



Report on field
work

WITH THE AMERICAN FORESTRY
ENGINEERS IN FRANCE

Jos.I.Steel

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HAMMERMILL
BOND

WITH THE AMERICAN FORESTRY ENGINEERS
IN FRANCE

Part I - The part of the American Forester in
the World War.

Part II - With Co. "A" 5th Battalion, 20th
Engineers (Forestry), later
the 13th Co. 20th Engrs.

PART I

The enormous demand on timber in present day military operations was strikingly shown in the recent Great War. From the plank roads at the front, the dug-outs, the wire entanglement stakes, camouflage stakes, railroad ties, to the hospitals, camps, warehouses and docks at the base ports, timber in various forms was a munition of war. The American Expeditionary forces has been in France but a short time when General Pershing cabled to the War Department for a forestry regiment who could supply the timber requirements of the American Army. The inadequacy of the ocean tonnage made it necessary to obtain all material from the French Forests.

The military organization, recruited from the forest industries of the nation, and officered by picked men of experience in forestry work, known as the 10th Engineers (Forestry), later merged into the 20th Engineers (Forestry), responded to the call of the War Department, and on October 9, 1917, the first contingent of the forestry engineers arrived in the interior of France.

All the work of the forestry engineers was to be conducted in France strictly in accordance with the French ideas of forestry practice. The United States Forest Service supplied many technical foresters. The Forester of the United States, Lieut.-Colonel Henry S. Graves, was in charge of the forestry work for a time, and later the Assistant Forester, Lieut.-Colonel William B. Greeley, succeeded him. The American forestry organization was virtually transferred to France. All the timber cut in France was requisitioned by the French Forest Service and then sold to the Americans at the requisition price. American foresters canvassed the whole of France for suitable logging sites and planned operations for the coming units.

Many of the officers were sawmill or logging operators at home, and to these men fell the task of actively carrying out the logging and sawmilling operations. The

enlisted personnel were selected on the basis of their former occupations, experience in sawmilling or logging being a requisite. These men knew their work and fitted into the general scheme admirably.

Most of the work of the Forestry Engineers in France was conducted in the rear of the lines of the Armies, and in places having accessible timber. Small units were scattered from the North of France to the Pyrenees, and from the pine marshes of southwestern France to the Jura Mountains bordering Switzerland. The species of timber cut were mostly oak and pine. Logging methods were similar to the pine operations in the Lake States, and the hardwood operations were similar to the small hardwood operations in the South. Small portable mills, rating from 5,000 to 20,000 ft. capacity, were the rule. At first the Americans took over some of the French mills and operated them, but later American equipment was received and was used more generally.

The first board was cut by American troops in France at a little French mill in the Jura Mountains on November 26, 1917. The first American mill began sawing near Gien, on the Loire river, on November 29, 1917. Still earlier another company of the 10th Engineers began cutting piling in the pine forests of the Landes, hauling them out of the woods on running gear of army supply wagons by man power.

The following gives the ^{monthly} production and number of mills in operation at different periods:-

Jan. 1918 -- 10 mills operating. Production: Lumber 1,369 MBM; piling 740 pieces; Std.gauge ties, 815 pieces; small ties, 7,100 pieces; miscellaneous round products, 29,740 pieces; cordwood, 3,303 steres.

Apr. 1918 -- 41 mills operating. Production: Lumber 14,578 M.BM; piling, 1,513 pieces; S.G. ties, 152,654 pieces; small ties, 104,685 pieces; misc. r.p. 334,556 pieces; cordwood, 23,899 steres.

July 1918 -- 59 mills operating. Production: Lumber 24,102 MBM; piling 3,296 pieces; S.G. ties, 298,163 pieces; small ties, 172,619 pieces; Misc.R.P. 227,865 pieces; cordwood, 90,487 steres.

Oct 1918 -- 81 mills operating. Production: Lumber 29,134 MBM; piling 6,909 pieces; S.G. ties, 692,208 pieces; small ties, 106,588 pieces; Misc. r.p., 248,826 pieces; cordwood, 151,464 steres.

