gardeners failed, owing to inexperience, to get a good crop this year, not 10 per cent will fail next year. People who did not plant this year have been so enthused with this nation-wide success of the home gardening and home canning movement that they will not be doing their duty to themselves or

to their country if they do not do their share in 1918. That they will do their duty I am altogether confident."

I want to praise the women of this country because it is the women who in a peculiar sense understand what the war means. It is my experience that the practical women of America have been practicing thrift for many years and that they know full well how to practice economy without parsimony, and that this year in addition they have added to their duties the patriotic work of extra food production and extra food conservation.

This war will be won in large part by fighting with food. We will do our duty in this hour of trial, and we have no greater duty than the production and conservation of food. This war is as much our war as it is the war of Europe, and unless we can keep the soldiers and the women and children of our Allies fed, the western line of defense may be thrown back toward the Atlantic seaboard, and it is well within possibility that in that case we would see the enemy's army on our shores.

To prevent this disaster calls for the best effort of every American household. You cannot starve Germany, Ambassador Gerard has told us so, and from the available evidence I believe he is right; but we will starve our Allies if we are so short-sighted, small and mean and unpatriotic as not to deserve the name of Americans. This must not be! It will not be.

You do not now have to be told again the need of food F. O. B. the kitchen door. This truth has made itself felt in millions of American homes this year. The town or city farmer who can raise even half of his winter supply of vegetables is able, as a result, to accomplish much as a constructive citizen. In other words, we must make a big drive to produce food in this country as near the point of consumption as possible, rout the middleman and the cold-storage man and help the railroads in the tremendous transportation problem that confronts them while the country is at war.

Glass jars and all other containers must be conserved this winter and the manufacturers must next year be prepared to meet the largest demand for them the country has ever seen. From every section of the United States and Canada come reports that the production of vegetables and fruits suitable for canning will next year far exceed the high water mark of this year.

The food problem is one of the vital issues of today. It is a problem from which none of us may escape. Each of us has his individual responsibilities in the situation. To win the final victory in the great war, America must feed not only herself and her fighting forces, but she must help to feed the people of England, France, Italy and Russia. To do this with the highest measure of efficiency is the real problem. There must be no lost motion. Every move must be made to count. Every act must be a blow for liberty in our work for Democracy to save and redeem civilization. It is not enough that we should all be alert to the food needs of America and her Allies: we must back that alertness with constructive skill and real industry.

# Forestry for Boys and Girls

by Bristow Adams

## "SHOES AND SHIPS AND SEALING WAX"

SAYS Toto, "am going to be a verator."  
"It ain't aver-ator," responds his older brother, "it's avee-ator."  
"Well, any how, whatever it is, I'm going to be it."  
"I'm not," returns Everett, "I'm going to be a soldier and shoot with a gun."

Toto maintains that he is going to fly and is going to shoot also, because, as he points out, the aviators that he knows are soldiers. He knows a good many, because there is an army aviation school near us, and ever since last June there had been class after class of young men, each group getting a start in the work, to finish in real flying at some other place in this country or abroad. Toto is a great favorite with all of them.

Soon Everett comes in and asks for ten cents to buy a wooden gun he has seen. I try to tell him that he can make a better one for himself, at which he turns the tables by saying "I can make one if you will let me use your saw."

He knows that the saw and plane and chisels and other tools, that father keeps locked-up, are not to be used by small, unskilled and careless hands; but he is sharp enough to see that I must yield the use of the saw to carry my point about his making the gun. So, on promise of care and quick, safe return of the saw to its right place he sets out to make the gun. He is good at this sort of task and does a neat job. The gun he makes is far bigger and better than the one he can buy.

Then Toto wants to make an airplane of

some sticks I have been saving to use in holding up plants. He sees that I can not favor his brother and refuse him at the same time, so he gets the sticks, and both boys work together and make the toy plane.

WOOD furnishes them with the stuff they need. Small as they are, and as little used to workmanship, they can make wood serve their purpose. Was there ever such a useful stuff for making all sorts of things? Even the airplanes and the guns of the great war must depend on wood. Here is the whole range of uses, from serving child's play to man's fury. Of course, if the trees had anything to say about it they would be used only for building up, and not for tearing down, and would be man's play things rather than his destroyers. Yet ground wood, finer than sawdust, is a part of much of the gun powder.

Toto has, in common with other boys of today, a whole new field of make-believe. In my day we never took much stock in flying, except as we dreamed of it. Most boys and men, even old men who never had seen a man in the air, have had dreams of flying. It is common in children's sleep, I think, to dream of launching forth from a high place and floating in space, much as a bird sails, and without effort. Very few, I find, have not had this dream,—a dream that comes again and again, of being wafted through the air. And now Toto actually sees it, along with the rest of us, and when he is a grown man it will be common. War has made it come sooner than it would have come otherwise. One cannot help thinking what a boon flying will be in making forest





surveys. Already an airplane has been in use to search out forest fires.

**P**LAYING at war has been just as much a game for boys as dolls have been for girls. It was always a part of youth to fight battles of one sort or another, real and unreal. This year our boys have helped in real war by fighting weeds in home gardens. Maybe this thought has made weeding easier than I found it. Ho: in hand, to keep down the weed enemies, sounds very well these days. It was hard work as I look back on it, and I find that Everett and Toto will work till they are ready to drop, digging rows of trenches all over the place, but rows of onions to weed are not so good.

Boys are about the same, I guess, no matter what the time or place.

**T**HERE was some fun, as I recall, in going miles over the fields after the mail, carrying a limber switch by way of a sword, and lopping off the heads of wild carrots and daisies that grew along the wayside, exclaiming, "Die, villain!" as the blossom heads dropped. The lumbering grasshoppers, flying up thick, were the bullets of the enemy; if one struck the hero's right arm he would have to transfer his sword to the left and keep up the fight; if he were struck in the leg he would have to hop along as best he could on one, trusting that it would heal before both pins were gone. If a grasshopper bullet struck him over the heart he just had to go to the hospital in a neighboring fence corner and find some slippery elm or blackberry medicine until he was cured of his wound. The folks

at home used to have to wait a long time for the mail on these days of battle; and it must be owned that the hurts received when the hero returned home were more serious than the ones he got in combat. I suppose all this has been changed by the rural free delivery, and the small boys of the present day do not have the perfectly good excuse of going after the mail to get them out of the job of weeding the onions.

**B**UT that is not what I started to write in the beginning. It was rather to call attention to the great need of wood, and the greater need, while we still have the chance, to see that there shall always be plenty. The wooden sword and the wooden toy gun may go out of fashion. I hope they will, just as I hope this struggle will prove to be the War for Peace. But wood will never be less useful; and when I see it going into so many new things, such as airplanes, I know that man will need it and use it even more in the future than he has in the past.

When the Walrus and the Carpenter, on that well-known walk, spoke of many things, such as "shoes and ships and sealing wax," they did not get very far away from wood. Because shoes must be made on wooden lasts, and many are pegged with wood, the leather is tanned from an extract of tree bark; in Holland boys and girls wear whole wooden shoes. And as for ships, we know they are made from wood, and even the iron ones have wooden masts and spars. When it comes to sealing wax, the hardened gum of the pine tree, known as rosin, we are in the very heart of the use of wood. Let's keep it growing!



# CHILDREN'S PLAYGROUNDS IN PARKS AND FORESTS

By SMITH RILEY, District Forester

"The paths, the woods, the heavens, the hills,  
Are not a world today,  
But just a place God made for us  
In which to play."

WHO of us but does not love the mountains with their snow-capped peaks and forests and tum-

bling streams?

More and more we are coming to realize that the National Parks and Forests of our country are nature's playground, set aside as vacation joylands for little folks and big. John Muir once said:

"The tendency now-a-days to wander in the wilderness is delightful to see. Thousands of tired, nerveshaken, over-civilized people are beginning to find out that going to the mountains is going home; that wilderness is a necessity; and that mountain parks and reservations are useful, not only as fountains of timber and irrigating rivers, but as fountains of life.

"So we wander in search of mountain wild flowers, following the trails that lead to the alpine meadows, listening to the bird songs as we pass, wrapped in the peace of the perfect hills, while all about us the infinite beauty of things created, the magic of the summer skies, the strength of the far-flung bastions, the purity of the eternal snows, and the glory of the flowers that bloom above the clouds, bid us remember

that we are walking in the freedom of the garden wild with God of the open air." There are numberless men

and women who see in the open only discomfort and apprehension. Such people are largely dependent upon the comforts of life, having received no opportunities in the active days of their youth to acquire a taste for the things of Nature and the great outdoors. Big places make big thoughts, and big thoughts make big men and women. Can we not then offer the use of our Parks and Forests as places of education for

the citizens of this nation in which to teach their children the lessons of the wilderness? Mountain, prairie, and walking clubs are developing rapidly throughout the country. These offer outings to those grownups who have developed an appetite for outdoor life, but only occasionally is it possible for parents to have their children accompany them.

There are two noted organizations, the Camp Fire Girls and the Boy Scouts, which take larger children into the out-of-doors. The children who join such clubs have, as a rule, a natural taste for country or mountain life, or have had opportunities to develop



PLENTY OF WORK IN THE AIR IS GOOD FOR THEM

Here we catch a glimpse of the Boy Scouts, in camp on the Pike National Forest in Colorado, at their regular morning exercises, part of the routine of camp life.



A YOUNG EXPONENT OF LIFE IN THE OPEN

Rosy-checked and happy, he typifies the value of the opportunity offered by the recreational use of the National Forests.



"JUST A PLACE GOD MADE FOR US IN WHICH TO PLAY"

A happy crowd thoroughly enjoying a picnic under the trees in the Pike National Forest in Colorado.

their "back to Nature" instincts. Is it not possible for us, however, to reach the hordes of younger children through these means, so they may learn the lessons of nature? Children receive vivid impressions from the ages of eight to fourteen. Why not, then, attempt to reach these younger children?

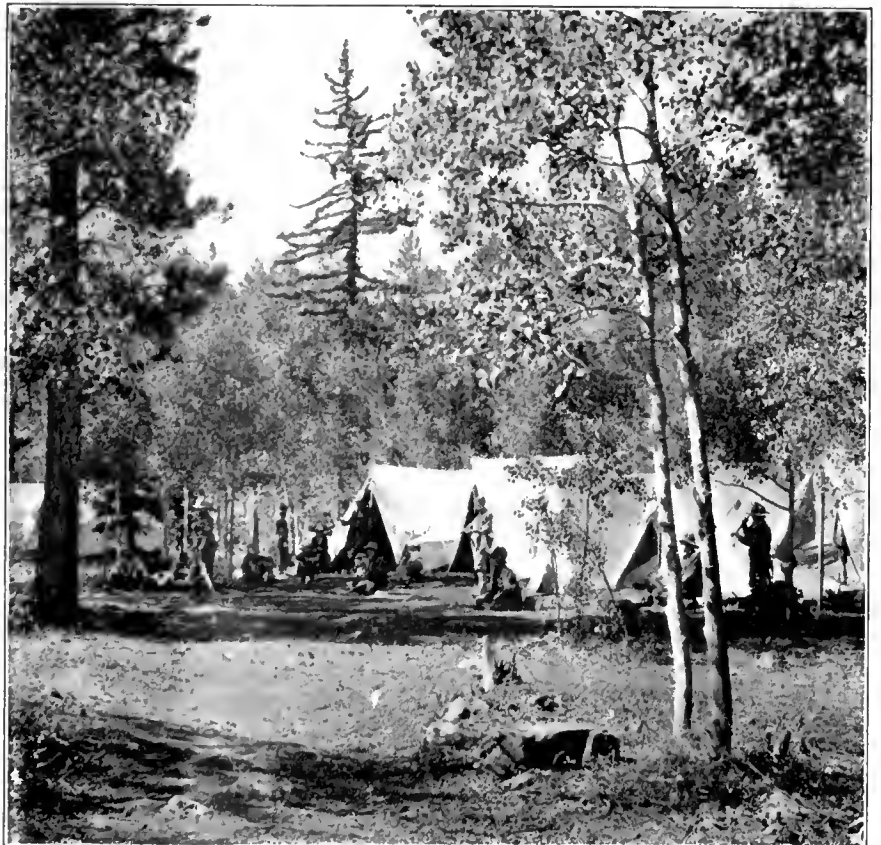
There is a present day tendency to develop and maintain camp grounds along through highways; to develop mountain foothill and waterside parks near cities. Throughout the West are many municipal parks and camp grounds where hundreds of people of all ages are given an outing each year. At none of these areas is there any form of development for the purpose of educating small children. Older children receive impressions from those things that influence adults, but the bulk of small children receive their keenest conceptions through play. Lessons that come in play are strongest and most lasting to a child.

Here is a big field for developing children's playgrounds in the open where they may teach the lessons which create a taste for nature. There is a tendency to make the playgrounds in the country very similar to those found on the school grounds or corner lots of a city. For example, the City of Denver has constructed a number of playgrounds throughout her moun-

tain parks, amid the most beautiful natural settings imaginable. These are fitted with swings, teeter boards, merry-go-rounds, and turning bars; the same equipment that is placed upon city playgrounds. A child, unless he be exceptional, may go to such grounds and wear himself out at play, time after time, without receiving the least impression of the beautiful natural surroundings.

Can we not hit upon a plan of building up such playgrounds so that they will create a realization of outdoor life and the surroundings in the minds of children? Suppose in place of the swings, teeter-boards, etc., a miniature camp was constructed; a two-room log house with fire-place, furniture and an enclosure where the children could play at camping. To vary this, some playgrounds should be furnished with shelter cabins and a fire-place out in front, which would give a different phase of camp life.

Playing housekeeping and giving parties is a child's favorite amusement. Why not make use of this to create a taste for outdoor life? Trees, shrubs and plants in the immediate vicinity of these camps should be marked with signs so the children might learn



BOY SCOUTS IN CAMP IN THE PIKE NATIONAL FOREST

A cheerful crowd, out for a good time. This camp indicates one of the many recreational uses to which the National Forests are put.

their name and appearance, and become familiar with the different kinds of forest growth, while cabins could contain pictures of the birds and animals common to that section. In addition to miniature camps, it has been suggested that where suitable areas, advantageously located, can be found, a miniature forest might be laid out with trails, fire look-out towers, fire boxes, etc. This would give the children a chance to play at forest protection and learn the lesson of preservation of all forest life. It is really surprising what a small per cent of both children and grownups who find keen enjoyment in outdoor life have any conception of the enormous damage to forest life wrought by carelessness. Thus, in making the National Forests and Parks attractive, let us think of the children of today as the men and women of tomorrow. Let us so construct playgrounds for them that through play they will receive a taste for nature and the lessons it teaches.

To be sure such playgrounds will cost something to construct and maintain, as will all camp grounds or pleasure areas prepared for the public. The children, too, will need instruction and direction at such playgrounds if they are to secure the greatest use and enjoyment out of them. It has been found that an officer must be stationed at camp grounds to guard against

fire and assist the public, and to teach the children the use of these play camps. It is the child's nature to teach other children the play-games he has mastered, and thus will our little folks learn of outdoor joys and pleasures and return to their homes rosy-cheeked and happy—the better boys and girls.

### UNIVERSITY EXHIBITS

The State College of Forestry at Syracuse University has had exhibits at eight fairs this fall. One feature of the exhibits showed an entire tree of Norway Spruce cut and sawed into various products, including two logs yielding eight foot boards, two fence posts, valuable if treated against decay, and one hop pole. The entire yield of the tree was fifty-nine board feet, and a chart which accompanied it gave cost and profit figures per acre per year, at the rate of growth which this particular specimen had made. Other features were specimens of paper made from bark which would otherwise have been absolute waste, and numerous other things manufactured from wood, but seldom credited to the forest, such as articles of clothing from fiber silk, and twine made from twisted Kraft paper fiber, rugs, phonograph records, wood flour, fiber shingles and transparent sheets of viscose, a wood product used as a substitute for celluloid. Another feature was a group of wartime products, showing food, medicine and explosives yielded by the forest.



A FAIR FIELD AND NO FAVORITES!

The always exciting "fat man's race" at one of the picnics enjoyed by hundreds of people each year in the National Forests.



LESSONS THAT COME IN PLAY MAKE DEEPEST IMPRESSIONS ON CHILDREN

This young American is Frank McConnell, son of Ranger McConnell of the Colorado National Forest, and he and his trusty friend are busily engaged carrying to the Ranger Station mail and supplies which have been left by stage three-quarters of a mile away.

# HYBRID OAKS

BY GEORGE B. SUDWORTH

**H**YBRID oaks of this country are exceedingly interesting trees. They are the result of a natural crossing of two different species of oaks and, as a rule, they are strikingly distinct from other oaks in the peculiarly mingled characteristics of the parent species. Their distribution is very irregular, so that our knowledge of the ranges of the different forms is incomplete.

In all, there are approximately twenty different hybrid oaks now known. Nineteen of these inhabit Eastern United States, only one being known in the Pacific region,

and none having been discovered in the Rocky Mountain Region\*.

The fact that 60 per cent of the forty-eight native species of oaks grow in the East may partly account for the correspondingly greater number of hybrid oaks discovered in that part of the country, where necessarily there would be greater opportunity offered for crosses.

There is no record of the crossing of white oaks and black oaks, all of the hybrid forms now known having been produced by crosses only between members of each of these two distinct tribes. Whether or not there is any inherent barrier to hybridization between white oaks and black oaks in the fact that the white oaks are annual fruiting trees and the black oaks are biennial fruiting species, is unknown.

A much larger number of black oak hybrids has been discovered than of white oak, there being sixteen black oak hybrids recorded and only four of white oak parentage. Whether or not the black oaks have a

greater tendency to hybridize than do white oaks, is unknown. The relatively more frequent association of different black oaks than is the case with white oaks may also be a determining factor in the greater occurrence of black oak hybrids.

The determination of what parent species of oaks have produced the various hybrids now known is a matter entirely of recognizing the distinguishing characteristics of the parents as exhibited in the hybrid. No one is prepared to prove the supposed parentage of any of the hybrid oaks, and obviously because the crossing

of the parent trees occurred without the aid of man. So far, no one appears to have tried artificially to reproduce any of these hybrid forms by cross-fertilization of their supposed parents. It is true, of course, that plant breeders in this country have had little or no incentive for crossing oak trees, because with the great variety of commercially useful species now available there



FIG. 1.—MATURE FOLIAGE AND ACORNS OF THE NEW HYBRID.

It will be seen that the shape and size of the leaves are very like those of the red oak, though many of them resemble the black oak more closely in shape, color and texture. The mature acorns are of the same general shape, though smaller, than those of the red oak.

would seem to be no pressing need of seeking new and better forms. Systematic botanists have contented themselves with naming and describing hybrid oaks just as they were found in nature, and have relied upon their judgment in determining the parentage. It is a noteworthy fact, however, that there is considerable difference of opinion among botanists as to the parentage of certain hybrid oaks. Thus, the parentage of one of the best known of our hybrid oaks, the Bartram Oak, first named *Quercus heterophylla*, has varied with the author from that of *Quercus phellos* x *velutina* and *Q. phellos* x

\*Dr. William Trelease records (*Proc. Am. Phil. Soc.* LVI, 48, 1917), the existence of "*Q. arizonica* x *grisea*—*Q. organensis*", which was doubtless found in the southern Rocky Mountain Region. His very excellent paper on "Naming Hybrid Oaks" also lists a number of apparently hitherto unpublished hybrids which were unknown to me when this article went to press.

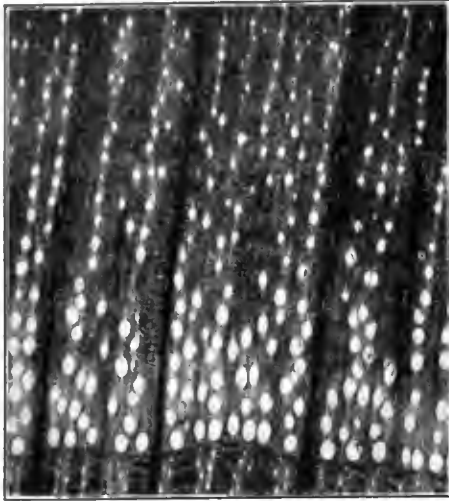


FIGURE 2.



FIGURE 3.

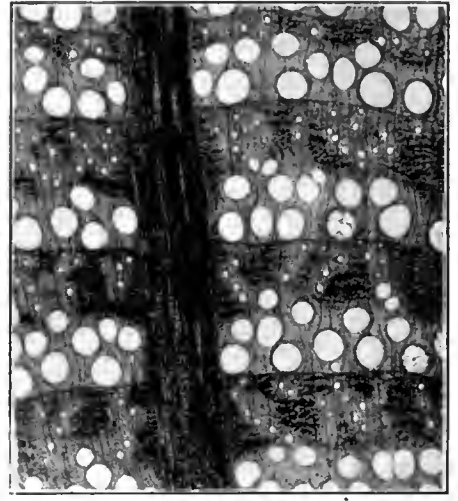


FIGURE 4.

PHOTOMICROGRAPHS WHICH MAKE POSSIBLE AN INTERESTING COMPARISON

A most superficial comparison of the cross-section of the wood of this new hybrid oak (Fig. 2) with that of *Quercus borealis* (Fig. 3) and *Quercus velutina* (Fig. 4) shows a unique distinction in the very large number of pores and in their gradual diminution in size in passing from the spring or early formed wood to the summer or late-formed wood of the annual ring. This would indicate that the new hybrid is more closely related to the red oak than to the black oak, in which there is a very abrupt change in size from the large pores of the spring-wood to the small pores of the summer-wood.

coccinea to *Q. phellos* x *rubra* (1).

**Well Known Hybrid Oaks.**

The following is a list of the native hybrid oaks discovered in the United States during the last hundred years. Some of them have been found but once and in several instances the individuals discovered have since been destroyed. While a number of these trees are, undoubtedly, of hybrid origin, properly they must be designated as species, because they were first described under a binomial. Notable examples of such hybrids are *Quercus morehus*, *Q. brittoni*, *Q. leana*, *Q. sinuata*, and *Q. heterophylla*:

*Quercus alba* x *stellata* Engelm. (1877). Illinois.

*Quercus alba* x *macrocarpa* Engelm. (1877). Illinois and Vermont.

*Quercus alba* x *prinus* Engelm. (1877). District of Columbia and Vermont.

*Quercus wislizeni* x *kelloggii* Curran (1885);=*Quercus wislizeni* x *Californica* Sargent (1895);=*Q. morehus* Kellogg (1863). California.

*Quercus coccinea* x *ilicifolia* Gray (1867), near Whitinsville, Mass.

*Quercus catesbaei* x *aquatica* (2)

**THE NEW HYBRID AND ITS DISCOVERER**

This shows the new hybrid—the Hawkins Oak, growing in a wooded section of the Hawkins estate in western Tennessee. It is some 85 feet high and 35 inches in diameter. Certain peculiarities about the tree attracted the attention of Mrs. Eugene Hawkins, prompting closer examination and the consequent discovery of the hybrid. Mrs. Hawkins is seen standing by the tree.



FIGURE 5

Engelm. (1877);=*Q. catesbaei* x *nigra* Sarg. (1895);=*Q. sinuata* Walter (1788). Near Bluffton, S. C.

*Quercus catesbaei* x *laurifolia* Engelm. (1877). Near Bluffton, S. C.

*Quercus catesbaei* x *Q. cinerea* Small (1895). Florida.

*Quercus cuneata* x *velutina* (1917);=*Q. digitata* (3) x *velutina* Sudworth (1895). Tennessee.

*Quercus georgiana* x *marilandica* Sargent (1895);=*Q. georgiana* x *nigra* (4) Small (1895). Georgia.

*Quercus marilandica* x *ilicifolia* (1917);=*Q. brittoni* Davis (1892). The author of the latter name believed this tree to be a hybrid between the black jack and bear oak. Staten Island, N. Y.

*Quercus marilandica* x *velutina* Bush (1895). "Near Saputa, Indian Territory."

*Quercus imbricaria* x *marilandica* Sargent (1895);=*Q. imbricaria* x *nigra* (4) Engelm. (1877). Missouri.

*Quercus imbricaria* x *velutina* Sargent (1895);=*Q. imbricaria* x *coccinea* Engelm. (1877);=*Q. leana* Nutt. (1842). Central Eastern United States.

(1) Now properly known as *Quercus borealis* Michx., *Q. rubra* L., long supposed to have been applied by Linnaeus to our red oak, was in reality given to our Spanish oak, which most of the mountain people in Virginia, North Carolina and Tennessee call "red oak."

(2) Now known as *Quercus nigra*, the black jack, to which this name was so long applied, now being designated as *Q. marilandica*.

(3) Now known as *Quercus rubra*.

(4) Now known as *Quercus marilandica*.

*Quercus imbricaria* x *palustris* Engelm. (1877). Missouri.

*Quercus phellos* x *velutina*; = *Q. heterophylla* Michx. f. (1812). Pennsylvania, New Jersey, Delaware, Staten Island, N. Y.; District of Columbia, Virginia, North Carolina, Alabama, Texas.

*Quercus phellos* x *marilandica* Sargent (1895); = *Q. rudkini* Britt. (1882). Staten Island, N. Y.

*Quercus phellos* x *rubra* (1917); = *Q. phellos* x *Q. digitata* (3) Small (1895). North Carolina.

*Quercus phellos* x *ilicifolia* Peters (1893). New Jersey.

*Quercus michauxii* x *macrocarpa* Sudworth (1897). Southwestern Tennessee.

#### The Hawkins Oak, A New Hybrid.

Through the courtesy of Mr. Joseph Meehan my attention was called to a hybrid oak which Mrs. Eugene Hawkins discovered in Carroll county, West Tennessee, in October, 1912. An excellent photograph (Fig. 5) taken by Mr. W. R. Mattoon shows it to be some 85 feet high and 35 inches in diameter. The straight, slightly tapering trunk is free from branches for 40 feet. An interesting fact about this tree is that it is growing in a wooded section of the Hawkins estate which is itself a part of the original 25,000-acre grant made in 1791 to Mr. Hawkins' great-grandfather, Isaac Roberts, by the State of North Carolina, then included in a part of the latter state known as the Western District, but now a part of West Tennessee.

Being familiar with the forest trees in that section of Tennessee, Mrs. Hawkins noted with surprise that the flesh of mature acorns from this tree, at first taken to be a red oak (*Quercus borealis*), was a deep yellow, those of the true red oak having a whitish flesh. A further careful examination of the tree showed that the trunk bark (Fig. 5) resembles in its marking that of the black oak (*Quercus velutina*), while the shape and size of some of the leaves (Fig. 1) are very like those of the red oak. Many of the leaves, however, resemble in shape those of the black oak, to which they are all similar in color and texture. The mature acorns (Fig. 1) are of the same general shape as those of the red oak, but of smaller size, ranging in length from five-eighths to three-fourths of an inch and in diameter from five-eighths to eleven-sixteenths of an inch. Many

of the acorns show more or less distinct vertical stripes. The twigs and winter buds of this hybrid are so like those of the red oak as not to be distinguished.

A superficial comparison of a cross-section of the wood of this hybrid oak (Fig. 2) with that of *Quercus borealis* (Fig. 3) and of *Q. velutina* (Fig. 4) shows a unique distinction in the very large number of pores and in their gradual diminution in size in passing from the spring or early-formed wood to the summer or late-formed wood of the annual ring.\* The gradual diminution in size of the pores in the wood of the hybrid would seem to indicate a closer relationship to the red oak than to the black oak, in which there is a very abrupt change in size from the large pores of the spring-wood to the small pores of the summer-wood.

It is proposed to designate this hybrid oak as *X Quercus hawkinsi*, in honor of its discoverer, Mrs. Eugene Hawkins, the writer's belief being that it originated from the crossing of *Quercus borealis* and *Quercus velutina*, both of which are growing in the vicinity of the hybrid tree. *Quercus palustris* also occurs in this locality and may possibly be one of the parents. The fact that the striped acorns of *Quercus palustris* have yellow flesh, and are similar in shape to those of the red oak supports this suspicion. On the other hand, however, the acorns of the black oak are striped and have a yellow flesh. Moreover, the similarly large size of the leaves of this hybrid oak with the color and texture of the black oak, and the close resemblance of the trunk bark to the black oak would seem to point more strongly to this species as one of the parents than to the pin oak.

So far as tested the acorns of *Quercus hawkinsi* appear to be only moderately fertile. Acorns planted by Mr. Joseph Meehan have produced one seedling, which is now about three years old, and a small quantity of acorns planted by the writer at the Letchworth Park Forest and Arboretum at Portage, N. Y., have yielded but one seedling. Some of the leaves of these young plants are identical in shape with those red oak seedlings of comparable age; while occasional leaves strongly resemble those of young black oak. It will be interesting later to note the types of adult leaves produced by these plants.

\*The author's cordial thanks are extended to the Forest Products Laboratory at Madison, Wisconsin, for preparing these illustrations.

**T**HE NATIONAL ASSOCIATION of Box Manufacturers, through an agreement with the United States Food Administration, is working out details of standardized wooden boxes for condensed milk, canned fruit and vegetables for export. The specifications cover the width, length and thicknesses of the sides, ends, tops and bottoms of the various types of boxes, the number and position of the nails to be used, the cleats and iron straps required, and the matching and glueing up of the pieces. A standard scale of prices for the different types of boxes delivered at any point east of the Missouri River has been agreed upon. The wooden box industry, through its association, will undertake to see that the Government's requirements for boxes are taken care of promptly.

**T**HE RECEIPTS from the sale of timber on the National Forests in California amounted to \$154,271.98 for the fiscal year 1917. This is an increase of 59 per cent. over the receipts for the fiscal year 1916 and 100 per cent. over the receipts for 1915. Twenty-five per cent. of this money goes to the state for the school and road funds of the counties in which the National Forests are contained.

**D**R. HUGH P. BAKER, dean of the New York State College of Forestry, is at the Second Reserve Officers' Training Camp at Fort Sheridan, Illinois. There are many prominent lumbermen in training at this camp and their practical experience is proving useful.

## A TREE THAT PRODUCES SOAP

**A**S a relatively new member of the American tree family the Soap-nut, *Sapindus utilis*, is entitled to friendly consideration. Originally the tree came to this country from China. The first importation was made into Florida by Rev. Benjamin Helm, who brought some of the seeds from the Orient more than 30 years ago. From these seeds only one fully developed tree is in existence and for many years the owner of this one had no thought that his tree produced anything of value.

It was in 1905 that American attention was first attracted to the soap-nut tree as a tree of importance in the matter of nut bearing. At that time there was published a report on the economic value of the tree prepared by United States Consul Kedder at Algiers. This report made possible the real development of soap-nut cultivation in America. Its publication was followed by generous importation of the seeds from Algiers, arranged by E. Moulie, who now lives in San Diego, Cal., and who had been instrumental in instigating Consul Kedder to make an investigation and report. The seeds imported by Mr. Moulie were distributed free of charge to people who showed such interest as to indicate that the planting and cultivation would be done with care. In addition to making the importation of seeds Mr. Moulie has made it a practice to buy every year practically the entire crop of seeds from the original American tree, and these have been distributed broadcast. He estimates that as a re-

sult of these gifts there are now 500,000 soap-nut trees growing in Florida alone, and large numbers in other Southern States and in 19 foreign countries to which he sent seeds.

The planting and cultivation of these trees attracted widespread attention and the Department of Agriculture made some importations from China, materially increasing the number of trees planted in the United States.

Several important uses are attributed to the product of the soap-nut tree. The hull of the nut supplies raw material for the manufacture of soap and other articles which require an ingredient with saponaceous properties. This material may even be used as soap without compounding. By shredding the hull and using it with water as if it were soap, a perfect lather is readily obtained and some authorities state that the cleansing qualities are superior to manufactured soaps. The extract's efficiency as a foam producer makes it useful as an ingredient in carbonated beverages. The kernel yields a fixed oil, which some say for culinary purposes is equal to olive oil. Some



THE FRUIT OF THE SOAP-NUT TREE

From the hull of the nut is procured raw material for the manufacture of soap. The material may be used without compounding, as it makes a perfect lather. It is also useful for making beverages which require foam.

therapeutic value is also attributed to the nuts.

The wood of the tree is close grained, takes a good polish, and is said to be well adapted for furniture making. The tree grows to a height of 50 feet. It is not expected that it will be used for its timber, however, as the yield of nuts is said to be from \$10 to \$20 a year for each tree. The tree begins bearing at six years of age.

**T**HE tremendous demand for forest products of all kinds which the war has created will by no means terminate with the cessation of hostilities. The reconstruction of Belgium and northern France will draw heavily upon the forests of the United States. The action of the Federal Government and the large lumber producers in the United States in sending Federal Trade Commissioners abroad for the purpose of studying export markets makes the future in the lumber business appear extremely bright. Authorities are predicting an increased demand for trained foresters during the next decade inasmuch as many phases of forest utilization are now demanding expert training which the trade did not require in the past.

**T**HAT there is enough fuel wood in Indiana forests going to waste to run every heating and cooking stove in the state for a year is declared by the Indiana State Board of Forestry. The board argues that the fuel value of a cord of good beech, sugar or hickory wood equals that of a ton of soft coal, that the average price of wood is about half that of coal and that people pay double price for the luxury of burning coal. Owners of woodlots are advised that to remove the dead, dying and weed-trees will not only furnish a vast supply of fuel but will be of distinct advantage to the remaining trees. Municipal woodpiles are being advocated, to be supplied with fuel which could be obtained from woodlot owners for the cutting.



## EDIBLE FRUITS OF FOREST TREES

IT is said that Daniel Boone and some of our other early pioneers could go into the wilderness with only a rifle and a sack of salt and live in comfort on the game and other wild food which the woods afforded. While few people want to try that sort of thing nowadays, persons who know the food value of the fruits of our native trees and shrubs are, according to foresters, able to use them to good advantage in supplementing other foods.

Aside from the numerous edible mushrooms, roots, fruits of shrubs and smaller plants, the trees of our forests afford a large variety of edibles which are highly prized by woods connoisseurs. First in importance, of course, are our native nuts—beech nuts, butternuts, walnuts, chestnuts and chinquapins, hazel nuts, and several kinds of hickory nuts, including pecans. The kernels of all of these are not only toothsome but highly nutritious, and are used by vegetarians to replace meat. The oil of the beech nut is said to be little inferior to olive oil, while that of butternuts and walnuts was used by some of the Indians for various purposes. The Indians, it is said, also formerly mixed chestnuts with cornmeal and made a bread which was baked in corn husks, like *tomales*. In parts of Europe bread is made from chestnuts alone. The chestnut crop in this country is being reduced each year by the chestnut blight disease, which in some sections is gradually killing out the tree.

Acorns are commonly thought to be fit only for feeding hogs, but many kinds of them can be made edible and nourishing for people as well. The Indian custom was to pound or grind the acorns up and leach out the tannin, which makes most of them unfit for eating when raw, by treating the pulp with hot water. The resulting flour, which contained considerable starch, was made either into a porridge or baked in small cakes of bread. As a rule, the acorns of the various white oaks having less tannin, are the ones best suited for food, but Indians also used those of the black oaks, even though they contain much tannin. The acorns of the basket or cow oak, the chinquapin oak, shin or Rocky Mountain oak, live oak, and of several other species, are sweet enough to be eaten raw.

Another nut which is not suited for eating raw, but from which a palatable food is said to have been prepared by the Indians, is the buckeye. The kernels of these nuts were dried, powdered, and freed of the poison which they contain when raw, by filtration. The resulting paste was either eaten cold or baked.

Several western pines have seeds which play an important part in the diet of the local Indians. Perhaps the best known of these is the fruit of the nut pine or pinon

which forms the basis for a local industry of some size. Not only is it extensively eaten by local settlers and Indians, but large quantities are shipped to the cities where the seed is roasted and sold on the street. The similar seed of the Parry pine and the large Digger pine seeds are eagerly sought by the Indians. The latter tree is said to have gained its name from its use as a food by the Digger Indians. The seeds of the longleaf pine are edible and are improved by roasting. Indeed, it may be said that most nuts are more digestible when roasted than if eaten raw.

One of the best-known fruits, the foresters say, is the persimmon, which is edible only after it is thoroughly ripe. As this is usually not until late in the fall, it is commonly thought that the fruit must be frostbitten. If the persimmon is eaten before it is well ripened, the tannic acid which the fruit contains has a strongly astringent effect, which justifies the story of the soldier in the Civil War who said he had eaten green persimmons so as to shrink his stomach up to fit his rations. The pawpaw, or custard apple, is also best when thoroughly ripe. The fruit of some species of haws is eaten or preserved in different parts of the country, while those of several different kinds of wild cherries have a food value and are used for various purposes. Wild plums are abundant in certain sections and occur in particularly plentiful quantities along the streams in the Eastern and Middle Western States.

Several varieties of wild crab apples make delicious jellies. Some of the largest, which attain the size of small apples, are more or less abundant throughout eastern North Carolina. Elderberries are frequently used for pies and for sauce. Those found in the West are sweeter and have a better flavor than the eastern varieties.

The berries of the hackberry, or sugar berry, as it is called in the South, are dry, but have an agreeable taste. Those of the mulberry are sweet and juicy when ripe. The mulberry is valued in some sections for feeding hogs and poultry and some species are occasionally cultivated.

Many people like the fruit of the shad bush, "sarvice" berry, or June berry, as it is variously called. In parts of the country this fruit is used to make jelly.

The French Canadians are said to use the acid flowers of the redbud, or Judas tree, in salads, while the buds and tender pods are pickled in vinegar. Honey locust pods, often locally called "honey-shucks," contain a sweetish, thick, cheeselike pulp, which is often eaten. Those of the mesquite furnish the Mexicans and Indians with a nutritious food. The Creoles of Louisiana, famous for their cookery, are reported to use the young buds of the sassafras as a substitute for okra in thickening soups.

