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THE 1920



Ames Forester

IOWA STATE COLLEGE

AMES, IOWA



Elvin

Mennenga

Died June 20, 1920

Harley W.

Sage

Died Nov. 13, 1918



Dedication

To those men, who at call of country stood forth ready to give all; who put their years of experience and technical training into the maelstrom of conflict that threatened to submerge the world; to the men who fulfilled all the demands of duty and regardless of personal desire remained at home to perform the tasks of daily routine in office and field, this volume is gratefully dedicated.

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The Ames Forester

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Forestry Club and Faculty.

*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 892,004 steres of fuel wood.

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 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 expectation. 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.
By courtesy of 'American Forestry.'



A French Pike.

THE AMES FORESTERS IN THE WAR

By Professor G. B. MacDonald.



Prof. G. B. MacDonald
In the Rockies the summer
of 1919.

The response of the colleges and universities of the country during the war is well known. The students of these institutions were among the first to respond to the Nation's call. Those who were present at the Iowa State College when war was declared, know well the depletion in the student ranks at the first call for volunteers. Many of the foresters then in school enlisted. After the first wave of enlistments, many students remained in their classes at the request of the military authorities,—much against their own desires. In some instances fully as great a patriotism was shown by some hasty enlistments. The question which seemed to be uppermost in the mind of every Ames forester was “when and how shall I go.”

Soon after the first call for volunteers the organization of the forestry regiments was undertaken, which offered inducements too strong for most of the Ames foresters to resist. The thought of being able to apply, even to a small degree, their forestry training in the prosecution of the war was the cause of thirty Ames foresters entering this branch of service. It would be interesting to follow through in detail the varied experiences of this group of men in France, but here only a few may be mentioned.

The foresters from Ames held all ranks from that of “slab



Sawmill at La Bresse, Second Battalion, 20th Engineers.

carrier" and "river rat" to that of first lieutenant. A large number of these men were directly engaged in either logging or milling with the 10th and 20th engineers, where each unit endeavored to outstrip the others in production of lumber or timber products for the army. Others of the foresters were engaged in estimating timber and mapping parcels of forest land which were soon to be logged. One Ames forester was transferred to the British Army for work of this kind. At the conclusion of the war two of the Ames men were giving instructional work in forestry in one of the army schools.



Forest at Camp Grande Brosse.



Firewood for Shipment. Near Eclaron.

The foresters were not without their thrills and worries. Five of the men were aboard the *Tuscania* when it was torpedoed but all eventually were landed either in boats or rafts on the Irish and Scotch coasts.

During the last days of the war the college had about 35 forestry students assigned to the Student Army Training Corps. These men were mostly first and second year students who were awaiting their call into active service. These men would have formed the first line had the war continued for a year or two longer.

In addition to the war activities of the Ames students, the forestry faculty made its contribution to war service. One mem-



Piling at Camp St. Eulalie.

ber undertook important investigational work at the Forest Products Laboratory at Madison, Wisconsin, where many experiments with woods and forest products were under way for the army. Other members of the faculty were engaged in work connected with the production of spruce, oak, and walnut lumber for military needs.

A number of the Ames foresters who were engaged in practical work when the war came upon us were prevailed upon to await the draft before engaging in direct military service. Some of these men were occupying responsible administrative positions in government and other work classed as "essential" and it was only through a true sense of loyalty and patriotism that they too did not cast their lot early in the war in the more spectacular service in France. The fighting spirit was displayed on both sides of the water.

A word of appreciation can only be given to these men who willingly responded,—two with their lives, the others with their services, when the call came. This service was not offered in a spirit of sacrifice but rather in a spirit of true loyalty to a cause worthy of the courage and strength of the country.



Camp Canondale. Near Bordeaux.

Some Problems of Land Ownership in the National Forests

E. A. Sherman.

Associate Forester, United States Forest Service.

In every study of the future needs of this country for wood and wood products, and in every intelligent plan for supplying such needs, the existing National Forests play a prominent part. These forests, on June 30, 1919, numbered 151, and embraced a total net area of 153,933,460 acres. This area, bearing as it does a stand of usable timber, aggregating perhaps six hundred billion feet, is properly considered the most important anchor which the nation has thrown to windward to prevent our drifting upon a reef of disaster resulting from a famine shortage of one of the natural resources absolutely necessary to industrial activity and progress.

Millions of acres in words or figures give one very little conception of the magnitude of these properties. The immensity of this territory only begins to dawn upon one when he realizes that out of our net National Forest area, if consolidated, you could carve four States the size of Iowa, duplicate Vermont, Massachusetts, and Rhode Island, and have 252,320 acres left over for small change.

But the National Forests are not solid blocks of Government-owned lands as a majority of people imagine them to be. Too often even the professional forester thinks of them as being areas entirely under the control of the Federal Government. This is largely due to the fact that the map of the United States showing our National Forests is on so small a scale that it is only practicable to show them as compact areas. Few people realize how different the actual situation is upon the ground from that indicated by the maps or by any statement of the acreage under Government control. The fact is that practically every one of the 151 National Forests is honeycombed with private holdings to such an extent as to seriously hamper Government regulation, and materially modify ideal plans of management.

Intermingled with the National Forest lands are millions of acres of land which do not belong to the Federal Government. To be exact, the total area within the National Forest boundaries June 30, 1919, was 174,261,393 acres, and of this total 20,327,933 acres were adversely-owned. This included State lands and lands under private and corporate ownership, which were required by specific grants or were filed upon and patented



Looking across Spirit Lake toward Mt. St. Helens in the Columbia National Forest, Washington. Within this area every odd-numbered section is railroad land, every Section 16 and 36 belongs to the State, and the remaining even Sections are, in part, the property of the Government. Picture this area after a lumber company has stripped the odd sections of their timber.

under various forms of the public land laws before the creation of the National Forests. It also included 2,341,238 acres of agricultural land, listed after examination and classification by the Department of Agriculture for homestead entry and used by 20,946 individual applicants.

The railroad grants, which embrace the odd sections within a definitely specified distance from certain land grant roads, include a greater acreage than that of any other class of alienation within the National Forests. If these lands were still owned in every case by the railroads it would be exceedingly interesting to compute the total amount of lands within the National Forests held under such ownership. But a considerable percentage has been sold to live stock companies, lumber companies, land holding companies, settlers, and others, so that the origin of the original alienation has lost much of its significance. The important thing from the standpoint of Forest administration is that the title to these lands is not vested in the Government, and the owner of the lands has interests and holds ideals not in harmony with the interests and ideals of the public.

Of the total area of alienated land within the National Forests perhaps 5,000,000 acres may be classified as agricultural. This includes the 2,341,238 acres classified by the Department of Agriculture as agricultural and opened to homestead entry. It is probable that the State lands, railroad lands, and lands taken up by individual settlers and homesteaders before the establishment of the National Forests embrace agricultural lands sufficient to bring the total to the figure named.