On October 31, 1918, there were 81 mills in

operation. The total strength of the forestry troops in France that date (20th Engrs. and Service Companies), 360 officers and 18,183 enlisted men, an aggregate of 18,543 on forestry work.

The following order from the Commanding Officer of the 20th Engineers gives the American "lumber-jack" a rightful chance to feel that his work in the winning of the war was well done:-

"General Order
No. 3

Hq. 20th Engineers (For)
U.S.M.P.O. 717
December, 1918.

To the Officers and Soldiers of the Twentieth Engineers
and Attached Service Troops:

On November 25, 1917, the first board was cut in France by American Forestry Troops at a little French mill in the Jura Mountains. At the same time, another detachment was getting out 50-foot piling in the Landes on escort wagons drawn by hand. The total cut during December, 1917, was 321,000 board feet of lumber and 12,000 railroad ties.

When the armistice was signed on November 11, 1918, the 20th Engineers were operating 81 American Sawmills and producing 2,000,000 feet of lumber and round products every working day. Up to December 1, we have cut a total of 272,500,000 feet of lumber, including 2,728,000 railroad ties, together with 38,000 pieces of piling, 2,739,000 poles of all sizes and 892,000 steres of fuelwood.

Recent reports from the various depots and construction projects of the A.E.F. show that the Army was at the time of concluding the armistice well supplied with lumber. When ties were called for in large quantities to support the advances of our troops at St. Mihiel and the Argonne, they were ready. At practically every dock project, deliveries

of piling and lumber were well ahead of the construction. In other words, the Forestry Troops have made good on the work for which they were brought to France. Notwithstanding the difficulties in obtaining equipment and transportation, notwithstanding the enormous increase in the size of the A.E.F., and the work which it undertook over the original estimates, the Army has been given the lumber which it needed, and the suspension of hostilities finds us with a substantial surplus which will be used for the restoration of France. This is an achievement in which every man in the Forestry Troops may well take pride, for every one of you have had a share in it. Your part in winning the war has been as important as that of any other troops in the A.E.F. Your loyalty and enthusiasm have been put to a hard test. You wanted to get to the front, but could not. You have had to put in long hours of the hardest kind of work, month after month, without glory or excitement, and without the special forms of recognition given to combat troops. The Medical Officers have told us that the Forestry Troops were being worked too hard, but the only answer has been a steadily increasing cut of lumber from month to month. You have failed in no task that has been assigned to you. You have gotten more out of sawmills than had ever been dreamed of by mill operators at home. Time and again, in spite of difficulties such as lumbermen never contended with before, you have exceeded our expectations. Your record as members of the A.E.F. will be a source of pride and satisfaction to you as you return to civil life. It will be your recompense for the sacrifices which many of you have made to come to France.

As Commanding officer of the 20th Engineers, I thank you for the untiring and uncomplaining way in which you have done your work. I am glad to have been identified with such a body of American soldiers.

A copy of this order will be sent to every company and detachment of the 20th Engineers, and attached service troops; read to the troops, and posted on the Company or Detachment bulletin board.

J. A. WOODRUFF,

Colonel, Engineers.

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Part II

Company "A" of the 5th Battalion, 20th Engineers (Forestry) was formed from men enlisted or transferred to the 20th Engineers, and was mobilized at Camp Humphreys, Belvoir, Va., on December 13, 1917. The first officer assigned was Captain Graham Steel, on December 21, 1917. The other officers later assigned were:- 1st Lieuts. E. F. Fee, 1st Lieut. W. B. Foreman, and 1st Lieut. T. H. Hughes, and 2nd Lieut. M. B. Whiting. The military training of this company at Camp Humphreys was very meagre, as most of their time was taken up in road construction work. Company "A" of the 5th Battalion broke camp at Belvoir, Va., on the morning of January 16, 1918, at 8:00 o'clock, and left by motor trucks for Camp American University, Washington, D.C. They remained at Washington, D.C. until the afternoon of January 29, 1918, when they marched to Arlington, Va., where they entrained for Hoboken, N.J. for overseas duty. On January 30, 1918, they boarded the U.S.A.C.T. "Calamares". On January 31st the Calamares dropped into the lower harbor, and at midnight headed for the open sea. They landed at Brest, France, on Feb. 17, 1918, and were quartered in the famous Napoleon barracks. It was here that the men of the company first became acquainted with the French "cootie". On Feb. 21st, after a rememberable ride in French box cars,

they were dumped in a little town of Brinon-sur-Sauldre (Cher), located in the central part of France, where ^{their} work was to commence. They were quartered in an old brickyard, which continued to be "home" for several months.