WOODLOT owners will be interested to know that birch, cherry, walnut, oak and mahogany have been approved for airplane propeller stock by the United States Government. Spruce is the principal wood used for the frames.

IT has recently been discovered that gum lumber immersed in pure gummed spirits of turpentine lasts many years longer when exposed to open air. The usual method of treating the lumber is to give it three coatings and allow it to thoroughly dry after each one.

## FIGHTING THE PINE BLISTER DISEASE

**M**ANY inquiries come to AMERICAN FORESTRY asking if it is possible to eradicate the pine blister disease or prevent it spreading by spraying. No spray has been found which can be used effectively against the blister rust either on pines, currant or gooseberry bushes. Spraying is not recommended, because the disease spreads very rapidly on currants and to considerable distances. A number of tests have been made by men who realize the necessity for careful work and who presumably did the most thorough work possible under the circumstances. In Europe, Ewert attempted to spray black currant bushes thoroughly enough to keep the disease off them. He concluded that it was impossible to do it. A similar attempt was made by McCubbin in Ontario two years ago. He sprayed every two weeks and also concluded that it was an impossibility to keep the disease entirely off the sprayed bushes. Other attempts have been made in different localities with the same results. Unless absolute freedom can be secured from this disease, spraying is inefficient, since a single rust pustule is sufficient to start the disease upon neighboring currants. The disease is known to jump from currant to currant at least one-half mile, and under favorable conditions it jumps several miles.

The question of securing a resistant variety of currant or gooseberry is still in need of further investigation. It is desired that scouts send in to Dr. Perley Spaulding, United States Department of Agriculture, at Washington, cuttings of currants and gooseberries which show marked resistance to the disease. Only cuttings of apparently resistant uninfected plants which are under very severe test conditions, that is, with heavily infected bushes within a few feet, need be sent in. Wrap specimens in damp (not wet) moss or dead leaves and label with your own name, place where collected and date. State briefly why the specimen is thought to be resistant.

Experiments are being carried on to obtain if possible some cheap chemical which will kill wild currant and gooseberry bushes. Over 500 experiments are in progress, using different chemicals and methods. Various derivatives of arsenic, sulphur and ammonia are being used as a spray to kill the foliage. Fuel oil is also being tried. Plots were sprayed with fuel oil and two days later burned over without good results. The soil about the plants in one series of experimental plots is being treated with dry chemicals such as salt, calcium chloride and sodium carbonate. Sodium arsenite, sodium cyanide and fuel oil are injected into the soil near the roots of bushes in liquid form. Some of the gaseous chemicals employed are sodium sulphid, sodium bisulphid, chloride of lime, calcium carbide, carbon bisulphid, formalin, chlorine water, hydrogen sulphid water, turpentine, nitro-benzine derivatives, crude carbolic acid, etc. These

substances are placed in the soil around the roots of wild currant and gooseberry bushes in various quantities.

Thus far the use of chemicals as outlined above has met with very little success. In addition, mechanical methods of removal are being tested to determine comparative costs and efficiency in preventing sprouting from the roots.

Where men are otherwise liable to the draft, no exemptions, either permanent or temporary, have been granted to Government blister rust workers. However, it is possible that temporary delay in reporting for duty until after the close of the present season's work may be secured for men whose services are highly necessary for the conduct of the work. No request for delay in draft can be made until the men are notified to report for duty at the army camps. It was announced that 30 per cent of the quota of each district would be called on September 5, the next 30 per cent September 15 and another 30 per cent on September 30. The remaining 10 per cent was to be mobilized as soon after that date as possible.

The following are the conclusions reached by experts who have made a study of the pine blister disease:

The essential thing in controlling the blister rust is to get out all currant and gooseberry bushes. The most effective time for doing this is in the early spring, and this part of the season should be used for rescouting control areas.

It is not feasible to spend time and money in scouting and eradicating diseased pine in New England, except where there may be outbreaks of the disease in new territory.

The establishment of control areas, in which all currant and gooseberry bushes, both wild and cultivated, shall be eradicated as far as possible, is regarded as the most practicable means of limiting the ravages of white pine blister rust; and owners of pine woods are urged to co-operate with state authorities to control the disease in their several localities.

In the expenditure of funds appropriated for blister rust work, the following plans are generally approved: 1. The method of direct state experimental areas to determine the cost of control by means of the eradication of wild and domestic bushes under various conditions; and, 2, such co-operation with private owners as will give expert direction or supervision to their work.

Localities established as control areas should be scouted at least four successive years for currants and gooseberry bushes.

Men inspecting should be required to carry whisk brooms and to brush their entire clothing with these after dipping them into disinfectant when circumstances require, also thoroughly to wash their hands and arms.

# OUR FOREST RESOURCES AND THE WAR

BY E. A. STERLING

**I**F our newspapers some morning should proclaim in a double-ribbon head that "Lumber Wins the War," it would but little over-emphasize the indispensable part our forest resources are playing in achieving ultimate victory. Such a headline will not be seen, but the papers can safely say any day or every day that the war cannot be won without lumber.

It is all so big that more than a meager comprehension of what is going on along any line is impossible now. The wonderful accomplishments come from a co-ordination of effort, requiring the combined use of many materials. What is big today may be small tomorrow. While headline news developed at one point might lose significance if it was known what was really going on somewhere else. The perspective will have to come later. From the isolated facts now known comes the realization that of all of our wonderful natural resources, industries and facilities of every kind, which are being drawn on to the utmost, forests and their products are in the front rank.

Our use of materials, enormous as it was in normal times, has been increased beyond precedent to fill military requirements. It is one of the saving factors for America and the whole Allied cause, that this nation was so blessed with its resources of iron, coal, lumber and food-stuffs. It is as true now as when Adams Smith first wrote the obvious fact, that the source of practically all income and materials, is the soil. Today the earth produces the ore for the steel; the coal for the fuel; the forests for the lumber and the grain for the food, which give America and her Allies the supremacy that will win the war. We all know these things without many fully realizing their significance. It is only when some essential is no longer available that its indispensable character is revealed. We take it for granted that coal and iron will be mined, and steel made for the guns, and myriad other military appliances. We need wood for shelter, ships, and many other construction purposes, and simply go and cut it from the forests. The steps in the production, transportation and fabrication of these materials are lost sight of, as is also the fact that they are basic natural resources without which no country can prosper, much less win a war.

Our forest resources are producing material as indispensable as steel. Wood is demanded for war purposes because of the well known but rarely thought of characteristics which make it the most widely used building material. It is indispensable both in war and peace because it is available everywhere; can be readily cut and shaped in any size or form; because it combines great strength with lightness; is easily worked and adaptable; is obtainable in kinds and grades for all purposes, and is a non-conductor of heat. It is natural, therefore, that it should

be one of the materials in greatest demand for war purposes.

To say that two or three billion board feet of lumber are being produced in the shortest possible time to meet the most urgent war needs the country has ever known, conveys very little. Even to say that a single billion feet would make a boardwalk ten feet wide from New York to Petrograd, via Vladivostok, really does not convey the full impression. As a matter of fact, no one really knows just how much wood is being used in our war preparations, nor does the number of feet especially matter. It is extremely important, however, to know that our forest resources are fully able to meet the unprecedented demands upon them, and to do it without materially reducing our reserve timber supply. It is equally important that the producing facilities of the lumber industry are able to shift from normal routine and produce sizes, kinds and quantities of timber as needed by the military authorities.

In the war news for many months have been frequent references to wooden ships, the army cantonments, and the new airplane fleet. These are among the large items in which wood is almost the exclusive construction material. In addition, however, are the docks and wharves, both here and in France, the warehouses, boxing and crating lumber, hangars and hundreds of smaller uses. The necessary kinds of wood required for all of these things, the unusual specifications and sizes, the large orders for wooden items which usually are produced only in small quantities, and the necessity for haste in production, indicate the diversity of demands which the forests must meet.

A Washington dispatch in late October reported over 45,000 cars of lumber shipped for government war purposes or orders distributed alone by the Committee on Lumber of the Council of National Defense. This gives a clew as to the magnitude of the war lumber output, yet is only a beginning. Nor do these 45,000 carloads, which would make a train 500 miles long, represent the total consumption, many orders being placed through sources other than the Lumber Committee.

The indispensable character of the lumber required is shown by the many purposes for which it is used. The National Guard camps and National Army cantonments comprise hundreds, if not thousands, of acres of wooden buildings. At one camp 50 carloads of materials were unloaded a day for the construction of 746 buildings, in which over 30,000,000 feet of lumber was used. Warehouses and cold-storage plants require millions of feet. About 900 carloads of dock and bridge timbers and other construction materials have been cut for export for American army purposes in France. Nearly 4,000 carloads of yellow pine alone have been shipped for wooden

ship construction, besides nearly as much fir and hardwood. Each wooden ship requires about a million and a half board feet, in addition to that used for the ways and scaffolds. Aviation schools and camps, army trucks and boxes, take millions of feet more.

Just as items: One hundred and thirty thousand pieces of piling for docks were in one order, while another government requisition called for 20,000,000 ammunition boxes, all to be made of wood. If these piles averaged 30 feet long, they would extend 800 miles, or nearly from New York to Chicago, if placed end to end. At Washington 10,000,000 feet of lumber has been ordered for new frame structures to accommodate army bureaus. At one government shipyard, somewhere on the Atlantic Coast, 50,000,000 feet of heavy lumber and timber is needed for ways and general purposes. One Pacific Coast emergency lumber bureau has received orders for nearly half a billion feet of one kind of wood; while for air-craft stock well over 100,000,000 feet of spruce alone will be required. In September contracts were awarded by France for 24,000,000 feet of spruce; Italy, 9,000,000 feet, and England 36,000,000 feet. Lumber for portable or collapsible military buildings of various kinds, for the use of the American Army in France, has just been requested. The first order is for about 15,000,000 feet, with ultimate needs aggregating several hundred million feet. Creosoted wood block flooring is to be used in government munition plants. An order for 38,000 yards, equivalent to two miles of street paving, is soon to be placed. These are but examples of the demands which our forests are meeting.

A hundred years ago, before the days of steel ships, treenails were a well-known product of the forest, but with the decline of wooden ship building, their production practically ceased. With the inauguration of the present shipbuilding program, treenails were suddenly in demand in greater quantities than ever before, with the result that emergency measures had to be taken to insure a supply. Locust is preferred to all other woods for this purpose, but since the supply is not sufficient, several other woods are now used in their manufacture. It perhaps should be explained that these treenails are long wooden pins, cut 20 to 26 inches long and  $1\frac{1}{4}$  inches in diameter. This is one example of the new demands which have been faced and met in supplying wooden products for war purposes.

We have accepted our forest resources as a matter of course, using them in many cases none too wisely. With a standing timber supply which is still sufficient to take care of all requirements for many years to come, lumber has simply been cut where most available and as needed. The lumber industry has strong resources, and is directed by men able to meet any emergency such as at present exists.

Every conceivable war requirement for wood can be met, although, of course, in some cases not as promptly as might be desired. In the western forests alone there are almost 4,000 miles of logging railroad, 870 logging locomotives, 13,000 cars and other necessary equipment. With a normal annual lumber output valued at over half

a billion dollars, mill and logging facilities were fortunately available for the production of diversified forest products for war purposes, which have a value beyond any dollars and cents figures because indispensable in the preparations for victory.

It should be remembered, too, that while the military needs are being taken care of, lumber for the every-day needs of the country is being produced as well. This alone, even with the decrease in building operations, will not fall far below 40,000,000,000 feet per year. Although their importance transcends all else, the war requirements are a comparatively small percentage of the total output. The emergency which the lumber industry has met has not been in the volume of the wood required, but rather in the urgency and special requirements.

When peace is attained—with victory—and the mills cut only for the normal requirements of peace and for reconstruction in Europe, it will be found that our forests have fully met the unusual demands upon them, and remain one of our greatest natural resources. It would be most gratifying if out of this crisis should grow a better public realization of the part the forests play in the economic stability of the nation. We shall always need wood for construction, fuel and the arts of civilization; the forests alone can supply it.

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**T**HE New York State College of Forestry at Syracuse has recently sent out a circular letter to Chambers of Commerce throughout the state warning against the ravages of the tussock moth, which bid fair to be severe on shade trees during the next growing season. The egg masses, which are white and conspicuous, may be seen readily at the present time on the bark of elms particularly, and these may be collected and destroyed or daubed with creosote so that they will not hatch. The college, in its letter, has suggested that local shade tree or park commissions take the matter of destroying the egg masses in hand at once and push it vigorously.

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**T**HE College of Agriculture, Cornell University, offers three courses in vegetable gardening during the short-course term which extends through a period of 12 weeks from November 7 to February 15. Two of these courses, one in commercial vegetable gardening, and the other in vegetable forcing or greenhouse vegetable culture, are planned to be of special value to those who contemplate vegetable gardening as a life work. The course in home vegetable gardening is designed to meet the requirements of those desiring to secure a general knowledge of the principles of vegetable production for home use.

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**P**LANS for a model after-the-war camp at Mount Gretna for Pennsylvania's National Guard have been discussed lately between officials of the Adjutant-General's Office and the Department of Forestry. These plans take into account the increased productivity, capacity and general beautification of the fifteen hundred acres of timberland included in the State's two-thousand acre military reservation.

# EDITORIAL

## FORESTRY AS A PROFESSION FOR YOUNG MEN IN THE UNITED STATES

THE great war has brought home to our people a number of very interesting facts regarding the necessity for and the extensive use of wood, and with this, the importance of the forest and its proper care. Suddenly we learn that wood is not merely useful as lumber, fuel, telegraph poles and pulp wood for newspapers, but that even in this age of steel and cement we want enormous quantities of wood for ships and camps, for railways and corduroy at the front, a hundred million feet or more of high-grade spruce for airplanes.

Beyond this, we find that wood is made into clothing, bedding, fiber for fiber cases and shoe soles, in short, that it may be converted into anything from paper collars to carwheels.

Even this does not exhaust the list, for the laboratory now tells us that sugar, and drinkable alcohol, as well as the old products of wood alcohol, wood vinegar, etc., can be and are made and used in enormous quantities.

War has taught us also the simple fact, well known to foresters but apparently unknown to our statesmen, that a country with its forestry work properly organized and supported has 20 years' supply of timber constantly stored up and ready for use. Forestry has saved Germany in this period of need.

The sudden war demands have called attention to the fact that while mere brush and uncared for woods, such as are now a great part of our eastern woodlands, may help the landscape in looks, and may be good hunting ground, they are not forest, and are of little use now when the United States needs one hundred and fifty million feet of select spruce for flying machines.

The nation has been stirred up in the last six months regarding the importance of using our soil to its full capacity, and we are discovering that the choice of the right crop is foremost in this work, and also that on hundreds of millions of acres the right and only crop is the forest crop.

Our people realize now as never before that the food, clothing and housing materials are products of the soil, that they need land, labor and time for their production, and especially that the forest crop needs a long time—that the spruce planted today requires a century and more to make fit stock for airplanes.

It is beginning to dawn on some of the people in power that this care of one of the great crops of the world, the care and planning for properties for a century hence, requires a little more than a mere wood chopper, and that certainly it requires policies which have some show of continuance.

What great field this offers for the young men choosing

a profession. Today we have a consumption, in peace times, of over forty billion feet of lumber alone; a forest area of about five hundred million acres, or more than 16 times the State of New York, and a population over one hundred million, and rapidly growing in numbers and in wealth and in its demands on the forest. And the care of this empire, the production of this yearly timber crop for the greatest people of the earth speaking one language, this great task is the work of the American forester.

A fine beginning has been made. Thirty years ago forestry was not yet in our dictionary; there was not a forester in the land with an acre of woods or a log of timber to sell. Today the Forester of the United States cares for over one hundred and forty million acres, an area larger than the combined area of all the forests of the German Empire; and today the Forester offers timber for sale in quantities of over five hundred million feet, and is in position to offer more than any other person in the world.

A number of schools have begun to prepare men for this work, but so far the supply of real foresters is in no proportion to the task before the profession.

In Germany a forester cares for about 10,000 acres of forest and usually has two to four assistants. On this scale we would need a body of 50,000 foresters and about 200,000 assistants, besides a large body of specially trained labor, to care for our woods as they should be cared for. Today not the hundredth part of this number of available men exists in our country.

The American way is not to run after the salesman—the man who has his labor or his goods to offer must hustle and prove his worth.

It is a safe estimate that 10,000 good, capable, honest and industrious men can find employment in the forest work just as fast as they really hustle and prove that they are worth having. And 5,000 more of stronger men can force their way into the forest business and acquire forest property and be their own foresters.

In Central Europe the forester is an educated, respectable and respected man, a power in his community, useful in times of peace and exceptionally useful and efficient in time of war.

In the United States the young forester (for so far there are practically no others) has already made a fine reputation for himself. He has established a real administration over millions of acres of forest, over billions of dollars worth of property; he has surveyed millions of acres, built hundreds of miles of roads, trails and telephone lines. He has not only organized a fine protection for public forests, but has done this also for private

organizations, which in the past failed entirely in this effort.

The forester in the United States has proven himself a public servant of the highest order and value.

A forester's life is one of the finest that any enterprising, hardy man can desire; work and hardships mingle with leisure and freedom, and to this is added variety in work and variety in place, the out-of-doors and a clean and beautiful environment. His work is not of the petty three-cent clerk character; he deals with large things, thousands of acres, millions of timber. The salary of the forester is good in the Old World and is good here. In the United States service it has been rather low, considering the high cost of living and special expenses, and it is to be hoped that Congress will see the necessity of substantial advances. But even here the forester has fared just as well and even better than the teacher, the doctor, lawyer, etc. Considering the length of time, the lack of experience, etc., the forester in the United States has fared well. When young men of just fair capacity and only four to eight years' experience draw \$2,000 and as high as \$4,000 per year, while good teachers of 20 years' experience work for \$2,000, there should be little complaint.

This statement would be incomplete without a word on the course of study which the forester pursues at school. The course in forestry normally takes up—in sciences—mathematics, physics, chemistry, geology and mineralogy, botany and zoology; then also surveying, including map making, besides the usual courses in forestry proper which take up about 40 per cent of the time. This program is so well planned, has been fully tried for years, has proven useful in so many cases for work in other lines besides forestry, that it is not at all boastful to say that a student who takes a forestry course is far more certain of a useful, well-balanced science course than is the student who trusts his own immature judgment and the enthusiastic pleadings of the various specialist teachers.

To sum up: The field is immense in its extent, interesting and enjoyable in character and appreciative in its pay. The United States has the forests and lands—the people, the industries. We need the foresters and we shall have the foresters. The forester even now is making himself felt the length and breadth of the land, and in this hour of war he is proving a fit rival of his colleagues abroad.

## BAD FOREST FIRE SEASON

**T**HE total number of fires extinguished by private, state and Forest Service employes during the past season in the Pacific Northwest was 7,688, of which 938 were classed as bad fires. All interests for forest protection combined employed 2,579 regular patrolmen outside of about 12,000 extra fire fighters, the total expenditure for fire protection by all concerned being \$1,825,000. Since the extremely disastrous fires of 1910 aroused public sentiment against fires, a closer co-operation between private, state and national agencies has done much to reduce the number of fires that start in dry times and still more to prevent the fires that do occur from destroying large areas of valuable timber.

Especially energetic measures were undertaken during the past season by some of the state authorities. In August the Governor of Oregon placed detachments of troops throughout the state where trouble prevailed and incendiary fires stopped at once. The Governor also

closed the hunting season after it had been open for a week. In the State of Washington the forest fire wardens controlled bad fires at the expense of those responsible for their origin and this provision of the Washington law has been commended by authorities in other states.

During the past season 650 forest patrolmen, together with the necessary extra help, extinguished 2,388 fires on the holdings of the members of the Western Forestry and Conservation Association. The season was one of the driest on record and most favorable for the origin and spread of destructive fires. Yet the actual loss of timber this last year was very much less than in previous bad years due to the increasing effectiveness of fire-prevention measures carried out by the timberland owners, whose patrolmen kept watch over an area totaling 21,326,000 acres. The timber landowners of this territory spent \$290,000 for fire prevention work.

**N**OTIFICATION has been given by the United States Shipping Board that Southern pine manufacturers will be called on by the government to furnish during the next 12 months timbers for the construction of 100 more wooden ships, in addition to the 144 schedules which had already been placed with mills. This means approximately half a billion feet of timbers will have to be produced for the government in the Southern pine territory within a year. Four hundred million feet will go into ships, and one hundred million feet will be needed for ways, docks, props, houses and other uses at shipbuilding sites.

**B**IRDS and Food Conservation are the subject of a war bulletin issued by the Conservation Department of the General Federation of Women's Clubs, of which Mrs. John Dickinson Sherman, of Chicago, is chairman. This leaflet urges the protection of birds because of their value as destroyers of insects. Startling figures are cited, showing that in Massachusetts alone the authorities estimate one day's work by the birds to be the destruction of 21,000 bushels of insects, while in Nebraska it is estimated that the destruction amounts to 170 car loads a day. In the leaflet club women are urged to do their share in protecting the birds, by seeing that the laws are enforced.

# HOW A SUCCESSFUL SUBURBAN HOUSE IS BUILT

BY RAWSON W. HADDON

WHEN we see a thoroughly successful house—one that seems well designed and conveniently planned—we are apt to be so much interested in the external successes that we give little or no attention or consideration to the less prominent details of construction which made very largely for the general success of the work.

In our admiration of the structure we, as mere spectators, are apt to think far more of how well proportioned a room is, or how convenient the stairs, than of how carefully the building materials have been chosen to assure durability and consistency with the general design of the house.

Of course, good design and substantial construction are of quite equal importance to the home builder, and in the extreme case, a slightly less well designed but carefully built house would be preferable to one that is well designed but not substantially constructed.

And structure must be as carefully considered by the architect as must the design, and a thorough knowledge of the comparative merits of various available materials is as essential to his success as a thorough knowledge of the rules and theories of architectural design.

When you build your house you will do well, in selecting an architect, to choose a man whose horror of flimsy beams and undersized or poorly selected studs is as great as his

dislike for houses in which one must go through one bedroom to get to another, or other equally uncomfortable errors in design.

In the American house of today—just as in the American house for the last two hundred and fifty-odd years—wood is the most generally used and most successful building material. But the earlier builders used only that material nearest at hand, which they could cut down within hauling distance of the building site or that which they could buy in their immediate neighborhood while we, today, not only have greater facilities for transporting material to fit our requirements of design and exposure or expense, but we also know

more about the comparative durability of various sorts of wood and their adaptability to various purposes.

The successful architect does not use haphazard methods in choosing his materials and each piece of lumber that goes into the building is used because experience has shown the architect that the material chosen is the best fitted to stand all the conditions imposed upon it in the part of the building where it is found.

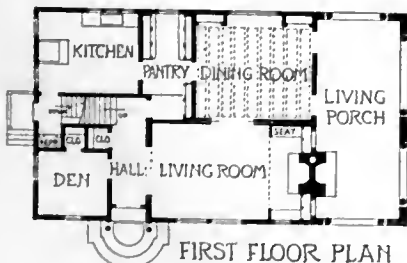
For this reason it seldom happens that any single kind of wood is used throughout the house, and instead of being a white pine or cedar house, many woods will be used, each in the place where it will give the best results, and your house will have



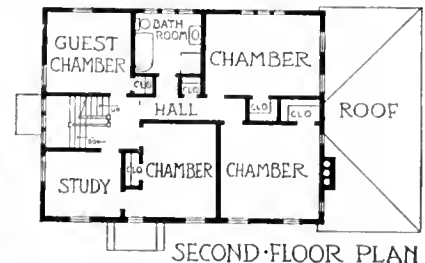
View of the DeVries home. B. E. Muller architect. Red roses will eventually be grown over the lattice in a solid mass to the top of the first story windows.



View of the Warner house. Bernard E. Muller architect.



First floor plan of the Warner house.



Second floor plan of the Warner house.

in various parts of it pine, spruce, cedar, oak, cypress, birch, maple and perhaps other woods.

The architect's duty, then, is to know just where and how each piece of wood is to be used and where each will give the greatest wear, where it is best fitted as a medium for carrying out the design (as white pine for delicate curving or mouldings) and what can be used to insure the least yearly expense in upkeep and repair.

A good example of successful design coupled with good construction is found in the William R. DeVries house, designed by Mr. Bernhardt E. Muller, of New York City.

In its exterior design and in its plan, the house is extremely interesting. While built along Colonial lines the design is not so strictly Colonial as to be oppressing in its imitation of the original type but is simply a free, modernized and, as one may say, humanized design following old lines. The triple casement window, for instance, is decidedly non-colonial, but it indicates to us the presence of a bright, open and airy living room and the three windows above this seem to suggest that the owner's bedroom in back of them and that it, too, is a cheerful and airy room.

The entrance porch is nearer the original style, however, and it is interesting to note how much is gained in general softness and interest in the design by the use of generous planting around the house as shown in the photograph of present conditions as compared with those before the plants had grown.

The DeVries house cost to build about \$15,000. In plan it is practically the same as the Warner house, designed by the same architect and also illustrated here.

At an earlier period of architectural



An attractive vista, giving a suggestion of the harmony of architectural and landscape treatment of the DeVries home.

practice in America the house would have been built of the same material throughout.

At present the knowledge and selection of wood is an important part of architectural education. And it is of equal interest—though the knowledge is not of such extreme importance—to the person who is building or eventually will build a home of his own. And it might be said parenthetically that this latter class includes, or should include, every man and woman in America.

In addition to being an example of good suburban house planning the DeVries house is of interest because of the fact that it illustrates the results of careful study made by the architect of the sorts of wood best fitted for every detail of the house.

In this study some conclusion may have been reached which will not be generally accepted without differences of opinion here and there. And it must be recognized that various considerations such as conditions of climate and exposure and the supply found in local markets will cause changes to be made in many instances. But the results are as a rule those accepted in general practice. They show us if nothing more, at least how many details the architect must consider in the building of a house.

As a result of his study of lumber, Mr. Muller has found it advisable to call, in his specifications, for not simply one or two, but for at least ten different varieties of wood to go into the construction of this particular house.

White pine he considered the most satisfactory and least expensive material for the exposed exterior detail. This includes window sills, casings and sash, the cornice, the entrance door and porch as well as the main porch and the entire cornice. The exterior walls and roof are shingled with white cedar shingles, those on the wall are twenty inches long and twelve inches to the weather, while the roof shingles are sixteen inches long and are exposed four and one-half inches to their length.

The entire framing, including the joists, headers, studs, beams, roof rafters, sheathing and also the rough (or under) flooring is of spruce.

Finished floors differ in various parts of the house. In the main rooms they are oak. The kitchen and pantry floors are maple, while the rooms on the second and third floors and the porch floors are North Carolina pine.

How carefully the subject must be gone into is demonstrated in the cast of the windows where such fine distinctions are made in specifying as that while the sills, casing and sash which must meet extreme exposure are to be of "clear, sound, well-seasoned white pine" the jambs and parting strips are to be of "comb grained southern yellow pine well-seasoned and free from pitch and other imperfections."

In his study of structural wood the architect soon finds that conditions vary quite sharply in many important respects in different parts of the country. Most important of these, perhaps, for present consideration, is the kind and quality of lumber grown in the immediate section of the country in which the house is to be built.

In the instance of the present design it will be seen that important variations would be necessary from Mr. Muller's specification to meet climatic considerations and to obtain the best materials available in the local markets at the least cost, if it had been built in California, or in the Lake States, for instance. For building in the New England states the arrangement of structural woods as specified by the architect would be most satisfactory and economical in all respects. It is not suggested as a general specification, however, and would hardly apply in other sections of the country.

As an example of the importance this knowledge on the part of the architect, it will be noted that while North Carolina pine is specified in this house for the floors only, by referring back to the article on Building Bungalows which appeared in the April 1917 number of the magazine, it will be remembered that in the case of the two bungalows at Southern Pines, N. C., designed by Mr. Aymar Embury, of New York city, North Carolina pine was used throughout for the reason that it was the best and most economical material for use in the location in which the houses were built.

For the present house, it will be seen that if the place of erection were the Middle West, the use of spruce for the framing, studding, rafters, etc., would call for a material which is not usually carried by dealers outside of the New England market. By substituting southern yellow pine,



Doorway of the DeVries house, showing the perfect lines of the portal and the simple effectiveness of the growing plants.



North Carolina pine or hemlock for the spruce, according to what kind happened to be most available and cheapest in the local market, equally satisfactory results would be obtained.

For the roof and siding it would, of course, be found desirable to substitute red cedar or cypress for the white cedar shingles in some localities, and they would serve the purpose equally well.

When you build, the architect you employ may not agree with this specification in all its details and if he does not the difference of opinion will probably be caused by some substantial consideration, but under most conditions the following list taken from the De Vries house specification will assist you in securing the most satisfactory materials for even the parts of the house of seemingly small importance:

Framing — Spruce, including lathing, joints, headers, studs, roof rafters, sheathing and rough flooring.

Exterior Walls—White cedar, 20 inches long, 12 inches to the weather.

Roof—White cedar, 16 inches long, 4½ inches to the weather.

Windows—White pine sills, casings and sash; jambs comb grained southern yellow pine.

Exterior Cornice—White pine.

Porches — White pine including hood over front door.

Flower Boxes—Cypress.

Stoops—Cypress.

Exterior Doors—White pine.

Exterior door jambs—White pine.

Exterior and interior door thresholds—Quartered white oak.

Floors (under floor) — North Carolina pine.

Floors (finished) — North Carolina pine, second and third floor rooms; North Carolina pine, porches; maple, kitchen and pantry; white oak, main rooms.

Stair—Quartered white oak, main stair from first to second floor; strings, treads and risers of other stairs are hard maple.

Handrail—Main stair quarter sawed white oak; birch, cellar and attic stairs; (balusters cypress).

Interior Finish—White oak, first floor, unless one exception is made for special work; cypress, pantry and kitchen; white-wood, hall, living room and rooms on second floor.

Drainboard in Kitchen—Ash.

The selection of materials with which to build is followed by the equally important, though less generally understood, selection of mediums that will give to these materials the best possible results in good looks. This includes the selection and proper application and use of paints and stains for both interior and exterior work.

On the whole this subject is one in which the architect has a far smaller range of choice than he has in most other matters.

The selection is limited to the products of a certain number of firms and these he must experiment with until at last he finds the product best fitted for the needs of the particular house and the one which experience has shown will give the best satisfaction in wear and which shows the smallest tendencies to become worn out or shabby in the course of time.

A series of articles to be printed in *American Forestry* in the near future will illustrate the typical well-designed house in various other sections of the country with a discussion of the most economical and satisfactory materials for use in their erection in at least as much detail as has been done in the present instance for a house in the New England states.

#### Dynamite For Planting Pecans.

"For several years we have used dynamite to blast our tree holes," says G. P. Gill, President New York-Georgia Pecan Company. Pecans are our specialty. We have learned from experience that these trees planted in blasted holes do much better than in spade-dug holes. It is our conclusion that a pecan tree planted in a dynamited hole will in the course of several years catch up with in growth a tree planted several years previously in a dug hole; that is, assuming that both trees are in the same kind of soil and have the same cultivation and care. I regard this as important because every pecan grower desires to get his grove into bearing as soon as possible. Nut trees are slow growers at best; anything that will hasten their growth and convert them into money makers sooner is naturally a good idea.

"There has never been any question about the advisability of blasting tree holes in very hard soil, but there has been considerable doubt expressed as to whether it pays to blast soil that is not very hard. Our soil is of the lighter type. We have found it has paid us many times over to blast."

#### Nurseryman Recommends Blasting.

James S. McGlennon, Florida, a nurseryman, also writes that he is frequently asked whether he recommends dynamite for making tree holes. As there seems to be so much interest in the subject, he says: "I would not think of planting a tree or shrub without blasting the soil unless it were one of the open soil types that would not need any breaking up. I feel that even a common gooseberry bush will mature enough earlier and bear enough heavier to warrant the expense if the planting is to be done in any of the hard soil types."

Attention is directed to *American Forestry's* list of books on Forestry, on page 703 of this issue. In this list is a comprehensive collection of titles and authors attractive to all interested in the bibliography of trees and related subjects. These and many other books may be ordered through the American Forestry Association. Prices quoted are by mail or express, prepaid.

## BOOK REVIEWS

Wood and Other Organic Structural Materials, by Charles H. Snow, C. E., Sc. D. McGraw-Hill Book Company, Inc., New York. Price, \$5.

Designed for engineers, architects, students of technology, teachers of manual training and those who use structural materials, this book takes for its purpose the presentation of general and physical characteristics of a group of these materials. Among those considered are woods, paints and varnishes—with their associated oils, pigments, gums and resins—glues, creosotes and India rubber. The work is comprehensive. In its subdivisions it treats of the uses of wood, the reasons for preferring wood to other materials, the value of forests and forestry, wood protection, fire-proofing and preservation, and many other subjects of related character. The author is dean of the school of applied science at New York University. He has given exhaustive study to his subject and has provided a vast amount of information of value, based on the premise that practical knowledge of the properties of structural materials will greatly influence students in the works which they may design and construct.

Botany of Crop Plants, by Wilfred W. Robbins, Ph. D. P. Blakiston's Son & Co., Philadelphia. Price, \$2.

This is intended as both text and reference book. Its compilation has grown out of a course of instruction extending over a number of years. Mr. Robbins is professor of botany at the Colorado Agricultural College and much of his material has been used in college freshman classes as a text from which to make assignments and as a guide and reference in the laboratory. The book is intended to give a knowledge of the botany of the common orchard, garden and field crops. In its preparation the writer had in mind non-agricultural as well as agricultural schools, because of the growing tendency to tie up botany more closely with economic interests and to draw more upon economic plants in citing examples and in choosing subjects of study in the laboratory.

Clearing and Grubbing, by Galbert P. Gillette. Clark Book Company, New York City. Price \$2.50.

In this book, just from the press, will be found not only very much valuable information by an authority on a subject which has heretofore been treated, in a way, as somewhat beneath the consideration of engineers, but also a compilation of all the important facts from state and government and current periodical publications on clearing and grubbing operations. It is the only book of its kind in print. A slight conception of the importance of the subject may be had when it is remembered that of the 400,000,000 acres of farm land now under cultivation, it is conservatively esti-

mated that 50 per cent. had to be cleared and stumped before it could be cropped; and, assuming that the 200,000,000 acres of farm land in America have been cleared and grubbed at an average cost of only \$10 an acre, the great economic necessity of the application of the most modern and practical methods in clearing operations will be readily seen. Mr. Gillette has met this need in his book, and has clearly and thoroughly covered the various methods and machinery employed, and embodied where ever possible most valuable cost figures, which his actual experience as an engineering contractor have made familiar to him. The merit of the book, and its value, are unquestioned.

**Successful Canning and Preserving**, by Ola Powell. Lippincott's Home Manuals. J. B. Lippincott Company, Philadelphia. Price, \$2.00.

Of the new literature on the preservation of food products, none is more important than Miss Ola Powell's "Successful Canning and Preserving." Miss Powell is assistant in Home Demonstration work in the States Relations Service of the United States Department of Agriculture. In this service her skill has gained national recognition and she is regarded as one of America's foremost experts on canning and preserving meat, vegetables, and fruits. Her experience and research enable her to speak with authority and entitle her new book to a place among the classics of this branch of literature.

"Successful Canning and Preserving" has two functions in that it is suitable for use as a text book and for practical application to household needs. Miss Powell's work in the States Relations service has rendered her admirably fitted for giving full value to both of these important phases. For several years she has directed the government canning clubs in which thousands of women and girls have acquired complete training and achieved practical and concrete results. In her book she details the methods by which the finest quality of canned products have been prepared by home canners of fourteen and older. Individual examples are given of the success of the work of canning club members. One such instance shows a season's marketing record of \$155.86 in profit for a girl in one of these clubs. As a family record is cited the experience of a household which during the season put up 6,500 cans and glasses of vegetables, jellies and jams of a value of \$772.80. The total cost was \$193.20, showing a profit of \$579.60.

While dealing primarily with canning and preserving the book devotes 25 pages to drying vegetables, fruits and herbs. The subjects discussed in detail

include: canning in tin, canning in glass, fruit juices, preserves, marmalades, jams and conserves, jelly making, pickling, the preservation of meats, the use of vegetables and fruits in the diet, the organization of canning clubs and the business side of home canning. No person who follows the book carefully can fail to meet with success in these various activities.

To increase its value as a text book the volume devotes considerable space to the subject of teaching canning and kindred studies. This is so explicit as to make the book an important addition to the course of high schools, normal schools and other institutions. Another feature of similar worth is a carefully prepared list of questions at the end of each chapter, from the point of view of a home economics teacher.

The book contains 372 pages, four colored plates and 164 illustrations.

**Chemistry of Food and Nutrition**, by Henry C. Sherman, Ph.D., Professor of Food Chemistry in Columbia University. The MacMillan Company, New York. Price \$1.50.

For its purpose this book has the presentation of the chemistry and nutritive value of food in relation to the requirements of the human body. It is the outgrowth of years of experience in research work and in teaching the subject to collegiate and technical students. It is especially useful to the general reader who realizes the importance of nutrition as a factor in general health. It also embodies material that should be of value to teachers and students. The plan of the work includes brief description of the principal foodstuffs and the agencies and processes through which they become available for the uses of the body. In addition it follows the functions of these foods in the tissues and sets forth the food requirements of the body under varying conditions, the nutritive functions of chemical elements and the quantities in which they should be supplied by the food. It also details the standards by which to judge nutritive value and economy of articles of food.