No reasonable objection can be raised to the alienation of lands which are chiefly valuable for agriculture. These usually lie in relatively compact bodies in small valleys or along the stream courses. Where proper provision has been made for rights-of-way by which to reach the adjoining National Forest lands and over which to remove the products therefrom, such alienations do not materially interfere with reasonable plans of administration and protection. Indeed, the presence of settlers in such localities is usually desirable from every standpoint. If all the adversely-owned lands in the National Forests were of such a character that they had been taken up for their agricultural value only, the problem of administration would be simplicity itself compared to the present situation.

After agricultural lands and railroad grant lands, mineral lands come next in order of importance among the adversely-owned lands in the National Forests. Approximately 1,000,000 acres of land in the National Forests have been patented under the mineral laws. This figure is not exact, since the data have never been compiled. It is believed, however, that the estimate

is not far out of the way. Prior to August, 1911, a total of 42,033 mining claims had been surveyed for patent within areas now embraced in National Forests. These were distributed among the field administrative districts as follows: District 1, 5,057; District 2, 19,214; District 3, 1,505; District 4, 4,237; District 5, 11,259; District 6, 761. Considerably more than half the total were located in California and Colorado, indicating the influence of the earlier mining activities in those two States. As the National Forests are subject to the operation of the mineral laws the same as though they were public domain, the process of disintegration is continuous. Probably close to 50,000 claims all told have been surveyed in the National Forests up to date and new surveys for patent are being made at the rate of 500 a year. The claims run from fractional parts of an acre up to a maximum area of 160 acres. The average will not exceed 20 acres. It is upon this total of 50,000 claims at 20 acres a claim that the estimate of 1,000,000 acre total is based. However, not all claims surveyed for patent are finally patented, so this approximation is subject to an indefinite discount for such cases.

Prior to the creation of the National Forests, much land was acquired under the mining laws without scrupulous regard to legal requirements. Every claim is now subject to careful examination by a responsible Forest officer before being passed for patent, and, if there is any doubt as to the merits of the case, by a qualified Mineral Examiner. The 10,000 acres of National Forest lands which are now being acquired under the mineral laws each year fairly meet the requirements of the law. It may be well, also, at this point to state that the real miner seldom causes any trouble or embarrassment to National Forest administration. He is bent on extracting substantial wealth from the ore bodies which he believes to lie beneath the surface of the claim which he has staked. He is not engaged in the pie-ayune business of holding up some other miner or some lumberman or the Government by refusing to allow him to cross his location without paying a good round sum. The real miner does not rush in on a proposed timber sale area and locate claims in order to hold up contemplated logging operations. Such things are done under the cover of the mineral land laws, but they are not usually done by real miners, and real miners when informed of the facts never defend such practices.

Lands granted to the States for public schools and other purposes at one time figured very prominently in the list of alienations in the National Forests, but during the past ten years this problem has been greatly simplified. As the result of an agreement between the State of South Dakota and the

Forest Service, dated January 4, 1910, the problem in that State has been solved by the State's securing from the Government two relatively compact bodies of National Forest land equalling, in area and value, all the State's school sections scattered throughout the Forest. In this way the Government secured all such scattered school sections and the State secured title to two blocks of land, one in the Harney National Forest embracing 47,937 acres, valued at \$1,120,993, and a tract of 12,212.17 acres in the Sioux National Forest valued at \$67,168.94.

Similarly, the Government of Idaho entered into an agreement October 4, 1911, with the Secretary of Agriculture, whereby the State relinquished to the Government all unsurveyed school sections within the National Forests, amounting to 548,157 acres, and secured 193,039 acres from the Kaniksu National Forest bearing merchantable timber valued at \$1,242,971.07, and selected from the public domain timber lands and grazing lands aggregating 355,118 acres.

The Governor of Montana and the Acting Secretary of Agriculture entered into an agreement December 23, 1912, by which the State finally secures in exchange for unsurveyed sections 16



Land in the Boise National Forest, Idaho, classified as agricultural and opened to homestead entry. Good example of land suited for such private use. Note sharp distinction between cultivated area and steep slopes which should remain permanently forested.

and 36 within the National Forests 106,608 acres carrying 618,875,000 feet B. M. of timber, valued at \$1,089,354, and in addition has secured from the public domain unoccupied non-mineral grazing or agricultural lands sufficient to make up the difference in acreage between the timbered area secured and the total unsurveyed sections 16 and 36 relinquished to the Government.

The Secretary of Agriculture and the Commissioner of Public Lands of the State of Washington entered into a similar agreement December 22, 1914. Under this agreement the State will relinquish its interest in unsurveyed sections 16 and 36 within the National Forests aggregating 485,000 acres and will secure in lieu thereof about 85,000 acres of grazing land from the public domain, and four or more reasonably compact bodies of land from the National Forests equalling in area and value the remaining acreage given up by the State. Owing to delays caused by the war and the fact that the lands which will be given to the State were unsurveyed, this exchange has not yet been consummated. However, all important points have been agreed to and most of the field work has been completed so that final adjustment satisfactory to all parties may be confidently anticipated.

By an agreement dated August 14, 1919, and signed by the Secretary of Agriculture and the Governor of Nebraska, an area embracing 8,958.63 acres of Government land was eliminated from the Nebraska National Forest by a Presidential proclamation dated November 25, 1919, in order that the State might select such land in lieu of scattered sections 16 and 36 within the National Forest aggregating 8,960 acres. This entirely disposes of the State land problem in National Forests in Nebraska.

In several public land States the remaining State problem is not so simple. Montana still owns a considerable acreage of surveyed school sections within the National Forests in that State. The addition of about 1,000,000 acres of land to the Idaho and Payette National Forests by special act of Congress, effective December 27, 1919, included 14,961.05 acres of surveyed and 43,680 acres of the unsurveyed school sections granted to Idaho. In addition, Idaho owns in other Forests in the southern half of the State 82,626.25 acres of surveyed school sections and State selections aggregating 23,912.68 acres. The State has already expressed a wish to relinquish its remaining school lands to the Government and to secure equal value of National Forest lands in a comparatively solid body agreeable to the Forest Service.

An agreement has also been signed by the Secretary of Agriculture and the Governor of Utah looking to a similar dispo-



Homestead in the Rainier National Forest, Washington, taken for its timber value and patented before creation of Forest. Note heavy timber and slopes too steep for cultivation. Such land in a National Forest should be acquired by the Government for forest purposes.

sition of the State school lands remaining within National Forests of that State. The total area involved will probably fall considerably short of 100,000 acres, the State having already selected other lands in lieu of most of its National Forest base.