The officers of the company were men of exceptional ability. Captain Steel was a graduate of the University of California, and has been engaged in railroad construction work and in lumbering operations in the West. Lieut. Hughes was a practical logger from the pine region of northern Wisconsin. Lieut. Foreman had been operating a string of portable mills in South Carolina.

The enlisted personnel of this company was made up of about 70 per cent enlisted men and 25 per cent drafted men. This high percentage of enlisted men was due to the fact that 60 per cent of the men came from the western states -- all volunteers. -- about 20 per cent from the southern states -- mostly drafted men -- and 20 per cent scattered, about evenly divided. The men from the West were woodsmen, forest service men, and ranchers; those from the South were mostly ranchers and "small" sawmill men; and the balance were from widely scattered trades and professions.

The forest in which the company operated was on the estate of Count de Wallet, and was called the forest of La Minee. This forest comprised an area of 2,000 acres, and the

forest had been, for the most part, planted. The tract was quite level and the soil was sandy. This region in France was devoted principally to the growing of forests, and for hunting estates.

The principal species were the Scotch pine (*pinus sylvestris*) and maritime pine (*pinus maritima*). There were also scattered patches of oak and birch on the better soils.

The only specie cut by the American troops was the Scotch pine. The forest was divided into tracts, called coupes, ranging from 2 to 10 acres in extent. The whole forest was divided by a main highway, and was further subdivided by a network of dirt roads. There seemed to have been no regular method of dividing the coupes. One coupe might contain a small area of young oak, while another three times as large, might contain an uneven aged stand of pine. Natural features such as creeks, ridges, swamps, and sand hills tended to make the boundaries of the coupes.

The Count de Wallet thought the world of the forest which surrounded his chateau, and seemed to have been rather reluctant about letting the forest be cut even for such a worthy cause as munition of war. Captain Donald Bruce was the American officer to submit the first report on the forest of La Minee. The timber had been acquired by the U.S. Army before Co. "A" had arrived in France. The practice was to have an American and a French forest officer examine

a tract of timber together. The French government would requisition the desirable forests from the owner, (as was the custom in the French Army of requisitioning food, hay, stock, etc.), and would in turn transfer the timber to the American Army at the French requisition price. In this way the Americans received good timber values and avoided friction with the French forest owners. The timber price paid for Scotch pine on the forest of La Minee was approximately \$10.00 per thousand. The French Forest Service sent out cruisers who prepared maps of the coupes included in the sale, and carefully marked each tree that was to be cut with a daub of yellow paint. Trees were marked on a ten-inch diameter limit basis, and selective logging had to be practiced. The Americans were required to abide by their agreement to not cut trees that were not marked. Trees had to be cut leaving a stump not higher than eight inches from the ground. Timber was required to be felled with due regard for the reproduction. Tops had to be lopped and limbs piled. The French report of the sale gave in detail the number of trees of varying circumferences d.b.h. and the sale was closed on the basis of a cruise in cubic meters.

The Count employed a forest guard. This man's duties consisted of watching the game refuge as well as patrolling of the forests. Small bands of deer were frequently encountered

in the forest, and occasionally one ran across a wild boar. The entire tract was stocked with Chinese pheasants. The guard daily accompanied the American cutting crews to see that they fulfilled their obligations as far as cutting trees and disposing of brush were concerned.

About forty per cent of the timber to be logged was in scattered parcels and the other sixty per cent was in a strip of parcels about a mile and a half long and a half mile wide. The oldest trees cut averaged between fifty and sixty years of age. Much of the small saw timber cut averaged between thirty five and forty years of age. The heaviest stand of timber per acre in the tract was 18,000 feet B.M., and the lightest stand cut was 1,500 feet B.M. per acre. The average stand per acre on the area cut was 8,000 feet B.M. The largest tree cut was a Scotch pine measuring 34 inches d.b.h., merchantable height 30 feet, scale 690 feet B.M. The smallest tree cut for saw timber was 9 inches d.b.h., 8 feet long, with a scale of 10 feet B.M. The average tree was 14 inches d.b.h., merchantable height 16 feet, with a content of 60 feet B.M.