**Feeding the Family**, by Mary Swartz Rose, Ph.D., assistant professor, Department of Nutrition, Teachers' College, Columbia University. The MacMillan Company, New York. Price, \$2.

Intended primarily for uses in the home, this volume undertakes to present food and diet information in such manner as will make it easily available in the midst of the cares of the household. The subject is treated clearly and concisely, in plain language, showing how the science of nutrition may be applied in daily living. The author treats of the

food needs of the individual members of the average family, from infancy to old age. Various concrete illustrations of food plans and dietaries are presented, and generous heed given to the housewife's problem in reconciling the needs of different ages and tastes. Among the problems helpfully treated are the construction of daily bills of fare on a rational basis, the wise expenditure of money for food and reasonable control of the kinds of food consumed.

The book has a value for every housekeeper.

**Human Foods and their Nutritive Value**, by Harry Snyder, B.S., Professor of Agricultural Chemistry in the University of Minnesota. The MacMillan Company, New York. Price \$1.25.

Professor Snyder, in this book, shows a clear understanding of food values and sets them forth in style well adapted for use of the work of a text-book for students in colleges. In concise form he presents the composition and physical properties of foods and discusses some of the main factors which affect their nutritive value. Combined with a presentation of the principles of human nutrition is given a study of the more common articles of food, in the belief that it will suggest ways in which foods may be selected and utilized with saving of money and increased efficiency of physical and mental effort. Especial prominence is given flour, bread, cereals, vegetables, meats, milk, dairy products and fruits as the articles most extensively used.

The Handbook of Explosives, just issued by E. I. Du Pont de Nemours & Company, gives instructions for the use of explosives for clearing land, planting and cultivating trees, draining, ditching, subsoiling and other purposes. Especial interest attaches to the information in connection with tree planting. The book shows that blasting mellows the ground to a depth of five or six feet and throughout a circular area 10 to 20 feet in diameter, making it easy to dig the hole and plant the tree correctly. In addition it creates a porous, water-absorbing condition which decreases the danger of drouth and invigorates growth. Details of processes of tree felling and stump blasting are also given. The book is filled with information on these and related subjects and is useful to all who are interested.

"Vertical Farming" is another book issued by the same concern. This deals with the use of explosives in shattering subsoils, to give greater feeding area for the roots of vegetation. This book is by Gilbert Ellis Bailey, A. M., E. M., Ph. D., professor of geology at the University of Southern California. It is freely illustrated.

## CANADIAN DEPARTMENT

ELLWOOD WILSON, SECRETARY, CANADIAN SOCIETY OF  
FOREST ENGINEERS

The next step in forestry progress in Canada will probably be toward the better disposal of logging debris. With the advent of co-operative fire protective associations and the consequent great improvement in the forest fire situation and the greater knowledge of the causes of fires and the means for their prevention, it is being realized that could we economically and practically do away with the slash from logging operations, one of the most serious of the remaining causes of forest fires would be eliminated. A fire once started in a logging slash is practically impossible to extinguish until it reaches an unlogged section or some other barrier. The uncut forest, except in exceptionally dry seasons, does not catch fire readily and the fire, if discovered soon enough, is comparatively easy to put out. In looking over a map of the St. Maurice Valley showing the burnt areas, one sees right away that nearly all the fires have followed logging operations, showing that the debris is a great menace. Lopping the tops in our spruce and balsam operations has been proved by actual experiment to cost practically as much as brush burning, and it is only a half-way measure. Where the tops are lopped they rot sooner, but for the first year or two are almost as dangerous as unlopped tops, and fires originating in such areas are almost as difficult to extinguish. Burning the debris is perfectly feasible, even with several feet of snow on the ground, and is very easy in soft wood operations. For two winters, the Forestry Department of the Laurentide Company has been cutting hardwood and all of the debris has been burnt without difficulty. The claim that the additional cost is too great might possibly be true if only one operator burnt his brush, but if such disposal were made compulsory by law, all operators would be on the same footing, and it would be no hardship. The claim that has often been made that it is cheaper to spend more for fire protection, instead of burning brush, is plausible but fallacious. Even by putting on many more rangers, it is very difficult to keep fires out of slash, and once started, the remaining timber is almost certain to be ruined before the fire is put out. Our dependence for the future is entirely on the uncut forest and the cut-over areas, on which trees below a certain diameter limit and the young growth are left and these must be thoroughly protected. The whole subject is being carefully studied and as fast as the owners of timber lands can be brought to see the necessity of absolute fire protection some practicable law will be formulated.

It is interesting to note the increase in the price of pulpwood lands, as shown by

the recent sale of timber limits in Quebec. Eight hundred and eighty square miles were sold at an average price of \$440 per mile, which exceeds by \$100 the largest average price previously paid. The highest price paid was \$1,000 per square mile. Quite a portion of the land offered for sale was withdrawn as the minimum price was not bid. A new condition is added to the leases. "The grantees of the aforesaid territory must within a delay of three years, manufacture annually in the Province of Quebec, with the timber cut in this territory, either pulp or paper, the proportion of ten tons per day, or sawn timber in the proportion of 10,000 feet board measure a day, per hundred square miles.

Some interesting efforts are being made in Ontario to reforest sandy hills in that Province. Five thousand, four hundred trees were planted, half the area being covered afterward with cedar brush. The section so covered showed the best results, the uncovered portion had many trees either covered with the drifting sand or blown completely out by the wind.

The Dominion Government is making, for the purpose of advertising Canada, some very interesting moving-picture films of power and manufacturing plants and public works. The latest one is of the new storage dam on the head of the St. Maurice River, built by the Running Waters Commission of Quebec, which will be completed

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The successful tenderer shall also be required to erect a mill or mills on or near the territory, and to manufacture the wood into pulp and paper in the Province of Ontario, in accordance with the terms and conditions of sale which can be had on application to the Department.

Parties making tender will be required to deposit with their tender a marked cheque payable to the Honourable the Treasurer of the Province of Ontario, for Twenty-five Thousand Dollars (\$25,000.00), which amount will be forfeited in the event of their not entering into agreement to carry out conditions, etc. The said Twenty-five Thousand Dollars (\$25,000.00) will be held by the Department until such time as the terms and conditions of the agreement to be entered into have been complied with and the said mills erected, equipped and in operation. The said sum may then be applied in such amounts and at such times as the Minister of Lands, Forests and Mines may direct in payment of accounts for dues or of any other obligation due the Crown until the whole sum has been applied.

The highest or any tender not necessarily accepted.

For particulars as to description of territory, capital to be invested, etc., apply to the undersigned.

G. H. FERGUSON,

Minister of Lands, Forests and Mines, Toronto,  
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this month. This dam will form a lake of 400 square miles in area and will equalize the flow of water which supplies power for the many varied industries situated along the river. The St. Maurice Valley is rapidly growing to be the most important industrial section of the Province outside of Montreal, and its development has only just begun. From the falls on the river power is supplied to Montreal, Quebec, Sherbrooke, Three Rivers and the asbestos mines at Thetford, and among the products of the factories are pulp and paper, aluminum, magnesium, carbide, acetone, aloxite and various other chemical products.

Material progress has been made by the Ontario Forestry Branch in the organization of fire protection work on crown timber lands in that province. There are 15,712 square miles under license to cut timber, from which the Province derives a direct revenue of upwards of \$1,500,000 per annum in normal times. In addition, a fire tax of \$6.40 per square mile per year is imposed on license holders. This amount is largely supplemented by the Province, since the fire ranging organization covers very large areas of lands, much of which have been cut over and burned over, but contain a great deal of young forest growth. The total appropriation for all the lines of work with which the Forestry Branch is charged is in the neighborhood of \$375,000. The bulk of this goes for fire protection, but provision is made also for nursery and



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planting work, eradication of the pine blister disease, etc.

E. J. Zavitz is Provincial Forester; J. H. White Assistant Provincial Forester and L. E. Bliss is General Superintendent of fire protection. The Province is divided into 34 districts, with a chief ranger in each district. There are 31 sub-chief rangers, and 986 rangers. For the most part, the rangers work in pairs and travel by canoe. Some are on railway patrol, while others utilize the various other methods of transportation suitable to the local conditions in each case.

Five automobile trucks, with fire-fighting equipment, have been provided for districts where roads to the settlers exist. Some 625 miles of old trails and portages have been cleared out, and 60 miles of new trails and portages constructed. Of lookout towers, 22 have been built, and 19 more are under construction. About 45 miles of telephone line has been erected.

The permit system of regulating settlers clearing fires is in effect in the clay belt of Northern Ontario, and is working well.

It will necessarily require time to get the new organization in thoroughly satisfactory running order, but the progress made thus far gives promise of continued improvement. This work was placed under the Forestry Branch only this year, and many serious obstacles have had to be overcome. The improvement already made is really notable.

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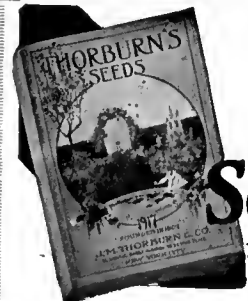
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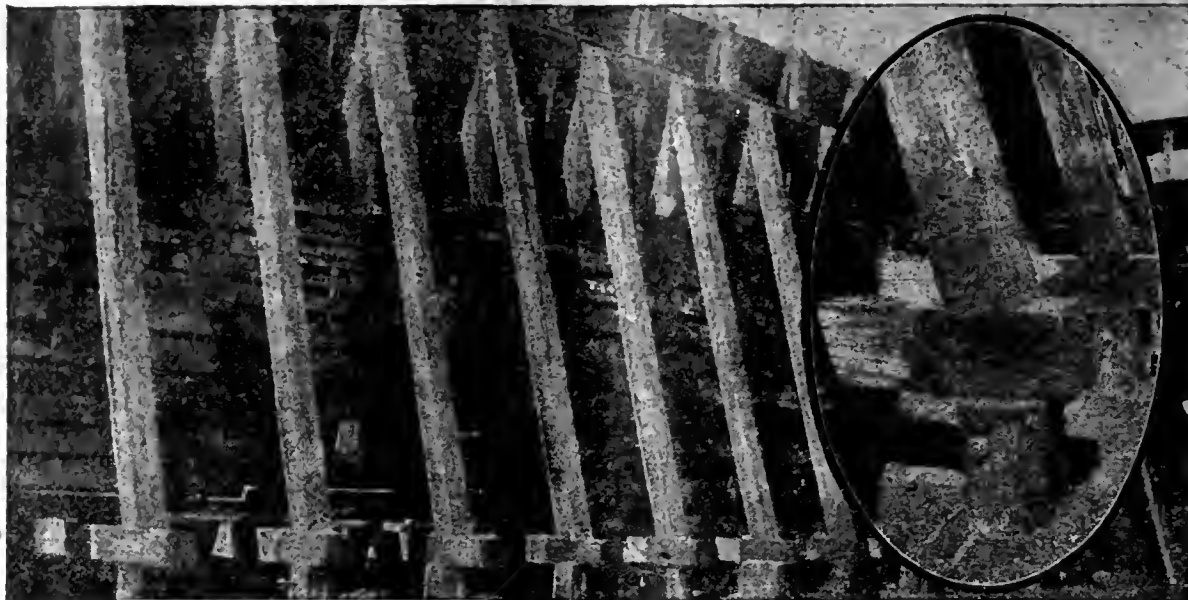
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DECEMBER 1917 VOL. 23

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#### HEMLOCK AND BALSAM FOREST IN BRITISH COLUMBIA

This is a scene behind the falling axes. It is an unusual picture because of its clearness and the perspective. Red cedar is usually associated with the older timber in these forests, and the same on the best types often cuts 75,000 to 100,000 feet per acre. Western hemlock is now being used extensively for pulp wood. It also makes excellent lumber, being much superior to eastern hemlock. The next step in the logging scene always is to skid the logs by cable to the head of the log road. The portable donkey engines in the woods are known as "skidders," the one at the foot of the log road is the "roadster" or "bull donkey."

# DONATIONS

FOR THE

## RELIEF AND COMFORT

OF THE

# FOREST REGIMENTS

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PERCIVAL SHELDON RIDSDALE  
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Members of the American Forestry Association and others interested in forestry are asked to contribute to the fund now being raised to provide comforts and any necessary relief to the members of the Forest Regiments called for service in France.

These men, there are some 10,000 of them, have the task of supplying for the army of the Allies such absolute necessities as cordwood for cooking and heating, posts for trenches and mines, planks to haul heavy ordnance over, boards for hospitals and billets; ties for railroads, timber for temporary bridges and many other emergency uses. At least 25,000,000 board feet will be needed monthly. This will be obtained from the French forests, the only source available at present, due to lack of water transportation. These forests the French have generously agreed to sacrifice, but desire them cut, as far as it is possible, along forestry lines.

A joint committee has been formed of the lumbermen and forestry organizations of all kinds throughout the country, which will solicit funds and take charge of all sums raised for the comfort and relief of the men in these regiments. All such funds are to be expended to meet the special needs of the men in this special industry. Immediate needs are along the lines of comfort and recreation essential to physical and moral welfare, and later serious relief for soldiers and dependents will be pressing. To meet this larger and more vital demand members of the American Forestry Association are asked to contribute generously. Reports of the use made of contributions will be published from time to time in all of the lumber and forestry journals.

We confidently ask you to stand behind the men of the Forest Regiments who furnish the lumber which, next to ammunition and food, is the greatest need of the Allied army. The personnel of the committee will assure that every cent subscribed will be utilized to the full in assistance and relief. All funds are to be sent to Mr. P. S. Ridsdale, secretary of the American Forestry Association at 1410 H Street, N. W., Washington, D. C., which Association has offered to give its office accommodations and the time of its secretary, free, to the administration of the relief work.

*FILL OUT AND SEND THIS FORM WITH YOUR CONTRIBUTION*

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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.

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# AMERICAN FORESTRY.

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DECEMBER 1917

NO. 288

## YE HOLLYE GREENE

DONALD A. FRASER

Ye hollye greene is Christis tree,  
Yt groweth cleane and springeth free,  
And all yts beauties reach their prime  
To grace His blest Nativitie.

Yts stately stem stands straight and still,  
As stood His roode on Calvary's hill,  
And, Lo! how slow yts growth, and sure,  
Just like His Kingdome 'gainst ye ill.

Ye thornes that pierced His brow in grieffe  
Are set around each gleaming leafe,  
And chalices of precious bloode  
Are glowing in each berrye sheafe.

When nature's moping cheerlessly,  
Ye hollye shineth faire to see;  
Remember, Christians, be not sad,  
Ye hollye greene is Christis tree.

# A FORESTER AT THE FIGHTING FRONT

BY P. L. BUTTRICK

**Y**OU have seen in winter bare New England or western hillsides from which all the timber has been cut, except a few struggling, undersized trees and

a few old snags and over which a fire has swept, burning up the slash and blackening the snags and remaining trees. Over this a light snow has fallen, not heavy enough to form a complete mantle, but sufficient to cover most of the surface. Roughly following the contour of the hill and here and there running up and down across them are little ribbons, which stand out some what; skid roads, roughly hollowed trails made in getting the timber down the slope.

Such too familiar scene of desolation greeted my eyes when I first came out in the open from a young pine forest and looked out across a valley into a section of reclaimed but devastated France. The resemblance of the desolated country about

French and German trenches and in "No Man's Land" between was so striking that when a French "75" "went off" concealed nearby, the report subconsciously interpreted itself to my mind as a dynamite charge set off by the stump-blasting crew working on a new cutting.

The boom of the exploding shell and the column of dust spurting into the air in Boche land across the forbidden zone even more easily became in imagination a fallen pine raising a snow cloud as its spreading branches hit the ground.

After the Battle of the Marne the German retreat between Rheims and Verdun stopped at one place just outside a little village called Pones. This village is about half way up the western slope of a small valley.

The French first line of trenches were just below the village and the German's a little lower down in the valley. The valley on both sides was covered with a



*Photograph Underwood & Underwood, New York.*

## WELL HIDDEN TRENCH IN THE BRITISH LINES

It is safe to assume that the German forces would have difficulty in locating a trench as well concealed as the one here pictured. The timbers still carry spreading boughs and these give an effect that would make the real purpose of the trench hard to detect at a distance, whether viewed from an airplane or from the ground. The picture was taken as an official war photograph.



*Photograph by P. L. Buttrick.*

## WOOD IS USED EVERYWHERE

It is not merely in regular trench work that the product of the forest is utilized in building trench defenses. This picture shows reserve trench built up with baskets of pine boughs filled with sod. Such defenses are frequent



Copyright by Underwood & Underwood, New York.

WHERE FORESTERS AND WOODSMEN ARE IMPORTANT IN MODERN WARFARE

This scene near Zillebeke is taken from an official British photograph. It shows British soldiers at work cutting down trees for the purpose of procuring timbers to be used in road-making and in strengthening dug-outs. The picture was taken during the Flanders drive and shows a type of activity that is carried on all over the war zone.

thick growth of sapling pine, some planted, some natural growth. For over two years little change took place and the trees continued to grow unmolested. In the spring of

1917, however, the French determined to advance their lines. Accordingly, artillery was massed in the woods back of the village. At a given time the French opened



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A FRENCH BATTERY RETURNING FROM THE FIRING LINE

In this peaceful forest scene the only suggestion of war is afforded by the long line of soldiers. These men are returning through the woods, on their way to the rear, after a long siege of shelling the lines of the enemy. The pictorial effect is that of a woodland spot in the vicinity of any American city—but the thrill of war is there, none the less.

a barrage fire which practically leveled the German trenches and obliterated the woods on the hillside. The very earth was turned upside down on parts of the terrain. Over this man-made desert the French infantry advanced and occupied the German trenches way to the top of the opposite hill

The white appearance of the hillside, so much resembling light snow, is due to the chalky, limestone character of the rock and soil. The lines so closely resembling skid roads were of course the trench lines.

The writer would have liked the opportunity of studying more closely the



*Photograph Underwood & Underwood, New York.*

#### HOW THE INVADERS TREAT FRUIT TREES

In their retreat along the Aisne the Germans left the mark of their ruthlessness on the entire countryside. The fruit tree here shown is typical of the destruction wrought. The picture is from a French official photograph.

effect of modern, intense, artillery fire on soil and tree growth. While he might have done so for a short time no censor would have had to trouble himself to read any manuscript of the investigation.

From what could be seen, however, modern artillery fire can produce a degree of destructiveness to soil and forests far in excess of that ever done in the most destructive lumber operations, even when followed by forest fire. It is said that the devastation in this section is as nothing to that in some places in Flanders. One can conceive, of course, of more complete destruction than



*Photograph Underwood & Underwood, New York.*

#### THE HAVOC OF WAR AS TOLD IN DESTRUCTION OF FORESTS

Determined to harass the enemy in every possible way, the German forces destroy forests as well as cities and farm crops. Manifestations of this spirit of ruthlessness, such as pictured above, mark the entire line of retreat of the Teutons. This picture shows the growth of years destroyed with a few strokes of the ax

that which I saw, but even here the productive capacity of the soil for forest growth, to say nothing of agriculture, has been almost irreparably impaired.

While the trenches may be filled up in the valley and the fields restored, their immediate value will be slight. Sub-soil ploughing has its advantages, but no one would consider land over which a gold dredge had operated to be desirable farm property, and much of the valley land resembles western land so treated.

It will take careful study and experimentations to discover the tree-growing capacity of the hillsides—studies not easily made under shell fire.

shells into these woods from time to time, "fishing" for these concealed batteries. The effect is that of a heavy ice storm combined with a moderately high wind—broken branches, shattered tops, occasional trees uprooted or broken down.

A more complete study of this light shelling would have been interesting, particularly if an opportunity could have been afforded to compare the effect of shrapnel and high explosive shells, but wars are not conducted for the benefit of foresters, of foresters with an investigating turn of mind.

A visit to the trenches themselves showed some inter-



*Photograph by International Film Service.*

PHOTOGRAPH TAKEN DURING AN AVIATOR'S DEATH FALL

This remarkable photograph was found in a camera picked up near the wreck of a flying machine in which an aviator had just fallen to his death, after a shot from a German air raider. It is assumed that the camera had been fixed for exposure and that when the stricken machine dropped the picture was taken automatically. It is believed that the scene pictured is that of an exploding shell, as no other theory explains the cloud of smoke and dust at the left. This mute evidence of the camera hestirs a picture of the thrill of war as experienced by the man who braves the perils of the air in a winged ship. When an airplane is successfully attacked by an enemy plane the aviator knows no escape. With his machine wrecked his plunge to death is inevitable. In this forest scene is given a suggestion of the type of woodland in which American Forest Regiments are at work. The bleakness of the landscape is in keeping with the general appearance of the forests in the war zone, but there is good timber available in the standing trunks.

The German fire was either directed largely against the French infantry advance or was not especially heavy, judged by barrage standards.

The writer had the opportunity of visiting some of the French batteries concealed in the woods back of the lines. The timber was a rather dense stand, some thirty years old, I should suppose. The Germans had dropped

esting uses of wood products. Most of the dugouts resemble in their construction vegetable cellars and powder magazines of our northern lumber camps, being built of small logs and poles banked with earth. The stiff soil of the region holds up well and the trenches require little shoring up.

When it is required the French use large numbers of

gabions or rough baskets of woven pine branches and filled with earth, this being one of the first uses the writer has ever seen for pine twigs.

A walk through some of the captured German trenches seemed to show that they preferred concrete for the purpose of shoring up, as it is hard to believe that they expected the rather thin layer of concrete and a lean mixture at that to withstand artillery fire.

If they did t h e Kaiser must have profusely "strafed" the engineer who planned the work, for the French fire knocked it into fragments or overthrew considerable sections in good sized sheets. One might hazard the guess that t h e French basket work would be a safer bulwark and more enduring than the German concrete.

Behind the trenches much use is, of course, found for wood of all sorts and sizes, some novel uses as well as many old standbys. The corduroy road of Civil War times and logging camp stories is in evidence, as A. R. C. ambulance drivers are prepared to testify.

Rough log and board shacks have sprung up all over the war zone for use as store houses, barracks, hospitals and the like. Many of the board shacks are made of poplar boards sawed from Lombardy Poplars which lined so many of the French highways.

Another interesting but dissimilar use of wood products is the making of fake plantations along

roadsides to screen troop and supply movements from the enemy. At first, apparently, large numbers of young pines were cut down and set up alongside the roads. Later this gave place to the hanging of pine branches on wire and frames supported by poles. Straw, grass and burlap are used in the same fashion. How successful this form of camouflage is can be realized only when

one sees a road from a high observation tower through a telescope or from an airplane.

From very ancient times the military man has recognized the value of forests for concealment from and deception of the enemy. The American Indian understood this perfectly and used it most successfully, but his descendants serving

with the American Expeditionary Forces may learn much from the French.

Not the least interesting feature of my first day at the front was the discovery of the many and varied activities of a modern army and the actual army itself, hidden away in a dense young pine forest. Naturally, little or nothing can be told about this, but much was strangely reminiscent of logging camps "back home"—log huts, blacksmith shops, stables, teams, narrow gauge railroads, even felling operations, for military purposes, of course. An occasional Soixante Quinze, not to mention guns of larger calibre, might seem to supply a somewhat discordant note to any logging camp, but when a gun appears to be merely a pair of wheels



Photograph by P. L. Buttrick.

#### ONE OF FRANCE'S RUINED VILLAGES

This was one of the stopping places in the German retreat after the battle of the Marne. The enemy occupied a position near the village until the spring of 1917, when driven out by French barrage fire. The destruction is complete.



Photograph Underwood & Underwood, New York.

#### SOLE SURVIVOR OF AN ITALIAN BOMBARDMENT

Giving an effect much like an eagle with spreading wings, this remnant of a tree is the only thing left even partially intact on the entire mountain-side of Mount Santo, which was taken by the Italians. The picture was taken by the Italian government.



Photograph by P. L. Buttrick.

**HOW WOOD HELPS TO WIN**

In trench building timbers are indispensable. This shows the use of wood in throwing up trenches in the French war zone. The Engineer regiments of American foresters and woodsmen will supply materials for this purpose, among others.

from a logging wagon upon which has fallen a small log, one takes it quite for granted.

Lumber jacks dressed uniformly in horizon blue and wearing fatigue caps or steel helmets, might look like a



Photograph by P. L. Buttrick.

**ROAD CAMOUFLAGE IN FRANCE**

Suggesting some of the methods applied for the purpose of misleading the enemy and preventing him from knowing too much of what is being done. This shows a screen covered with pine boughs in the Champagne region.

strange setting in front of a bunk house, but after a few weeks of familiarity with men in such garb, which in active use soon takes on a work-a-day appearance, one takes them as quite a part of the scheme of things. In



Copyright by Underwood & Underwood, New York.

**HOW WOOD AND WIRE HAMPER THE FIGHTERS.**

This mass of entanglements is directly in front of that line of trenches known as the Hindenburg line. This line was supposed to be impregnable and the Germans had built trenches there, as showing that they intended to stay at the place for a long time. The British soldiers of the western front cut through the entanglements and drove the enemy from his position. The picture shows the results of the cutting through.

fact, the whole thing seems very work-a-day and non-military, but then the present business of mankind is war, and this is a very work-a-day war.

Regarding Belgium a dispatch from Paris says: "It will be a treeless Belgium to which the people of that unfortunate country will return, if its invaders are not driven out before they have completed their work of devastation. Factories have been despoiled of their machinery, every form of property has been requisitioned, and now woods, forests and even individual trees are being cut down wholesale. The wooded heights of the Belgian Ardennes, which used to protect the center of the country from east winds, are rapidly being denuded, the tall elms that lined the high roads and canals have been felled, and walnut trees that adorned the gardens of the well-to-do in Brussels have not been spared.

"In the early days of the occupation, the Belgian State Forest Department was allowed to supervise the work of

felling and see that it was scientifically conducted, but after a few months, the Germans took over the direction of the department and observed only one rule—to obtain the greatest amount of wood for military purposes in the shortest possible time.

"The Belgian government has been able to learn details of the work done, such as that 1,000 acres have been cleared in the Hertogenwald (Liege) and felling continues there, the fir plantation, 'Fays de Lucy,' the finest in the country, has been completely razed, and the magnificent forest of Soignes, south of Brussels, is rapidly disappearing. These are only examples of dozens of similar cases which are known, and to this devastation must be added the consumption of wood by the native population which for three years has been unable to import any and has had to use quantities instead of coal.

"Serious consequences from every point of view, health, climate and hydrographic, are expected from this widespread destruction of woods and forests, if it continues another year or two."

## HOW WARFARE TAXES THE FORESTS

ONE of the big developments of the war is the extent to which it has educated American lumbermen to think in mighty figures without visible signs of excitement. Two or three years ago a buyer for a hundred million feet of lumber would have thrown the industry into a fever and delivery would have been a matter of long negotiation and discussion. Today the lumber trade deals in billions of feet and orders are filled overnight.

Forest products enter into modern warfare on a tremendous scale. Practically everything an army does calls for wood in one form or another. From encampment construction to trench building and from munitions to flying machines the forest is an indispensable source of supply and the woodsman an essential ally. Wooden ships and wood alcohol, paper shirts and cellulose, chloroform and surgical dressings; all these and countless other articles necessary to successful warfare depend on the forest for their origin.

Of the hundreds of millions of feet of lumber required for the building of the encampments for national army and national guard the story has already been told. To this must be added in a vast aggregate the materials used in aviation camps, supply depots and the other forms of construction required in preparing the United States armed forces for their battle to make the world safe, and the other hundreds of millions of feet used in the building of ships for the emergency fleet. All this material has been produced and delivered in a space of time amazingly short and the current demands are steadily receiving the same priority of attention at the hands of lumber manufacturers and transportation companies.

With a lumber industry already keyed up to high pitch of efficient production the present month brought the announcement of a new source of demand for lumber for

army uses. This involved the supply of three hundred million feet of southern pine for the erection of portable knock-down houses for the use of American troops in France as barracks and hospitals. This undertaking of itself contemplates immediate lumber requirements half as great as those of the encampment construction and adds new pressure to the demands on the industry.

The plans of the War Department architects provide for houses to be made up in panels, shipped across the sea in knocked down condition and bolted together by the soldiers in France. Co-operation between government and manufacturer was exemplified by important changes in specifications after a conference of the lumber interests with representatives of the War Department. The original plans called for the manufacture of the panels by the lumbermen. By pointing out that this was a work with which they were unfamiliar the manufacturers convinced the government that it was better that they should confine their efforts to producing the required material. This will be done and the lumber delivered to contractors who will pursue the structural feature of the work.

The need for these houses arises from conditions similar to those which make it necessary for this country to send regiments of foresters and woodsmen to the French war zone. Labor for construction purposes is practically unobtainable in Europe. With the ready-made houses the soldiers may provide their own shelter. Every phase of the work will be in standard units which will make it possible for the men to erect quickly buildings ranging in size from the one-room shelter house to a hospital accommodating hundreds of patients or barracks for thousands of soldiers.

The speed with which this new requirement for material will be met will be in keeping with the record established in providing lumber for the army camps.



The rapidity with which the camps were constructed is almost beyond belief. At Fort Sheridan, in preparation for the officers' training camp, 86 buildings were erected in 10 days. At Fort Oglethorpe 135 buildings were put up in 12 days. Without highly organized efficiency in the lumber and building industries these records would have been impossible.

This construction program, through sheer magnitude, appeals to the imagination and concentrates public gaze on this particular form of the demand now being met by the lumber industry. Less spectacular, perhaps, but of no less importance, is war's demand for forest products in other directions. Consider the case of the wooden packing box. With none of the romance attached to the magic cities that have sprung up for the army camps and lacking the glamor of building a thousand ships, the packing box is playing a vast part in the lumber requirements of wartime. The material used for making boxes for army and navy supplies has already run into hundreds of millions of board feet and the demand will continue as long as there are an army and navy to provide with supplies. Other huge quantities of packing cases are required for the packing and transmission of munitions and these likewise are consuming lumber in tremendous volume.

In the building of army transport wagons is another field for the use of lumber in large amounts. The vehicle of this type must be a model of strength and service and into its construction must enter the best grades of pine, oak and hickory. A good many thousand army transport wagons are now under construction and the demand from this source will last indefinitely.

When it comes to the actual instruments of warfare the products of the forest enter largely into the needs of an army. Without charcoal it would be impossible to make the black powder which is used in such quantities in explosives, especially shrapnel. Rosin is another item which has made itself indispensable. This product of the pine forests of the South is used by thousands of barrels in the making of shrapnel, for the purpose of holding the bullets in position in the explosive shell head. The manufacture of high propellant explosives requires great quantities of acetone and alcohol, both of which are products of wood distillation. From the refuse of pulp mills science procures muriatic acid, sulphuric acid and chloroform. Wood pulp itself has so many uses as to make them difficult to specify. During the war it has found its place in the manufacture of paper shirts, vests, socks and handkerchiefs, blankets, clothing padding and kindred uses. In Germany wood cellulose is extensively used instead of cotton in the manufacture of gun cotton. Wood pulp is even being utilized in considerable volume in the manufacture of a substitute for cotton for surgical purposes and in making tough paper for surgical dressings and paper board for splints.

In other words, an army depends on forest products from the time its men are mobilized in encampments until

the wounded have received the attention of the surgeon. The National Lumber Manufacturers' Association makes the statement that the first twelve months of America's participation in the war will probably see as much as three billion feet of lumber used for purposes of national defense. This is for construction purposes, and to these figures must be added the large quantities used for incidental requirements. The figures are startling but in spite of their size they represent less than seven per cent of the normal annual lumber production of the United States. In timber resources and manufacturing facilities the lumber industry can take care of all ordinary demands and supply the timber needed for war purposes.

The abnormal need for lumber will not end with the war. When peace shall have been established building material in tremendous volume will be needed for reconstruction of ravished Europe. Coincident with this will be the resumption of normal building operations in England which have been checked by the war. Already the British Government is considering housing plans to relieve the congestion now existing. It is figured that the country will need to erect from half a million to a million new houses within the first two years after the end of the war. Since 1906 there has been a steady decrease in the building of houses for working men. With the outbreak of the war there was practically complete cessation of even the diminished activities in this line, excepting in munition manufacturing areas. To make up for the deficiency it is believed that the government will provide financial assistance for house building on a mammoth scale.

One phase of the patriotism of the lumber interests was manifested in a campaign recently conducted throughout the South by speakers organized by the Southern Pine Association. To stimulate the woodsmen to the expenditure of their best effort in speeding up the production of timbers for the Emergency Fleet these speakers canvassed the entire southern lumber area and spoke before workers at sawmills and logging camps. The appeal to the men was based on the vital need of America for wooden ships and the importance of supplying structural material as quickly as possible. A poster displayed throughout the lumber regions said: "Every swing of an ax, every cut of a saw, may score as heavily as a shot fired from the trenches. Help our boys in France. Help them win the war." As a result of the speeding-up campaign it was expected to increase the output of ship timbers from 850,000 feet a day to 2,000,000 feet.

**M**ISS Grace Pickens is taking the course of forestry at the University of the State of Washington. She entered at the opening of the current session. Other women have registered for selected forestry courses in the University, but Miss Pickens is the first to specialize in a work that has been considered a man's calling. She is from La Grande, Oregon, and has spent much of her life in the woods.

## FORESTERS AND WOODSMEN IN WAR WORK

**A**LLIED leaders in Europe have given cordial welcome to the first contingents of American foresters and woodsmen to arrive in the war zone and take up service in the forests of France. The first arrival was the 10th Engineers (Forest), which went oversea in August. This regiment was followed in November by the first and second battalions of the 20th Engineers (Forest). By French and British war leaders these men are looked upon as a vital contribution on the part of the United States to the allied cause in the great conflict. The requirements of the fighting forces in the way of timbers for trench building and lumber for other forms of construction are such as make these trained workers indispensable to military success.

No figures are available as to the amount of timber which has gone into shoring up trenches and dug-outs, into the building of miles and miles of trench sidewalks and corduroy roads and into artillery and trench screens. Nor is it possible to estimate the quantity used in railroad and bridge construction and in the building of warehouses, barracks, hospitals and other structures. Experts agree that it totals many millions of feet along the hundreds of miles of front. From the statement of a French colonel it is learned that as high as thirty thousand trees have been used in a single day by one French army corps alone. This emphasizes the worth of the American Forest regiments, which will be charged not only with supplying timbers for military use but with producing the material along such lines as will best serve the purpose of perpetuating the French forests.

Along a part of the French front white fir will be the principal timber available for the use of the American regiments. This fir is described as of good quality and fairly good stand, resembling the balsam of the American northwest. It grows in a region of good roads and comparative ease of logging operations. In another section the timber is akin to Norway pine, but with smaller yield per acre. Elsewhere is found short leaf pine, somewhat

like Florida pine in size and yield. Operations in this timber will be conducted in swamps and sand. In some places the American forces will find such hardwoods as beech and oak, of growth smaller and thicker than the hardwood timber of the western Appalachians.

Mid-December found the third and fourth battalions of the 20th Engineers (Forest) completely recruited and organized for service in the war zone. No definite announcement is made as to the time of embarkation for France, but it is understood that in line with the general policy for the formation of the regiment the two new units will soon be at work in the French forests.

Each battalion of the 20th contains three companies of 250 enlisted men, a large proportion of whom are foresters, woodsmen and sawmill workers. When the ranks of the third and fourth battalions had been filled there was a considerable overflow of available men and these are being utilized in the formation of the fifth and sixth. It is probable that two battalions will go forward each month until the full strength of the regiment is completed. This will require ten battalions of the character of those already organized. To increase the efficiency of the trained workers in these battalions the regiment will also have nine service battalions, composed of laborers. The aggregate strength of the regiment will be close to 17,000 officers and men, making it the largest regiment in the world.

Col. W. A. Mitchell, U. S. A., is in command of the

regiment and is in charge of the work of organization at American University campus in the District of Columbia. Colonel Mitchell has had broad experience which qualifies him admirably for the leadership of this force. His work has included road building in the Philippines, mapping at Fort Leavenworth and the designing and construction of dams in the Ohio river. He has served as instructor and assistant professor in military art and civil engineering at West Point. With the outbreak of the recent Mexican trouble he was sent to Arizona with a view to taking over Mexican railway operations if the

### ONLY A VOLUNTEER

By a Private in the 20th Engineers (Forest).

**W**HY didn't I wait to be drafted  
And led to the train by a band?  
Or put in a claim for exemption?  
Oh! Why did I hold up my hand?  
Why didn't I wait for the banquet,  
Why didn't I wait to be cheered?  
For the draftee receives all the credit  
While I only volunteered.

But nobody gave me a banquet,  
And never a soul a kind word.  
The puff of the engine, the grind of the wheels  
Were all the goodbye that I heard.  
Then off to the training camp hustled,  
To be trained for a good half a year,  
In the shuffle, abandoned, forgotten;  
I was only a volunteer.

Perhaps some day in the future  
When my little boy sits on my knee  
And asks what I did in the world war,  
As his big eyes look up to me,  
I will have to look into those eyes  
Which at me so trustfully peer,  
And tell him that I wasn't DRAFTED  
But was only a volunteer.



KIT INSPECTION AT CAMP OF THE FOREST REGIMENT

Some members of the 20th Engineers (Forest) at their camp at American University, District of Columbia. The picture shows how foresters, woodsmen and other civilians have been transformed into real soldiers in a short space of time. The officers are Captain C. B. Cutting and Second Lieutenant L. B. McDaniels. These men will soon see service in the War Zone.

occasion required. His selection as commander of the largest regiment affords opportunity for the exercise of his unusual executive ability and his skill in handling men and engineering problems.