The situation in Colorado is very similar to that of Utah. The State still retains its interest in probably 145,000 acres of National Forest school sections, but is favorably disposed to making a consolidation exchange to the mutual advantage of both State and Forest Service.

Nevada has no school lands within the National Forests. California has disposed of her interest in all such lands, and New Mexico and Wyoming have done the same. Oregon has indemnity rights for about 50,000 acres of unsurveyed school sections in the National Forests based upon about 37,000 acres of timberland and 13,000 acres of grazing or waste land. Several bills have been introduced in Congress granting to the State of Oregon about 50,000 acres of timber land of much greater value in lieu of this acreage, with the proviso that the grant should be retained and administered as a State forest. It has doubtless

been due to the great disparity of values that Congress has never acted favorably upon such a measure. Meanwhile the Forest Service stands ready and willing to negotiate an exchange based upon equal area and value, but such an arrangement has never met with the approval of the State authorities.

Arizona, of all the public land States, occupies the most fortunate position with respect to its school lands within the National Forests. This State has steadfastly retained her interest in such lands except where agricultural in character and desirable to open to homestead settlement. There have been two very good reasons for following this policy. First, the State has had no little difficulty in finding sufficient desirable surveyed lands non-mineral in character and unoccupied by settlers to make up the quantity grants given it by Congress. It would obviously be absurd for it to give up lands in the National Forests in exchange for other lands from the public domain or elsewhere while its drafts upon the public domain remained unfilled. Second, its school sections in the National Forest already compare favorably as revenue producers with the lands the State owns outside the National Forest. Arizona and New Mexico were admitted into the Union with the special proviso that Sections 2, 16, 32 and 36 within the National Forests should not pass to the State so long as they remained within National Forests, but that the State should receive from the United States Treasury each year an amount bearing the same proportion to the total receipts from the National Forests in the State as the area of such Sections 2, 16, 32 and 36 bear to the total area of National Forest land in the State. Under this arrangement the State of Arizona received \$18.60 for each such school section in the National Forests during the fiscal year ending June 30, 1917, as compared with an average of \$19.20 per section for its lands outside the Forests. Since the \$18.60 was obtained without any administrative costs whatever to the State it is evident that the present arrangement is eminently satisfactory locally. At the close of the fiscal year ending June 30, 1917, the total area of unrelinquished school sections in the National Forests of Arizona aggregated 1,375,320 acres. This total has remained substantially unchanged.

When the Washington and Montana State exchanges are consummated the State school lands in National Forests still controlled by the State, exclusive of Arizona, will be reduced to a grand total of about 650,000 acres. This does not include lands selected by the States prior to the creation of the National Forests. The great bulk of such selected lands, however, has already been purchased from the States by individuals and corporations so that the total acreage of selected lands lying within National

Forests and still owned by the States probably does not now exceed 100,000 acres.

In short, the State land problem in the National Forests is well advanced toward permanent solution, in most of the States by exchange and consolidation, and in Arizona by statutory provision and satisfactory administration. In Arizona and New Mexico such sections are the absolute property of the Government so long as the National Forests are maintained, and, as the Forests are established under boundaries which are believed to be permanent, the question of jurisdiction is settled. Because of these provisions of law the school sections in National Forests in Arizona and New Mexico are not included in the list of adversely-owned-lands, and do not make up any part of the twenty-million-acre total.

But the State land problem is easier of solution than any other land problem presented by the National Forests. The foregoing discussion unfolds only a fraction of the existing intricacies of the land title situation on these great Government properties. In addition to State lands, railroad grant lands, mineral lands, and homestead lands which are truly agricultural, we find in the National Forests several million acres of land which, before the establishment of the Federal reservation, were acquired under various forms of the public land laws. First among these are lands acquired by the payment of \$2.50 per acre under the iniquitous timber and stone act. Next come lands valuable only for their heavy stands of timber acquired under the homestead law with only the merest pretense at residence and cultivation by entrymen who had already exercised their rights under the foregoing act. This is followed by areas acquired under the lieu selection provision of the Act of June 4, 1897, and other forms of "scrip." Some of these are still owned by the original entrymen, but most of them have passed into the hands of innocent purchasers for value. But even without such transfers the titles are protected by limiting statutes.

Out of all this mass of confusion the situation as to titles may be summed up as follows: There are 20,327,933 acres of adversely-owned land in the National Forests. The adjustment of State equities will probably reduce this about 1,150,000 acres, and will at the same time probably reduce the net acreage of National Forest land about 800,000 acres, the remainder being selected by the States from public domain. Of the 19,117,533 acres of adversely-owned land which would then be left within the Forests we may consider about 5,000,000 acres of agricultural lands as of such character that their being left in private control permanently is desirable from the standpoint both of sound public policy and good economics. In this category will be found a con-

siderable acreage of land which was acquired originally under the placer mining laws, but which was really desired for farm purposes and is being so used. This applies to probably 10 per cent of the total area alienated under the mineral laws, or, say, to 100,000 acres. The use for mining purposes by individuals or companies is the highest economic use of the surface rights to probably 150,000 acres more in the National Forests. This includes unworked placer ground, sites for mining camps, hoists, mills, tailing grounds, etc. The surface of the remaining 750,000 acres of land in the National Forests which are claimed under mineral patent is chiefly valuable for timber production or watershed protection, the same as the surrounding National Forest lands. This does not mean that such lands are of no value for mineral, but that their topography is such that any minerals which they contain may be exploited, removed and utilized without reference to surface activities.



Hydraulic placer mining in the Boise National Forest, Idaho. As the miner advances he leaves behind him a boulder-strewn chaos from which the gold has been removed and the soil washed away. It is no longer of value for mining but in time will grow timber. Title should revert to the Government as it otherwise presents an abstacle to good administration.

Making due provision for the adjustment of State obligations and due allowance for agricultural and mining lands which should remain under private ownership and control, it is seen that we have within the boundaries of the National Forests an aggregate estimated area of 13,927,533 acres of adversely-owned lands which are, generally speaking, chiefly valuable for timber production and watershed protection, the very purpose

for which the National Forests were established and are being protected and maintained. In short, 3 per cent of the gross area in the National Forests is chiefly valuable for agricultural and mining and 88½ per cent is publicly-owned lands chiefly valuable for timber production and watershed protection, and 8½ per cent is privately-owned land of the same character.

But watershed protection cannot be made a source of private profit, and timber production on privately-owned land has naturally been unable to yield a profit in competition with the great free source of supply which the public has had placed at its disposal in the past. Consequently these lands have been used by their owners for other purposes that would yield them an immediate property return. Lands have been overgrazed. Timber has been cut regardless of consequences. Unchecked fires have spread permanent havoc.