To an American the timber seemed to be of a very poor quality. The average tree would generally yield only one or two standard railroad ties. The timber had grown rapidly and had little strength or durability. The stands were not so thick

that natural pruning had been secured at an early stage, and as a consequence a low grade of lumber resulted. The wood was not very durable, as it contained considerable sapwood and a large percentage of spring wood. Small gauge ties that were laid in the logging railroad of the operation rotted out completely in a period of nine months. Of course it must be remembered that the road bed was not drained and the ties were moist and in contact with the ground and exposed to air at all times, which no doubt favored rapid disintegration.

The demand for piling for wharf construction and trestle construction made it necessary to comb the stands and cut out suitable trees. The whole tract yielded only some 2,000 piling, ranging between 30 to 60 feet in length. The trees did not carry their height well, and a good straight tree for a piling was rather an exception.

Before the logging equipment and sawmill were received the crews were occupied in the woods cutting barb wire entanglement stakes, measuring 6 feet in length with a top diameter of not less than $2\frac{1}{2}$ inches. The first month's work consisted chiefly in cutting over the coupes to obtain these small stakes. Larger poles were also cut for camouflage stakes and also for props in the trenches and dug-outs.

The Count Wallet kept close observation on the operation. The Americans were not even permitted to cut dead trees which were not included in the sale. The Americans had

to buy dry fuelwood from the Count so that they could start fires in their camp kitchen. Another time the Americans got into a squabble with the Count for cutting down a dead tree along the logging road in order to provide fuel for their locomotive. It happened that they were without coal for their locomotive, and the Commanding Officer ordered that the tran crew cut down a certain dead tree for fuel so that they could haul logs for the mill. The Count raised quite a howl over the one dead tree, and it was finally settled by paying him for the scale of the contents in the tree.

The forests were managed on a sixty year rotation. Thinnings were made in order to improve the stand. All ages were represented in the coupes, from seedlings to mature trees. On one section of the forest the cuttings were planned so as to favor the birch. The birches grew quite rapidly in that neighborhood and commanded a good price as fuelwood, which made it a profitable forest tree. The oak did not thrive well, as conditions of soil and moisture did not seem to favor its growth. A severe windstorm created havoc in the cut-over area by blowing over the seed trees and uprooting almost all of the birches which had been favored in the management scheme. The water table was very close to the surface of the ground and the sandy soil afforded very little windfirmness. Much of the tract cut over will have to be replanted.

The logging methods changed with the addition of equipment. The first attempts to work were confined to the use of the axe and the French brush hook. At first the small trees were cut for stakes and poles. The stakes were piled by the roadside until wagons and horses should arrive. (I vividly recall the scene in the early days of March, 1918, when we had secured wagons but no horses, where it took forty men tugging on a rope attached to the wagon to haul out a half load of stakes over an auxiliary dirt road).

During the first part of April forty head of horses and half a dozen log wagons were received. Then logging commenced in earnest. The trees were felled by falling crews of two men, using a short two-handled falling saw. Felling timber in this new way was a hardship on the workmen, as the cut had usually to be made flush with the ground. Crews of buckers, using the two-man, 6-foot, narrow bladed New England type of saw, cut the logs into length. The butt log was usually cut in a 10 or 12 foot length for sawing lumber, and the next cut was usually in an 8 foot length for a standard gauge tie. A crew of 20 men experienced with the broad axe, were kept in the woods hewing standard and narrow gauge railroad ties, which were much in demand by the Armies.

Logs were skidded to the nearest road. At the roads they were loaded on the wagons with a cross-haul or an A-frame jammer. The logs were then hauled out and decked along the main road, or along the proposed line of the logging railroad.

The show was logged to one sawmill setting. The condition of the roads and the availability of water made it possible to locate the sawmill at only one point, near the end of the tract. The longest log haul was three miles, while the average was about two miles.