Major James E. Long, Engineer Officers' Reserve Corps, has had the responsibility of purchasing equipment for the forest regiments. Major Long is a St. Louis man, with broad experience in the management of sawmill and logging operations. In his work on the staff of the chief of engineers his special training and knowledge have been of much value in preparing the forest forces for their work in France. One instance of the thoroughness of his work is the systematic method of making shipments for the regimental equipment. Each battalion is furnished with complete outfit for sawmill and logging operations. For sending these forward Major Long devised a plan through the operation of which every part and accessory is given a number and everything for one battalion is painted a distinctive color. This will make the work of assembling the equipment comparatively simple and will save much confusion.

Each battalion will be provided with four sawmill units. Two of these will be semi-portable, complete with edgers, trimmers, 100 horsepower boilers and other equipment, and will have daily capacity of 20,000 to 30,000 feet. Two of the units will be portable, with 60 horsepower boilers and with daily capacity of 10,000 to 18,000 feet. Each battalion will also have two 25-horsepower gasoline tie-cutting tractor units, for sawing ties in thin and scattering timber. Each of these units will have a capacity of 4,000 to 5,000 feet. In figuring capacity the ten-hour day is used. This will be materially increased, as each unit will have a portable electric light-

ing plant and operations will be conducted twenty-four hours a day.

After recent shifting the officers of the 20th are as follows:

Regimental Headquarters—Colonel W. A. Mitchell; Major Edwin H. Marks, Acting lieutenant colonel; Major William C. Moore, M. R. C., regimental surgeon; Captain H. L. Bowlby, adjutant; Captain P. E. Hinkley, regimental supply officer; First Lieutenant Cornelius W. Smith, chaplain.

Camp Headquarters—Major Benjamin F. Wade; Captain Edward H. Sargent, adjutant; First Lieutenant Gilbert C. Eastman; Second Lieutenant Richard L. Hyde.

First Battalion Headquarters Detachment—Major E. E. Hartwick; Captain Leon M. Pill, adjutant; Captain H. B. Campbell, engineer officer; First Lieutenant L. J. Freedman, supply officer. Attached—Captain F. M. Bartelme, regimental engineer officer.

Company A, First Battalion—Captain, Arthur W. Elam; first lieutenants, Germain P. Graham, Duncan P. Shaw and James C. Williams; second lieutenants, John B. Cuno and Roy L. Chaffin.

Company B, First Battalion—Captain, Robert A. Cutting; first lieutenants, Harold C. Lyons, William A. Clark and Thomas W. Poindexter; second lieutenants, Arthur N. Dripps, Cecil B. Bradley and Angus I. Ward.

Company C, First Battalion—Captain, H. W. Boetzke; first lieutenants R. N. Benjamin, W. J. Wilson and J. Leroy Wood; second lieutenants Hollister Johnson and H. T. Hopkins.

First Battalion Medical Detachment—First lieutenants Robert B. Hill, M. D., Lloyd A. Elliott, M. R. C., and Charles P. Harrick, D. R. C.; second lieutenant, Julius A. Herbott, V. R. C.

Second Battalion Headquarters Detachment—Major Samuel O. Johnson; Captain Fred F. Spencer, adjutant; Captain Fred F. Horstkotte, engineer officer; First Lieutenant Mark R. Ethell, supply officer.

Company D, Second Battalion—Captain, John C. Perry; first lieutenants, William H. Crosson, Roy W. Pilling and Lawrence R. McCoy; second lieutenant, Myron H. Grover.

Company E, Second Battalion—Captain, W. D. Brookings; first lieutenants W. D. Volk, C. C. Kelley and F. R. Prince; second lieutenant, E. S. Brush.

Company F, Second Battalion—Captain, James C. Long, first lieutenants, Edwin D. Woodruff, Marion Nine and Walter O. Crosby; second lieutenant, Maurice L. Johnson.

Second Battalion Medical Detachment—Captain, J. H. Swafford, M. R. C.; first lieutenants, W. A. Fair, M. C., and R. H. Rowdybush, D. C.

Third Battalion Headquarters Detachment—Major, Arthur W. Corkins; Captain, Winthrop H. Estabrook, engineer officer; Captain Oliver J. Todd, adjutant; first lieutenant Charles M. Jenkins, supply officer.

Company A, Third Battalion—Captain, Collin E. Clark; first lieutenants, Harold M. Power, Jay H. Price and E. B. Hamilton; second lieutenants, Earl B. Birmingham and Albert L. Shellworth.

Company B, Third Battalion—Captain, Earle P. Dudley; first lieutenants, Herbert L. Holderman, Alexander H. Ellison and Morton Van Meter; second lieutenant, Fayette L. Thompson.

Company C, Third Battalion—Captain, George G. Steel; first lieutenants, Clement C. Abbott, Frederick B. Judge and Fred A. Stone; second lieutenant, Charles J. Davis.

Third Battalion Medical Detachment—Captain, Frederick C. Moor, M. R. C.; first lieutenants, Harold T. Antrim, M. R. C., and Edward S. Bracken, Jr., D. R. C.

Fourth Battalion Headquarters Detachment—Major George H. Kelly; Captain Winfield D. Starbird, engineer officer; Captain Edwin C. Wemple, adjutant; First Lieutenant Paul D. Mackie, supply officer.

Company D, Fourth Battalion—Captain, R. B. Carter; first lieutenants, W. G. Conklin, Ralph H. Faulkner and Alfred D. Kettenbach; second lieutenant, Fred A. Roemer.

Company E, Fourth Battalion—Captain, Andrew J. Fisk; first lieutenants, Lester W. Jacobs, Henry F. Power and Frank Mizell; second lieutenants, Luther B. McDaniel and W. A. Foster.

Company F, Fourth Battalion—Captain, Stephen C. Phipps; first lieutenants, William G. Howe, John Summerset and Milton Pittman; second lieutenant, Harry H. Miller.

Fourth Battalion Medical Detachment—First Lieutenants Leroy A. Schall, M. R. C.; Joseph C. Kimball, M. R. C., and John W. Snyder, D. R. C.

Discussing the men of the United States Forest Service who have gone into the Forest Regiments and other branches of the armed forces, Assistant Forester William

L. Hall declares that no other class of men in civil life, perhaps, was more nearly ready for military service than were the foresters and the men employed in state and federal field work. "These men had the preparation which came from years of field experience," says Mr. Hall. "They had all manner of problems to deal with and every kind of emergency to meet. They had been subject to shifts on short notice, with new assignments involving difficult problems and unknown conditions. Above all, they had the spirit of service and esprit de corps. They were fit, ready and anxious to do their part. All arms of the military service have absorbed men from the Forest Service. Our records show 214 men now in the army or navy, and the records are probably not complete.

"The Forest Regiments offered unusual opportunities which Forest Service men and others were keen to accept. More were qualified than could be commissioned. In the organization of the 20th the War Department appears to have reached the conclusion that the qualifications called for are principally experience in sawmill work and logging. If this decision holds, there will be only limited opportunity for foresters in the later battalions. But foresters and men of thorough Forest Service training are equally well prepared for other branches of the military service. Especially are they qualified to take their chances in the National Army.



IN CAMP WITH THE TWENTIETH ENGINEERS (FOREST)

Foresters and woodsmen in the Forest Regiments have occasion to show their skill at light housekeeping as well as in the activities of the woods. These are men of the 20th engaged in dish washing after mess at the American University, District of Columbia. The sturdy appearance of the men augurs well for the regiment's success.



MAJOR E. H. MARKS



MAJOR B. F. WADE



MAJOR A. W. CORKINS



CAPTAIN E. H. SARGENT

SOME OF THE OFFICERS OF THE 20TH ENGINEERS (FOREST)

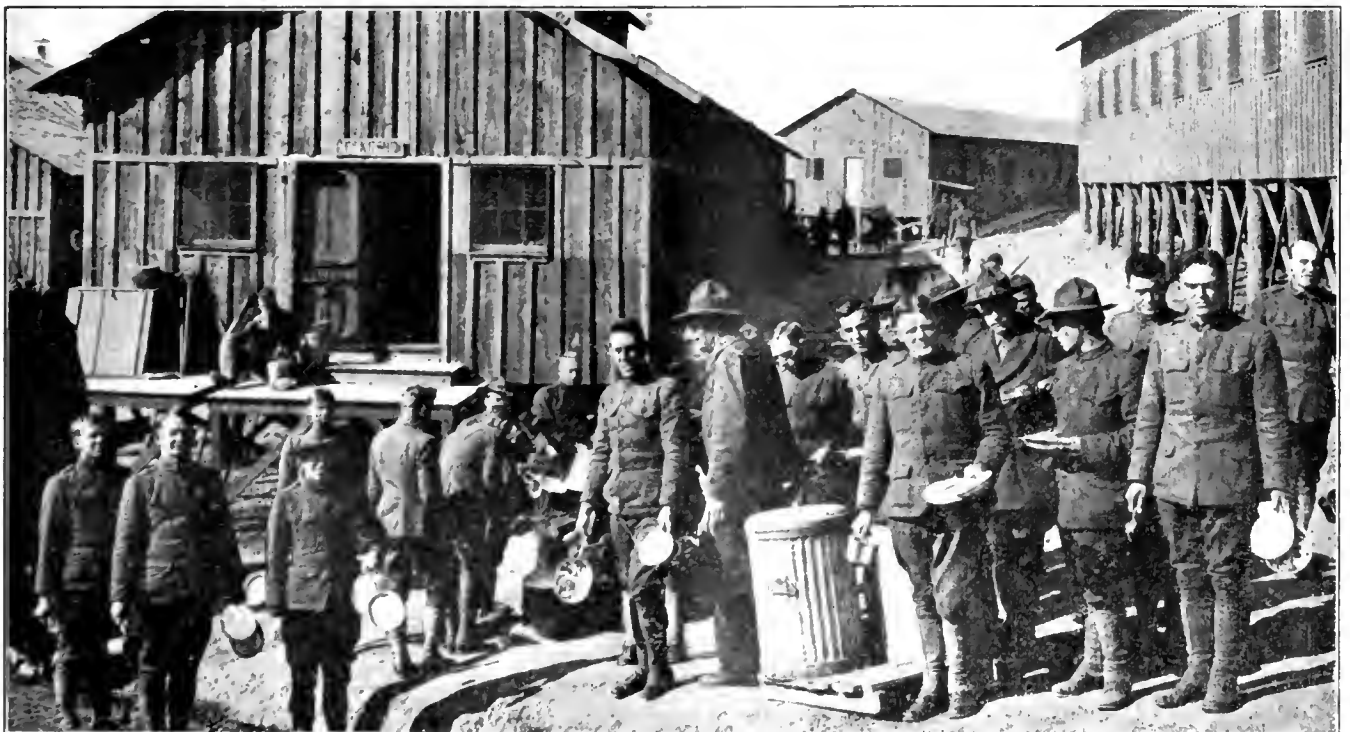
*Photographs Harris & Ewing, Washington, D. C.*

Some have felt that the draft is, if possible, to be avoided; that it shows a better spirit to volunteer; and even that it is something of a reflection on Forest Service men of good experience not to be given commissions at the start.

"This point of view is wrong. The nation has established the selective draft as the approved method of raising its army. After December 15, men of draft age will no longer be accepted as volunteers. The test of real patriotism is whether we accept willingly the nation's approved plan and without halting or question take our places in the program. Forest Service men, when they clearly understand the situation, will accept the situation not only willingly, but with enthusiasm. Under the

new instructions governing the selective service we know the class into which the necessary employees of the Forest Service will fall. When that class is reached we must expect that our men will go and we must make preparation against that time. Our part, if we are within conscription age, will consist in preparing ourselves for that service. If we are not within conscription age, our part will be to help carry the work so that the absence of those who go will not prove a vital loss."

At the offices of the Forest Service it is declared that there may be much difficulty in procuring information about the work of the Forest Regiments in France. In reply to requests for articles descriptive of the operations Major Greeley, who is with the Expeditionary Forces in



AT HOME WHEREVER YOU MAY PLACE THEM

These men of the 20th Engineers (Forest) are shown waiting their turn at the hot water tubs at American University camp. Military men who have seen the Forest Battalions in drill and other work declare that they are as fine a body of men as the army has ever assembled. The outdoor life of the forester and woodsman is reflected in the physical appearance of the men here pictured, who are typical of the regiment.

France states that the censorship makes it almost impossible to send out any information of real news value. Indirect accounts received at the offices of the Service, concerning a letter to the family of one of the men of the Tenth indicate that the regiment has already had its trials. The trip across the ocean was long and exceedingly rough. Many of the men suffered severely from seasickness. Some of the biggest and huskiest had the worst time. The regiment reached France during a spell of bad weather and was exposed to steady rains for several days without an opportunity to dry things out. As a result, some of the men were on the sick list with various minor ailments. They were, however, in a hospital located at a comfortable chateau and were being well cared for. From all accounts the little English-French dictionaries are being worked overtime.

It is understood that the regiment is quartered in "billets." Word comes that "even the wood cutting camps lost in the forests of France" had a liberal allowance of turkey and "fixin's" sent them for Thanksgiving. This probably refers to the Tenth, although "lost in the forests" is not to be taken too literally. According to a bulletin of the Forest Service it has become plain that meeting the needs of the Forest Regiments for sweaters calls for swift and large expansion of the knitting work. Colonel Mitchell, of the Twentieth, has requested immediate delivery of 1,300 sweaters and 1,600 comfort kits and other articles. The Woman's Committee for the Tenth and Twentieth Engineers was able to provide 123 sweaters, mainly knitted by Forest Service women. The Potomac Division of the Red Cross, which embraces Maryland, Virginia and the District of Columbia, with their great camps, was able to add 677. Thousands more will be needed for the Twentieth within the next two months.

The Lumber and Forest Regiments Relief Committee gave \$600 for the purchase of wool which will be knitted into sweaters for the men of the Tenth and Twentieth Regiments.

Major William B. Greeley writes from France under

recent date and makes earnest appeal for sweaters for the men of the regiments. He says that the garments are badly needed and that mufflers are also in urgent request. The mufflers are wanted particularly for men engaged in driving motor trucks and similar occupations involving exposure.

In connection with the request for knitted garments Major Greeley urges that the knitting be made fairly close for the sake of warmth. He also emphasizes the importance of shrinking the wool before knitting, in order that the garments may hold their shape. Simple instructions for shrinking have been prepared by the Forest Service. The wool in the hank should be laid out flat, in tepid water in a bathtub or other convenient place. After being there for 15 minutes it should be taken out and laid flat to dry in temperature of the living room, care being taken to prevent exposure to heat or cold. Emphasis is placed on keeping the wool flat while shrinking and drying. To



MAJOR JAMES E. LONG

hang it up while it is wet will cause it to pull. Added tidings of the need for sweaters comes from other sources. Captain Inman F. Eldredge, Company B, Tenth Engineers (Forest), writes from the war zone as follows:

"Chaplain Williams has just notified me that the ladies of the Forest Service and the Red Cross are prepared to furnish sweaters, scarfs and wristlets to the men of this command who have none. Owing to the rough nature of the work in which our men are engaged, scarfs and wristlets would not be of great service and we would feel that we were taking them from other men who might make better use of them. For sweaters and heavy socks, however, we have a real need and the soldiers will be able to make good use of them. If they can be supplied we have need for

100 sweaters and at least 200 pairs of heavy knit socks. Socks particularly are needed, since during the coming winter many of our men will be working in a wet country."

Chaplain Williams is commissioned as a lieutenant with the Tenth. He writes: "We have just arrived in our permanent camp. It has been very cold and the sound of



BREAD WAGON OF FOREST REGIMENT

This is a camp scene of daily recurrence at the camp of the 20th Engineers (Forest) at American University. The bread wagon is on its welcome round distributing supplies from the regimental bakery. It is safe to assume that the wagon will be no less welcome when the men reach the war zone.

sweaters in the making has been received with great joy. We are so near to the fighting line that we can hear the guns booming away when it is at all quiet.

"I am enclosing the names of the men in Companies D and F that desire sweaters, all of them being men who do not possess such articles and who have signed up for the same. I have written the captains of the other companies to send you similar lists for themselves, and I think it would be well if it could be done, to send the articles for each company direct to it. We have not requested scarfs or wristlets believing that men in other forms of work could use those articles to better advantage."

Impetus was given enlistments in the Forest regiments late in November by the announcement of the chief of engineers that after December 15 no man of draft age could voluntarily enlist. Accompanying this announcement was a statement calling attention to the advantage of skilled men enlisting before the expiration of the time limit in order that they might select the organizations in which they preferred to serve. "By doing this," said Major General Black, chief of engineers, "each man can render his country a greater service than by waiting for the draft and can also be placed where his experience and training will make the service better and more profitable for himself."

In addition to its contributions of men to the Forest Regiments the United States Forest Service has been called upon for various forms of activity in connection with war work.

During December there were demands for lumber

men in the aviation corps of the army. These men were wanted for service in 12 large construction squadrons being organized at the barracks at Vancouver, Washington. The woodsmen thus enlisted were for work in connection with the timber needs for airplane construction. It is probable that men from the Service and lumbermen will be needed as officers.

The Signal Corps has asked for assistance in the preparation of purchase specifications for propeller woods. The primary object is to reduce handling through a right selection at the source of supply.

The Forest Products Laboratory of the Forest Service, upon the request of the American Bureau of Shipping, is now revising the rules of the Bureau governing the use of wood in ships. The Bureau of Shipping is an organization representing shipbuilders, ship owners, and marine insurance companies, like the Lloyd's Agency in England. Its classification of ships governs the rating on which insurance depends; hence its rules have a very important influence in all shipbuilding in the United States. The present building program of the Emergency Fleet Corporation is governed by the rules of the Bureau practically in the same way as is construction for private corporations. The Forest Service will therefore exercise an important influence upon the technique of the emergency construction.

The Forest Service has also been working with the Navy on kiln construction and methods of storing kiln-dried lumber for use in airplanes. Co-operation with the Navy has also taken the form of inspection of lumber for use in airplane construction and assistance in preparing specifications for material.

**W**ILL C. Barnes, assistant United States Forester, has returned from a five-month field trip. He reports that about 75,000 head of sheep grazed last summer on range made accessible at the head of Lake Chelan by building a barge with a capacity of 2,700 head of sheep. The barge was built by the stockmen at the suggestion of the Forest Service, and conveys the sheep from the foot of the lake to its head, about 50 miles, where they land on high summer range that could not otherwise be reached. Adjoining Canadian range affords room for additional sheep, which the Dominion authorities are willing to have admitted by the Forest Service.

**T**HREE cases of livestock losses have been reported in which the owners have suspected enemies of the Government. One sheep man in South Park lost in a single night 1,000 sheep, for which he had just paid \$14 a head. While it is possible that the reported losses were due to poisonous plants, the State Veterinarian did not find evidences of poison, but thought the loss might have been caused by contagious pneumonia. The other two were cattle cases. Forest officers have been urged to exert unusual vigilance, particularly in the matter of looking into the presence of strangers in the vicinity of ranches and on the mountain ranges.

**D**ISTRICT Forester F. A. Silcox, of Missoula, Montana, has resigned from the Forest Service to accept a temporary position as special assistant to the Secretary of Labor. In that capacity he will undertake an investigation of labor conditions in the Pacific Northwest. It is expected that after his work there is completed he will resume his regular duties with the Forest Service. Mr. Silcox had been commissioned as captain in the 20th Engineers (Forest) and was to have been called for service in a short time. He resigned his army commission in order to take up his new work.

**T**HE Forest Service was represented at the recent Portland Land Show by a forest fire exhibit, which attracted considerable attention. This exhibit showed apparatus and tools used by the Service in its fire protective work and a number of bromides showing the effects of uncontrolled forest fires.

**T**HE Forest Service will again co-operate with the Weather Bureau in keeping a record of snowfall on the National Forests this winter. Snow stakes will be read by rangers at frequent intervals. From the data obtained the Weather Bureau is able to approximate stream flow in the region for the succeeding summer.

# A PROBLEM OF EROSION

BY R. S. MADDOX

FORESTER, TENNESSEE GEOLOGICAL SURVEY

**B**ECAUSE of the problems involved in forestry, Mr. Whittle's article in *AMERICAN FORESTRY* of August, on erosion, is of more than passing interest. He shows pictures of and describes eroded lands containing gulches 200 feet deep still eating back, undercutting and devastating both agricultural and forested lands. Erosion is a big problem and in some sections, particularly in the South, a serious one. On the debit side of our nation's account are being written down in nature's book huge losses not only from our forests, but also from our tilled lands. New fields are being constantly cleared to take the place of once cultivated fields now turned out as waste. Much of this newly cleared land is eroding in its turn and the cycle of destruction goes on. Certainly there must be a halt to this process if both or either of these natural resources of land and timber are to be maintained.

But while the erosion question is of most vital importance, the writing of this article was called forth because of the way in which Mr. Whittle handled his subject. Of the encroachment of eroded lands discussed by Mr. Whittle, he said: "Only one staying hand has been lifted—the dark pine forests that grip the earth with strong fingers and resolutely confront the dragons of the caverns. Where the forest is weak the chasms have pulled it down. Where the forest is strong the caverns give up the struggle. Man has taken cognizance of the combat and given his only aid to the struggle against erosion; he has learned to let the forests alone where the gorges encroach. To plant a forest athwart the line of approach has seemed futile to the farmer landowner. He realizes how long it takes to grow a forest and how formidable it has to be to withstand the undercutting of the persistent force. So that once the gorge has invaded, the farmer abandons hope of ever again bringing the land under agricultural subjection, so forbidding are the rough, steep slopes and so narrow and tortuous the bottoms of the gorges."

Whether Mr. Whittle expresses his own views or those of the landowners, on that phase of erosion is uncertain. There is, however, room for open discussion of such a

large subject. Without confuting his statements, it is practically if not wholly impossible for such large gulches to be held in check by forests at their heads. The root system of the trees extends into the ground only a short way compared to the depth of the steep, bare banks, and the undercutting will eventually cause the forests to topple over until by a catching up and filling in of the soil below there is an adjustment made between the erosive forces and the declivity of the banks, thus stopping the running-off process. The steepness of the banks is proof that the washing dirt has been carried away practically as fast as it comes down. It is not sufficient to depend upon the forested areas at the heads of these eroded lands to check the waste. Mr. Whittle

did not state whether the trees growing up from the bottoms of the gulches were now blocking the passing out of the dirt constantly washing in from the sides. If this dirt is caught and held by those trees, eventually, even if left alone to nature, a slope between the bottoms of the gulches and the top crests will be established and covered with vegetation. If the dirt passes out freely through the gulch so much the longer will the slope be in forming. But in either case, dirt must come from the banks before this final, fixed slope, as it might be called, is obtained; and, during this making process it is necessary to sacrifice more and more of the forests and agricultural land

on the top of the banks until the adjusted slope is a result, unless man can come to the rescue.

To hasten the process of adjustment, the washed down dirt must be caught and held, that is, its running away must be checked. This helps to raise the bottom level of the drains and also provides stable soil on which to start permanent growth. It is next to impossible to get a growth started on a constantly shifting or moving soil. If some of the trees growing in these gulches were used in making temporary dams, then some permanent growth could be set out on the dirt caught by them in order to constitute a permanent dam. Black locust bushes, Bermuda grass and honeysuckle vines are excellent for this purpose and would no doubt be of



RECLAMATION OF GULLIED LAND

The dam was built in September, 1916, in Weakley county, Tennessee, and the black locusts shown were planted in the spring of 1917. The photograph was taken in July, 1917.





COMPARE THIS WITH THE NEXT PHOTOGRAPH

No. 1.—An area of eroded land, seemingly a hopeless waste, but really in process of reclamation, in Carroll county, Tennessee. Dams were built in the fall of 1915 and the photograph was taken in November of the same year.

much service in handling the problem discussed. It is a wrong idea to abandon land simply because it cannot be brought back to produce crops from tillage, if this is what Mr. Whittle means by "bringing the land under agricultural subjection." Nor is it right to think trees are valueless and doing no good because they can not be marketed profitably. The slopes finally resulting from the reclamation of these severely eroded lands might be so steep as to be impossible of or impracticable for cultivation. But if trees should hold these slopes

and prevent further erosion and encroachment on valuable forests and agricultural lands above, they would command a value in themselves not to be estimated. Even though trees on such slopes and gulches were very costly to handle either for farm uses or for the market, there is a probability that the demand for timber will, after a while, give them a money value in addition to their worth for protecting lands above and checking rapid drainage.

Published herewith are photographs showing an erosion problem and how it is being handled in Tennessee.



THE RESULTS OF RECLAMATION PLAINLY TO BE SEEN

No. 2—This is the same area as shown in No. 1, in Carroll county, Tennessee, but it was set out in black locust in the spring of 1917. The large trees in the lower left-hand corner were set in the spring of 1916, above the dam shown in No. 1 in the same location.

They give an idea of the effect of planting black locusts above temporary dams so as to form a permanent dam to hold the dirt as it crumbles from the banks above. It is plain to see that after a while the banks will round off and will contain a growth of value, and the erosion will be stopped. The banks, however, must pay the price of this rounding off process. There is no other solution

unless the dirt for filling be hauled, which in such cases is wholly impracticable. The gullies in the above cut are not so deep or so steep as those Mr. Whittle describes, but the principle in each is the same, and could man aid nature, much could be done to save the forests, forest and agricultural land in the South, the destruction of which is now taking place.

### FREE TREES FOR PENNSYLVANIA

**N**O limit will be set this year by Pennsylvania on the number of forest tree seedlings for free distribution, says Commissioner of Forestry Robert S. Conklin. Any one who wants to plant trees next spring may have them for the asking. No strings are tied to the offer, the only conditions being that applications for less than 500 trees will not be filled, applicants must pay for packing and transportation, and the trees may not be sold but must be actually planted in Pennsylvania for reforestation. No applications can be filled for ornamental trees.

The State Forest nurseries have raised more trees this year than ever before, but so many of the foresters have enlisted and so few laborers are available that the number to be planted on the State Forests probably will be even less than last year. Over 10,000,000 trees are ready to set out next spring, and as many more are in the nurseries, but are too small to plant next year.

The stock available for free distribution is almost all three years old, and includes white pine, Scotch pine, red pine, pitch pine, Norway spruce, European larch, Japanese larch and red oak. It is of better quality than any sent out last year.

### FORESTRY PRIZE AWARD AT CORNELL

When the new Forestry Building was opened by the New York State College of Agriculture at Cornell University in 1914, Charles Lathrop Pack, of Lakewood, N. J., widely known as a leading conservationist, who has been closely associated with the development of forestry along the most advanced lines, made contribution of \$500 to the Forestry Department for use in its work. The money was deposited with the university treasurer for investment, the annual income to be used "in the interest of forestry." This amounts to a little over \$20, and the faculty has decided that its best use is to give an annual prize to the student in the Forestry Department who has made the best record for the year both in his studies and in his general attitude toward the work. This disposition of the money by the faculty strikes us as a wise one, for it gives that little additional spur to personal incentive lent by competition, and makes it more interesting for the boys. The prize for the past year has been awarded and the winner was Samuel C. Sweeny, of Hartsdale, N. Y., a senior in the Department of Forestry. Mr. Sweeny is now in the South at one of the operations of the Bogalusa Company, getting his three months practical experience in a logging camp, which is part of the course in forestry at the New York State College of Agriculture.

### A BALLAD OF THE TIMBER CRUISER

BY LEW R. SARRETT

**Y**OHO! Yoho! Yoho!  
 You whistlin', bristlin' blizzard,  
 A-sweepin' timber low,  
 You buckin', blust'rin' roarer  
 With your whirlin', burlin' snow!

You're snatchin' at my whiskers,  
 And you're rippin' at my clothes,  
 You're pawin' at my duffle-bag,  
 And you're bitin' at my nose.

You've swallowed up the balsams  
 With your blindin', grindin' drift,  
 You've sheeted up the rapids,  
 And you're workin' double-shift.

You've bluffed the lop-eared rabbit;  
 Squirrel's prayin' for his soul;  
 Doe's shiverin' in the tamaracks;  
 Mink's popped into his hole.

Tho you've scared the whole blamed outfit,  
 I'll call your brawlin' bluff—  
 Here's to you! Blast and Bluster!  
 Man's made of tougher stuff.

Yoho! Yoho! Yoho!  
 You howlin', growlin' Norther,  
 A-roarin' as you go,  
 You rippin', tearin' bully  
 With your icy clouds and blow!

**P**PAPER blankets have been made, in every way as effective as 5-pound wool blankets, and only one-tenth as heavy.

**T**HE locust which is too small for fence posts may often be sold for insulator pins and brackets for telephone and telegraph lines.

**T**HE government is reported to have reached a decision that tree nails or wooden pins used in shipbuilding must be of locust or eucalyptus. The black locust will be the particular species used. This is a good fast-growing tree for New York if it can be properly protected from the locust borers.

**S**HUTTLE factories and other manufacturing plants use more than seven and one-half million feet of dogwood annually in this country.

# LANDSCAPING AND FORESTRY

BY SMITH RILEY

DISTRICT FORESTER

**D**O foresters need a knowledge of landscape engineering? Should the forest schools teach this subject?

It has been the fashion to consider the practice of forestry as tree culture upon a vegetable garden basis with every foot of space devoted to the production of wood.



SECTION OF PROPOSED ADDITION TO COLORADO NATIONAL FOREST

View in midwinter of Big Thompson River and Loveland—Estes Park auto road, with forest and cliffs in distance. Plans should be drawn to recognize careful preservation of all natural values along forest roads.

The forester has been called a lumberman who cultivates trees for volume production. In urging the creation of National Parks from National Forest areas, many have attempted to define a wide difference in the character of these areas by defining the limits to which a forester will practice his profession.

A forest, be it state or private, will always be recognized for its esthetic values. This has been demonstrated in all older countries where forests have been preserved and cultivated for centuries. We should then proceed upon the basis that it is a part of the profession of a forester to cultivate to the highest sense the values of lands

devoted to the production of trees. While this is true in the case of private forests, it is doubly true in the development of both State and National forests. Such areas devoted to forest culture will ever have a high value and be used to impart new vigor and life to toiling mankind. Such areas will also be recognized for their educational value in developing the bodies and minds of children. Can we say then that esthetic values should be ignored?

In the National Forests a forester deals largely with development in natural settings. The State Forester and in some cases the private forester deals with lands where the natural settings have been destroyed and



HORSE THIEF TRAIL ON THE UNCOMPAHGRE

Already a beautiful trail, but one which offers a splendid opportunity for constructive landscaping—to bring out values which will make it a joy to travel, even by the most unobserving.

must be recreated. In either case, the forester must appreciate the existing values or the possibilities, and such appreciation can only come from a knowledge of the subject and principles.

Upon the National Forests trees are planted and trees are cut. An eye to esthetic values in planting upon a

large scale will not go amiss. Fire-swept areas are being planted upon the slopes of Pikes Peak in the interest of water shed protection for the municipal supply of Colorado Springs and nearby towns. Certain species of trees are adaptable to given exposures and the larger trees are adaptable for planting upon moving soil. What is wanted here is a quick, attractive showing to gain public

over. There are hundreds of ranger stations in the National Forests where we have studied the relation of the buildings making up the station to each other, the relation of the roads and walks to the buildings and the relation of the trees, shrubs and flowers to the whole, then the relation of the whole station to the forest setting. One can imagine that every principle of landscaping

can be violated in the development of such stations so they may prove an eyesore to every visitor or passerby, or the inmates of the station. It is a well known fact that while many have no trained appreciation of esthetic values, inequalities offend, an undeveloped sense to such an extent that unfavorable impressions are received and laid to other causes. With the beautiful natural settings of these forest stations and the vast variety of material to work with in the trees, shrubs, vines and flowers found throughout these areas wherever development is contemplated, much can be accomplished.

In some of the National Forests maps have been called for showing in detail the conditions



A POPULAR TOURIST RESORT ON THE PIKE NATIONAL FOREST, COLORADO

A forest, be it state or private, will always be recognized for its esthetic values, and many can testify to the popularity of the Pike, and this resort, known as Cassells

approval of the work being done. We may start this planting upon certain slopes offering a setting of high values so the earlier portion of the plantations will in a short time attract the eyes of all who approach the locality. In this way the attractions of the locality are steadily improved for the use of recreation and the work is realized and approved by the public at an early date.

A big timber sale has been made in the Superior National Forest in Minnesota. There are many lakes within the sale area. These lakes contain islands. In making the sale an exception is made of the trees near the lake shores and upon the islands. This action is taken to protect

the esthetic values. A keen appreciation of the principles of landscape engineering would undoubtedly make it possible to improve the esthetic values upon such islands and lake shores by the removal of a certain per cent of this timber. Such action would be very agreeable to the timber purchaser as he desires to remove the greatest possible volume of timber for the area worked



ON THE SUPERIOR NATIONAL FOREST, MINNESOTA

Iron Lake, near the outlet into Lac La Croix, showing the Canadian shore to the left. The esthetic values of the islands would be improved by removing a certain per cent of the timber.

at the forest stations. The relative location of the buildings, roads, walks, trees, bushes and flowers will be shown. The wind and storm directions are given consideration. After due study these maps will be used to make a working plan or ideal plan to be used in the future development. New buildings are needed—the plan will be followed in placing these buildings. The

dwelling at this station is poorly placed, a new one is contemplated. It will be located according to the plan. A ranger's wife takes a great interest in the beautification of the station grounds; such effort, if undirected, may result in inequalities, where if a plan covers this phase of the development, all effort will in the end result in an attractive station. Particular attention should be given to the use of native material that will not establish artificial conditions requiring constant attention. An example here would be the use of shrubs that would freeze down in unusual winter weather, necessitating the cost of replacement. Another example would be the use of flowers requiring cover in the winter or summer watering. Attention of this kind is costly, besides, the nature of the officer's work is such that attention cannot be given at the crucial moment. Upon the other hand, there are hundreds of beautiful wild flowers available for such work that will require no attention.

There are two schools of landscaping, the English and the Italian. The English school endeavors to reproduce or preserve natural effects. What more interesting field for the applica-

visited by thousands each summer. A beautiful tree has been left as a centerpiece to a car parking space. Owing to the grading necessary a large mound was left around the base of the tree. What plants should be put in here to cover the ground of this mound so there will be flowers in spring and summer, a pleasing symphony of fall colors in berries and foliage, not forgetting the



PUMA PASS RANGER STATION, PIKE NATIONAL FOREST  
 Showing Stoll Mountains in background and Ocean to Ocean Highway in foreground. The absence of trees between the station and road, and particularly around the house, spoils an otherwise attractive setting. Care in planning would obviate injury of this nature.



SHERIDAN RANGER STATION, IN SUMMER

A beautifully located station, winter and summer, on which thought has been expended and an appreciation of the esthetic.

tion and cultivation of this principle of landscaping can be imagined than the development and care of these forest stations?

The Forest Supervisor who cultivates a taste for landscape engineering can develop a knowledge that will be of great value to him in the administration of his forest. A camp ground has been developed upon an auto road

necessity of plants to give pleasing winter colors in buds, twigs and stems?

A summer home area is located in a canon. There are trees, conifers and hardwoods, with many varieties of shrubs scattered over the area. He who plots the lots and lays out the approach road to such an area can, by a knowledge of landscape engineering, bring to bear every factor of esthetic value. Work of this kind will make an area doubly attractive which, under an unskilled hand, would prove uninteresting to a home seeker.

A trail is needed along a ridge and to the top of a mountain.

This trail, one of the forest's network of trails, is built to make the ridge accessible for fire patrol and open a way to the top of the mountain that is to be a fire lookout point. If the man who locates this trail has a realization of the values in the grouping of natural objects—in short, if he realizes the values of this group of red fir tinged by the late afternoon or early morning sunlight,

that growth of young pine upon this angle of slope, this glimpse of a waterfall in a narrow canon backed by a group of snow peaks, this large cluster of mountain maple burdened with seed in early summer and doubly attractive in autumnal colors, this little mountain meadow or swale bright with larkspur and lupines in summer.

while vivid blue with delicate fringed gentians in early fall; I say, he who sees these values can by a turn here to the right or left, a slight climb there, bring out values in this trail location that will make it a joy to traverse even by the most unappreciative while the appreciative traveler who once

traverses its length will look forward with the greatest keenness to the time that may again place him in that vicinity to drink in its values in the same or other seasons of the year. Do not lose sight of the fact that this same ridge trail can be located and built in such a manner that the pleasure seeker will pass unnoticed many objects of beauty that could have been brought to him without additional cost in construction, a mere trail, in fact, to a fire lookout with attractive views here and there that have been brought out by happenstance.

One of the forester's problems of no little magnitude is that of paints for his signs, fire tool boxes and buildings of all kinds, what color schemes are adaptable, should these be in contrast to the surrounding colors or blend with those of the setting. There is some argument for direct contrast of color in those objects to which it is desirable to attract direct attention, such as

signs of all kinds, fire tool boxes, etc. Many colors for these purposes, such as brilliant reds, black upon a white background or the reverse, heavy browns or chrome yellow, will give contrasts that are foreign to a forest setting and are, therefore, displeasing. It is a well-recognized principle that greens and grays are the

colors to be used in applying the rules of the English school of landscaping, so the forester cannot go far wrong in using these colors which blend so harmoniously in every variety of forest setting. It will be found that a combination of luster green and pale gray or ivory white will give excellent contrast and yet pleas-

ing harmony for all manner of signs, in fact, such contrast for identification and harmony for setting that cannot be secured in any other colors. In selecting gray care should be taken to secure a dusky gray with a warm tint, as a cold or blue gray will give an unpleasing contrast that makes it unadaptable.