The misuse of these lands in themselves has an effect upon the intermingled lands out of all proportion to their area. Although the 88½ per cent of the National Forests are Government lands, the remaining 11½ per cent often practically controls the entire area because such privately-owned lands were largely carefully selected with an eye to strategic control. We, therefore, have scattered throughout our reserved areas lands owned by men whose interests are totally different from the public interests and whose plans of management have quite a different basis than the broad public interests which must regulate National Forest administration. Naturally lands in which holdings representing divergent interests and policies are indiscriminately intermingled require an administration which takes such conflicting factors into account, otherwise the result could only be a deadlock injurious to all. Just as naturally the private owners are certain to use to the utmost the power of their strategic location to force plans of management and use most favorable to their own interests. There are other considerations entering into the question, but it does not appear necessary to go farther in order to see clearly that the private ownership of forest and watershed lands in the National Forests is undesirable from every standpoint of good administration, good economics, and good public policy.

It would seem that the foregoing presentation of the adversely-owned land problem in our National Forests revealed a sufficiently plethoric Pandora's box of difficulties; but only a part of the story has yet been told. These properties are still open to the operation of a great many of the public land laws under which various rights are every day being acquired.

All National Forest lands, excepting those purchased under the Weeks Law, are subject to acquisition under the mining

laws the same as lands in the unreserved public domain. This situation in itself presents endless possibilities of complication, a detailed explanation of which would require a chapter in itself. The Act of February 25, 1920 (Public No. 146), authorizing the leasing of coal, phosphate, oil, oil shale, gas and sodium, was a long step in the right direction. This law provides that Government lands containing deposits of minerals of the character named are no longer subject to private acquisition, but the mineral bodies may be worked under leases issued and regulated by the Secretary of the Interior. Possibly some modification of this principle should eventually apply to other mineral lands within the National Forests, perhaps limiting the patent to the ore bodies and such use of the surface as may be required for their development and exploitation. Such adjustments as may eventually be necessary will no doubt be worked out without injury either to the public forests or to the mining interests.

Much more intricate is the application of the various rights-of-ways acts to lands within the National Forests. Rights-of-way for canals, ditches, or reservoirs for irrigation purposes may be obtained in the National Forests under the act of March 3, 1891; rights-of-way for dams, reservoirs, water plants, ditches, flumes, pipes, tunnels, and canals, for municipal or mining purposes, may be secured under the Act of February 1, 1905; rights-of-way for telephone and telegraph lines and power lines may be obtained through the National Forests under the Act of March 4, 1911; rights-of-way for railroads may be obtained under the Act of March 3, 1899. Nor does this entirely exhaust the list of laws under which easements of various kinds may be obtained within the National Forests.

To make the situation even more complex, the Government has not followed a uniform policy in handling such lands as are under its control within the various National Forests. The most glaring case is presented by the situation in a number of National Forests in the State of Oregon. By the Act of June 9, 1916, the Government became revested with the title to 2,300,000 acres of land formerly granted in aid of construction to the Oregon and California Railway Company. These lands passed into the possession of the Southern Pacific Railway Company, and through failure to comply with the terms of the grant the Government, based upon a decree of the Supreme Court, reassumed title and jurisdiction, at the same time reimbursing the railroad for the loss of the grant. In recovering possession of these lands, Congress made provision for the sale of the timber and the distribution of the land to homesteaders and others. Over a half million acres of these lands entirely unsuited for agricultural

use lie within the boundaries of existing National Forests. The even sections are National Forest lands belonging to the Government. Upon such even sections the Government plans to practice forestry. Upon the odd sections which it recovered from the railroad the Government does not plan to practice forestry, but proposes to sell the timber, allow such indiscriminate cutting and waste as suits the fancy of the purchaser, and permit the lands to pass to private ownership. It is hard to imagine a more illogical situation, and hard to believe that it will not eventually be remedied by Congressional action. Surely such a monstrosity cannot be perpetuated.

The land title problem in the National Forests then comes down to five broad classes:

(1) Agricultural lands which should remain in private ownership. These present merely an unavoidable, but necessary, administrative problem. In a large measure the same thing may be said of the land which has been acquired under the mineral laws and the surface of which is actually used or needed for mining purposes.

(2) State lands, a problem which is being removed by a method satisfactory both to the State and Federal Government.

(3) Rights-of-way secured under various forms of public land laws. Like the agricultural and true mining lands, these are merely an unavoidable, but necessary, administrative problem. They require careful consideration and should not be extended by legislation beyond the actual needs of the broad public purposes which they are intended to serve.

(4) Special legislative problems, such as is presented by the Oregon and California Railway lands already referred to.

(5) Approximately 13,927,533 acres of land which are chiefly valuable for timber production and watershed protection but, although within the boundaries of the National Forests, are now owned by individuals or corporations.

This last class of land presents the greatest opportunity for constructive work in rounding out these great forest-producing properties, making them most useful in the future, and simplifying their administration, protection, use and development.

The urgency of this problem is apparent when one studies the area tables for the different National Forests. Some of the forests are more than 50 per cent in private ownership. The Tahoe National Forest in California contains 677,319 acres of privately-owned land, as compared with 545,063 acres of Government land. The Shasta National Forest in the same State presents a comparable situation, having only 809,014 acres of Government land intermingled with 777,866 acres of adversely-

owned lands. There were over 300,000 acres of adversely-owned lands in each one of 14 different forests June 30, 1919. There were between 200,000 and 300,000 acres of adversely-owned lands in each one of 23 other National Forests on the same date. Thirty-one National Forests contained between 100,000 and 200,000 acres of adversely-owned land each. The nearest approach to complete Government ownership is found in the case of the Kaibab National Forest in Arizona, which contains only 561 acres of privately-owned land as contrasted with 752,339 acres of National Forest lands.

Some little progress has already been made by Congress in placing in the hands of the Forest Service administrative authority and machinery for the ultimate solution of the more vexing problems presented by privately-owned lands in National Forests. This legislation, however, has been of a fragmentary character.



Lodgepole pine on the Medicine Bow National Forest, Wyoming.

By special act of Congress enacted March 4, 1911, the State of Oregon was granted the right to select certain desert lands in that State in exchange for certain school lands within the National Forests of that State. These exchanges have been consummated, thereby simplifying the problem to that extent.

Another special act of Congress, enacted July 31, 1912, enables the Federal Government to exchange public lands in the State of Michigan and to secure from the State private lands

desired for National Forest purposes. Exchanges approximating 50,000 acres are already under way in that State, and it is hoped by this means the problem presented by the 74,000 acres of adversely-owned land in the National Forests of the State of Michigan may be substantially eliminated.