The continuous wet weather made logging a difficult task in this region. The dirt roads would not hold up in rainy weather, and after tractors were received it was only with difficulty that the timber products could be moved to the main road or railroad.

A mile and one-half of meter-gauge railroad was built into the far tract of timber, which connected with a common carrier French railroad. As railroad logging equipment there was received a thirty-ton, sixty horsepower Belgian locomotive (by no means up-to-date) and 25 French logging cars or trucks. These trucks were 10 feet long, and consisted only of a log frame mounted on wheels. There were no springs or bumpers. The railroad was kept busy "logging the mill" as decking facilities would not permit a great storage at the mill.

When the sawmill was operated at night it was necessary many times to make trips into the woods at night to haul in a load of logs. Loading was done by the aid of Millburn acetylene lamps. (It was a peculiar scene to see men loading logs at night. One then did realize that there was a war in progress.) The railroad operation was handicapped because of the schedule it had to maintain over the common carrier line, and also the engine was in demand to haul the products from the mill to a station eight miles away where the products had to be reloaded onto standard gauge cars.

In the early summer of 1918 two five-ton White tractors, having wide iron wheels, were secured. These proved very satisfactory in hauling logs out on the dry dirt roads, and served well hauling to the mill along the main gravel road. The dirt roads in wet weather just seemed to have no bottom. The trucks were loaded by means of a jammer and a team of horses. The trucks were equipped with a trip pockets so that they could be unloaded at the mill in a few minutes. The trucks hauled on soft roads from 1,000 to 1,500 feet B.M. per load. From 10 to 15 trips each day were made by the two trucks, bringing from 12 to 22 thousand feet of logs to the mill -- haul averaging four miles to the roundtrip. The logging train supplied the balance of the logs for the day and also for the night run.

Titan and International tractors, having very large rear wheels and a wide wheel base, and having one small steering wheel in front, were used in connection with Troy trailers and Buffalo-Pitts trailers to haul out poles and fuelwood from the remote corners of the operation. These tractors proved quite efficient over the loose, sandy roads even in wet weather. They burned coal-oil, and ran from four to five miles an hour. However, they were very successful in hauling trailers, especially on the better roads. They were used principally in hauling fuelwood and piling to the railroad track.

Along in February, 1919, (after the Armistice) two Holt caterpillars were received, one a 75 and the other a 40 horse-power. They were used very successfully on the roads which had, after a year's time, been converted into a mass of ruts. It was by using these caterpillars with trailers that it was possible to move out all of the fuelwood. Road conditions were so bad off the main road that the two caterpillars had to work near each other -- one to be on hand to pull the other out when it became mired.

The piling cut was skidded to the roads by the use of big wheels. (Big wheels were used most generally in all the small French logging operations) About 800 pieces of piling, 25 to 40 feet long, were delivered to the railroad cut-off at Nevers (Nievre), mostly by trucks with trailers, because of the

lack of railroad facilities during the drives at the front. The trucks with trailers, were loaded with the piling at the rollways by means of a cross-haul. The trucks were equipped with turn-tables and king bolts, and the piling was bound onto the trucks and trailers by means of a chain cradle. Three truck trains of 15 trucks each were sent to Nevers in this way, a distance of over 85 miles, and also several smaller truck trains. Out of the 58 loads forwarded, not a one failed to arrive on schedule time, notwithstanding the long haul over a hilly country. This feat in hauling seemed remarkable at that time.

All the tops and limbs of the trees were cut up into fuelwood. The quartermaster was clamoring for more fuelwood for the Army all the time. This cutting operation was slow and tedious. At first "A" company men endeavored to work up the fuelwood as they cut the saw timber. Later, however, service troops (colored) were attached to the operation for the purpose of cutting this fuelwood. The limbs were utilized down to a one inch diameter, and were cut into meter wood, that is wood lengths about 39 inches long. The axe was preferred for lopping the tops, but on the small limbs the French brush knives proved the most effective. This wood was shipped from the operation just as fast as rolling stock would permit. The very small limbs and needles were left in the woods, as the Count had arranged with the people in the adjoining villages to gather all this for fuelwood.