Congress has appropriated funds for the construction of National Forest roads in co-operation with the states and counties in which the forests are located. These roads will be located by the Forest Service, while the surveying and construction will be carried forward by the Bureau of Good Roads of

the Department of Agriculture. In arranging for these roads plans should be drawn providing for the recognition of all natural values along these roads looking to their careful preservation. I recall a beautiful group of yellow pine trees along a recently constructed western



A DELIGHTFUL SPOT IN THE SAN ISABEL NATIONAL FOREST  
This view from Clubhouse Park shows the beautiful location of summer homes in the San Isabel Forest.



A PARTY JUST RETURNING FROM A TRIP TO THE SUMMIT OF  
PIKES PEAK

Along the Pikes Peak auto highway, where 3,000,000 young trees have been planted by the Forest Service in the interest of Colorado Springs' municipal water supply. It is not hard to foresee the esthetic value of the growing stand to the tourists who ascend this famous peak.

state road. The dirt of a shallow fill which might have been otherwise disposed of was placed against the base of the trees, which became weakened by lack of root air and were attacked and killed by the pine bark beetle, to remain skeletons of desolation along this otherwise beautiful road.

A previous study of values and a plan for the careful preservation in course of road construction will do much to retain many values with very lit-

tle additional cost, that will otherwise be destroyed.

There can be no question that a knowledge of landscape engineering will be of untold value to foresters doing constructive work. With the rapidly changing conditions in regard to forestry in this country, a knowledge of this subject will become more valuable to the practicing forester. I, therefore, feel that the forest schools should offer at least a short course in the subject.

## A WONDERFUL WALNUT TREE

BY V. W. KILLICK

**I**N a crisis of a walnut blight epidemic, some time ago. A. R. Rideout, of Whittier, California, accidentally discovered a single tree in the orchard of Jacob Chase, three miles south of Whittier, which showed a remarkable propensity for resisting the blight disease. Rideout leased the Chase tree for a number of years, and by budding it to seedling nursery stock, produced the first "blight immune" variety of walnuts.

Rideout's success led other men to search for more specimens of blight immune trees. A few were discovered and nursery stock produced from them. All these together have contributed to save the California walnut industry from being entirely overrun with the disease.

The Chase tree is a seedling and was planted in 1886 by a Mr. Van Vorce, who secured the seed from France. It has a spread of eighty feet and stands some fifty feet high. It is very symmetrical, a vigorous grower and prolific bearer, having produced 325 pounds of nuts last year.

As the tree has become quite a landmark to the community, Rideout has built an observation tower through



THE CHASE WALNUT, AT WHITTIER, CALIFORNIA

In a crisis which threatened ruination to the walnut industry in California, this was the tree which by careful budding produced the first "blight immune" walnuts.

its foliage. The tower is fifty-five feet high and, standing upon it, one gets a very unique view of the gigantic tree from above.

## DEAD LEAVES VALUABLE

**D**EAD leaves have a value of \$10.40 a ton as a fertilizer. Estimates Prof. Franklin Menges, farm adviser of Pennsylvania, while C. C. Logan, extension agronomist of North Carolina, declares they contain per ton 15.2 pounds of nitrogen, almost twice as much as horse or cow manure; 5.2 pounds of phosphoric acid and 8.4 pounds of potash, the total value of these plant food constituents being \$8.15.

Dr. Logan says: "It can be seen that the plant-food in a ton of fresh, dry forest leaves is worth considerable more than the plant-food in an equal amount of either cow or horse manure. In addition to this greater fertilizing value, the leaves would supply about four times as much organic material as the same amount of manure, since the latter, under ordinary conditions, contains about 80 per cent water. This organic or vegetable material is the need of practically all lawn and garden and most field soils of the state. The leaves, therefore, should be spread over such soils most in need of organic matter and be mixed in by plowing and harrowing during the fall or winter. A good rate would be 100 pounds for every 300

square feet, applied annually. If the leaves are thoroughly mixed with the soil, they will aid materially in holding water and in keeping soils moist during dry periods, thereby preventing them from running together, baking, and becoming hard. This is in addition to the goodly amount of valuable plant-food constituents supplied as seen by the table above."

Dr. Menges declares: "The composition of the leaves of different species of trees varies, but 100 pounds of leaves as they fall from the trees at this time, partly dry, contain 60 per cent water, 9 per cent nitrogen, 2 per cent phosphoric acid, 4 per cent potassium and about 2 per cent lime. A ton of leaves will contain 18 pounds nitrogen, 4 pounds phosphorus, 8 pounds potassium and about 40 pounds lime. The nitrogen, valuing it at 40 cents a pound, would be worth \$7.20, and the potassium at the same rate would be worth \$3.20. Leaving the value of the phosphorus, the lime and the organic matter out of consideration, a ton of leaves would be worth at the abnormal prices now prevailing \$10.40."

# CLIMATIC RECORDS IN THE TRUNKS OF TREES

BY A. E. DOUGLASS

DEAN COLLEGE OF LETTERS, ARTS AND SCIENCES OF THE UNIVERSITY OF ARIZONA

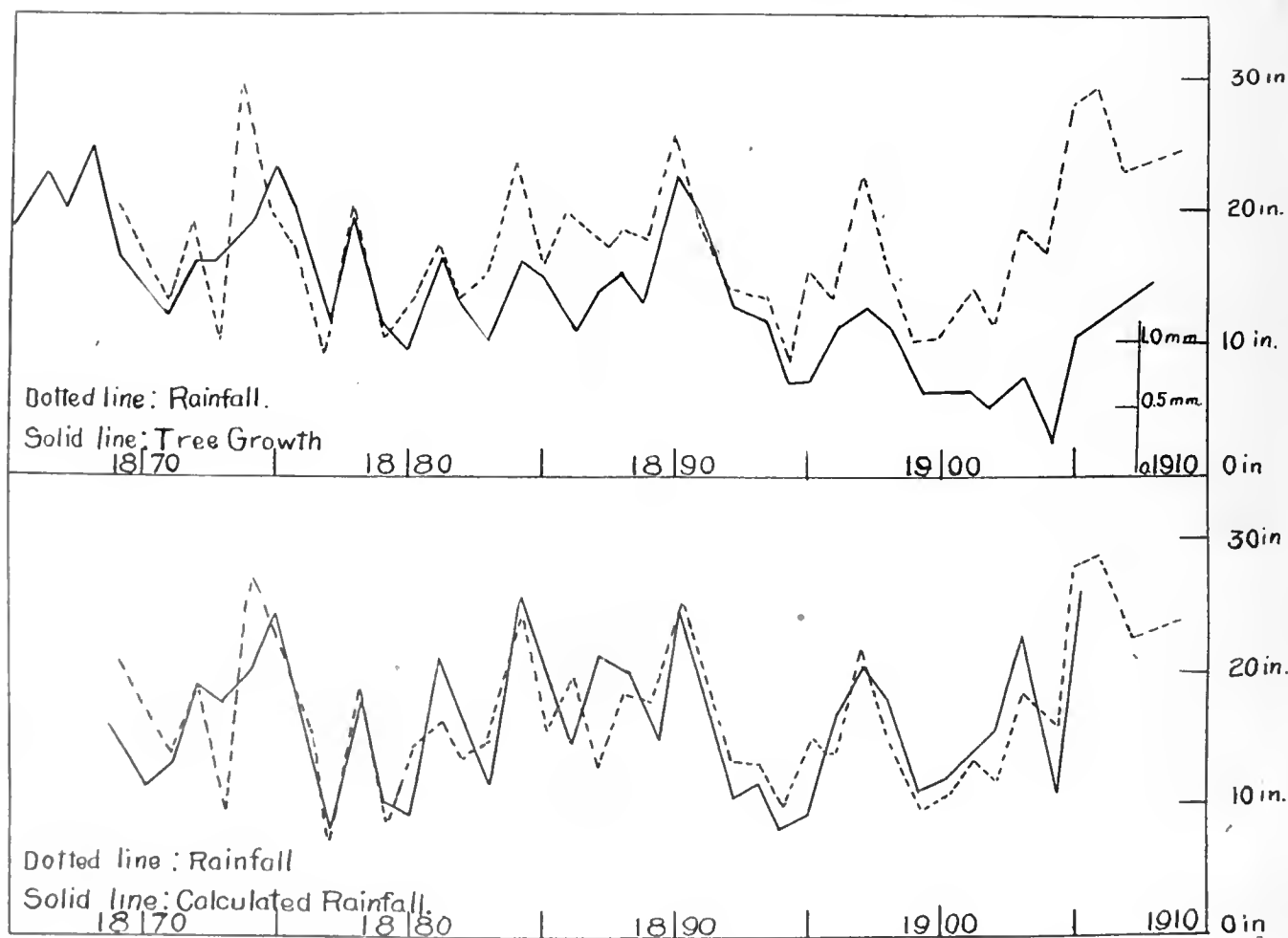
THE annual rings of trees have been found to display in their varying width a life-long record of events historically important in the life of the tree. Such events naturally have to do with favorable or adverse weather conditions, interference by competing vegetations, shade, drainage, pests, fires, and so forth. Most of these effects are well known to the forester, thus the result of forest fire is a matter of constant observation. Smoke near great iron manufactories in diminishing the rings of trees has been studied with care, and numerous interesting photographs showing it have been published by the Mellon Institute.\*

In the Geological Museum at Berlin one may see samples of pine, collected by the late Professor Potonie, some grown in upland and some in swampy ground, showing wonderfully diminished growth in the latter, due to the excess of water. The effect of drainage in wet climates is beautifully shown in a small section of *Pinus sylvestris*

in the office of Professor Jelstrup, chief of the Norwegian Forest Service, at Christiania. This little section shows 17 rings of annual growth in a radius of 15 millimeters from the center. In that year trenches were dug draining the land and allowing the soil to dry in part. The remainder of the radius of the section is 40 millimeters in width, but contains only eight rings. The growth increased five and a half times after drainage.

But in the great fundamental questions of weather conditions, nature has constructed immense laboratories over the earth, some of which isolate effect of varied rainfall in a beautiful manner. In regions where the rainfall is really deficient, the tree makes a lifelong struggle against drought and, if other accidents are largely absent, that struggle is the most prominent feature of the rings. Even if the other factors are present, we must remember that the average of a group of trees, sufficiently scattered in location, will practically eliminate

\*J. F. Clavenger, "Effect of the Soot in Smoke on Vegetation," Bulletin No. 7, Smoke Investigation, Mellon Inst., Pittsburgh, Pa.



COMPARISON OF 43 YEARS OF RAINFALL AND TREE GROWTH AT PRESCOTT, ARIZONA

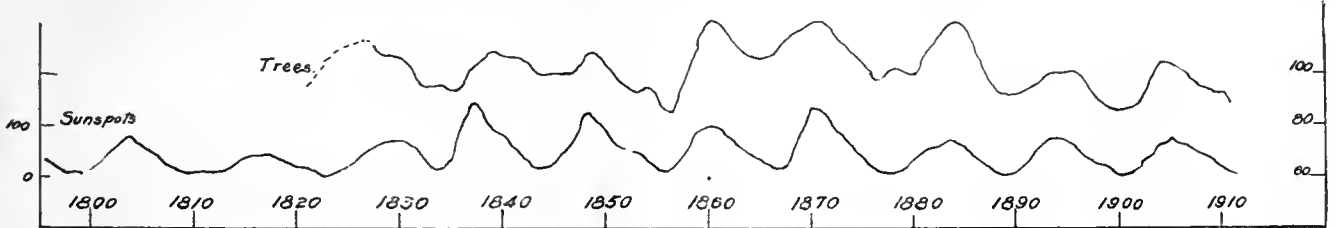
Fig. 1—In the second diagram, the "Calculated Rainfall" is obtained from the Tree Growth by multiplying its value each year by three terms: First, a general coefficient changing mean tree growth to mean rainfall; second, a small factor correcting for age of tree, and third, a "conservation" factor to correct for preservation of moisture fallen in previous years. This conservation factor is very nearly the formula for "accumulated moisture" reversed.



accidents of competition, injury and so forth and that other factors such as fires, drainage and sometimes pests, which themselves depend on weather, actually exaggerate climatic effects. Hence if in rigorous surroundings we can show empirically a relation between tree growth and terrestrial or cosmic conditions, we are justified in regarding it as a genuine case of cause and effect.

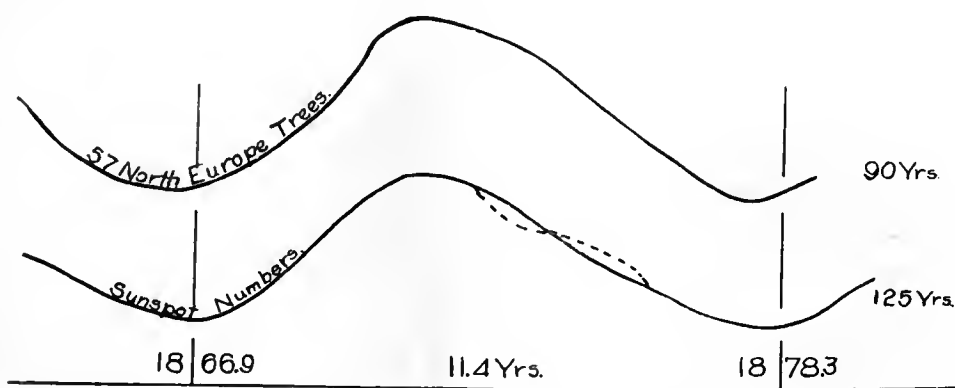
Long residence in the great yellow pine forest of Northern Arizona led me to the study of that tree especially. In 1907 I had made and reduced ten thousand

trees the cross-identification was more essential, for in that region two causes operate to produce errors in ring counting; first, the strongly marked double rainy season (winter and summer) producing rarely an extra ring which resembles the annual rings; and second, the occasional series of deficient years causing some trees, in part of their growth at least, to stop ring production for one or more years. The error there of straightway counting was found to average four per cent in the last two hundred years. By cross identifying all rings this error



(Figure 2—upper part.)

measures upon twenty-five long-lived trees. Four years later three or four thousand very careful measures upon the last fifty years of nearly seventy different trees were added. And now I have nine thousand more



(Figure 2—lower part.)

COMPARISON BETWEEN 57 NORTH EUROPE PINE TREES (smoothed) AND SUNSPOT NUMBERS  
The trees are from England, Norway, Sweden and North Germany.

was reduced to half of one per cent or perhaps to zero. Recently I have made an interesting check on the accuracy of the accepted identification by noting every statement of weather, freshets or crop failures mentioned by

upon eighty different samples of the European *Pinus sylvestris* or common pine of North Europe. The conifers, by the great regions they cover, the great variety of climates they endure, and especially by the prominence of their rings, seem best adapted to this purpose.

Apart from care in measuring the rings, the details of which have largely been described (Monthly Weather Review, June, 1909, and Bull. Am. Geog. Soc., May, 1914, Carnegie Publications, No. 192, Chapter XI.), the most fundamental and essential feature of the method is the cross-identification of rings among a group of trees. The ease and accuracy with which this can be done in a fairly homogeneous forest is remarkable. A group of thirteen tree sections collected along a distance of a quarter of a mile in the forest of Eberswalde, near Berlin, show almost identical records. Two to ten rings in every decade had enough individuality to make them recognizable in every tree. A group of twelve sections from Central Sweden, cut, however, from logs at the sawmill at Gefle, show such agreement that there is not a single questionable ring in the last hundred years or more. Especially marked combinations of rings could occasionally be traced across Europe between the groups hereinafter mentioned. In Arizona, identification across seventy miles of country was unquestioned and even at two hundred miles resemblance was apparent. But in Arizona

the historian Bancroft in his accounts of the settlements of Arizona and New Mexico. I find fourteen cases in which the noted feature of the year agrees with the tree record, and but one doubtful disagreement. The most striking correspondences occur with reference to the flood on the Rio Grande in 1680, the famines between 1680 and 1690, and the droughts in Arizona in 1748, 1780 and 1821.

The accuracy with which the pine trees near Prescott, Arizona, represent the rainfall recorded in that city for forty-three years, is, without correction, about seventy per cent (Figure 1.) By a provisional correction for conservation of moisture by the soil, this accuracy rises to about eighty-two per cent. The nature of this conservation correction is very simple, it is practically the "accumulated moisture" of the meteorologists. It signifies that the rings in these dry climate trees vary not merely in proportion to the rainfall of the year but also in proportion to the sum of the profits and losses of the preceding years. The "credit balance" in their books at the beginning of the year has only somewhat less importance than the income during the current year. One must remember that conservation in this dry climate may be very different in its action from that in wet climates where the ground is continually moist or water-soaked.

In reckoning the amount of moisture for the year

one must remember also that precipitation in the form of snow goes over to the following spring growth and should be included in the rainfall of the succeeding year. Also in regions where there is a pronounced double rainy season, heavy precipitation in winter is necessary in order to tide over the spring drought, otherwise the tree may put on a false ring (usually easily distinguishable) or even in extreme cases stop growing for the year and show no effect of the summer rains. These features are finely shown in the Prescott trees.\*

In the eighty sections recently examined or collected in North Europe a striking coincidence was found between the growth of these trees and solar phenomena (Figure 2.) That some such agreement should exist was not entirely unexpected. The question of the relation between sunspots and weather is one upon which doctors—and noted ones—have disagreed. This investigation was begun to see whether the trees, by representing the weather, would show such connection, if any exists. A very strong and very reasonable connection was found between tree growth and rainfall in Arizona. But also substantial evidence was found of a relation to sunspots. To give some idea of it one may say that in the last hundred and sixty years, ten out of the fourteen sunspot Maxima and Minima, have been followed about four years later by pronounced maxima and minima in the tree growth. Also during some two hundred and fifty years of the early growth of these trees they show a strongly marked eleven-year variation.

But in the very first group of European trees studied, those obtained at Eberswalde, near Berlin, the remarkable fact became at once apparent that these thirteen trees from one of those beautiful German forests, show the eleven-year sunspot curve since 1830 more accurately than do the corresponding curves of rainfall or temperature. The eleven-year variation in the trees is shown in the accompanying photograph of one of the Eberswalde sections (Figure 3.) It will be seen at once that there is a rhythmic sway in growth, large rings alternating with small ones. The arrows placed on the photograph are not there to call attention to the larger

growth but to mark the years of maximum sunspots. The other twelve trees of that group do not show quite so perfect rhythm as this particular part of this section but are like the other parts of this section, showing strongly a majority of the maxima. Taking the group as a whole the agreement is highly conspicuous and the maximum growth comes within six-tenths of a year of the sunspot maximum.

In order to test further this coincidence, groups of tree sections were obtained from other parts of Northern Europe, namely, Southern England, outer coast of Norway, scattered places along the inner coast of Norway, Christiania, Central Sweden, scattered localities in Sweden, Northwest Austria and Southern Bavaria.

Five of these eight groups are of the Eberswalde type and show the sunspot variation. Of the other three, the trees from the inner coast of Norway as a whole appear to show a reversed cycle, probably because they are deep inland valleys while the southern groups, Northwest Austria and Southern Bavaria, close to the Alps, have combined agreement and disagreement so that they cannot as yet be considered to give a definite result. In the six groups, however, representing the triangle between England, Northern Germany and the lower Skandinavian Peninsula, a variation in growth since 1820 showing pronounced agreement with the sunspot curve is unmistakable. Every sunspot maximum and minimum since that date appears in the trees with an average difference in growth of twenty per cent between them. This is shown in the diagram ac-



TREE SECTION, *PINUS SYLVESTRIS*, FROM NORTH GERMANY  
Figure 3—The arrows mark the years of greatest sunspots. Note the periodic character of growth.

companying this article. The next most pronounced feature is that five of the eight minima show a small and brief increase in tree growth. This suggestion of a second maximum is of interest because in it we find agreement with Hann and Hellmann in their studies of European rainfall and sunspots and lend added weight to results which each author obtained but which neither allowed himself to regard as conclusive. In the splendid work of Hellmann upon the rainfall of the North German drainage area, it is this inconspicuous maximum which he finds the more important of the two.

In summarizing, two facts and a conclusion stand out prominently. First, it has been shown that trees may,

\*See chapter by the writer in "The Climatic Factor," Carnegie Publications, 192.

and some in dry climates do, give a valuable record of annual rainfall; second, it has been shown that trees may, and some in wet climates do, give an excellent record of sunspot activity. Now, unless we introduce some new agency such as a profound changing stimulation in the direct solar rays, a subject well worth investigating, we must regard the trees as receiving their solar influence through the medium of the weather, and are forced to the conclusion that there is a connection of some sort between solar activity as displayed in sunspots and the weather, which by the aid of tree growth we have a most extensive means of investigating. Here then we are presented with a most fascinating field for future work. We must admit from the photograph and curves that there is a physical connection between solar activity and the growth of vegetation, certainly as represented in trees of certain districts. But the nature of this connection, through what weather element or elements it takes place, just how the sun affects those elements, even the exact causes of sunspots and why they recur in larger numbers every eleven years, are questions which will only be cleared up by extensive investigations.

One final practical word is well worth saying to lovers of forests. The account here given presents an idea of the value of records contained in trees. It is the oldest trees containing the longest records which are likely to die or be cut down first. So it is within the power of those having the care of forests, when the very old trees have to be removed, to preserve sections, marking them carefully with the month and year and locality, and thus preserve for future investigators, sources of information which, once lost, can never be replaced.

### WHITE PINE BLISTER DISEASE

AT a recent meeting in Pittsburgh of the Committee on the Suppression of the Pine Blister Rust in North America about 30 representatives from the Department of Agriculture and various states and Canadian provinces were present. It was brought out that the blister rust is probably worse in Northern than in Southern Europe, and that it may, therefore, prove particularly destructive in the Northern United States and Canada. Dr. Spaulding, of the Office of Forest Pathology, stated that he believes the blister rust is more virulent on healthy, growing trees than on weaker ones. Wind is probably the main agent in distributing the disease, but birds and insects are also responsible. The disease is so firmly established in New England and New York, and probably in Ontario, as to make its eradication impossible. It is more widely distributed in the Lake States than it was a year ago, particularly in the St. Croix River Valley. So far as known, it has not been introduced in the western white or sugar pine regions.

NOT everyone knows that the first Pennsylvanian to really appreciate the value of forests was William Penn himself. In 1631 he provided that for every five acres cleared in Pennsylvania one acre should be left in woods.

### DONATIONS TO THE LUMBER AND FOREST REGIMENTS' RELIEF COMMITTEE

AMERICAN FORESTRY will publish each month the list of those making donations to this fund since the fifth of the preceding month. Practically all of the donations so far received have been made without solicitation and were inspired by reading in the magazine that a relief and comfort fund for the men of the forest regiments was to be started.

Contributions to and including December 5, 1917, are as follows:

W. R. Brown, Berlin, N. H.....	\$500 00
The Southern Lumberman, St. Louis, Mo.....	25 00
L. H. Daloz, Boston, Mass.....	12 00
L. F. Beigham, Chestnut Hill, Mass.....	12 00
Wash. Heights Century Club, Wilmington, Del.....	10 50
Cleveland Oconee Lumber Co., Atlanta, Ga.....	10 00
John C. Freund, New York City.....	10 00
I. T. Beckwith, New York City.....	10 00
W. H. McElwee, Raleigh, N. C.....	10 00
W. B. McRshon, S. jinaw, Mich.....	10 00
Clarence Hay, New York City.....	7 00
Mrs. T. M. Ives, New York City.....	7 00
C. I. McNair, Cloquet, Minn.....	7 00
F. R. Thorns, New York City.....	7 00
Frederick R. Simms, Chislehurst, England.....	6 50
F. A. Chace, Fall River, Mass.....	5 00
Dover, Del., Century Club.....	5 00
Newark, Del., New Century Club.....	5 00
Acorn Club, Seaford, Del.....	5 00
Mrs. Wm. R. Cabot, Boston, Mass.....	4 00
Miss Harriet Fearing, Baltimore, Md.....	4 00
Miss Anna G. Bard, Huenema, Cal.....	2 00
Mrs. James H. Beal, Boston, Mass.....	2 00
Miss Bertha G. Brooks, New York City.....	2 00
Miss G. S. Cary, Boston, Mass.....	2 00
Miss C. G. Curris, Intervale, N. H.....	2 00
Mrs. Geo. H. Hosmer, Ithaca, N. Y.....	2 00
Miss Lucy Lewis Hay, Philadelphia.....	1 00
Mr. and Mrs. J. H. Lesh, Newton Center, Mass.....	1 00
Wm. S. Perot, Conshohocken, Pa.....	1 00
Total.....	\$687.00

### THE FOREST FIRE SEASON

TAKEN as a whole, the forest fire season of 1917 has been the most serious throughout the West since 1910. Not since that year has the Forest Service been put to so severe a test. California escaped with less damage than the Northwest, where 7,688 fires were reported, entailing an expenditure of \$1,825,000 for fire protection. In August the Governor of Oregon placed detachments of troops throughout the state where incendiary fires were prevalent, and closed the hunting season after it had been open for a week. In the State of Washington the forest fire wardens controlled bad fires at the expense of those responsible for their origin, a measure which was said to prove very effective.

THE California Packing Corporation of San Francisco was awarded the sale of 233,000,000 feet of timber on the Norval Flat-McCoy chance on the Lassen National Forest. Three bids were received, that of the successful competitor being 10 cents per thousand above the minimum. The prices to be paid are: For yellow, Jeffrey, and sugar pine, on the Norval Flat, \$2.35; on the McCoy chance, \$3.00; for fir on both, 50 cents per thousand.

# THE WOODPECKERS

(Family Picidae)

BY A. A. ALLEN, PH.D.

ASSISTANT PROFESSOR OF ORNITHOLOGY, CORNELL UNIVERSITY

**F**EW birds are more easily recognized by the layman or the amateur ornithologist than are the woodpeckers. In spite of the fact that they constitute a large family of over 375 species and are found over the entire world, except in Madagascar and the Australian region, they are remarkably uniform in their habits and in their modifications. Indeed, some of the distinct and even strikingly marked species, like our downy and hairy woodpeckers, resemble each other almost feather for feather. Twenty-four of the nearly 200 species of woodpeckers occurring in the New World are found in North America.

The typical woodpeckers have large heads with stout chisel-like bills which end in a narrow edge rather than a point, and are thus well suited for chipping wood. Their tongues are very long, capable of being protruded a couple of inches beyond the tip of the bill, and have recurved barbs at the tip. This combination of bill and tongue make a perfect tool for drilling into the chambers of wood-boring larvae and spearing the concealed grub. For this reason woodpeckers are considered one of the most valuable groups of birds.

The tail feathers of the woodpeckers are very stiff and pointed and serve as props to support the weight of the birds as they climb the trunks of the trees in their characteristic manner. The tiny woodpeckers of South America and Africa, called piculets, and the four species of wrynecks of the Old World, however, have soft tails.

The feet of woodpeckers, likewise, are adapted to this climbing habit and differ from all of the birds that we have thus far considered, in having two toes directed forward and two backward. Thus they serve as pincers for better grasping the bark. In a few species, the three-toed woodpeckers of northern North America, one hind toe has been lost.

Because of all these modifications, the woodpeckers are separated from the Order Passeres or "Perching Birds" to which the families heretofore considered he-

long, and are put in an order by themselves, the Pici.

In color, the woodpeckers vary from the common black and white varieties, through various shades of brown and green, to those that are brilliant scarlet and yellow. In fact, patches of scarlet are found on the heads of the males of most species, even the most dully colored.

Woodpeckers are usually solitary birds and even the family parties disperse soon after the young are able to care for themselves. Our northern species, however, sometimes gather in scattered groups during the winter, often accompanying the flocks of chickadees and nuthatches, and regularly come to feeding stations main-

tained for them. In fact, they become so fond of suet that they continue to visit pieces hung in the trees all through the summer months, even when they drip in the sun and become rancid. They even feed their young with some suet and bring them to it when they are able to fly.

In nesting habits also, woodpeckers are remarkably uniform, for they all drill holes in dead or soft-wooded trees and lay their eggs on the chips at the bottom of the cavity. The size of the hole varies from about one and a half inches in diameter with the downy to two and a half inches with the flicker, and is correspondingly larger with the pileated and ivory-billed species. The hole is directed toward the center of the tree but a short dis-

tance and then drops downward for from six to eight inches to two feet and is usually enlarged toward the bottom for the convenience of the incubating bird. Usually both birds assist in drilling the hole and often carry the chips to some distance from the tree in order not to attract attention to it. The eggs are always glossy white and unspotted, but the number varies with the different species from four to twelve. There is one celebrated case of a flicker which continued to lay as often as the eggs were removed, until it had laid 71 eggs in 73 days.

Most woodpeckers excavate new nesting cavities each year, but some return to the same hole year after year,



A RED HEADED WOODPECKER RETURNING TO HIS APARTMENT

When he returned from the South a flicker had usurped his previous years' hole and he was compelled to drill another higher up. The two families had frequent quarrels.

particularly the flickers and red-headed woodpeckers. Some make roosting holes for the winter or for the male bird while the female is incubating. In Europe several species of woodpeckers have come to use artificial nesting boxes put up for them, but, in this country, the flicker is, as yet, the only one that does so regularly. Other species will undoubtedly learn to do so as time goes on and available dead trees become scarcer and nesting boxes more plentiful.

To be acceptable to a flicker, a nesting box should be from six to eight inches square inside, and from 18 inches to two feet deep. The hole should measure two and a half to three inches in diameter and should be on one side, a couple of inches from the top. The inside of the box should be rough. The best place for the box is 15 or more feet from the ground, on the straight bole of a tree free from branches, on a dead tree, or on the top of a tree that has been cut off. Inasmuch as woodpeckers build no nests at the bottom of their holes, but merely lay their eggs on the chips at the bottom, it is necessary



THE HOMING BIRD

A flicker coming home to the nest that it has occupied for three successive years. The scaffolding and the box at the right show how the next photograph was secured, the camera being put in place of the box and the shutter worked with a string.

to put about two inches of sawdust or ground cork in the bottom of the box to keep the eggs from rolling around.

Woodpeckers have no true song and their call notes are inclined to be harsh and unmusical. In place of a song, the males, and possibly the females at times, have a loud rolling tattoo which they make by hammering with the bill upon a dead limb, a loose piece of bark, a drain pipe, tin roof or other resonant surface.

The most striking member of the woodpecker family in North America is the red-headed species, found from Ontario to the Gulf and from Colorado to the Atlantic,



"BIRDS OF A FEATHER FLOCK TOGETHER"

A downy and hairy woodpecker at a feeding station. When they are seen together the difference in size is very apparent but otherwise the two species are easily confused.

although for some reason it is rather rare in some localities, particularly in New England. Males and females are alike with the entire head a deep red, the back and most of the wings blue black and the secondaries of the wings, the lower back and underparts pure white, giving them a most conspicuous appearance, especially in flight. The males of many species of woodpeckers have more



THE FLICKER AT ITS NEST

Note the feet with two toes forward and two backward, characteristic of the family. The flicker's bill is slightly curved and more pointed than other members and his habits are different.



Photograph by C. W. Leister

**A RED-HEADED WOODPECKER RETURNING TO ITS NEST**

The hole has been cut so neatly through the bark that it is difficult to see it in the photograph.

or less red on the head, but no other has the entire head red.

Redheads are versatile birds in their feeding habits, and though they drill for their food less than the downy and hairy species, they often fly out after passing insects like the flycatchers or get down on the ground in search of ants and worms like the thrushes. Occasionally individuals arouse the enmity of the whole bird and human world by taking on nest robbing habits, eating the eggs or young of smaller birds. In the fall of the year their

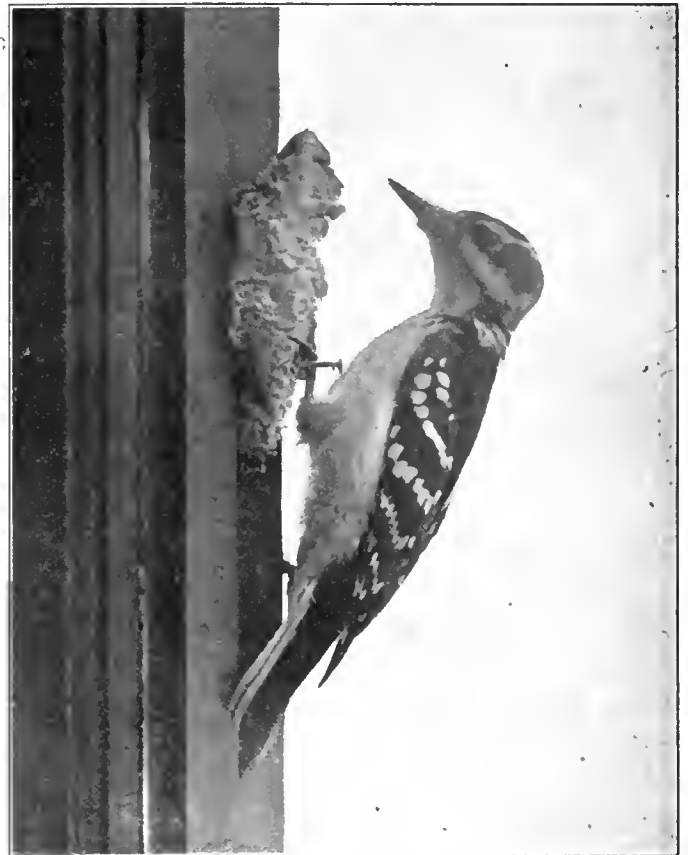


**A DOWNY WOODPECKER AFTER SUET**

The suet has been rammed into a hole bored for it so that crows and squirrels cannot carry it away in one piece

presence in a locality is largely dependent upon the supply of beechnuts, chestnuts or acorns, and at these times great disputes often occur between the redheads and the blue jays for the possession of certain nut trees and for a time such trees present a riot of color. Like the nuthatches, redheads often store nuts for winter use in the crevices of the bark or in fence posts. If the nut crop is good redheads are likely to pass the winter as far north as northern New York or Ontario, but otherwise they retire south of Maryland.

More abundant in most places than the redhead is the flicker, the only brown woodpecker in the United States. The flicker is known by various local names, such as high-hole or high-holder, clape, wickup, wake-robin, golden-winged woodpecker, and over 100 others which space forbids to mention. The flicker is about the size



**PROVING HIS TRUST IN MAN**

A hairy woodpecker taking suet from the window casing. The photograph was taken through the window.

of the redhead, somewhat larger than a robin, brown above barred with black, light brown below spotted with black, and grayer on the head. Its most characteristic marks are a red crescent on the back of the head, a black crescent on the breast, a white patch on the rump, and golden yellow lining to the wings and tail. The western flicker has this lining of the wings and tail red instead of yellow.

The flicker is a rather aberrant member of the family and now seldom drills for boring larvae. Its favorite food is ants, which it secures by drilling into their nests upon the ground. Thus it is frequently seen hopping about lawns with the robins. Its bill is slightly curved

and less chisel-like than most woodpeckers', and its tongue, instead of being barbed, has a sticky secretion poured upon it from the modified salivary glands which entangles the ants.

The downy and hairy woodpeckers are found throughout North America east of the Rockies, and are perhaps the best known of all the woodpeckers. The northern and southern birds have been separated into distinct races because of slight differences in size, but, to all appearances, the birds are the same. The two species are almost exactly alike, except for size, the hairy woodpecker being about the size of a robin (9.4 inches in length), and the downy somewhat larger than a sparrow (6.8 inches). Both birds are striped black and white above, and pure white below, about the only difference being that the outer tail feathers of the hairy are pure white, while in the downy, they are barred with black. The males of each species have a crescent of bright scarlet on back of the head, that of the hairy being divided through the middle by black. Both species are permanent residents where found, and often nest in the vicinity of the place where they are fed in winter.

Another familiar species of the southern states, ranging as far north as southern New York, is the red-bellied woodpecker. It is a noisy bird about the size of the hairy, but with the whole top of the head red and with the back barred rather than striped. The red of the

the South Atlantic and Gulf States but now is confined to the largest and most remote cypress swamps of the lower Mississippi Valley and Gulf States, where it is on the verge of extinction. It is a wild, shy bird, and cannot withstand the encroachments of civilization and the lumber mill.



"WELCOME HOME"

The downy returns with a full market basket of supplies for his always hungry young family.



WOODPECKERS ARE VALUABLE BIRDS

A downy woodpecker and indisputable evidence of his routing of bark beetles from his territory.

belly is quite inconspicuous. Like other woodpeckers, it is fond of suet.

The largest of all the woodpeckers is the ivory-billed species, a bird about the size of a crow, and fully as black, with a scarlet crest, a white stripe on each side of the neck, and large white patches in the wings. It was formerly not an uncommon bird in the larger forests of

Nearly as large and much more widespread, though confined to the forests, is the pileated woodpecker. It is similar in color to the ivory-billed, but has somewhat lighter underparts and does not have the white in the wings so conspicuous or the ivory-white bill. The northern and the southern forms of this bird range from Quebec to the Gulf, but it is nowhere a common bird. In the cypress swamps of Georgia and Florida, however, it occurs in numbers.

The red cockaded woodpecker is one of the less well known woodpeckers of the South, found in the pine forests. It is similar to a hairy woodpecker in general appearance, but has the back barred with black and white and has black streaks on its sides.

The three-toed woodpeckers, of which there are two species inhabiting the boreal regions and coming southward in winter to northern United States, are also about the size of the hairy, but have an orange yellow patch on top of the head.

In the West are found the California Woodpecker, which has the habit of storing acorns in holes which it drills in the bark of trees, the gila and golden-fronted woodpeckers, which resemble the red-bellied species; the Lewis woodpecker, the greenest of the North American species; the red-naped, red-breasted and Williamson sapsuckers which are similar in habits to the eastern yellow-bellied sapsucker.