Congress has also authorized the Executive Department to acquire privately-owned land within the Paulina (now the Deschutes) National Forest in the State of Oregon by giving in exchange National Forest land of equal area and equal value. Exchanges approximating 40,000 acres have been made under this provision and the lines of the forest reformed so as to exclude the consolidated area. On the Zuni (now Santa Fe) National Forest in Mexico, a considerable area of privately-owned land is being acquired under the provisions of a special act which passed Congress August 22, 1912, National Forest timber being given in exchange therefor. In this instance Congress fixed the basis of exchange, Government timber and privately-owned timber being valued at 62½ cents per acre.

The Ochoco National Forest in Oregon was made the subject of a special act of Congress passed June 24, 1914, authorizing the acquirement by the Government of privately-owned land within the exterior boundaries of the forest by giving in exchange equal area and equal value of National Forest land. Under the provisions of this act several exchanges have been consummated and the boundary lines may now be revised so as to exclude the greater part of the privately-owned lands.

A more advanced form of legislation is furnished by the Act of July 3, 1916, which authorizes the acquirement of privately-owned lands in the Florida National Forest by giving in exchange an equal value of National Forest lands, area in this case being disregarded. Under the provisions of this act the privately-owned lands within the Forest, which now considerably exceed in area the National Forest lands, are being rapidly acquired. The Government now owns only 308,268 acres of land within boundaries, embracing a gross area of 675,420 acres. Within ten years the land exchange work upon this forest should be substantially completed, at the end of which time the Government will probably be the owner of approximately 550,000 acres of land practically free of alienations. It is possible to acquire a large acreage because of the cut-over condition and low market value of the privately-owned lands, \$2.00 per acre being the valuation accorded such lands in exchanges thus far consummated, although they are very fair lands for producing timber.

The Forest Service has been given authority by Congress,

in an act passed September 3, 1916, to acquire privately-owned lands within the Whitman National Forest in Oregon by giving in exchange an equal value of Government timber. This is the most desirable form of exchange legislation thus far sanctioned by the law-making body. With this authority the Forest Service will eventually be able to acquire all the privately-owned lands within the National Forest chiefly valuable for timber production or watershed protection, provided the owners are willing to dispose of them at a fair valuation. On the day Congress passed this law it also gave the Forest Service authority to acquire privately-owned lands in the Oregon National Forest in the State of Oregon upon the same basis as in the Florida National Forest. This measure is being used chiefly as a means by which to acquire the privately-owned lands on the watershed furnishing the water supply used by the city of Portland, thereby safeguarding the water supply from the danger of contamination through misuse of private lands.

Finally, at the present time there is pending in Congress 36 individual exchange bills very similar to the foregoing measures. Eighteen of these are in the House and eighteen in the Senate. These bills involve 26 different National Forests, and, while varying somewhat in their particulars, are all of the same general tenor. The multiplicity of measures originating from so many different parts of the country indicates an urgent need for general legislation of this kind, this fact being recognized by Congress to the extent that the Public Lands Committee, before whom these individual bills are pending, has turned aside from the study of this multitude of special measures and has now under consideration a bill general in its nature. The passage of such a measure, which is apparently merely a question of time, will place in the hands of the Forest Service a reasonably adaptable instrument with which to solve a considerable number of the most pressing land title problems now hampering the administration of the National Forests. The solution of these problems, however, will not be the work of a single season, but will require the best efforts of at least a generation.

The important fact for the public to hold always in mind is that it will take fully a generation of hard and earnest work, and the transfer of probably \$100,000,000 worth of Government land and timber, to repair the injury already inflicted upon our great National Forests by land alienation, much of it needless and unwise. Surely, with such an example as a warning, the mistakes of the past will not be repeated in the future.

THRILLING TALES OF THE TUSCANIA

All good stories should have an introduction, and as the collaborators wrote distinct accounts of the sinking of the *Tuscania*, it is necessary to harmonize the stories somewhat. It was the original intention of the editor to combine the separate narratives of the authors into a single story, but each was distinct enough to merit printing entire. Suffice to say that each got off the boat alright, which seemed to be the principal object in view at the time. The editor met Shorty Hoyer a month or so later and he was very willingly chopping wood in France. Nevertheless, we are proud of the fact that we had five Ames foresters on the *Tuscania* and are more than glad that they are still with us.—*Editor's Note.*

FROM THE ROLLING DEEP

By V. B. Hoyer ('20)

"Let's sink her again." Such was the main occupation of the good ship *Tuscania*, sunk by a German submarine off the coast of Ireland on February 5, 1918. The men would, for some time after that day, gather in small crowds and indulge in the popular indoor sport of sinking the ship again. Many and wondrous were the tales told at these impromptu gatherings.

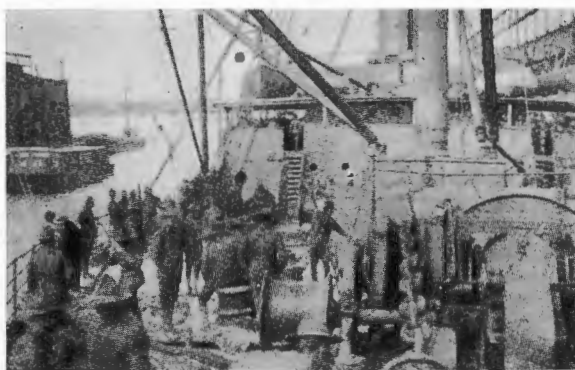
Along in December, 1917, the patriotic fever was running high, with the result that R. A. Fletcher, E. M. Davis, John Evans, George Hartman, Charles Ineck and myself, all being, or having been, students of Forestry at Ames, enlisted in the 20th Engineers (Forest) and eventually found ourselves at Jefferson Barracks, St. Louis, where we performed the act of raising the right hand aloft and saying "I do" at the designated time.

January 2, found Ineck, Evans, Davis, Fletcher and I on board the troop train speeding toward Washington, D. C., at which place the 20th was being mobilized. Ineck, Davis and Fletcher landed in Co. E of the 6th Battalion, but Evans and I were out seeing the camp at this time, so we found ourselves in Co. F of the same battalion. After a stay of seventeen days at Washington, we were again on our way, this time headed for the docks of Hoboken.

We ferried across the river and immediately boarded the liner *Tuscania*, which had been converted into a transport. The

first leg of our ocean journey was a 48-hour trip to Halifax, Nova Scotia, where we picked up the convoy consisting in all of thirteen ships. From here we sallied forth upon the rolling deep and then ensued day after day of monotonous travel and poor grub.

Along about noon of February 5, we sighted the shores of Scotland and later those of Ireland. With land in sight and several British torpedo boats which had met us a couple of days previous, everyone felt quite secure and were looking forward to the landing in Liverpool the following day.



Leaving Hoboken.