Gasoline wood saws were tried out for cutting the limbs to length, but this did not prove very successful.

The sawmill forwarded to the operation was a small circular mill of the portable type, which had been originally consigned to the American Red Cross. The sawmill had a rated capacity of 5,000 feet, and was manufactured by the American Sawmill Machinery Co. It was equipped with a 40-horsepower boiler and a 32 horsepower engine, both manufactured by the A.B. Farquhar Co. The mill was lighted by a "Lally" lighting plant.

The main products of the sawmill were sawn standard ties and one inch lumber. Logs 8 feet in length were slabbed on two sides and shipped to the front. Two by fours and other dimension were also cut on special orders, mainly for hospital and barracks construction.

The sawmill was operated at high capacity all the time. For the greater part of the time a day and also a night shift were operating. Workmen were not lacking in numbers, so very exceptional records were established for the mill. The following are representative figures on a day's production, a day consisting of two ten-hour shifts:-

Feet cut per day (Avg. 5 months run)	32,000	ft B.M.
Average feet of lumber per day	16,373	"
Average cut standard ties, pieces	278	

Largest cut, ft. B.M. (Oct.9,1918)	53,898
Largest amount lbr. (Sept.25,1918)	30,038
Largest cut std.ties (Dec.2,1918)	1,128

The following is a report of the forest products made at this operation (Brinon-sur-Sauldre (Cher)):

Lumber	2,390,443	ft.B.M.
Switch timber	194,763	
Standard ties, ft.B.M.	1,303,912	
Small ties, ft. B.M.	18,198	
Standard ties, pcs. sawn	40,716	
Small ties, pcs. sawn	1,020	
Standard ties, pcs. hewn	7,651	
Small ties, pcs. hewn	48,786	
Piling, pcs.	2,246	
Poles, pcs.	73,475	
Misc. Round Products	93,112	
Fuelwood, steres	20,575	

The shipment of products from the operation caused as much difficulty as manufacturing the products. The mill was located on a narrow gauge French line, and it was with great difficulty that the Americans obtained a schedule so that they could use the French line. The products had to be loaded on

narrow gauge cars at the sawmill and then hauled by the logging locomotive eight miles away to a transfer point on the standard gauge line. If the French railroads were to have transferred the products, most of them would still be in the woods at the operation. It was necessary to keep a loading crew at the transfer point all the time, and virtually establish a lumber yard at that point. When offensive operations of the Allies were under way, it was impossible to get cars to ship forest products, as ammunition and troops took precedent. For two months time, during June and July, 1918, only three or four carloads of products were shipped from the operation. Later American rolling stock arrived in France and shipments went forward more readily.

Orders were sent out to the operations from the Forestry Headquarters at Tours. There would be standard cutting instructions on say linch lumber and railroad ties. Special cutting and shipping instructions would be received at most any moment. The orders were pyramided. One day Co. "A" would be operating full blast cutting ties; then would come on the following day an order to cut some special size timbers and ship at once. In such cases the logs would have to be specially selected in the forest, felled, and hauled to the mill. The next day instructions might be received to bend all energy toward getting out an order of piling, which was needed to complete a cut-off on a railroad, or to

construct a wharf at a base port. The obstacles were many and trying conditions were met most everywhere. However, all worked out well in the end.

"A" Company was first housed in some buildings of an old brickyard. Several months later the regular pyramidal tents were received, sufficient in number to house the troops. After the sawmill began operating, walls six feet high were built for the squad tents. The large buildings belonging to the brick kiln were converted into a kitchen and mess hall, others were converted into stables, garages, oil house, blacksmith shop, etc. The drinking water in the region was very poor. Men were instructed to only drink water that had been chlorinated in water bags that were located at camp. The Forestry troops drew a ten per cent larger ration than the doughboys, because they were performing hard labor. Even then the food question was a serious one, as the loggers never seemed to have been able to get enough food. Hot lunches were taken out to the men working in the woods by motor car. At one time there was a stretch of two months when we never drew any potato ration. Instead onions were received. Fortunately, "A" company was remote from other American camps, and the boys could wander down to the village and enjoy a steak and "pomme de terre" fried, when they were on the verge of starvation.