The sapsuckers get the name from their habit of drill-

ing rows of small round holes in the bark of many species of trees and drinking the sap which collects. One bird usually taps several different trees and each one in several places, and then makes the rounds as often as the sap collects. It is interesting to note that the barbs on the tongue, so characteristic of the woodpeckers, have



Photograph by G. A. Bailey.

#### HE ALSO LIKES SUET

A red-bellied woodpecker at a feeding station. This is a southern species, but ranges as far north as southern New York.

been modified into a fringe or brush for collecting the sap. Sapsuckers eat likewise such insects as are attracted by the sap and, like the red-headed woodpeckers, are quite expert at catching insects on the wing. In addition they eat some of the soft inner bark exposed when the holes are being drilled, and, in soft-wooded trees, like the poplar, where the sap does not flow freely, and the cambium is almost gelatinous, they sometimes peck off fairly large areas. Ordinarily their rows of holes do not overlap and little or no damage is done to the tree, but sometimes, when the birds are very numerous, and for some reason persist in attacking a particular ornamental evergreen or mountain ash, they ruin its appearance, seriously weaken it, or even kill it. The holes drilled by the sapsucker often stain the underlying timber, causing what

are known as "bird pecks," and are said by lumber dealers to cause a devaluation to timber of the United States of nearly a million dollars annually.

At times sapsuckers behave in an erratic and foolish manner, zigzagging through the trees with no apparent reason, flying into windows or walls or the sides of houses, even becoming so stupid as to allow themselves to be picked from the trees, or alighting on one's person and climbing up his leg as though it were the limb of a tree. It has been suggested that the sap ferments in the sun and that the sapsuckers become intoxicated, but this theory has by no means been proved.

The common sapsucker of the East is the yellow-bellied species. It is about the size of a hairy woodpecker with the same general appearance, but has the throat and the whole top of the head red. It has also a conspicuous



#### YELLOW-BELLIED SAPSUCKER

The Sapsucker at his sugar bush. The numerous round holes drilled to get the sap do not usually injure the trees, but sometimes do, and stain the underlying timber.

white stripe on each wing, a black crescent on the breast, and slightly yellowish under parts which are somewhat streaked. The female has a white throat and of immature birds the top of the head is black.

**T**HE use of creosoted wood blocks, which originally began as paving material for city streets, has now spread into many other lines, according to a statement issued by the United States Forest Service. The durability of such pavement, the noiselessness under heavy traffic, and its sanitary properties give creosoted wood block especial value for use where heavy trucking takes place, and such flooring is now found throughout the country in factories, warehouses, machine shops, foundries, quarries and docks, and even in hotel kitchens, hospitals, laundries and slaughter houses.

**I**N the study of wood using industries foresters from Syracuse University have discovered an Onondaga County man who has an interesting water-power saw mill. When the power is not needed for the saw mill he runs either a grist mill, or a cider mill with it. He also has a small electric light plant operated by the same power. The mill has been in operation for more than twenty-five years. Authorities at the College of Forestry say that full and profitable utilization of the woodlot products will be assured only when the State is dotted with these "many purpose" mills.



# WOOD TO THE FRONT AS WARTIME FUEL

WITH every section of the country clamoring for coal and with the railroads experiencing the worst traffic congestion in the history of the United States, recourse is had to the forests as affording a solution of the wartime fuel crisis. From those in authority has come the call for the use of wood as winter fuel in the household and wherever else its use is possible. Briefly and baldly stated, there is not enough coal to go around, and unless wood is used in its stead the coal famine will prove disastrous.

Reduced to figures the coal shortage amounts to fifty million tons. This means two and one-half tons for each of the twenty million families in the United States. To transport this amount of coal would require the use of a million coal cars of fifty tons capacity apiece. In saving this strain on already overtaxed transportation lines and in conserving the fuel supply of the nation it is argued that the individual household can show a measure of patriotism which is vital to the national strength.

Nor does the demand for fuel conservation limit itself to the household. The United States Government has pointed out that churches can make important contribution by using wood in their furnaces. The experts maintain that wood is even better than coal for heating churches, lodge rooms and other places where heat is not constantly required. When heat is wanted in places of occasional assemblage it is required quickly and in large volume. For such purpose no other fuel answers as well as wood. The saving to be effected by use of wood would in these instances work no hardships and the aggregate would be of tremendous importance in making the available supply of coal meet imperative needs.

Definite plans for the substitution of wood for coal have been worked out by the United States Fuel Administration and state organizations all over the country. New England was one of the first sections to take active heed of the situation. Early in December New England

was several million tons short of its requirements for soft coal. Hard coal had been in fairly plentiful supply during September and October, but with the increased needs of winter there was not enough to meet the demand. Every effort was made by the fuel administration to facilitate shipments and to secure the economical use of the coal received, but even after curtailing or eliminating unnecessary forms of use the situation was steadily becoming more serious. The outlook for improvement in future deliveries was unfavorable and the fuel administrator took steps to warn the public of the situation and to urge that personal and community prudence, as well

as national patriotism, required that New England begin at once to utilize her native supply of cordwood to the fullest possible extent.

It has been ascertained that the supply of wood now on hand throughout the New England states is considerably less even than normal requirements. With increased stringency in the coal situation practically certain and with the possibility that another winter will find the condition even worse, earnest efforts are being made to stimulate wood cutting and wood using without delay. To this end local committees of public safety in all wood producing localities and county agents throughout the various states have been requested to take inventory of all available supplies of cordwood stumpage within reasonable dis-

tance of a market and to endeavor to arrange for its immediate conversion into fuel.

As the text of this campaign a poster issued by James J. Storrow, federal fuel administrator for Massachusetts, and published herewith, makes the statement that New England must burn more wood; that the coal shortage is serious and that this condition is likely to continue during the war.

The New England movement is typical of the intensive campaigns inaugurated throughout the country under the guidance of the United States Fuel Administration,

## CUT-A-CORD

**NEW ENGLAND must BURN more WOOD.**  
**THE COAL SHORTAGE IS SERIOUS.**  
 A condition likely to continue during the war.

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### STOVE AND FURNACE WOOD EVERYWHERE IN DEMAND

War Ships and Munition Plants Cannot Burn Wood  
 We Ought Not to Demand the Coal They Need  
 New England Volunteers Her Woodlands in the Emergency

If You Own a Wood Lot

## Cut Some Wood in the Service of Your Country

If you need fuel, BUY WOOD FROM YOUR FARM NEIGHBORS. Order now what you will need later. Let the choppers know who will take their wood. There is another winter coming after this.

Comparative Fuel Values of Green and Dry Wood		Relative Fuel Value of a Cord of Dry Wood in Tons of Hard Coal		
Wood seasoned 12 months, fuel value	100 per cent.	One Cord Approximately Equal to 1 Ton	One Cord Approximately Equal to 2 1/2 Tons	One Cord Approximately Equal to 3 1/2 Tons
" " 9 " " "	95 " "	HICKORY	BASSWOOD	PINE
" " 6 " " "	90 " "	OAK	SOFT MAPLE	SPRUE
" " 3 " " "	85 " "	HARD MAPLE	CHESTNUT	HEMLOCK
" " 0 " " "	85 " "	BEECH	GRAY BIRCH	CEDAR
		ASH	POPLAR	BALSAM
		BURCH		
		APPLE		

Coal burning stoves and furnaces may be adapted for burning wood by placing strips of sheet iron over the grates or by use of fire brick.

OFFICE OF JAMES J. STORROW,  
Federal Fuel Administrator for Massachusetts, State House, Boston

in co-operation with the Department of Agriculture. The Southern states have vast supplies of wood and activities are already under way in that section looking toward the substitution of wood for coal. The Department of Agriculture has volunteered to provide the services of expert foresters who will supervise the cutting of wood so that no damage may be done to growing timber and in order that the largest use may be obtained of the supply of wood. In addition to this source of supply the government has statistics to show that there is a large quantity of dead wood in many sections of the country and that the supply in many communities is large enough for the entire needs for domestic purposes. In many instances this wood is destroyed as waste.

One cord of hardwood is declared to equal a ton of hard coal in fuel value. This takes in such woods as hickory, oak, hard maple, beech, ash, birch and apple. Varieties of wood which equal three-quarters of a ton of coal to the cord are basswood, soft maple, chestnut, gray birch and poplar. A value of half a ton to the cord is

imputed to pine, aspen, hemlock, cedar, spruce and balsam.

The government is making every effort to prevent the creation in this country of fuel conditions such as those with which Europe is confronted. In a single day early in December Associated Press dispatches from London, Paris and Rome detailed the serious fuel problems in England, France and Italy. England has been forced to establish fuel rations based on a weekly allowance of 200 pounds for a four-room house. France has issued coal cards, with a limit of 264 pounds a month for families of four persons or less. In Italy heating has been suppressed except in public buildings and cooking is done with gas or charcoal. The coal supply of Italy is so short that during last summer more than 1,000 square miles of forests were cut down for use as fuel and for making charcoal.

Students of the situation in the United States agree that the use of wood is the sole solution of a fuel crisis which is constantly growing more acute.

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## BLACK LOCUST NEEDED FOR SHIPS

**T**HE revival of the wooden-ship industry has occasioned a considerable demand for black locust wood for "treenails," which are used to fasten the planking to the ribs of the ship. Black locust originally occurred only along the Appalachian Mountains and on the adjacent highlands, from Pennsylvania to Georgia, but it has spread until it now is found in merchantable sizes over a large area. The wood is very hard and close grained and is one of the most durable hard woods known, particularly when in contact with the soil or in other moist situations.

In supplying black-locust wood for shipbuilding purposes it is very important, experts of the Forest Service say, to be able to distinguish it from that of the honey locust, a tree quite similar in many respects but whose wood has a coarser grain and is of inferior quality. The danger of selecting the wrong tree is increased by the fact that in some localities the names applied are exactly reversed, the honey locust being known exclusively as black locust and the true black locust being known as honey locust.

In the case of both trees the leaves are of the compound type, that is they are composed of a number of small leaflets arranged along the central leaf-stalk. The true black locust (which is known botanically as *Robinia*

*pseudacacia*) has leaflets with smooth or entire margins. The leaves of the honey locust (*Gleditsia trianthus*), however, are shallow-toothed or scalloped along the edges, particularly toward the ends.

The character of the thorns also furnishes a dependable means of identification. The thorns of the black locust are short and arranged in pairs. Those of the honey locust, on the other hand, are frequently several inches in length, are often divided into three or more branches, and may be produced in great quantities. They often occur in dense clusters along the main trunk of the tree. The seed pods are also distinctive. Those of the honey locust are, as a rule, from 10 to 18 inches long, while the pods of the black locust are shorter and usually measure from 2 to 4 inches.

To the experienced woodsman all of these features, of course, are very familiar, as is also the characteristic appearance of the black locust caused by the attacks of an insect known as the locust borer, which causes a characteristic swelling of the branches.

The officials of the Forest Service at Washington will identify specimens without charge. They point out that samples of leaves, twigs and fruits are always more dependable as a means of identification than the wood itself.

**W**HILE the studies of the value of the grazing privilege made this year have borne out the original position of the United States Forest Service that the fees formerly in force should be doubled, the present difficulties of the western livestock industry and the necessity for stimulating livestock production as a war measure have caused the Secretary of Agriculture to defer for the present any further increase in grazing fees, except

minor changes to correlate the fees between certain forests or groups of forests.

**U**NDER a contract with a film manufacturing company, the Department of Agriculture will supply motion pictures dealing with its activities, every two weeks. The first release was "The Work of a Forest Ranger."

# PLANTS AND ANIMALS OF THE ATLANTIC AND GULF STATES

BY DR. R. W. SHUFELDT, C. M. Z. S.

**F**ROM the Atlantic to the Pacific, all through the northern and middle tiers of states, there is very little flower collecting to be done during the month of December, while it is just the reverse in the case of those regions of the country bordering upon the Gulf of Mexico and the South Atlantic Ocean. In the latter area many plants, and some trees, are in full bloom; a long list of flowers are there to be studied, and, incidentally, not a few very interesting animals. When the country is covered with snow in the North, and the temperature rarely rises above the fifties, we never, as a matter of course, meet with any flowers, while occasionally we do run across various kinds of seed-pods, and sometimes remnants of plants, all of which are worthy of close observation and study.

As the holiday season comes on—war or no war—and the Christmas idea comes into the minds of the people, there is no plant or tree that appeals to us more forcibly than does the well-known American holly. A beautiful example of this is presented in Figure 1. Throughout the region where this tree or shrub grows—more particularly in the neighborhood of our cities—it seems to stand much in need of Federal protection, for the reason that the gatherers of its berried branches, in order to meet the demand of the market for it during the holiday season, have ruined and mutilated thousands of its kind. It

is a pitiful sight to observe the miserable, semi-limble stumps of the holly in the fields, along the roadsides, and at the edges of some of our forests. This vandalism is carried on each year for miles about any one of our large northern cities.

Neltje Blanchan, who has searched out some of the ancient superstitions in regard to holly, very truly points out for us that “happily we continue to borrow all the beautiful Old World associations, poetical and legendary, that cluster about the holly at Christmas time, although our native tree furnishes most of our holiday decorations. As far back as Pliny’s day, the European holly had all manner of supernatural qualities attributed to it; its insignificant little flowers caused water to freeze, he tells us; because it was believed to repel lightning, the Romans planted it near their houses; and a branch of it thrown after any refractory animal, even if it did not hit him, would subdue him instantly, and cause him to lie down meekly beside the stick! Can it be that the Italian peasants, who still believe cattle kneel in their stalls at midnight on the anniversary of Jesus’ birth, decorate the mangers on Christmas Eve with holly, among other plants, because of a survival of this old pagan notion about its subduing effect on animals?”

The leaves of the American holly remain on the tree for three years; and we use the wood, which very closely



A RELIC OF THE PAST

Fig. 11—in the National Zoological Park, at Washington, we find many trees and animals well worthy of our closest study; later on, some of these will be referred to in greater detail. The rustic bridge here shown spanned one of the streams in that beautiful preserve. About a year ago it was replaced by a substantial stone one, so this picture is both historical and unique.

resembles ivory, for inlay work, tool handles, whip stocks and walking sticks. Engravers prize it very highly to engrave upon—an art now almost out of date; and it also has many other uses. This tree, that is, the American holly, will, within the next half century, be utterly extinct in the United States. Other hollies are the Yaupon, the Dahoon, the Swamp or Meadow holly, and the Mountain holly. In the Old World there are still different species of *Ilex*, and nearly all of them are fine and ornamental trees, worthy of far better protection than they now receive.

Far back into history the holly and the mistletoe are closely associated, in a decorative way, all through the holiday season, and many of the customs have come down to us.

"The mistletoe hung  
in the castle hall,  
And the holly  
branch hung on  
the old oak wall;  
The baron's retain-  
ers were blithe  
and gay  
Keeping their  
Christmas holi-  
day."

Holly trees transplant very successfully if proper precautions are taken, and a very beautiful species, with immense, red berries, is being intro-

duced here from Japan. All the various kinds now to be found in the country should, at the suggestion of the American Forestry Association, be protected by both State and Federal Governments before it is too late to save them.

More than abundant all through the autumn, and often up to the arrival of winter, is the well-known little White Heath Aster (Figure 2), which looks for all the world like an extremely small edition of our common daisy of the meadows. It has also received the name of Michaelmas Daisy, White Rosemary, Farewell Summer, and Frostweed—because Jack Frost sometimes sees it in bloom. It rarely grows more than a yard high, and is sometimes so massed in favorable places that it appears, at a little distance, like some kind of a feathery inflorescence. Occasionally its little flowers are more or less strongly tinged with magenta or pale purple. The central discs are bright yellow, while the leaves of the plant are light green, minute, linear and heathlike, to become,



AMERICAN HOLLY, A TREE RAPIDLY DISAPPEARING IN SUBURBAN DISTRICTS

Fig. 1.—It is said that the generic name, *Ilex*, of this splendid tree is the ancient Latin name, originally applied to the Holy Oak; *opaca* is its specific name. Its drupes are of a brilliant red or vermilion color, while in some of the other hollies they are yellow.

near the base of the smooth stem, more lance-shaped and blunt; these latter may be minutely toothed or serrate.

In some parts of the country the bee-keepers have encouraged the spread of this tiny aster, for not only is it known to yield a large amount of nectar, but the latter is of a brand that our honey-bees are extremely fond of.

This miniature edition of the daisy may readily be identified by its very small and very rigid leaves. Last summer (1917) many of the early autumn flowers—this little Michaelmas daisy or aster among them—were ushered in with a flourish of trumpets, as it were, if one may be permitted to thus refer to the imaginary finale of the trumpet-flowers, as they drop out of the list of flowers that bloom in the northwestern sections of the country as September draws to a close.

Flowers of the Trumpet-creeper are among the most conspicuous of all those that are to be seen in the districts where the plant thrives, which includes, as a rule, the time extending from April to September, depending upon

the latitude where it is found. Those who have had the pleasure of seeing these great orange and scarlet flowers growing wild are not likely to ever forget the sight. Sometimes the vine may be massed over the great stone pier of a bridge at its initial anchorage, when hundreds of the flowers are in view at once. They stand out with especial prominence in the setting they receive from the luxuriant foliage of this great climber, its toothed and



HERE WE HAVE ONE OF THE LITTLE RAGAMUFFINS OF THE ROADSIDE

Fig. 2.—This tiny white aster is pretty generally known as the Michaelmas Daisy or Heath Aster (*Aster ericoides*). In the middle districts of its range, it sometimes blooms as late as November; it is a very abundant species as far south as Kentucky.

pointed leaflets being of a paler shade than the dark, shiny green, matured leaves, which are pinnate in outline and ovate in form. As will be noted in Figure 3, the flowers are corymbed, the brilliant corolla being funnel-formed, five-lobed, and somewhat irregular. The vine itself is woody, and climbs by means of its aerial rootlets. Its pods are well illustrated in Figure 4, where, too, may be seen some of the flattened, winged seeds. This flower is a great favorite with our Ruby-throated Humming-bird, and Audubon attempted to portray that spe-

cies hovering over a cluster of them. But the flowers bear but a very faint resemblance to specimens as they occur in nature, or as the camera has depicted them in Figure 3.

Our Trumpet-creeper belongs in the Bignonia family (*Bignoniaceae*), and has been named *Tecoma radicans*, it being the only representative of its genus in this part of the world. Associated with it in the same family we have the Catalpa or Indian Bean (*Catalpa speciosa*), also the sole species of its genus, though Gray tells us that there is "a low much branched tree, with thin bark and a smaller corolla," and so on, which by Thomas Walter has been designated as *Catalpa bignonioides*, and which is

localities, the well-known Virginia Ground Cherry, the highly attractive fruit of which, when ripe, is feasted upon by numerous species of birds of the region where it is found. Among the latter may be mentioned such species as our bluebirds and robins, and they, with others, love the places where this plant thrives best—on our hillsides, in pasture-lands, and on open ground generally. In describing this plant, F. Schuyler Mathews tells us that it is a "branching and erect-stemmed species, mostly smooth. The ovate, lance-shaped leaves, tapering toward both ends, very slightly shallow-toothed and light green. The flower dull pale yellow with five brown-purple spots; anthers deep yellow. The



#### SPINY SWIFTS, OR LIZARDS, MAKE INTERESTING PETS SOMETIMES

Fig. 7—In the United States we have a genus of land lizards, to which the name of Swift has been given, for the reason that they can run with such astonishing rapidity. There are some fifteen species of them, and they all fall in the genus, *Sceloporus*. They inhabit different ranges in different sections of the country, although several may occur in the same range. The one shown in the cut is one of the largest of the group, and has been called the Spiny Swift (*S. spinosus*) on account of the spiny character of its scales. It occurs in great numbers in Mexico, and from there it ranges northward and eastward from western Texas and New Mexico to western Florida. It has a length, when adult, of nearly ten inches.

here defined as the Southern Cigar Tree or Southern Catawba Tree, to distinguish it from its northern relative. Finally we have in this *Bignonia* genus the Crossvine (*B. capreolata*), a most interesting climber, which exhibits a "cross" on the surface exposed by a transverse section of its stem. It climbs up into trees, and flourishes in rich soil from Virginia to Florida, westward to include Ohio, Illinois and Louisiana. Most of the *Bignonias* have been cultivated as ornamental trees and vines and may frequently be seen in our gardens or on our estates.

From New York to Manitoba, and southward to the tier of states bounding the Gulf, we may meet, in suitable

stigma matures before the anthers, and extends beyond them. Fertilized by the honey-bee and the bees of the genus *Halictus*; *Halictus pectinatus* is a common visitor (Professor Robertson). The reddish berry enclosed within the enlarged calyx. One to three feet high." There is an insect that feeds upon the leaves of these plants and riddles them with fine perforations, but one of the most interesting things about it is the manner in which the calyx becomes skeletonized, admitting of a view of the fruit inside. When a large cluster of them has passed to this stage, it is certainly a very beautiful object, when held up to the sun in such a way as to observe the lighting up of the whole structure



THE FLOWERS OF THE SPANISH NEEDLES ARE SMALL AND HAVE YELLOW PETALS  
 Fig. 6—One of the plants in the eastern part of United States which do not shed all their seeds at once, frequently holding them until winter is about over. Many of these seeds stick to one's clothing, when one comes in contact with them in passing through places where they grow and so they are scattered far and wide. The plant is known as Spanish Needle (*Bidens bipinnata*). As a matter of fact, all of the *Bidens* group possess this very annoying clinging characteristic.

as the rays pass through them. These dried plants may sometimes be found in the fields after winter has set in and the ground is covered with an inch or more of snow. They are gentle encouragers as to the fact that the world has not seen its last summer, for when the joyous month of July comes round again in 1918 we shall still find our old friends, the Virginia Ground Cherries, adding their quota of interest and beauty to the flora of our pastures and meadow lands, with perhaps a few scattering plants higher up on the hillsides.

In those parts of the South which we have in mind, many of the smaller animals are in evidence all winter long, while during the same part of the year in the North they hibernate for several months at a time, and are never seen in the woods during the season that Jack Frost holds things in his icy grasp. For example, our beautiful little lizard, the common Swift, disappears just so soon as the really cold weather sets in, and we do not see him again until the bloodroots begin to think of peeping above ground. The male of this species is a beauty, with his glistening azure sides bordered with velvety black, and the bizarre pattern of brown that ornaments his back. From western Texas to Florida, his big cousin of the South (Figure 7), also prettily marked, gets a great deal more out of life than he does; for in the balmy southern regions he loses not an hour through being compelled to hibernate from early winter to the beginning of spring. He may be seen any day in December or January, in the forests of his range, comfortably sunning himself on some old log.

The various species of *Bidens* have practically all shed their seeds in the

North (Figure 6), while in many parts of the country, south of the Mason and Dixon line, the troublesome seeds of these noxious plants are abundantly in evidence. No one of the group is better known, either North or South, than our Spanish Needles—the brown seed needles of which are pretty thick and always double-pointed. These plants belong to the great Composite family (*Compositae*), along with a great many others of our most familiar flowers. In the *Bidens* genus there is even a Tickseed Sunflower, the seeds of which can stick to one's clothing with just as much tenacity as the seeds of the various species of Beggar-ticks in this array of pests of the autumn woods (*B. trichosperma*).

Many people have often wondered what the curious, spindle-shaped, little silken affairs, ornamented with bits of sticks or pine needles are, which are seen hanging from the twigs of many of our city shade trees, as well as from

not a few of the conifers in the forests, especially the red cedar and the arbor vitae. A good picture of one of these is here given in Figure 8, and it is the common "Bag-worm," a tree-pest of the first order. The larva feeds upon the leaves of many trees and shrubs, but ignores the sedges and grasses, and is most injurious. They can best be destroyed by collecting the cases in bags and baskets and burning them in a bonfire. Several years ago a great many bushels of them were thus collected in St. Louis and burned, with decided benefit to the city's shade trees the following summer. The late eminent economic entomologist, Prof. Charles Valentine Riley, gives an excellent account of this, with a life his-



PODS THAT HOLD THE FLAT, WINGED SEEDS OF THE TRUMPET FLOWER

Fig. 4—Long late in the autumn, the lengthy, deep tan-colored seed pods of the Trumpet flowers are to be seen, dangling from the leafless runners of the vine; from one to several in a bunch, quite a few hang onto the vine until winter is past. The rows of seed are separated by the fibrous division shown in the cut, where two winged seeds are seen falling out.



TREE CULTURISTS HAVE GIVEN THE "BAG WORM" VERY CLOSE STUDY

Fig. 8—A remarkable little moth (*Thyridapteryx ephemeriformis*) ranges from the Great Plains to the Atlantic Ocean, throughout the Appalachian subregion. Its life history is a very strange one, and much has been written upon it. Many shade trees and shrubs are victims of its voracious as well as promiscuous feeding habits; this is its cocoon.

tory of the insect. Dr. William J. Holland, in his "Moth Book," says: "The 'bag' or 'basket' of the male insect is smaller than that of the female. The males escape from the lower end of the case in the winged form, and having copulated with the females, which remain in their cases and are apterous and sluggish, die. The female deposits her eggs, which are soft and yellow, in the sack where she has her home, and ends her existence by leaving what little of her body remains after the ova have been extruded, as a sort of loose plug of desiccated tissue at the lower end of the sack. The eggs remain in the case till the following spring, when they hatch. The young larvae emerge, and placing themselves upon the leaves, where they walk about on their fore feet, with their anal extremities held up perpendicularly, proceed to construct about themselves little cones of vegetable matter mixed with fine silk. After a while they cease to hold these cones correct, and seizing the leaves and branches with their feet, allow the bag to assume a pendant position. They moult within their cases four times before reaching maturity and pupating." Sometimes hundreds of these little bags are seen to be suspended from the twigs of a single tree.

When the frosty nights of October come along, up through the Middle Atlantic and New England States, we have the annual and gorgeous display of the turning of the foliage of many of the different species of trees from the greens of summer and spring to the incomparable tints and shades of the reds, scarlets and yellows that



BADLY "STUNG," WITH THE STINGS PROVING FATAL

Fig. 10—Here we have a more complete example of the Virginia Creeper, with the same specimen of caterpillar shown in Figure 9. The latter has been fatally attacked by a female ichneumon fly, and the masses of white objects almost covering the unhappy victim are the larvae of the parasite. On the evening the caterpillar was collected, it appeared as in Figure 9; while next morning it presented the appearance so well shown here.



THE SCARLET LEAVES OF THE VIRGINIA CREEPER—ONCE SEEN WILL NEVER BE FORGOTTEN

Fig. 9—There is no more beautiful vine in all America than our Woodbine, or, as it is more generally known, Virginia Creeper. It has been called *Pseodera quinquefolia* of the Vine family (*Vitaceae*). Its generic name *Pseodera* is supposed to come from the Greek term *hedera*, given to the ivy. *Quinquefolia* refers to the leaf-arrangement of the five leaflets, so distinctly shown in the cut. The beautiful green caterpillar is the larva of one of our best Sphinx moths, the *Pholus satellitia pandarus*, a subspecies of the Satellite sphinx.

Mexico. Many will be familiar with the sight depicted with the camera in Figure 10 of this article. The unhappy larva has been attacked by one of our smallest thymenopterous parasites—a representative of the ichneumon family. The female of this insect, which is about the size of a mosquito, deposits her eggs upon the skin of the caterpillar. These soon hatch out, and the minute grubs work their way into the body of the victim, to feed upon the fat immediately beneath the skin. Later on, and previous to the maturing of the caterpillar, these grubs appear on the surface of the skin, and there weave the little silken cocoons so well shown in the reproduction of the photograph in Figure 10.

From these cocoons emerge the perfect insects, and the poor caterpillar invariably succumbs to the ordeal through which it has passed. The caterpillars of other species of our beautiful Sphinx moths suffer in a similar manner, and thousands of them perish thus every year.



FLOWERS OF THE GORGEOUS TRUMPET VINE

Fig. 3—There is no vine in America that presents a more striking appearance than our Trumpet-vine (*Tecoma radicans*). Abundant in northern Virginia, it has been introduced as an ornamental vine by many home-owners at the National Capital. In August its gorgeous vermilion flowers constitute one of the glories of the dusty roadside.

usher in the early months of autumn. Amidst this marvelous color-display there is a no more elegant participant than our Virginia Creeper, especially if the vine be a big one and has grown to exhibit its foliage to the best advantage. As these lines are written, the gray, pebble-dashed south wall of my home is overrun with such a vine, covering as it does many square yards. As the sun strikes it during the day, the thousands of scarlet leaves, intermingled with hundreds of bunches of small, round, bluish-black berries—the former all facing outwards—we are having presented to us a sight of peculiar beauty and magnificence—one of the chief glories of America's floral world. Darwin experimented with the tenacious hold of the tendril-disks of this vine, and other writers have had much to say about it. It grows luxuriantly in Cuba and even in northern

# EDITORIAL

## WASTE OF FORAGE THROUGH LACK OF GRAZING

THESE are days when conservation has come to be a grim reality. As never before the American people are striving to save in every way possible. Every natural resource is being made the most of and this is doubly true if it in any way affects our supply of food and clothing.

Much is being said, and very properly, about meatless days, reduction in the use of fats, use of more and heavier woolen clothing to save our coal, conserving our milk supply for the children, and the husbanding of our grains for use as human food.

The American people must produce all of the beef, mutton, wool, milk, cheese, butter and other animal products possible; and yet we must use in doing this the minimum of our valuable grains. This means that we should see to it that every scrap of our cheaper feeds is used in this production. Undoubtedly the cheapest of these feeds is to be found in our western range plants, especially that highly succulent forage, both herbaceous and shrubby, to be found in great abundance in the higher mountainous regions.

This range, in the northern Rocky Mountains, is not fully utilized. It has never been grazed to anything like its full carrying capacity and its waste without doubt constitutes one of our greatest economic leaks in the present crisis.

The forage of our wild lands is produced more cheaply than any other feed of like value. It simply grows without cultivation or care of any kind, and it does not have to be cut, hauled, etc., yet its real value is based, not on the cost of production, but on the amount and value of animal products it will produce when fully utilized by grazing. Never in the history of our country has the demand for animal products of all kinds been so great as at the present time, and yet the demand for grains for human food is so great that they should be used as sparingly as possible for the feeding of animals. It is, therefore, almost a crime to allow grass, if at all accessible, to go to waste when the country is in such dire need of what this forage will produce. The opinion is quite general that the range lands of the West are already fully utilized. This is true for certain portions of the range only. On many of the National Forests in northern Idaho, eastern Washington and western Montana the number of stock grazed is not half what the range can carry. Hundreds of thousands of acres of excellent forage in this region is wasting at the present time which should have been transformed during the past summer into meat and wool. When computed in pounds of food and clothing this loss is enormous and its value at present prices is indeed fabulous. Who is to blame for this state of affairs, and how is this waste to be stopped? No one is directly to blame, and the waste can be stopped only by education and development. The farmers and

stockmen of this region must be educated regarding the nature and value of this range, and the forests must be further developed with roads and stock trails in order that they may be more accessible for trailing herds and flocks in and out of these regions. The forest supervisors are doing this as rapidly as their limited funds will permit, they are also advertising this range and making its value known to stockmen by every means at their command. Yet they cannot get enough permittees to take up the allotments made and only a small part of the stock necessary to consume the forage which annually goes to waste. One of the chief difficulties lies in the fact that the farmers are as a rule inexperienced in trailing stock back into rough and mountainous country. If this range were in Utah, Arizona or California the veteran stockmen in these regions would soon get to it, and it would be fully utilized by these men who would at once recognize its value and eagerly grasp this opportunity for greater sheep and cattle production. Another reason why this range is not taken is because stock owners in the contiguous valleys do not fully understand the great advantage accruing from the formation of cooperative stock associations. In fact, many have never heard of these associations and know nothing at all of how they are operated.

One concrete example will serve to explain conditions obtaining on probably half the National Forests in the northern Rockies, some of which have had practically no grazing animals on them at any time. The forest referred to advertised to allot 12,000 sheep for the summer of 1917, the range being capable of carrying from 25 to 40 per cent more if permittees could be found. However, only 3,000 sheep were brought onto this range for the season. This means that but 25 per cent of the forage necessary to maintain at least 12,000 sheep with their lambs was used during the past grazing season. In other words, the forage necessary to maintain for three months 9,000 sheep with their lambs has been wasted. An investment in sheep of at least \$125,000 could thus have been maintained for one-fourth of the year and likewise its increase of from 5,000 to 6,000 lambs, worth at a conservative estimate from \$30,000 to \$35,000. A fair gain for the sheep for this period would be ten pounds per head and for the lambs thirty-five pounds per head, with two pounds of wool per head for sheep and lambs. This means that forage sufficient to produce 90,000 pounds of mutton and from 175,000 to 210,000 pounds of lamb or approximately 300,000 pounds of meat, and from 28,000 to 30,000 pounds of wool, both much needed at this time, is lost forever. The price at this time is so fabulous that the reader is left to determine the money value for himself. This is one of the smallest National Forests. Many of them in the region named could easily handle five times, and



some ten times this number of sheep, besides many cattle. Those in charge would gladly do this if people could be induced to provide the stock and to use the range. It is believed that many would do so were they fully informed of its real value, the methods of securing the range, and knew how to get the stock back to it. As said before, many have never heard of co-operative stock associations whereby the rancher with only a few head of stock may join with his neighbors, who also have small numbers, and together secure a range allotment for the season. In this way each man holds his stock in his own name, paying his share of the grazing fees and cost of herding. Many people do not realize how

far sheep and cattle may be trailed back into the mountains to excellent advantage. By this method the local ranges would be saved for spring and fall grazing. The opportunity given the close-in pastures for recuperation during the summer months would enable them to support a greater number of stock in the fall and spring, thus enabling the farmer or the stockman of the valleys to considerably increase the number of animals handled, add materially to his income and "do his bit" most substantially by way of augmenting the depleted supplies of our most highly valued classes of food products and clothing material. That this increase should be brought about is highly important.

### WOOD CUTTING TO OVERCOME COAL SHORTAGE

**T**HE serious shortage of coal throughout the entire country makes the substitution of wood for fuel a real necessity. How far increased use of wood can help this year is unknown. It appears, however, that the amount of fuel wood now cut and seasoned is far below normal, not more than one-half the usual supply. The small available supply of seasoned wood has caused the price to increase in many places to nearly double that of a year ago. Some towns in New England are reported as now paying as high as \$18.00 per cord for seasoned wood, while as high as \$12.00 per cord is paid in some places for wood f. o. b. These are unusual prices and were it not for the great scarcity of labor would undoubtedly greatly stimulate wood cutting wherever wood is available. Enormous quantities of standing timber suitable for fuel are available. The situation, therefore, demands prompt action not only to meet present exigencies, but to alleviate the situation a year hence.

The Federal Fuel Administrator for New England, Mr. J. J. Storrow, in a call to a conference on the subject, said:

"A serious shortage of coal threatens New England this winter. The situation does not warrant neglecting any possible measure of preparedness. For this reason it seems advisable to make a New England campaign for the production of wood on a large scale. Good hardwood properly prepared and dried can be used extensively for domestic purposes as an emergency measure. Wood cut in November can be burned the latter part of the winter, when the coal situation may be most acute. The campaign should also look ahead toward a large supply of wood for next winter when the coal situation may be more serious than this year."

The full attendance at the conference bespoke the interest of everyone in the solution of the fuel problem and conclusions reached were summarized as follows:

1. People throughout New England should be urged to use wood wherever they can do so in order to save coal.

2. It is earnestly recommended that the fuel administrators and the agricultural and other officers throughout the New England states shall urge upon all woodland owners to cut cordwood promptly and extensively.

3. As far as possible portable sawing machinery should be used in order to save the expense of additional handling. In some instances the wood can probably be cut into one foot lengths advantageously. The machinery uses a different class of laborers, reducing the number of skilled laborers required.

4. In order to secure the best results, local organization is necessary. Leadership and sometimes capital are required, which we believe should come from the local banks and business men.

5. It is recommended that the fuel administrator in each state shall appoint a representative committee from the several counties and wood-using industries, including the State Forester in each state, these committees to take charge of the wood situation under the fuel administrator. Insofar as their judgment approves, local committees in the several towns should be organized in order that the local committees shall protect themselves against extortionary prices.

The Fuel Administrators for each state should appoint committees in each town to canvass all timber land owners and urge upon them the necessity for increasing the cutting of wood not only to be used this winter but for a reserve supply of seasoned wood for next winter. Even where \$2.00 or even \$3.00 per cord is now paid for cutting the wood the owner is receiving more for his stumpage under present prices than he did a few years ago when cutting cost but \$1.00 per cord.

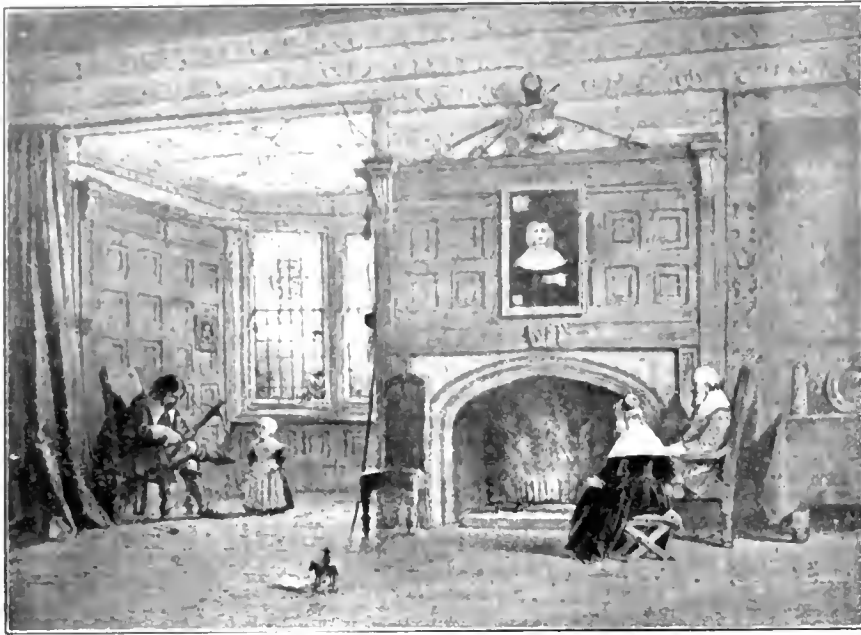
It is clear that woodland owners are, therefore, not being asked to make any financial sacrifices, but just to get a strong grip on the situation and use every effort with available labor to get out more fuel wood and then more during this winter. It must not be forgotten that the opportunity is big to improve our woodlands in this work. Let every reader of AMERICAN FORESTRY take hold and "do his bit" along this line.