Just when day was about to yield to night, at five minutes of six o'clock, there was a terrific explosion on the starboard side, which shook the ship from bow to stern. There was no question in the minds of anyone concerning the origin of that explosion. Almost at once the men came pouring up from below and sought their various stations. For a bunch of men with as little training as our battalion had had, there was very little confusion. The American bump of curiosity was largely in evidence. Practically all but those who were to go in the first boat on our side were at the rail to see how a lifeboat was manned. The boat was lowered quickly enough and, with a load of perhaps fifty men, hit the water right side up, but was almost instantly overturned, precipitating the men into the ice cold waters of the Irish channel. The lowering equipment seemed good for only one boat, as the second was lowered about ten feet where it jammed and the efforts of the men at the winches only served

to tilt it enough to spill out the five or six who had gotten in on the highest deck. These men were treated to a plunge of about twenty or thirty feet into the frigid waters below. The cries of those who were now in the water were plainly audible to those who remained on deck, and one is not likely soon to forget the despairing anguish in those cries for "Help." Nothing could be done for them save pulling aboard such as could be reached with a rope. Boat No. 2 was finally launched by the simple expedient of severing the ropes and allowing it to drop. When it was thus unceremoniously precipitated into the briny deep, I figured that my chances for a long life had appreciably diminished, as it was the boat in which I had for some time planned on finishing the voyage in. After this unexpected departure of the boat to which we were assigned, we were detailed to the upper deck to assist in launching another. But as they weighed five tons, our efforts were of no avail and were finally called down and lined up on the port side. Our captain told us that a boat was coming to take us off, but it was a long time coming and time began to hang heavy on our hands. By this time the ship had such a decided list to the starboard that it would have taken a wampus to stand upon it with any comfort. Finally, however, we were ordered up on the next deck and over to the starboard side and then down a deck. There about a rod or so away stood the "Pigeon," a British torpedo boat, and the hundred or so of us that still remained on the doomed vessel quickly transferred ourselves to the smaller craft by crawling across the intervening space on ropes. One or two met with a ducking here by jumping onto ropes which were not fastened at one end, but the men were quickly hauled aboard by the British sailors. As soon as we were all stowed away, the destroyer started putting distance between herself and the sinking ship. After a four-hour run we entered the harbor of the small town of Buncrana and unloaded into small sloops which conveyed us to shore. How good "terra firma" did feel. We immediately struck out for a camp some three miles out of town, where we were given some hot soup which tasted mighty good. I ran onto Evans here and we were certainly overjoyed to know that each other had pulled through all right. Some Irish soldiers sacrificed their hunks and tucked us in and we put in a few hours of good, sound slumber. The following day we moved to Londonderry and then to a convalescent camp at Randallstown. Here we were joined by the other three, and right glad we were that our Ames contingent was still intact. The other three got away on a raft and put in half the night drifting until they were picked up and taken to land. We are all of the opinion that "A life on the rolling deep" is not to be desired.

ONE OF THEM SUB BOATS

E. M. Davis ('16)

"There's Scotland, lads, and you'll soon see Ireland on the other side." A ship's officer was speaking to an olive-drab group of Yanks as he pointed out a bluish line where sky and water met. Thirteen days before the *Tuscania* had left New York for Halifax, completing a convoy of thirteen ships. There had been sickness and sea sickness, overcrowding and under-feeding, little heat, less ventilation and endless military restrictions, so that now the officer's announcement was doubly welcome, as he had added that we were due to dock in Liverpool by midnight. The Scotch coast rose higher and more distinct, and in half an hour Ireland also was plainly visible. Here and there a distant lighthouse blinked in the early dusk of February. The groups split up and dissolved as the boys went below for mess.

Down in E.5 a sea lawyer from the Ozarks had the floor. "Why one of them sub boats ain't got no more chance than—" Boom! a muffled, jarring explosion brought the *Tuscania* to a standstill. The lights went out, one side slowly settled, and from some point in the darkness below, the sound of rushing water could be heard.

Then, as the novelists say, "pandemonium reigned." Grasping mackinaws, life belts and hats, we blundered through the blackness in the general direction of the stairs, colliding with bunks, posts and each other. Here rose a voice with a quaver in it, and there a string of "cuss words" inspired by a barked shin or a bumped head. "Here's the stairs." "Take your time," "Don't crowd," and several hundred scared Yanks groped their way up the narrow stairs, through a long hall and up a second flight in a way that was orderly as compared with the three daily stampedes for the mess hall.

Many of the troops had already reached deck and were lined up at their stations, calling out their lifeboat numbers to guide the missing ones. On reaching my boat, I found half a dozen cockney sailors preparing it to launch. They appeared to take more than usual interest in their work. By the time the canvas cover was removed and the oars got out, the boat's full quota was present.

The men previously assigned to lower the boats had never seen it done in the daytime. When they tried it in the dark, complications followed. One side of the *Tuscania* had settled till the deck lay at an angle of about 20 degrees. As a result, the boats on the high side could not swing clear when lowered.

Lifeboat 14 was finally swung out and jerkily started down. Suddenly one end, dropping several feet, nearly spilled the occupants before the other end caught up. Next a projection caught her side. As the men above continued to lower she tipped sideways farther and farther. Then came a sound of breaking wood. "Blast it," said a cockney, "there goes a bloody 'ole in'er. She reached the water and proved him to be wrong. By the time we had unhooked the lowering tackle several men joined us by sliding down ropes, filling the boat and and we pushed off.

For the first time there was leisure to notice what was happening around us. From the bridge, red rockets rose and burst, one after another. The *Tuscania* seemed deserted by the rest of the convoy. But from behind her shot a low gray destroyer and then another. At full speed they passed and disappeared. Several heavy explosions followed: "Depth bombs," muttered a sailor, "Hope they got her." The light from the rockets showed several boat-loads safely rowing away. But some boats were hanging by one end, half way to the water, empty. Others had capsized in launching and many dark specks were rising and falling with the waves. Though boat 14 was too full to be easily handled, oars and waves combined, soon carried us out of sight of the liner and the other boats.

A nervous reaction set in as the height of the excitement passed. Two men started an irritable argument as to whether a mine or torpedo had done the damage. Another was growling over his favorite razor left behind. A chronic poker player had some sorrows to air, "First luck on the whole ——— trip. Must have been \$60 in the pot. I just won it and blooey! they got us. ——— if I didn't get up and go right away from there and clean forget that cash." Above them all rose the almost hysterical voice of a stoker. "I'd been above and was just going back down the ladder. It hit square in the boiler room. Twenty of us in that watch and me the only one left. I know it. I was spattered with the pieces of them." Someone had just told a cheerful tale of a sub turning its machine gun on crowded lifeboats, when the stoker cried, "Look, there it is." Sure enough something was moving toward us on the crest of a wave. Nearer it came and, finally passing, we could make out a capsized boat with three or four men clinging to the bottom. Our calls were not answered.