The American foresters could not help but carry home many of the French ideas on forestry methods and utilization.

It is said that the French utilize 94 per cent of the tree, even grubbing out the roots and using them for fuel,

First of all, the forests were all under a definite system of management. The tracts were divided into coupes or parcels, and thinnings were made from time to time. Provision was made for a sustained yield from the forests. It was a surprise to most of the Americans to find that the trees for the most part had been planted. The French people looked upon their forests as they did upon any other agricultural crop. If the French people learned that you were a forester, they would, figuratively, welcome you with open arms. In France a forester is a highly esteemed man in any community. The French in turn stood aghast at the way the Americans cut the trees in the woods and at the mills, but they too learned a lesson of efficiency and production from the Americans. The French people had great regard for their forests. The estate owners and guards seemed to be so well acquainted with the trees on their tracts that they could almost "call them by name".

French forests were not greatly menaced by fire danger, as the periods in the summer months when rain did not fall were exceedingly short. However, the underbrush of heather and moss covered ground would dry out very rapidly. The Americans were prohibited from smoking in the woods during the summer months. Only one fire broke out at the Brinon operation, and that was started in the leaves in a coupe of young oak. Sparks

from the locomotive were the evident cause of the fire. The whole camp responded for fire call one evening, were marched one quarter of a mile from camp at double-quick time, and upon arriving at the fire were divided into two lines, one line going on each flank of the fire. The fire had burned about an area of three acres, being swept along rapidly thru the dry leaves by a brisk wind. The men, some one hundred on each flank, merely marched along the fire line and trampled the fire out in the space of about three minutes time.

In the maritime pineries in the Landes (southwestern France) some very serious fires occurred. Here adequate prevention measures are taken each year to detect and suppress fires.

In utilization the Americans learned many a lesson from the French. It was a common sight to see the women of the village trundling along with a wheelbarrow of faggots which were to be used as fuel. In the French homes you find the people very economical in building their fires. In the fireplace they built a fire with a handful of twigs and sticks cut to very short length. It is only in the well-to-do homes that they build fires for heating and comfort. Wood is expensive and is used sparingly, even in the preparation of foods. Charcoal stoves were employed in many of the homes to cook on. Wherever Americans stayed or were billeted, they usually burned out the fireplace by making too hot a fire.

At the town bakery one gets an idea of the use of faggots on a large scale. The baking ovens are massive brick affairs, and the bread seems to have been baked in the fire box. Bundles of faggots (twigs and branches 6 to 8 ft. long) are stuffed into the fire box and then are burned. The fire is pulled and the oven is then swabbed out with a rag tied on the end of a long pole, and the loaves of bread are then placed in the oven by employing a long handled wooden ladle. The bread made in this way is surprisingly palatable.

Very little wood is used in construction of the French home. To give strength to walls, oak timbers are embedded in the brick and concrete, and of course the ceiling and rafters are made of wood. The only building made entirely of wood was a building containing the forestry exhibit which had been built for the Paris exposition.

The forests were also game preserves. Most of the forests were stocked with deer, and occasionally wild boar. Rabbits were in abundance, and were the best game for the sportsman. Some ducks were found on some of the lakes, and chinese pheasants abounded in and near to the fields. The lakes were usually stocked with pike or trout. The duties of the forester included the taking care of the game preserves.

The French sawmills were antiquated. Most of the small mills had hand feed carriages. If they cut a thousand feet a day it would be an enormous cut. Logs were hauled from the forests to the mills, (usually located in the villages) by

means of big wheels. During the war women operated many of the mills.

The French forest operations were always neat and orderly. Piles were always uniform, and brush was carefully piled. It was indeed a pleasing sight to the eye. The French usually cut their pine timber in the fall. They would cut the log into short lengths and peel the bark so that the wood would season better. In the French operations the round products were always peeled and seasoned before shipping, to save on shipping weight as well as facilitate handling.

It was interesting to note that the hardwoods along the roads and stone fences were coppiced every three or four years to provide fuelwood. The stumpy tree with a few sprouts presented a peculiar picture to the American.

Back of it all there is a lesson. The day is not far distant when Americans will have to follow the same general forestry practices as the French are now doing.