**T**HE municipal forest of Baden-Baden, Germany, yields an annual net profit of \$5.25 per acre. Many cities in the United States might have the same income. The town forest of Fosbach, Germany, pays a net profit of \$12.41 per acre per year.

## A PAGE OF REMARKABLE FIREPLACES

AT LEFT—At Haddon Hall, Derbyshire, this old fireplace and the Old English Oak wainscoting is still in existence, though the drawing was made more than half a century ago. It was around fireplaces of this sort that the traditional Christmas of Old England grew. To mention those old celebrations suggests old oak-paneled rooms of this sort and we can hardly think of the rooms themselves without visions of glorious old holidays and the finest traditions of home life.

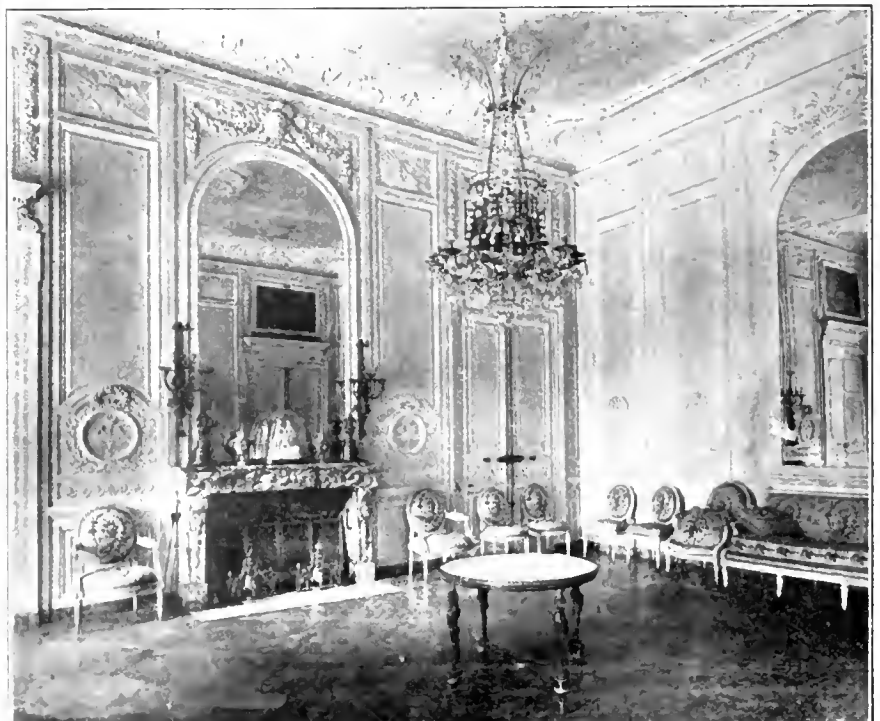
BELOW—This Dutch kitchen dates from the seventeenth century and is in the Ancient Draperer's House, Leyden. Note the wooden shelf and hood and the tiled walls and floor.



ABOVE—This remarkably Italian looking room is in the residence of William G. Mather, Cleveland, Ohio, and was designed by Charles A. Platt, of New York.



AT RIGHT The rooms in the Trianons are less elaborate than at Versailles. In this, the *Salon a Musique* at the Grand Trianon, the wooden paneling is painted putty color, and there is none of the gilding of ornament that was used so lavishly by Louis XV at Versailles.



# USING WOOD IN FIREPLACES TO CONSERVE COAL

BY RAWSON W. HADDON

WHEN the year gets round to the time immediately before the day when

" . . . baby's hand just touches heaven  
When Daddy lights the tree."

we begin to realize again how important the fireplace is to the final completion of our happiness when we are gathered for the most important holiday of all the year.

But for us, Christmas celebrations this year can hardly take on the lighthearted aspect that they have assumed in former years, though there never has been a Christmas for all the people of this country—unless perhaps it was that dark winter of Valley Forge—in which it was

should indicate an actual fact as well as a picturesque phrase.

It is announced that stringent measures are to be taken by the government for the conservation of the present coal supply, both mined and that which is now in the ground, for use in necessary government and public service establishments.

A single instance of this is the elimination of large and useless (and, from an esthetic viewpoint, most offensively ugly) electric advertising signs, with a resultant saving of hundreds of thousands of tons of coal for use in munition factories and other important industries.

But from this extreme case of hundreds and perhaps thousands of tons a day the duty of economy is distributed among other consumers and rests with equal importance upon the householder, in the use of whose supply of fuel it is also of the greatest importance that strictest economy and judgment be exercised.

At this point the forest is again called upon to do a part in carrying out the plans of the government, and one of the natural suggestions has been that fewer coal fires be used and that more attention be given to the heating of rooms by means of wood fires in open fireplaces. It is proposed that only a minimum temperature be maintained throughout the house and that extra heat, in living rooms for instance, as bed rooms seldom, if ever, need any large amount of heat, be obtained by the use of open fireplaces. Here, however, we must immediately realize the wastefulness of open coal fires and turn to wood for a satisfactory and economical fuel.

Quite outside of what may, with only a small amount of good natured exaggeration, be called the "aspect of military necessity" in this suggestion, fireplace heating has another and equally important point of view.

This is concerned with the fireplace, and the spark-



Photo courtesy Arthur Todhunter.

We have our share of ups and downs,  
Our cares like other folk;  
The pocketbook is sometimes full,  
We're sometimes well nigh broke;  
But once a year, at Christmas time,  
Our hearth is bright to see;  
The baby's hand just touches heaven  
When Daddy lights the tree.

MARGARET E. SANGSTER

more important for us to realize and cherish and get every possible pleasant hour from our available stock of home atmosphere and home thoughts.

Nor have there been many times when it was so important to inspire those at the front with the assurance that we, at home, are keeping the "home fires burning" to welcome and cheer them when they return. And at this present time, there are good reasons why "the fires"



Photo by Frank Cousins.

Mantel in the Cook-Oliver House, Salem, Mass. Designed in 1799 by Samuel McIntire.

ling, crackling warmth of the open fire as one of the most important elements of the decoration of our homes.

To us of the present day, with all our improvements and labor-saving devices, which are all fine enough in themselves, but which are apt to lessen our consciousness of deeper grounded artistic longings and elements of life, the fireplace has, until very recently, been a neglected quantity.

Indeed we hear far too infrequently nowadays allusions to scenes where, as Robert Bloomfield, the cobbler-poet, said:

"Flat on the hearth the glowing embers lie,  
And flames reflected dance in every eye;"

and too many contemporary American homes have been turned into enormously efficient but rather soulless habitations where the simpler, more graceful sort of ideals are all too easily lost sight of.

In building a fireplace there are many types to choose from. There are the large and elaborate sorts for instance, which were the product of calm and spacious days when magnificence in living was one of the arts of life, and which can be reproduced to advantage in very large and formal houses of the present time. Then, too, there are the simpler and more intimate and homelike products of our own Colonial days, which were built, originally, during a period when the



Living room in an old Colonial House that has been restored by an architect for his own use. Residence of Herbert M. Baer, Westport, Conn.

home fireside was the final goal of existence and when all social and national considerations revolved around it as a central point. Indeed, in all modern periods of history the fireplace has been developed as important an architectural feature as it has been a rallying point of social and family life.

In the earlier types the fireplace opening is extremely large, too enormous by far for present day use, but certain English and early American types are extremely well calculated for use today.

The design of the fireplace is, in fact, the one important keynote in the successfully decorated room. Much is gained, too, by building the fireplace into a paneled wall, as the majority of those illustrated are built.

In English houses the paneling is generally carried around four walls of the room, while in the American examples only one wall was paneled and the remaining ones were plastered or papered. This shows in the photograph which heads this article and the plastered side wall can be seen in the illustration of the living room of Mr. Baer's house.

In the design it is important that the use for which the room is intended be taken into consideration, and that it be in character and harmony with the room and with the furnishing to be placed in it.

Roughly speaking, there are three general types of fireplace which are used at the present time. An example of the most elaborate type is found in Georgian work such as that in the drawing room at Belton, of which an interesting reproduction has been carried out by the Hayden Company of New York, and reproduced through their courtesy.

The structural work in this room is built of English oak and the elaborate wood carvings executed in old pear wood. The mantel itself, as in the original, is executed in marble as a contrast to the large amount of woodwork otherwise used. In finishing the wood it was thoroughly stained, and waxed to bring out its fine nat-



Photo courtesy of the Hayden Co.

A reproduction of an old English paneled room of most elaborate design. The paneling is oak and the carvings in old pear wood.

ural color. In this English type the fireplace opening is in itself rather small in comparison to the scope of the whole design. A very much stronger and more definite note is struck by the picture and carving over the mantel which are, in themselves, important and necessary parts of the composition, making the mantel frame and the "over mantel" together form the entire and distinct feature of design.

In the fireplace and paneling in Mr. Baer's house, on the other hand, an entirely different scheme, and different theory of design is found. In this latter type the overmantel is subordinated in importance to a large and ample fireplace opening. In this case it will be noted that no decoration whatever is found in the place occupied by the picture and the carving in the Belton example, and the fire opening is in this way emphasized and made the important element of design. This emphasis upon the opening itself is further accentuated by the absence of any mantel shelf and the use of a single bold and emphatically simple molded frame. This is a good example of early Colonial work and illustrates a type of wall treatment that deserves the careful and earnest consideration of the home builder of today.

"The paneling shown in this room," writes the architect, "was taken out of an old house of about the same period as that of my own residence and dates, approximately, from the year 1750. It was delivered at my house in absolutely original condition, and, as antique buyers say, 'in the rough.' Built of local pine, it had in the course of years received coat upon coat of paint, some good and some of extremely poor quality. Much of this had been chipped off and in order to finish the woodwork properly after it was set up in the room, it was necessary to burn off a large part of this paint and to carefully scrape off the remainder. After this, the woodwork was given two and then three coats of paint which I selected as being without any doubt the best for the purpose. Finally a coat of flat enamel was applied. The importance of the selection of proper paint cannot be over-emphasized. Between each coat, to make a good job, the paint should be properly sandpapered."

The last of the three types occupies a middling course between the two extremes already discussed and is found illustrated in the mantels most frequently found in later Colonial and English work and which may be illustrated by the mantel heading this article and by an interesting one in Salem, designed by Samuel McIntire and erected in 1799. This latter type is more often used than the earlier Colonial one and perhaps is justly the more popular scheme. Certainly it fits better in the unpaneled room and it suggests a cer-

tain informality and homelikeness which, though making its use impossible in the formally arranged or decorated room, makes its use advisable in a far greater number of conditions than is possible in the case of either of the previous types.

While the Salem example is an authentic antique and probably built, also, of some local wood, the illustration which appears over the verse on the first page is quite modern in erection, but is an exact reproduction of an old mantel now in the possession of Mr. Arthur Todhunter, of New York city, who has done much to further art appreciation in the home by the many splendid products of his business. Such mantels and fireplace furnishings from well designed antique models are within the reach of every house builder at a cost very often far smaller than would be necessary for the purchase of considerably inferior designs elsewhere.

It will be noted that this third type of mantel is designed quite independently of the surrounding wall. And while it is found both in paneled and in plastered rooms it has no more actual decorative relation to one than to the other. While the first type, to be successful, must be designed with an equally important overmantel, and the second type derives its entire success from the absence of the same, and loses much of its effectiveness if the space above it is not left severely unornamented. The space over this third type is left to be decorated as the house furnisher wishes. An old pictorial paper makes decorations impossible in the Salem example, but the other illustration shows the scope left to personal taste in the matter of mirrors and mantel shelf decorations.

The structural materials selected for the work, and the manner in which these are finished is important. When the decorative scheme calls for woods left in rich natural colors materials must be selected with care both with regard to their color and wearing qualities. In recent work many interesting results have been obtained with practically every domestic wood. Much work could be illustrated in which results of the greatest interest and merit have been obtained in the use of American oak, red gum, walnut, cypress and many others. For work which is to be finished with heavy coats of paint or enamel (which must be selected with care and in the light of the conditions that maintain in the paint market at the present day) the favorites seem to be, to name only a few, pine, spruce, maple, cypress and others.

And finally, when all is said and done and we have had our artistic appreciation and all the homelike coziness that an open fire will give, we need in no wise look upon our enjoyment as a selfish extravagance or

a self indulgence, but rather as a sacrifice that our brothers and fathers may thereby be furnished with those things that will assure for them safety and some degree of comfort and a final happy issue out of this present great conflict in which they, in far distant lands, are fighting so bravely and so unselfishly for the protection of our homes and of the lives of those who are dearest to them—and to us.

In itself the contribution to the grand total seems a pitiful and an insignificant one, but it so happens that from our seemingly unimportant economy in this one particular, and from our saving of coal that follows as a result of this use of wood fires, we have a positive assurance that we are making possible the production of materials for the final and complete crushing of that hideous and monstrous and almost unspeakably degraded and cruel enemy that comes to our very doors threatening our lives and menacing the continuance of our best traditions and those ideals for the establishment of which our forefathers laid down their lives long years ago.

Those who are now at the front, and those who will soon be there, will be most in your thoughts this Christmas Day and they will be glad to know that you at home are helping in all, even in these apparently unimportant ways.

Through all the long months that they must spend on foreign soil and during which they must contend with the necessary privations of war, it will inspire them to greater and nobler efforts to know that you are comfortably established at home, out of the way of harm, and keeping up those traditions and conditions to which they hope, after their final, glorious victory, to return.

And, in doing this, in lighting your fireplace, you have the satisfaction of knowing that every wood fire, every additional cord of wood and every ton of coal saved in home use means almost untold protection to your soldiers in the form of the possible additional production of ammunition for their use. Every cloud of smoke ascending from our chimneys, where it comes from a wood fire, means just so much fuel saved to prevent the ghastly conditions caused by a shortage of ammunition that brought about those horrible catastrophes in Russia—and more recently on the Italian front.

Victorious advances will require far more munitions than defensive campaigns and in the future as victories increase the need of straining every energy to supply these munitions will be necessary. You, the government knows, will assist in this by using less and less coal at this time and by substituting for it comfortable fires of wood. A small sacrifice, surely, even at its very worst, for so good a cause.

# AMERICAN FORESTERS IN MILITARY SERVICE

This list 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 will be reprinted and increased from month to month. All foresters and others who can supply additional names 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** GEE, Fred. B., Deputy Forest Supervisor, U. S. F. S.  
 Albano, Jack, forest ranger, U. S. F. S.  
 Aldous, Tura M., grazing, U. S. F. S.  
 Alexander, Ben, (Bilt. For. School), 2nd R. O. T. C.  
 Alexander, J. B., 1st Lt. Aviation Corps, (Uni. of Wash., '17).  
 Allen, Raymond, New Jersey.  
 Ames, F. E. (Yale For. School '05).  
 Anderson, A. C., 2nd Lt. U. S. A. (Uni. of Wash., '17).  
 Anderson, Emil A., deputy forest supervisor, U. S. F. S.  
 Archer, Frank L., forest clerk, U. S. F. S.  
 Armstrong, Carroll W. (Bilt. For. School) Quartermaster's Dept., Fort Dodge.  
 Armstrong, Ralph H. (Bilt. For. School), 104th Inf., Expeditionary Forces, France.  
 Atkinson, E. S., (Yale For. School, '16).  
 Atwood, C. R. (Univ. of Maine, '15), manager, Unit 1, New England Sawmill Units.  
 Avery, B. F., commissioned in Eng. (Forest) forces; (Yale For. School); Spanish River Pulp and Paper Mills.  
 Aylward, F. N. (Univ. of Calif.), Ambulance Corps.
- B** ADERTSCHER, Ed., temporary clerk, U. S. F. S.  
 Baker, Hugh P. (Yale For. School, '04), N. Y. State Col. of Forestry.  
 Baldenburg, Max B., clerk, U. S. F. S.  
 Barker, S. Omar, Co. D., 502nd Service Bn., Camp Merritt, N. J. U. S. F. S.  
 Barlow, Harold (Yale For. School, '14).  
 Barr, John B., forest ranger, U. S. F. S.  
 Barton, Robert M., 20th Engineers (Forest), American University, Wash., D. C.; forest ranger, U. S. F. S.  
 Bastian, Clyde E., Corp. 20th Eng. (Forest), (Uni. of Mich., '16).  
 Batten, R. W. (Yale For. School, '16).  
 Beaman, Clarence W., messenger, U. S. F. S.  
 Beattie, Homer Milo (Mich. Univ., '04), sergt. 10th Engineers (Forest).  
 Bedwell, Jesse L., forest ranger, U. S. F. S.  
 Behre, C. Edward, 20th Engineers (Forest), American University, Wash., D. C., U. S. F. S.  
 Bell, George R. (Yale For. School, '18).  
 Bellue, A., 10th Engineers (Forest).  
 Benedict, M. S., 1st Lt. 10th Eng. (Forest), for. sup., U. S. F. S.  
 Benedict, Raymond E., Major 10th Eng. (Forest), For. Br. B. C.  
 Bentley, George A., Capt. Quartermaster's Dept., purchasing agent U. S. F. S.  
 Bennett, Edwin L., forest ranger, U. S. F. S.  
 Bennett, William W., Co. E. 314 Ammunition Train, Camp Funston, Ft. Riley, Kansas, U. S. F. S.  
 Bernhardt, Carl L., (Uni. of Wash., '18).  
 Berry, John K., scaler, U. S. F. S.  
 Berry, Swift, forester, U. S. F. S.  
 Betts, Fred. H., forest ranger, U. S. F. S.  
 Bevan, Arthur (Uni. of Wash., '17).  
 Billingslea, James H., Jr., Top Sergeant (Uni. of Wash., '14), forest ranger, U. S. F. S.  
 Bird, R. L., Corp. 20th Eng. (Forest), (Cornell, '16).  
 Bird, Vern A., forest ranger, U. S. F. S.  
 Bloom, Adolph, Ensign U. S. N. Train. Sta. (Uni. of Wash., '16).  
 Bonney, Parker S., Sub. Lt. British Navy (Uni. of Wash., '13).  
 Bosworth, James H., 20th Engineers (Forest), American Univ., Wash., D. C., U. S. F. S.  
 Bowen, John S., 20th Engineers (Forest), American Univ., Wash., D. C., U. S. F. S.  
 Bowen, Jos. B. (Yale For. School, '17).  
 Bradley, Tom O. (Mt. Alto), Pa. Dept. For.  
 Brady, Charles C. (Uni. of Wash., '18).  
 Brady, Seth C., messenger, U. S. F. S.  
 Breneman, Howard E. (Mt. Alto For. Acad., '17), Co. C., 10th Eng. (Forest), Pa. Dept. For.  
 Brewster, Donald R., forest examiner, U. S. F. S.  
 Brickerhoff, H. E. (Yale For. School), 1st Lt. Inf.  
 Brindley, Ralph, 2nd Lt. R. O. T. C. (Uni. of Wash., '17).  
 Brockway, M. (Univ. of Me., '15), checker, Ten Saw Mill Units.  
 Brooks, James F., forest ranger, U. S. F. S.  
 Brown, Bascom H., forest ranger, U. S. F. S.  
 Brown, R. A., Co. D., 23d Engineers, Camp Meade, Md., U. S. F. S.  
 Brown, Vance, scaler, U. S. F. S.  
 Browning, Harold A., asst. forest ranger, U. S. F. S.
- Broxon, Donald (Uni. of Wash., '14).  
 Bruce, Donald, Prof. of For., Uni. of Cal. (Yale For. School, '10; assigned in charge of timber reconnaissance in France.  
 Bryant, Edward S., Capt. 10th Eng. (Forest), for. ins., U. S. F. S.  
 Buch, John Edward (Mt. Alto For. Acad., '17), Co. C., 10th Eng. (Forest), Pa. Dept. For.  
 Buck, Shirley, National forest inspector, U. S. F. S.  
 Bullerdick, Ray O., Supply Office, Camp Tantauferro No. 1, Ft. Worth, Texas, U. S. F. S.  
 Bunker, Page (Yale), city forester, Fitchburg.  
 Burgess, John, surveyor draftsman, U. S. F. S.  
 Burnham, R. P. (Uni. of Wash., '17).  
 Buttrick, P. L., Amer. Ambulance Serv. (Yale For. School, '11).  
 Byrne, Geo. J., Jr., Ambulance Corps.
- C** ALKINS, Hugh G. (Yale For. School, '09), forest supervisor, U. S. F. S.  
 Calloway, G. A. (Uni. of Mo.).  
 Calloway, Joseph R., forest ranger, U. S. F. S.  
 Calvert, Gerald F. (Uni. of Wash.).  
 Cameron, J. F. (Uni. of Wash., '19).  
 Carney, Thos. J., 38th Co. 10th Battalion, 166th Depot Brigade, Camp Lewis, American Lake, Washington, U. S. F. S.  
 Carpenter, Herbert M. (Bilt. For. School), 20th Eng. (Forest).  
 Cappel, Frederick, forest clerk, U. S. F. S.  
 Cassidy, Hugh O., forest ranger, U. S. F. S.  
 Cecil, Kirk P., surveyor, U. S. F. S.  
 Chudderdon, Harold A., forest ranger, U. S. F. S.  
 Chamberlain, Harry A., forest ranger, U. S. F. S.  
 Chapman, Charles S., Major 10th Eng. (Forest), (Yale For. School, '02), forestry assistant, U. S. F. S.  
 Chartrand, Lee F., 20th Eng. (Forest), forest ranger, U. S. F. S.  
 Charlson, Alex., (Uni. of Wash., '16).  
 Christensen, Alfred C., forest clerk, U. S. F. S.).  
 Clark, Donald H., 1st Lt. R. O. T. C. (Uni. of Wash., '17).  
 Clark, E. V., 1st Lieut.; R. O. T. C., forest supervisor, U. S. F. S.  
 Clemmons, Walter C., forest ranger, U. S. F. S.  
 Colledge, Edward W. (Bilt. For. School), Am. Ambulance Service, France.  
 Colburn, H. C., 10th Eng. (Forest), Co. B., Expeditionary Forces, France, U. S. F. S.  
 Condon, H. R., 2nd Lt. 10th Eng. (Forest), Pa. R. R. forester.  
 Conklin, J., 20th Eng. (Forest).  
 Conklin, W. Gardiner, 1st Lt. 20th Eng. (Forest), (Pa. State For. Acad., '08), Pa. Dept. Forestry.  
 Cook, A. M. (Yale For. School, '08).  
 Cook, John W., clerk, U. S. F. S.  
 Cook, G. D. (Mich. Agri. College), 1st sergt. 10th Eng. (Forest).  
 Cook, H. O., Capt., 2nd Forest Regiment, Massachusetts.  
 Cook, Samuel, forest ranger, U. S. F. S.  
 Cookston, Roy, Capt. 10th Eng. (Forest).  
 Coolidge, Lieut. Joseph (Harvard, '12), 20th Eng. (Forest), consulting forester.  
 Copsey, C. N., 10th Eng. (Forest).  
 Cope, H. Norton, forest ranger, U. S. F. S.  
 Cowan, T. DeWitt, 20th Engineers (Forest), American Univ., Wash., D. C., U. S. F. S.  
 Cowan, Talmadge D., forest ranger, U. S. F. S.  
 Critchley, Horace F. (Mt. Alto, '13), Res. Off. Tr. Camp, Ft. Niagara, Pa. Dept. For.  
 Crookston, Byron F., 2nd Engineers (Forest), American Univ., Wash., D. C., U. S. F. S.  
 Crowell, Lieut. Lincoln J. (Yale, '08, Bilt., '11), 20th Eng. (Forest), U. S. F. S.  
 Crumb, Isaac J. (Uni. of Wash., '20).  
 Cuff, Ivan A., forest ranger, U. S. F. S.  
 Culley, Matthew J., forest ranger, U. S. F. S.  
 Cuno, John R., 2nd Lt. 20th Eng. (Forest).  
 Curwen, William H., surveyor-draftsman, U. S. F. S.
- D** ALLENBACH, Emil, messenger, U. S. F. S.  
 De Camp, J. C., grazing assistant, U. S. F. S.  
 Deering, Robert L., 1st Lt. 10th Eng. (Forest), forest examiner, U. S. F. S.  
 D'Amour, Lieut. Fred E., 33rd Inf., Co. L., O. R. C.  
 Davis, V. B., 20th Eng. (Forest).  
 Devine, Lieut. Robert (Mass. Inst. Tech.), training camp.  
 Deutsch, Henry C., forest ranger, U. S. F. S.

- Dodd, C. T., 20th Eng. (Forest).  
 Dodge, Alex W. (Yale), 1st. sergt. 32nd Co., 8th Bat., Camp Lewis, Amer. Lake, Wash.  
 Doggett, William H. (Yale For. School, '17).  
 Dorrance, John Gordon (Biltmore, '10), 2nd. Lt. E. O. R. C., Md. State Board of Forestry.  
 Dorward, D. L. (Yale For. School, '14).  
 Douglass, C. W. H., Aviation Corps (N. Y. State Col. of Forestry, '15), American Forestry.  
 DuBois, Coert, Major 10th Eng. (Forest), dis. forester, U. S. F. S.  
 Dubuar, James F., forest assistant, U. S. F. S.  
 Dunbar, Roger S. (Bilt.), 20th Eng. (Forest).  
 Dunn, Beverly C., Adjutant 10th Eng. (Forest).  
 Dunning, Duncan, forest assistant, U. S. F. S.  
 Dunning, Earle (Bilt.), Quartermaster's Dept.  
 Dunston, Clarence R., 1st. Lt., U. S. Indian Service.  
 Dunwoody, Capt. W. Brook (Yale, '16), 3rd Field Art., Ft. Myer, Va., 2nd Asst. State Forester Va.
- E**LDREDGE, Inman F., Capt. 10th Eng. (Forest), forest supervisor, U. S. F. S.  
 Elliott, Harry R., forest ranger, U. S. F. S.  
 Eddy, Ben, 23rd (Highway) Engineers, U. S. F. S.  
 Egnor, James W., MacCormack State Park, Indiana.  
 Elliott, F. A., 10th Eng. (Forest).  
 Ellis, Ralph T., woodsman, Ten Sawmill Units (Mass For. Dept.).  
 Emerick, Lloyd P., forest clerk, U. S. F. S.  
 Emerson, Fred D. (Bilt.), Camp Dix.  
 Emerson, J. Ward, forest ranger, U. S. F. S.  
 Estill, Davis H. (Bilt.), corporal, Inf.  
 Euchern, Wm. H. (Bilt.), 20th Eng. (Forest).  
 Evans, Vincent (Uni. of Wash., '16).  
 Everett, E. W., 20th Eng. (Forest).  
 Ewing, Robert B., forest ranger, U. S. F. S.
- F**AIRCHILD, Rollin A., forest clerk, U. S. F. S.  
 Fifer, Charles (Uni. of Wash., '20).  
 Fish, Harold (Uni. of Wash., '18).  
 Fisher, David (Uni. of Wash., '14).  
 Foerster, M. H., 41st Co., 11th Bat., Camp Zachary Taylor, Louisville, Ky.  
 Foess, Jacob E., 20th Eng. (Forest), (Mich. Ag. Col., '17).  
 Foley, A. C., Corp. 20th Eng. (Forest), (Uni. of Mich., '18).  
 Foran, Harold (Uni. of Wash., '16).  
 Ford, Earl J., woodsman, Ten Sawmill Units, England (Mass. Forestry Dept.).  
 Ford, Elmer R. (Penn. State, '14), Officers' Training Camp, Fort Myer (Assist. For. Md. St. Bd. of For.).  
 Fowler, Frederick H., district engineer, U. S. F. S.  
 Frankland, James, forest ranger, U. S. F. S.  
 Fritchle, C. R. (Uni. of Mo.).  
 Fritz, Emanuel (Yale For. School, '14), forest asst., U. S. F. S.  
 Freedman, Lieut. Louis J. (Harvard), Eng. Corps (Forest).  
 Frey, E (Cornell, '17), 10th Eng. (Forest).  
 Fullenwider, William G. (Bilt.), 10th Eng. (Forest).  
 Fuller, Francis S., forest assistant, U. S. F. S.
- G**ALER, George E., forest ranger, U. S. F. S.  
 Gallaher, W. H., 2nd Lt. (Yale For. School, '10), U. S. F. S.  
 Garrett, C. B. (Uni. of Wash., '16).  
 Gaylord, Donald (Yale For. School, '15).  
 Gearhardt, Paul H., Battery E., 316 Rg., H. F. A., Camp Jackson, S. C.  
 Geary, H. O., 20th Eng. (Forest).  
 Gebo, L. W., 20th Eng. (Forest), (Cornell, '16).  
 Gibbons, William H., 2nd. Lt., forest examiner, U. S. F. S.  
 Gill, Thomas H. (Yale For. School, '15), forest ranger, U. S. F. S.  
 Gilman, John, forest ranger, U. S. F. S.  
 Gilson, R. M. (Yale For. School, '17).  
 Girk, Royal J., forest clerk, U. S. F. S.  
 Given, J. Bonbright, 1st Lt., Camp Jackson, S. C.  
 Godwin, D. P., 1st Lt. 10th Eng. (Forest), forest exam., U. S. F. S.  
 Gooch, Winslow L., 10th Engineers (Forest), American Exped. Forces, France, U. S. F. S.  
 Goodman, Walter F., forest ranger, U. S. F. S.  
 Gowen, Geo. B., Coast Artillery.  
 Graham, Paul (Uni. of Wash., '13).  
 Granger, C. M., assistant district forester, U. S. F. S.  
 Graves, Henry S., Lt. Col., director, division of forestry headquarters, American Expeditionary forces; United States Forester.  
 Greathouse, Ray Livingston, Co. A., 362 Infantry, Camp Lewis, American Lake, Washington, U. S. F. S.  
 Greeley, William B., Major, deputy director, division of forestry headquarters, American Expeditionary forces; assistant United States Forester.  
 Grefe, Raymond F., forest ranger, U. S. F. S.  
 Grinnel, Henry (Bilt.), Forest Regiment.  
 Guthrie, John D. (Yale For. School, '06), forest sup., U. S. F. S.
- Guthrie, Richard T., forest examiner, U. S. F. S.  
 Gwin, Clyde M., Camp Lewis, American Lake, Tacoma, Washington, U. S. F. S.
- H**AASIS, F. W., (Yale For. School, '13), Regular Army, Medical Dept.  
 Hackett, William, forest ranger, U. S. F. S.  
 Hagon, Jules L., 20th Engineers (Forest), for. ranger, U. S. F. S.  
 Hall, A. F., 20th Engineers (Forest).  
 Hall, F. B., woodsman, Ten Saw Mill Units, Mass. Dept. of For.  
 Hall, R. C. (Yale For. School, '08), forest examiner, U. S. F. S.; assigned to timber reconnaissance in France.  
 Hall, Stanley B. (Harvard, '09).  
 Hammer, George C., Neopit Indian Mills, Neopit, Wis.  
 Hammond, Charles P. (Biltmore), 20th Engineers (Forest).  
 Hansen, Harvey L. (Univ. of Calif.), Ambulance Corps.  
 Hansen, Thorvald (Yale For. School, '17), forest asst., U. S. F. S.  
 Hansson, Arnold (Yale For. School, '17).  
 Harding, Charles C. (Yale For. School, '16).  
 Harlachner, Josef (Mt. Alto, '17) 20th Eng. (Forest), 1st Bat., Pa. Dept. For.  
 Harley, Percy H., forest clerk, U. S. F. S.  
 Harrington, Neal (Mich. For. School, '12), Company G., 341 Inf., Camp Grant, Rockford, Ill.  
 Harmelling, H. (Uni. of Wash., '12).  
 Harris, Alvin E., 20th Engineers (Forest), American University, Wash., D. C., U. S. F. S.  
 Hendrickson, Guy C., forest clerk, U. S. F. S.  
 Hendrix, Albert W., forest ranger, U. S. F. S.  
 Hicock, Henry W. (Yale For. School, '15).  
 Hicks, L. E., forest ranger, U. S. F. S.  
 Hill, F. C., forest ranger, U. S. F. S.  
 Hill, Rollin C., 10th Engineers (Forest), American Exped. Forces, France, U. S. F. S.  
 Hilliard, L. E., woodsman, Ten Saw Mill Units, England; Mass. For. Dept.  
 Hirst, E. C. (Yale For. School, '09), state for., New Hampshire.  
 Hogentoler, Joseph R. (Mt. Alto, '12), with Governor's troops, Pa., Pa. Dept. For.  
 Holt, Felix R. (Yale For. School, '02).  
 Honeycutt, E. E., 20th Engineers (Forest).  
 Hotze, E. B. (Uni. of Mo.).  
 Hope, L. S. (Yale For. School, '16).  
 Houpt, William E. (Mt. Alto, '09), 20th Eng. (Forest), formerly Pa. Dept. For.  
 Houtz, Jesse (Mt. Alto, '13), Field Artillery, Camp Meade, Md., formerly Pa. Dept. For.  
 Huff, Rolland, forest ranger, U. S. F. S.  
 Hull, J. H. (Yale For. School, '11).  
 Humphrey, J. C. H. (Yale For. School, '09).  
 Hussey, Ralph W., forest ranger, U. S. F. S.
- I**NGALLS, E. E. (Yale For. School, '17).  
 Inskeep, Raymond P., forest ranger, U. S. F. S.  
 Isola, Vico C. (Yale For. School, '14).  
 Irwin, James A. (Mt. Alto, '12), Sergt., 10th Eng. (Forest), France, formerly Pa. Dept. For.
- J**ANOUCHE, Karl L., forest ranger, U. S. F. S.  
 Johnson, O. S., Sgt. 20th Eng. (Forest) (Uni. of Minn., '16).  
 Jones, E. F., forest examiner, U. S. F. S.  
 Johns, Walter Ridgley, 158 Co., 35 Battalion, 166th Depot Brigade, Camp Lewis, American Lake, Washington, U. S. F. S.  
 Johnson, F. W. (student, Ohio State), 10th Engineers (Forest).  
 Jones, Luther G. (Yale For. School, '16).  
 Judson, Luchard (Yale For. School, '17).
- K**ELLEY, Evan W., Capt. 10th Eng. (Forest), forest examiner, U. S. F. S.  
 Ketcham, Louis, forest ranger, U. S. F. S.  
 Kaestner, H. J., Forester of West Virginia.  
 Kelley, Capt. Arthur L. (Colo. Ag. Col.), 19th Co., Inf., O. R. C.  
 Kenny, John, woodsman, Ten Saw Mill Units, Mass For. Dept.  
 Kephard, G. S. (Cornell, '17), 10th Eng. (Forest).  
 Keyes, John H., 20th Eng. (Forest), (Yale, '14).  
 Ketrledge, John C., forest examiner, U. S. F. S.  
 Kiefer, Francis, Capt. E. O. R. C., asst. dist. forester, U. S. F. S.  
 Kilmer, William F. (Biltmore), Co. B., Signal Corps, Camp Sheridan, Ala.  
 Kimball, George W., forest examiner, U. S. F. S.  
 King, Robert F., 2nd. Lt. Coast Artillery (Uni. of Wash., '19).  
 Kingsley, Ray M., forest ranger, U. S. F. S.  
 Kittredge, Joseph, Jr., forest examiner, U. S. F. S.  
 Klobucher, F. J. (Yale For. School, '16), forest ranger, U. S. F. S.  
 Knowlton, H. N., enginer in forest products, U. S. F. S.  
 Kobbe, William H. (Yale For. School, '01).  
 Koomey, L. H. (Yale For. School, '12).  
 Kraebel, Charles J., forest assistant, U. S. F. S.  
 Kraft, F. G. (Uni. of Mo.).