The night became darker; the winking lighthouses seemed no nearer. The sea grew steadily rougher and a time came when we could barely keep her bow to the waves and constant bailing was necessary.

From some point ahead, the white beam of a searchlight

swept back and forth across the water, missed us and passed on. We could neither reach that ship nor make ourselves heard above the wind and waves.

It must have been an hour later when something a shade blacker than the night loomed up close by. A tiny spark of light showed it to be a ship. "Altogether now, yell." No equal number in any bleachers ever yelled louder. A faint reply came and the ship steamed around to windward, where her bulk partly sheltered us from the waves. Ropes were thrown. Two or three who were wise in the ways of boats caught them and took turns around cleats, taking up slack and letting it out as No. 14 rose and fell, bringing her close to the other. Her rail seemed hopelessly out of reach till a wave came. As the boat rose quickly, three men crouched, jumped, cleared the rail and landed squarely on deck. The wave, receding, dropped us 15 feet, only to be lifted up by the next. With every rise a few men made the jump. Now and then one fell short a trifle, but always he was caught and pulled aboard by the sailors. At last the empty boat was cut loose and drifted off in the darkness.



Good Old Irish Spuds.

It was not an entirely cheerful group around the stove in the forecastle. A few were seasick; a few more, wet through, stripped and crawled into the bunks while their clothes steamed on the wires above the stove. One man anxiously inquired for

news of his brother, and the poker player still mourned his luck. I wondered about the four other Ames foresters and missed Fletcher, who was assigned to my boat.

In came a sailor with hot tea. A volley of questions met him. He replied that we were aboard the trawler "Gloria" of Larne, Ireland, having drifted twelve miles from the spot where the Tuscania was torpedoed four hours earlier. "She sank an hour ago," he said. "It's light your losses will be with a dozen trawlers out and her afloat so long." A sergeant entered and, after taking names, remarked, "Well, boys, fifty-three of us; not so bad for a forty-man boat."

The Gloria bumped against the dock in Larne at one a. m. A small but sympathetic crowd was gathered in the street where motor busses waited for us. For a mile or so we rumbled through the dark, silent streets, stopping at a large hotel. A cordial welcome was followed by a hot meal, after which the crowd gradually drifted upstairs to bed.

Music, of a sort, woke me at broad daylight. It was "Over There" as interpreted by a muscular pianist and a dozen or more powerful pairs of lungs. "More of the gang," I thought, and hurried below. One of the first persons I met was Fletcher, wearing one of the few campaign hats remaining in the crowd. Mine, like most of the others, had been lost in the shuffle, so I hummed him for a shilling and bought a cap. He had no news of the other three Ames foresters.

Throughout the day our numbers increased to about 400 as other trawlers came in. The American invaders were met with such uniform kindness that we left Larne with regret on the third day; half the town waving goodbye from the station. For two hours, tiny green fields separated by low hedges and thatch-roofed stone villages, slid past our windows before we stopped at the village of Randallstown.

There on the platform stood a squad of pipers in the Highland uniform. With pipes squealing and kilts swinging, they led the column down the street and into a large camp. Among the soldiers that lined the street were not a few Yanks. Suddenly I recognized one. "Hello, Shorty Hoyer! Fletcher's here! You alone?" "No, John Evans is with me." A little farther along I saw John and exchanged hellos. To celebrate the reunion we attended a free lunch at one of the canteens.

This, we learned, was a convalescent camp for the Scotch Highland regiments—the Gordons, Black Watch, Seaforths and others. Few of the men had seen less than two years' service and all had at least one wound. As at Larne, our treatment was all that could be desired.

A week later the scene shifted to Winchester. On this first

morning in England, the Sixth battalion lined up, as usual, to get something or other that should have been issued long ago, also as usual. The headgear was varied—American, British and civilian; the coats, ditto; likewise, shoes and leggings. A “hardboiled” English scrub woman gave a look, sniffed contemptuously, and observed to her friend, “I bet the Germans run like hell when they see this bunch coming.”

We learned that there were other Tuscania troops in camp, but quarantined. Not all, however, for a familiar head popped around a nearby building, searched the line for some friend and, finding him, grinned. There was a stage whisper, “Is Ineck in your gang?” “Sure,” answers the head. And the Ames contingent was accounted for.

HOW I GOT OFF

By C. H. Ineck (ex-16)

I am sorry that the Editor-in-Chief has such a good memory as to remember that I was a passenger on the torpedoed transport Tuscania. Because of this good memory I am obliged to relate a part of my experience just to please him and to help him fill up space in his magazine. I am glad that Fletcher, Davis and Hoyer are also relating their experience. I know that they are more capable of describing events than I, and will do full justice to the events as they happened up until the time that our ship was hit by the torpedo. At this place I will have to begin my narrative, as I believe that my experience in getting away from the ship and seeing land again was somewhat different from theirs.

For the first time in my life I missed my supper and never thought of it again until the next day. I believe I had a good reason to forget it. I was in my stateroom and had just looked at my watch; it was 5:55 p. m., I went to mess at 6:00 o'clock sharp and, as I always made it a practice of being on time for this regular event, I decided to go down the galley. I sat on my bunk and had just reached out to get my mess kit when the torpedo struck. It was a sharp report, followed by a crashing, jingling sound; the lights went out immediately and the ship tilted to starboard side; the show was on, and my mess kit, and mess, entirely forgotten.

I managed to pick up my mackinaw and life belt in the dark and I didn't lose any time hunting for my hat or getting out into the hallway. On my way out to my lifeboat I had clear sailing, as the hallway was not very crowded. Some one right ahead of me went out singing “Where do we go from here,

boys?" If he really felt like singing, he certainly felt differently than I did, and if he was trying to make believe, he certainly made a good job of it. I got out to my life boat, No. 13-A, just as the storage battery lights came on and just in time to see life boat No. 13 go down end first into the water, spilling all its occupants into the cold sea. Boat No. 13, being right over our boat and lowered by the same rigging, gave some of our men, who were out in time, a little knowledge about how to free and swing and lower a boat, and we profited a great deal by their mistakes and accident. When our boat was clear and the ropes ready, we were more particular and careful about the knots and pulleys and twisted ropes, and instead of loading the boat with men before lowering, we allowed only ten men to get into the boat; I was one of the ten men. The rest who were assigned to the boat were to lower us to the water and then come down on the ropes. Ten of us got into the boat and the rest of the crew swung us out and began to lower us. We went down very nicely until within twenty feet of the water, when the pulley on my end of the boat broke and down we went end first. I don't know what I grabbed, but it was something solid. I was determined to hold to the boat whenever, or however, it went, and I did, even though five or six men from the other end did try to jar me loose. Very luckily the boat righted itself and nothing more serious happened than that it half filled with water and threw a few of the fellows out into the water, who were fished out, however, before we left the ship's side. The fun began when the rest of the 32 men of our boat began coming down the ropes and dropping into the boat, and some around it. Those who were successful enough to hit the boat were left to untangle themselves; those who dropped into the water were pulled into the life boat. It was only a matter of a few minutes until we were ready to pull away from the ship. It was lucky for us that the last man to get into our boat was an old sailor, the ship's chief gunner, and an Englishman. He was immediately voted commander-in-chief of the boat full of landlubbers, and it was some job he had, but he did it well. Had it not been for him I'm afraid I might not be here to write this story.