- Krause, John E., forest ranger, U. S. F. S.  
 Krell, Frederick C. (Penn State, '13), sergt: 1st class, 10th Eng. (Forest), Asst. Forester Pennsylvania Railroad.  
 Krueger, Myron E., 20th Engineers (Forest), forest ranger, U. S. F. S.
- L**AFON, John, Capt. 10th Eng. (Forest), Forest Branch B. C. Langville, H. D., Major 505th Serv. Regt.  
 Larzon, Arthur K. (Uni. of Wash.).  
 Lee, Chester A. (Yale For. School, '17).  
 Leach, Walter (Mt. Alto, '14), 314th Inf., Camp Meade, Md., Pa. Dept. For.  
 Lentz, Gustav H. (Yale For. School, '17), Sergt., 10th Eng (Forest).  
 Lewis, Ferry D., forest ranger, U. S. F. S.  
 Lindsey, Eugene L., 1st Lt. 10th Eng. (Forest), (Yale For. School, '19), forest examiner, U. S. F. S.  
 Littlefield, Theron R., forest ranger, U. S. F. S.  
 Lockwood, Milton K. (Biltmore), 1st Lt., Camp Jackson, S. C.  
 Loud, William D., 20th Eng. (Forest).  
 Loveman, A. M. (Yale For. School, '16).  
 Lowdermilk, Walter C., 10th Engineers (Forest), American Exped. Forces, France, U. S. F. S.  
 Lundgren, Leonard, Captain, engineer, U. S. F. S.  
 Luther, T. F., 20th Eng. (Forest), (Cornell, '17).
- M**ACKECHNIE, A. R., 2nd Lt. U. S. A. (Uni. of Wash., '18).  
 Malmstein, Harry E., grazing assistant, U. S. F. S.  
 Marckworth, Gordon D. (Yale For. School, '17), 20th Eng. (Forest), Va. State For. Dept.  
 Marsh, A. Fletcher (Yale For. School, '11).  
 Masch, Walter (Mt. Alto), 20th Eng. (Forest), Pa. Dept. For.  
 Marston, Charles O. (Biltmore), 10th Engineers (Forest).  
 Marston, Capt. Roy L. (Yale), 103rd U. S. Inf., Co. E. France.  
 Mason, David T., Capt. 10th Eng. (Forest), Uni. of Cal. (Yale For. School, '07).  
 McCullough, Thomas E. (Yale For. School, '11).  
 McGillicuddy, Blaine (Uni. of Wash.).  
 McGlaughlin, Eugene R., 20th Eng. (Forest), (Ohio State Uni.).  
 McKnight, Roscoe, 1st Lt. 10th Eng. (Forest), U. S. F. S.  
 McNulty, L. Edgar (Mt. Alto For. Acad., '17), Co. C., 10th Eng. (Forest), Pa. Dept. For.  
 McPherson, Benj. D. (Mt. Alto For. Acad., '16), 10th Eng. (Forest), Pa. Dept. For.  
 Meek, Chas. R. (Mt. Alto, '12), 20th Eng. (Forest), Co. A., 3rd Bat., Pa. Dept. For.  
 Meloney, Henry M., 20th Eng. (Forest), forest ranger, U. S. F. S.  
 Mendenhall, Fred D., surveyor-draftsman, U. S. F. S.  
 Mershon, William B. (Biltmore, '10), 10th Eng. (Forest), sergt: 1st class.  
 Mesch, Walter (student at Mont Alto), 20th Engineers (Forest).  
 Meschke, Karl G., 20th Eng. (Forest), forest assistant, U. S. F. S.  
 Meyer, L. A., 10th Eng. (Forest).  
 Meyer, Leo W. (Yale For. School, '17).  
 Middour, Joseph C. (Mt. Alto For. Acad., '16), Co. C., 10th Eng. (Forest), Pa. Dept. For.  
 Miles, Clark, forest examiner, U. S. F. S.  
 Millar, W. N., Capt. 10th Eng. (Forest), (Yale For. School, '08).  
 Miller, Edwin B. (Mt. Alto For. Acad., '17), 10th Eng. (Forest), France, Pa. Dept. For.  
 Miller, Fred H., forest ranger, U. S. F. S.  
 Minner, Clifford R., forest ranger, U. S. F. S.  
 Modisette, W. M. (Biltmore), 1st Lt. U. S. Cavalry.  
 Moir, W. Stuart (Yale For. School, '17).  
 Mongrane, Joe, woodsman, Ten Saw Mill Units (Mass. For. Dept.).  
 Montgomery, Ray C., forest ranger, U. S. F. S.  
 Montgomery, W. E. (Mt. Alto, '13), Res. Off. Tr. Camp, Augusta, Ga., Pa. Dept. For.  
 Moody, Capt. F. B., Engineer Officers' Reserve Corps.  
 Moore, Barrington, Capt. (Yale For. School, '08), U. S. F. S.  
 Moore, W. M., forest examiner, U. S. F. S.  
 Morrison, Tom, 10th Engineers (Forest), American Exped. Forces, France, U. S. F. S.  
 Morton, J. Newton (Mt. Alto For. Acad., '16), Co. C., 10th Eng. (Forest), Pa. Dept. For.  
 Mosch, Walter (Mt. Alto) 20th Eng. (Forest), Pa. Dept. For.  
 Murphy, Frank T., 20th Engineers (Forest), American Univ., Wash., D. C., U. S. F. S.  
 Murphy, E. C., 2nd Lt., U. S. A. (Uni. of Wash., '20).  
 Murphy, R. A. (Yale For. School, '17).  
 Mutz, George, forest ranger, U. S. F. S.  
 Muzzall, A. H., 10th Engineers (Forest).  
 Myers, Frank B., forest assistant, U. S. F. S.  
 Myers, Edgar (Cornell, '17), 10th Engineers (Forest).  
 Myers, Reynolds V. (Biltmore), senior non. 10th Eng. (Forest)
- N**ELSON, Enoch W., grazing assistant, U. S. F. S.  
 Nelson, Oscar L., forest ranger, U. S. F. S.  
 Nevitt, John V., forest ranger, U. S. F. S.
- Naramore, David C. (Biltmore), 20th Engineers (Forest).  
 Neasmith, John J., 20th Eng. (Forest), (Syracuse, '17).  
 Nordstrom, Edw. E., woodsman Ten Saw Mill Units (Mass. Forestry Dept.).  
 Norton, J. Newton (Mont. Alto, '16), 10th Engineers (Forest), Co. C., France.  
 Norton, Thomas E., 20th Engineers (Forest), American University, Washington, D. C., for. rang., U. S. F. S.  
 Nye, Elmer L., 20th Engineers (Forest), American Univ., Wash., D. C., U. S. F. S.
- O**AKLEAF, H. B., forest examiner, U. S. F. S.  
 Odell, W. T. (Uni. of Wash., '12).  
 Oliver, J. Earl, forest ranger, U. S. F. S.  
 Oles, W. S., 20th Eng. (Forest), (Cornell, '16).  
 Orr, Ronald H., 20th Eng. (Forest), (Biltmore For. School, '09).  
 O'Shea, Thomas E., woodsman, Ten Saw Mill Units (Mass. Forestry Dept.).  
 Otis, David B. (Biltmore), 1st Lt., Camp Dix.
- P**AETH, William J. (Yale For. School, '12), forest assistant, U. S. F. S.  
 Paine, F. R. (Yale For. School, '14).  
 Pagter, Lawrence B., 20th Engineers, forest examiner, U. S. F. S.  
 Paine, Topliff O., forest ranger, U. S. F. S.  
 Partridge, Herbert E. (Biltmore).  
 Paxton, Percy J. (Yale For. School, '09), forest exam., U. S. F. S.  
 Peabody, Joseph, 20th Eng. (Massachusetts For. Dept.).  
 Peck, Allen S., Major, 10th Eng., '09, forest insp., U. S. F. S.  
 Peck, E. C. (Yale For. School, '18).  
 Perry, Edgar L., 10th Engineers (Forest), American Exped. Forces, France, U. S. F. S.  
 Perry, Jr., R. E. (Cornell, '17), 10th Engineers (Forest).  
 Pilcher, Rufus J., forest ranger, U. S. F. S.  
 Plummer, Donald (Uni. of Wash., '20).  
 Port, Harold F. (Mt. Alto For. Acad., '16), Co. A., 10th Eng. (Forest), France, Pa. Dept. For.  
 Porter, O. M. (Yale For. School, '15).  
 Powell, Harry A., British Army, (Uni. of Wash.).  
 Powers, James E. (Mt. Alto, '15), Artillery, Pa. Dept. For.  
 Powers, Victor S. (Uni. of Wash., '18).  
 Prichard, R. P. (Yale For. School, '09).  
 Prince, Edmund H., 2nd Lt. National Army.  
 Pryse, E. Morgan, forest assistant, U. S. F. S.
- Q**UINLAN, James, woodsman, Ten Saw Mill Units (Mass. Forestry Dept.)
- R**AINSFORD, W. K. (Yale For. School, '06).  
 Ramsdell, Willett F., deputy forest supervisor, U. S. F. S.  
 Rase, Frederick W., surveyor, U. S. F. S.  
 Rand, E. A., 1st Sgt., 20th Eng. (Forest), (Uni. of Me., '14)  
 Riblett, Carl H., forest ranger, U. S. F. S.  
 Rice, A. M., 20th Engineers (Forest).  
 Richards, E. C. M. (Yale For. School, '11).  
 Ricketts, Howard B., clerk, U. S. F. S.  
 Ridings, Troy G., 10th Engineers (Forest), American Exped. Forces, France, U. S. F. S.  
 Ringland, Arthur C., Capt. 10th Eng. (Forest), (Yale For. School, '05), forest inspector, U. S. F. S.  
 Rixson, C. L., forest clerk, U. S. F. S.  
 Roberts, Wesley K. (Uni. of Wash., '18).  
 Robertson, Colin C. (Yale For. School, '07).  
 Robinson, S. E. (Yale For. School, '12).  
 Robison, L. E., (Yale), 10th Engineers.  
 Rockey, K. E. (Yale For. School, '12).  
 Roeser, Jacob, Jr., forest assistant, U. S. F. S.  
 Root, Lloyd (Mt. Alto For. Acad., '17), Co. C., 10th Eng. (Forest), France, Pa. Dept. For.  
 Ross, R. M. (Bilt., '09), Forest Regiment.  
 Rowland, Arthur L. (Mt. Alto), Pa. Dept. For.  
 Rowland, Horace B., Jr. (Mt. Alto For. Acad., '15), Co. F., 10th Eng. (Forest), France, Pa. Dept. For.  
 Rush, William M., forest ranger, U. S. F. S.  
 Russell, Austin P., forest ranger, U. S. F. S.  
 Russell, Joseph P. (Uni. of Wash.).  
 Russell, William J., 20th Engineers, forest ranger, U. S. F. S.  
 Ryerson, K. A., 10th Engineers (Forest).
- S**ADLER, George M., forest ranger, U. S. F. S.  
 Salton, Robert C., forest ranger, U. S. F. S.  
 Sanford, E. C., 1st Lt., 10th Eng. (Forest), forest supervisor, U. S. F. S.  
 Sanger, Owen J., 1st Lt. Canadian Contingent (Uni. of Wash.).  
 Schmaelzle, Karl I. (Uni. of Wash.).  
 Schmitz, Henry (Uni. of Wash., '15).  
 Schoeller, J. Diehl (Uni. of Wash.), 1st Lt. Cavalry, Inf. School of Arms, Fort Sill, Oklahoma.



- Schowe, William A., forest ranger, U. S. F. S.  
 Scofield, William L. (Yale For. School, '13), for. rang., U. S. F. S.  
 Segur, Lewis L., forest ranger, U. S. F. S.  
 Seltzer, J. W., 1st Lt. (Pa. State For. Acad., '09), 10th Eng. (Forest), France, forester N. J. Zinc Co.  
 Senft, Walter M. (Mt. Alto), Pa. Dept. For.  
 Severance, H. M., New York National Guard.  
 Shafer, Oscar F., 10th Engineers (Forest) American Exped. Forces, France.  
 Sharron, John L., Ten Saw Mill Units, Mass. Forestry Dept.  
 Sheeler, George W. (Mt. Alto, '12), Co. C., 502d Service Bat., Pa. Dept. For.  
 Shepard, H. B., 2nd Lt., 10th Eng. (Forest), forester Lincoln Pulp Co.  
 Shepard, Robert, 20th Engineers (Forest), American Univ. Wash., D. C., U. S. F. S.  
 Shenefeldt, Ira Lee (Mt. Alto, '16), Co. C., 502d Service Bat., Pa. Dept. For.  
 Siggins, Howard W. (Mt. Alto For. Acad., '14), Co. C., 10th Eng. (Forest), Pa. Dept. For.  
 Silcox, F. A. (Yale For. School, '05), district forester, U. S. F. S.  
 Simons, S. T., 25th Eng., Camp Devens, Ayer, Mass., U. S. F. S.  
 Skeels, Dorr, Capt. 10th Eng. (Forest), Uni. of Montana.  
 Slonaker, L. V., 10th Engineers (Forest), American Exped. Forces, France, U. S. F. S.  
 Smith, A. Oakley (Yale For. School, '14).  
 Smith, Edwin F., forest ranger, U. S. F. S.  
 Smith, E. H., 1st Lt. 316th Inf., Pa. State Forestry Dept.  
 Smith, Edward S. (Mt. Alto, '16), Nat. Army, Camp Meade; Pa. Dept. For.  
 Smith, H. A. (Mt. Alto, '16), Field Hospital Ser., Fort Benj. Harrison, Indianapolis, Ind.; Pa. Dept. For.  
 Stadden, Robert W. (Mt. Alto, '14), 20th Eng. (Forest), Pa. Dept. For.  
 Speers, Vincent E., forest clerk, U. S. F. S.  
 Speidel, H. A. (Yale For. School, '11).  
 Staebner, R. C.; eng., Little River Lumber Co., Townsend, Tenn.  
 Stanton, L. G. (Uni. of Wash., '18).  
 Steer, Henry B. (Cornell, '15), 10th Eng. (Forest), U. S. Indian Service.  
 Stevens, Carl M. (Yale For. School, '12).  
 Stewart, Clifford H., forest ranger, U. S. F. S.  
 Stewart, Jefferson M., clerk, U. S. F. S.  
 Stone, Everett B. (Yale For. School, '17).  
 Stuart, R. Y., Capt., forest inspector, U. S. F. S.  
 Stults, Hal L., forest ranger, U. S. F. S.  
 Stutz, Jerome H. (Biltmore), 10th Engineers (Forest)  
 Swapp, Roy, forest ranger, U. S. F. S.  
 Sweeney, Joseph A., forest ranger, U. S. F. S.  
 Sweeney, Michael J., forest examiner, U. S. F. S.  
 Tommasson, Thos., 10th Engineers (Forest), American Exped. Forces, France, U. S. F. S.  
 Turner, F., 2nd Lt. (Univ. of Calif.).  
 Tweedy, Temple (Yale For. School, '14).  
**V**AN WICKLE, J. M. (Uni. of Wash.).  
 Van Arsdall, Howard (Mt. Alto), Pa. Dept. For.  
 Voight, Alfred W., forest ranger, U. S. F. S.  
 VanHorn, Harry E. (Mt. Alto For. Acad., '14), Co. A., 10th Eng. (Forest), France, Pa. Dept. For.  
 Van Riper, C. A., 20th Engineers (Forest).  
 Verge, Fred, woodsman, Ten Saw Mill Units (Mass For. Dept.)  
**W**AGNER, G. C., Jr. (Yale For. School, '18)  
 Walsh, Harry A., Capt. Quartermaster's Dept., U. S. F. S.  
 Ward, Herbert S., clerk, U. S. F. S.  
 Walter, Roy Irving (Biltmore), Camp Jackson, S. C.  
 Warren, Avra M., 2nd Lt. National Army, 1st Battalion, 310th Infantry, Camp Dix, N. J.  
 Warren, M. C. (Uni. of Cal.), 10th Engineers (Forest).  
 Waters, Louis H., 20th Engineers (Forest), American Univ. Wash., D. C., U. S. F. S.  
 Webb, Walter R., Asst. Engineer in Forest Products, Radio Serv.  
 Weiknecht, Robert H., forest assistant, U. S. F. S.  
 Welby, Harry H. (Biltmore), 10th Engineers (Forest).  
 Wells, Arthur B. (Mt. Alto, '11), 18th Machine Gun Co., Fort Ethan Allen, Vt., Pa. Dept. For.  
 Wentling, Floyd, 10th Engineers (Forest), state forest warden.  
 Westfeldt, W. O. (Yale For. School, '16).  
 White, Martin E., forest ranger, U. S. F. S.  
 White, William E., forest examiner, U. S. F. S.  
 Wieslander, A. E., 20th Engineers (Forest).  
 Wilcox, J. M., Corporal Inf. (Uni. of Wash., '20).  
 Wilder, Raymond T., Private 20th Engineers (Forest), Mass For. Dept.  
 Williams, Hubert C., 1st Lt. 10th Eng. (Forest), (Yale, '08).  
 Wilson, Stanley F. (Yale For. School, '14), for. rang., U. S. F. S.  
 Wirt, William (Uni. of Wash., '18).  
 Wise, Lloyd (Ohio State, '17).  
 Wisner, — —, Corp. 20th Eng. (Forest), (Syracuse, '17).  
 Withington, George T. (Biltmore), New England Saw Mill Units.  
 Wohlenburg, E. F., 2nd Lt., 10th Eng. (Forest), forest examiner, U. S. F. S.  
 Wold, Henry, Ordnance School, Eugene, Oregon, U. S. F. S.  
 Wolfe, Kenneth, forest ranger, U. S. F. S.  
 Wolfe, Stanley L., 1st Lt., U. S. F. S.  
 Woolsey, Theodore S., Jr. (Yale, '02); major 10th Eng. (Forest). Amer. Expeditionary Forces, France.  
 Woodruff, James A., Lt. Col. 10th Eng. (Forest).  
 Woods, J. B., 1st Lt. 10th Eng. (Forest).  
 Work, Herman, 1st Lt. 10th Eng. (Forest), deputy forest supervisor, U. S. F. S.  
 Wulff, Johannes (Yale For. School, '17).  
 Wycoff, Garnett (Ohio State, '13), 10th Engineers.  
**Y**EOMANS, E. J. (Yale For. School, '12), for. rang., U. S. F. S.  
 Young, L. P., 2d Lt. Inf. (Uni. of Wash., '17).  
 Young, Douglas E., private English army, killed in France April 10, 1917 (state forest warden, Maryland).  
 Youngs, Lieut. Homer S., 16th U. S. Infantry, care of Adjutant General, War Dept., Washington, D. C., U. S. F. S.  
**Z**ELLER, R. A., forest assistant, U. S. F. S.  
 Zieger, Robert H., forest ranger, U. S. F. S.  
 Ziegler, E. A., Capt. Coast Art., Direc. Pa. State For. Acad.

**A**PPROXIMATELY 1,500 fires occurred in the National Forests of California during the past season. They were suppressed at a cost of \$100,000. One hundred and fifty of these fires could be classified as severe. Between fifteen and eighteen thousand acres of timberlands were burned over.

**I**N order to speed up the getting of men, supplies and equipment to forest fires, Supervisor Erickson, of the Crater National Forest, uses an auto truck into which are loaded not only men and outfit, but also pack animals and equipment. After going as far as possible by auto the outfit is packed on the burros to the place it is needed.

#### THE ANNUAL MEETING

**A**S a measure of wartime conservation it has been decided by the Board of Directors to dispense with the usual form of annual meeting of the American Forestry Association in January. Instead, a formal meeting without addresses or discussions will be held at the offices of the Association on Wednesday, January 9, at 10 A. M. in order to comply with the bylaws. When the war is over and the forestry regiments return from abroad a big meeting will be held to discuss war time forestry developments.

**O**NE of the most expensive woods used in America is boxwood. It sells for about \$1,500 per 1,000 board feet.

# RUGGED BEAR'S BREAST PEAK

BY GUY E. MITCHELL

**I**N our school geographies the Cascade Mountains receive but passing notice, as a small part of the Pacific Coast mountain system of the United States. As a matter of fact, the Cascade Range, extending from northern California northward through Oregon and Washington, form a tremendous and majestic forest-clad barrier of thousands of square miles, cutting off the

Pacific Ocean from the arid plains and valleys of the interior, and surmounted at frequent intervals by some of the most stupendous extinct volcanoes of the continent. The peaks and ridges rise high above the great Cascade plateau, which in ages past has been uplifted to an altitude above the sea of nearly 5,000 feet. The whole land is volcanic, the outflow from a multitude of vents, which in a remote period of the earth's history poured out countless thousands of billions of tons of lava and scoria. Out of these mountains, many of

them snow-clad through the greater part or even the entire year, come the rivers which, winding through the high valleys and augmented by many brooks and larger tributaries, constitute the great, strong running streams which feed the fertile irrigated lands to the east, or tumble down the more precipitate slopes to the west and produce a water power sufficient to turn the wheels of

a thousand industries—one of the great and only slightly developed resources of America.

The photograph shows a typical mass of volcanic origin, one of the giant mountain peaks of the Cascade range, unheard of by more than one in ten thousand people outside of its immediate vicinity, a type of hundreds of other similar high peaks, but one of exceptional

beauty and ruggedness. It is not, however, as might be supposed, an extinct volcano; it is a mountain left by erosion, not built up by eruptions. This peak, known as Bear's Breast Peak, is at the head of the middle fork of the Snoqualmie River. Its altitude is 9,200 feet above sea level and its highest 2,000 feet rises above timber line, bare and rugged.

A severe test of mountaineering is the climbing of Bear's Breast Peak. What appear in the photograph to be but rough places are in fact impassable cliffs and rents in the rock, up or across which

no man can pass; yet once attained the view from the summit of the peak is incomparably fine, the grand chaos of the great Cascade range and plateau stretching away as far as the eye can see—100 miles or more in the intensely clear western atmosphere. The lower slopes of the mountains are richly clothed with heavy forests of majestic firs from 150 to 250 feet in height.



BEAR'S BREAST PEAK IN THE CASCADE MOUNTAINS

This is one of the most beautiful of the mountains of the Pacific Coast range, the view from the summit of which well repays the strenuous effort of him who climbs to the top.

CANADIAN DEPARTMENT

ELLWOOD WILSON, SECRETARY,  
CANADIAN SOCIETY OF  
FOREST ENGINEERS

It is axiomatic that a man has a right to do what he likes with his own property. This right has been curtailed to the extent that the use a man makes of his property shall not injure the public or his neighbor. A man owning a tree may cut it down, but he must see that it does not fall on his neighbor's fence or house or otherwise damage his property. Further than this the Government has decreed that it has the right to protect a watershed of a navigable stream or of the water supply of a city by preventing the cutting of timber which would injure it. The State of New York has taken the position that a man may not cut his timber and leave his slash in such condition as to be a menace to other timber lands. Will not the time soon come, when realizing the long time element in the growing of timber and the fact that it takes more than one generation to grow a merchantable tree, the State will hold that no timber owner shall have the right to cut his timber without making adequate provision for its replacement, in time, except in the case of agricultural land where total clearing is a necessity. The case in the example of government-owned lands on which cutting rights are leased or sold is fairly clear, but is it a very great extension of the principle to ask that every man who comes into possession of timber land and wishes to use it as such, should be compelled to plant a tree for everyone he cuts. There is only one objection to such a policy from the selfish standpoint of the owner, and that is the cost. But here, just as in the case of private property taken for public ends, the general community should be willing to pay the ultimate cost by paying the enhanced price of the timber caused by the expense of replacing it for the future. As Professor Toumey has so well said, the question of replanting, in the very essence of things, is a matter for the public, and it should bear some part of the cost. Let the timber owner take the responsibility of replanting and let the community foot the bill, in increased timber prices.

The value of preparedness has been splendidly demonstrated in Canada. For the past few years the Commission of Conservation has been making an inventory of the kinds and location of timber in British Columbia. This past month the Government wanted to know where to get spruce for airplanes. Applying to the Commission, they were told at once, not only where to get it, but there was a man ready to show them. Mr. Craig, who has been in charge of this work, was immediately attached to the Imperial Munitions Board and will look after this work. The Commission is pressing for an inventory of tim-

ber in Ontario and Quebec and it is hoped that the work will commence next summer.

The preliminary report of the Commission on the condition of cut-over pulpwood lands, and the prospects of a future crop, has been made by Dr. Howe, of the University of Toronto. It is very interesting and significant. The lands in question are, like practically all forests from which pulpwood is cut, covered with mixed stands of spruce, balsam and hardwood. At first only the spruce was cut, then the loggers went back and took off smaller spruce and an increasing amount of balsam, and on the last cut nearly 78 per cent of balsam was taken to 22 per cent of spruce. Such cutting, of course, favors the growth of hardwoods and leaves them predominant in the stand, overshadowing and suppressing the young spruce and balsam left. It is shown that, under these conditions existing on the lands, it takes 40 years for the little spruce trees to grow one inch in diameter, 100 years to make a six-inch tree and 150 years to reach the minimum diameter of 12 inches established by the cutting regulations in Quebec. Balsam grows somewhat faster. One inch in diameter is reached in about 16 years and seven inches at about 70 years. These statements refer to the time required to make a merchantable forest from the seedling stage onward. There are on the average 30 spruce and 59 balsam trees per acre from four to eight inches in diameter already present. These will furnish another crop in time, but the time is long. The growth tables show that it will require about 70 years for the four-inch trees and about 50 years for the eight-inch trees to reach the 12-inch diameter limit. The larger balsam, however, will be merchantable in 10 years. There are only six spruce and six balsam trees over eight inches diameter on the average acre. This number is too small to justify exploitation alone, so that the next cutting must be delayed until a sufficient number of the smaller trees reach a merchantable size. On these heavily culled lands it will probably be found that henceforward a period of from 30 to 60 years must elapse between cuttings, if only spruce and balsam are to be removed. Unless the hardwoods are to be removed and thus give the soft woods a chance, it will prove cheaper and more expeditious to plant trees, rather than to wait for the next cut furnished by nature.

The report of the St. Maurice Forest Protective Association for 1917 is in and shows that a total of 4,367 acres were burned over this summer, only 287 acres of which were in merchantable timber. Cut-over areas and old burns showed 2,272 and 1,592 acres respectively, again demonstrating the fact that cut-over land is the worst hazard and the land which most needs protection. This cannot be efficiently given until some system of slash disposal is put in force. The cost of extinguishing fires by extra labor has dropped from \$13,001 in 1914 to \$1,050 this year, showing very forcibly that most of our fires were extin-

guished in their incipiency by the rangers. The causes of fires were as follows:

Railways .....	122
Section Men.....	4
Unknown .....	38
Construction Work.....	26
Drivers .....	5
Dam Builders.. ..	8
Fishermen .....	8
Settlers .....	4
Jobbers .....	2
—	
Total.....	217

The forest survey of New Brunswick is making good progress under Director G. H. Prince. Nine hundred and twenty-five thousand acres have been mapped this year, making a total of 1,200,000 acres since the start of the survey, or about 16 per cent. of the total area of Crown land in the province. The Forestry Department will co-operate in the scaling and logging inspection this winter.

H. R. MacMillan has gone with Canadian Aeroplanes, Ltd., a branch of the Imperial Munitions Board, to take charge of procuring spruce for airplanes.

The secretary of the Canadian Forestry Association is making a lecture tour through the Province of New Brunswick. He is having large audiences and much interest is shown in his work.

In Alberta the Dominion Forest Service has built about 20 miles of telephone line and carried on its program of trail building. Four of the Alberta men are reported as having joined the "Boys at the Front" lately. In the Crowsnest Pass a fire occurred during the past summer which cost \$4,500 to extinguish. R. H. Roberts, assistant to Inspector Gutches, is going overseas with the 20th U. S. Engineers (Forest). Prof. W. N. Millar, late of the University of Toronto, is with the 10th U. S. Engineers (Forest), which is officered and largely manned by United States Forest Service men.

A bulletin has been published in Australia giving the details of the investigations of Mr. D. W. Paterson into the paper pulp situation, and his recommendations. He recommended that spruce and poplar should be planted in the high altitudes of Victoria in proximity to water powers available for pulp mills. He said that spruce could be first cut for pulp after 15 years and that 900 acres would supply the needs of Australia for one year. His advice was that 2,000 acres be planted the first year and 1,000 acres yearly after that until the first planted trees were ready for cutting. After an area is cut it is to be replanted and thus a continuous supply of timber insured, as it is not economical to cut pulpwood from mixed forests and that only pure stands will pay. Mr. Paterson's estimate is that the profit realized after 15 years, including interest on capital and all costs, other than payment for the land, provided cheap water power was available, would be \$120 per acre.

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## BOOK REVIEWS

Stories which will appeal to children of all races and climes appear in a book just issued by the American Book Company, New York, Cincinnati and Chicago. Under the title "Stories the Iroquois Tell Their Children," Miss Mabel Powers has collected and given the world thirty or more tales of genuine charm. They are divided into two classifications, Iroquois wonder stories and Iroquois fairy stories. Miss Powers has been adopted by the Senecas and is known as Yeh sen noh wehs. The book has a foreword of approval signed by the chiefs of the six tribes.

Hundreds of commodities are listed in the new issue of "Du Pont Products," just issued by E. I. du Pont de Nemours & Company. The book shows that this manufacturing concern and its subsidiary companies have undergone an enormous expansion since the beginning of the war. Particularly interesting is the expansion in the line of chemicals, made necessary by the inability of this country to import many of the chemicals essential to various branches of industry. Many of the commodities listed have not before been made in America. The book may be had by applying to the offices of the company at Wilmington, Delaware.

Foods and Household Management; a Textbook of the Household Arts, by Helen Kinne, professor, and Anna M. Cooley, associate professor, of Household Arts Education, Teachers' College, Columbia University. The Mac-Millan Company, New York. Price \$1.10.

For use in high schools and normal schools this book offers a valuable adjunct to the course in household arts. In its preparation due regard was had for its use in the home as well. The contents include a treatment of the cost and purchasing of foodstuffs, the management of the home and other questions vital to the economy and health of the household. Specific treatment is accorded foods, their production, sanitation, cost, nutritive value, preparation and serving. The work includes approximately 160 carefully selected recipes and a large number of cooking exercises of more experimental nature, designed to develop initiative and resourcefulness. The book is practical and economical.

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The Forests of Maryland, by State Forester F. W. Besley. The Maryland State Board of Forestry, Baltimore.

Information useful to the forest owner, the timber buyer, the manufacturer and the student is embraced in the book just issued by State Forester F. W. Besley for the Maryland State Board of Forestry. The report is based on an accurate and complete inventory of the forest resources of the state and contains separate forest maps for each county. The purpose of the book is to show in condensed form and orderly manner the state's forest wealth, its value to the people, and how the resources may be best conserved by wise use for supplying present needs and the needs of the future. Of the total land area of 6,330,000 acres Maryland has a woodland acreage of 2,228,000, or 35 per cent. The book is interesting and of practical value.

**Relation of Birds to Forests.**

The Indiana State Board of Forestry, in order to encourage the protection of birds and study their relation to forest life, is offering prizes to the pupils of schools for the best essay on the "Relation of Birds to Indiana Forests." For the best essay from the seventh and eighth grades, respectively, a prize of \$5 will be given. For the best essay from each of the high school classes a prize of \$7.50 will be given. The offer is extended to all schools doing work equivalent to the grade and high schools.

The essay must not exceed 2,000 words, and must be mailed to the Secretary, State Board of Forestry, not later than May 15, 1918. It is suggested that pupils who expect to enter the contest write for the rules governing the contest.

Birds of America (Nature Lover's Library). The University Society, Inc., New York. 3 volumes, price \$29.50 a set.

As a contribution to the literature of America this is a notable work. The aim of its compilers was to present a complete review of the available knowledge concerning birds. The fundamental factor in the undertaking was a realization that the task of preparing a comprehensive account of the bird life of the continent is too great to be accomplished in a lifetime by any individual working alone. Co-operation on the part of many authorities was deemed essential and the array of talent represented in the list of compilers is an indication of the scale of the enterprise. The editor-in-chief was T. Gilbert Pearson, of the National Association of Audubon Societies. John Burroughs was consulting editor; George Gladden managing editor and J. Ellis Burdick associate editor. The special contributors were Edward H. Forbush, state ornithologist of Massachusetts; Herbert K. Job, ornithologist for the Audubon Societies; William L. Finley, state biologist for Oregon, and L. Nelson Nichols, member of the Linnaean Society.

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## CURRENT LITERATURE MONTHLY LIST FOR NOVEMBER, 1917

(Books and periodicals indexed in the library of the United States Forest Service.)

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**National and state forests**  
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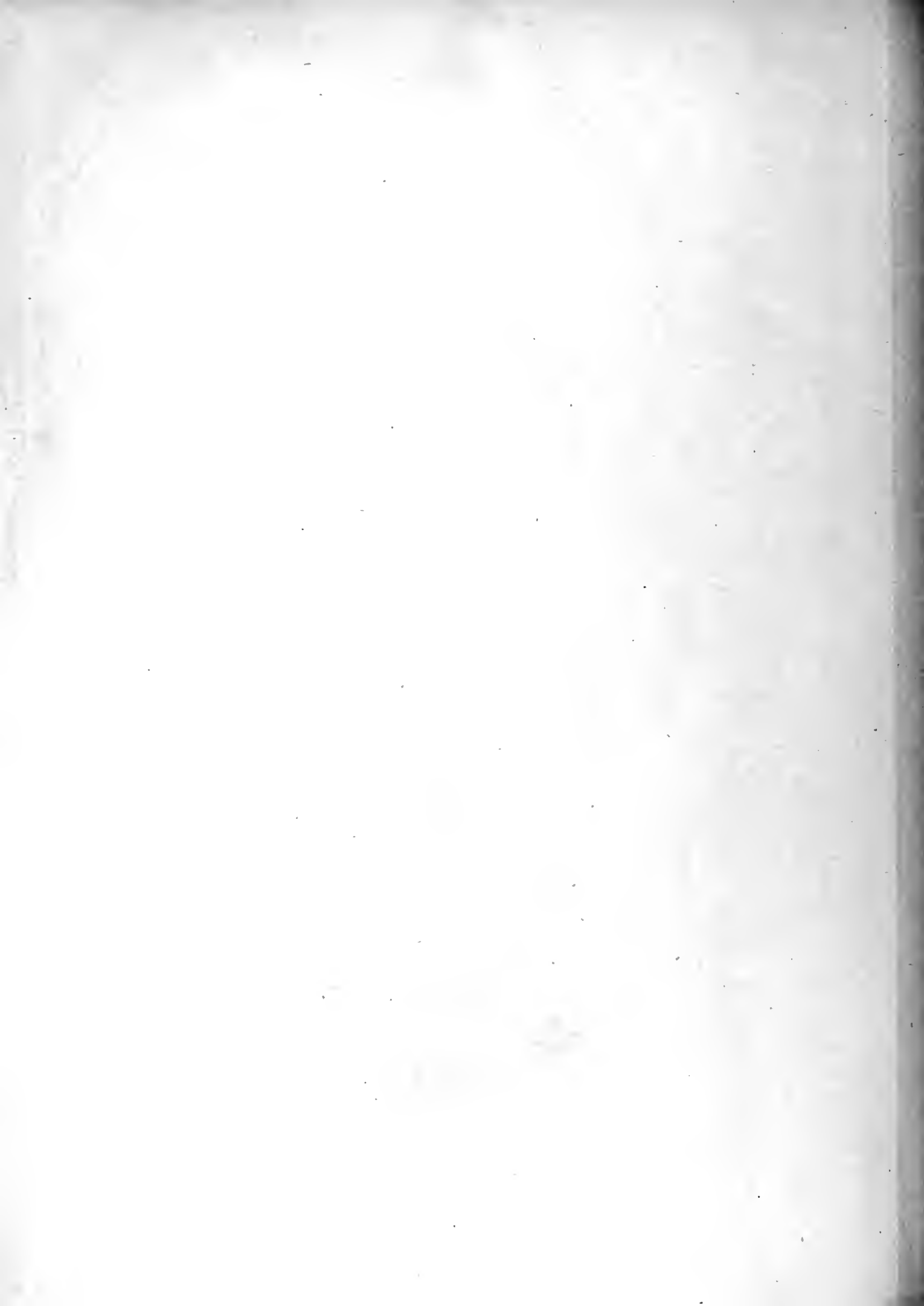
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- IT IS A VOLUNTARY organization for the inculcation and spread of a forest policy on a scale adequate for our economic needs, and any person is eligible for membership.
- IT IS INDEPENDENT, has no official connection with any Federal or State department or policy, and is devoted to a public service conducive to national prosperity.
- IT ASSERTS THAT forestry means the propagation and care of forests for the production of timber as a crop; protection of watersheds; utilization of non-agricultural soil; use of forests for public recreation.
- IT DECLARES THAT FORESTRY is of immense importance to the people; that the census of 1913 shows our forests annually supply over one and a quarter billion dollars' worth of products; employ 735,000 people; pay \$367,000,000 in wages; cover 550,000,000 acres unsuited for agriculture; regulate the distribution of water; prevent erosion of lands; and are essential to the beauty of the country and the health of the nation
- IT RECOGNIZES THAT forestry is an industry limited by economic conditions; that private owners should be aided and encouraged by investigations, demonstrations, and educational work, since they cannot be expected to practice forestry at a financial loss; that Federal and State governments should undertake scientific forestry upon National and State forest reserves for the benefit of the public.
- IT WILL DEVOTE its influence and educational facilities to the development of public thought and knowledge along these practical lines.

### It Will Support These Policies

- National and State Forests under Federal and State Ownership, administration and management respectively; adequate appropriations for their care and management; Federal co-operation with the States, especially in forest fire protection.
- State Activity by acquirement of forest lands; organization for fire protection; encouragement of forest planting by communal and private owners, non-political departmentally independent forest organization, with liberal appropriations for these purposes.
- Forest Fire Protection by Federal, State and fire protective agencies, and its encouragement and extension, individually and by co-operation; without adequate fire protection all other measures for forest crop production will fail.
- Forest Planting by Federal and State governments and long-lived corporations and acquirement of waste lands for this purpose; and also planting by private owners, where profitable; and encouragement of natural regeneration.
- Forest Taxation Reforms removing unjust burdens from owners of growing timber.
- Closer Utilization in logging and manufacturing without loss to owners; aid the lumberman in achieving this.
- Cutting of Mature Timber where and as the domestic market demands it, except on areas maintained for park or scenic purposes, and compensation of forest owners for loss suffered through protection of watersheds, or on behalf of any public interest
- Equal Protection to the lumber industry and to public interests in legislation affecting private timberland operations, recognizing that lumbering is as legitimate and necessary as the forests themselves.
- Classification by experts of lands best suited for farming and those best suited for forestry; and liberal national and State appropriations for this work.





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