Can you imagine 32 men in a life boat with five oars, men, many of whom had never seen the ocean before and who had never even rowed a small lake boat? Can you picture these men rowing this large life boat with twenty-foot oars on an ocean that tossed us around like a small cork on a rough lake? We had a hard time pulling away from the ship, although there were at least five or six men to an oar, some pushing, some pulling, some cursing and a few quiet. After ten or fifteen minutes arguing, working, pushing and pulling, we managed to get away

from the ship, and here the Englishman took charge and began to give out orders, when things worked better. When we were far enough away from the ship and out of danger of the suction, should the ship sink immediately, and when we began to feel once more that we had a chance, some one mentioned a smoke, and everyone wanted a smoke or a chew. One man found a plug of salted chewing tobacco, and it went around to the chewers. Another fellow found one dry cigarette. It likewise passed from man to man among the smokers, and you may believe that it was a lip-burner before its life was done. Our boat was half full of water and the plug was out of the bottom, so with one army hat, one small tin can and one pail, those men for whom there was no room at the oars, bailed water out of the boat. This practice was kept up all night and we were able to hold the water at an even depth inside the boat.

As we worked our way farther away from the sinking ship we could look back and see the lights, they were still on; this was between 7 and 7:30 p. m., and we could see the form of the ship as she stood there with the starboard side of her main deck nearly touching the water. Dim forms of men could still be seen moving around on the decks. Occasionally a red skyrocket would penetrate the sky and burst high above the troubled decks from which it started. Finally the lights went out and we lost all sight of the Tuscania. We wondered about the rest of our comrades—how many were left behind—and it was several days before we knew.

We were out on the rough ocean in a life boat, without fresh water, a boat half full of salt water, wet from head to foot, no help in sight, and nothing more than a few life boats



This looked good to the boys.

about us in the same circumstances. One or two upturned boats, a raft or two and other articles washed from the decks of the ship floated about. The question arose—what shall we do, where shall we go? We sighted a lighthouse on the Scotland side of the channel, and the gunner told us that it was a lighthouse on an island off the coast of Scotland, about 15 miles away. By heading for the light the high wind was in our favor and helped us along. Everyone in the boat was in favor of heading for the light, anywhere, any direction, as long as there was hopes of finding land. Thus we started our all-night journey toward the light and toward the Isle of Islay, just off the coast of Scotland.

It was rough going, great waves would break over us, drenching us with cold, icy water; at one moment the bow of the boat would be five or ten feet higher than the stern and the next moment just opposite; water was not only coming into the boat from the bottom, but over the sides as well. The hat, the can, and the bucket were doing double duty. Once, twice and three times, a destroyer already loaded with survivors sighted us, drew up to us, flashed their searchlight on us, looked us over, and sailed away. Each time our hearts were filled with joy only to drop again with disappointment when the boat would pass on, but they were only searching for parties who were less fortunate than we. After the third boat passed us by we decided that we were being left to help ourselves, and it was up to us to save our own lives, so we pulled hard toward the light. Under the directing orders of the gunner we were rapidly becoming good seamen. We had to be for we had a big job ahead of us which the gunner had already warned us, and that was, that we must keep away from the rocky coast until day light. He knew that if we tried to land, our boat would be smashed to pieces on the rocks and that probably not one out of ten would come out alive. We learned the reasons why a little later on.

At about 3:00 o'clock a. m. we came so near the shore that we could see the dim outline of the rocks just a short distance ahead of us. Everyone was tired and several men were down and out and layed down in the water in the bottom of the boat, others had great blisters on their hands from rowing. I was all in but managed to take my turn at the oars. Every one in the boat wanted to take a chance to land. That solid rock looked good to us even though we knew the danger. The gunner said, "No." We insisted on landing so strongly that finally he said, "All right, if you want to die, land your boat. I'll take a chance with you but it's the slimmiest chance you ever had." So we pulled together again getting closer and closer to the shore. By this time we were trying to pull away from it but the wind

and tide were so strong that we only lost ground and came closer to the rocks and the great white breakers. At about 4:30 o'clock we were within 200 yards of the rocks, every man on his feet pulling and pushing somewhere on an oar, every ounce helping to hold our own against the wind and waves with only two men in the boat helpless. This last fight lasted for a good half hour. We were carried to the right by the tide and managed to keep our distance from the rocks. Still pulling with every ounce of our remaining strength we rounded a high rock cliff and within only a minute or two of the darkest period of the night we found ourselves in a quiet, windless, waveless and tideless spot. It was hard to believe. We could still see the rocks ahead but what were they, when there was no wind or waves to drive us into them? If we could just stay there until day light, only a matter of an hour or so, we could find a landing.

Carefully and slowly we worked our way among the rocks. Someone sighted a light a few hundred yards ahead. We all sighted it and watched it. The light was moving. We forgot about our oars and we might have lost them all had they not been fastened to the boat. The gunner let out some kind of a seaman's call that sounded like a mixture of Scotch and English dialect. He received an answer and the light described a half circle through the air. "It's a landing, boys, a small port." No one in the world can imagine my feeling when he said that—not only mine—there were others also. It did not matter then if the boat did wreck on a rock, the light was close. I felt like getting out and trying my luck at wading it, if I couldn't wade I could swim, if I couldn't swim, I could sit on a rock until a boat came after me anyway. Anything only to get my feet on something solid. We were all so excited that the ending of our seamen life was worse than the beginning, our oars became twisted and we were all talking at once for the first time that night. As we drew nearer the man with the light we could see a dock, back of it a village. We made for the shore and began jumping out of the boat while the water was still neck deep. Several Scotchmen had appeared with lanterns by this time; our noise, yelling and talking had awakened the whole village population, and by the time we were all off the boat the women were also up, fires were burning in the great fire places of the hotels and houses that took us in. The village was Port Ellen on the Isle of Islay; it was 5:00 a. m. February 6th. Not until we were around the fire warming up did we realize what we had gone through, how narrow our escape and we wondered what had become of our friends and comrades. This was the saddest and yet the happiest hour of our lives.

Then came the wonderful breakfast, that first meal after

the supper which I had missed and forgot about so suddenly. We were clothed, fed and cared for by these good people who gave us everything they had. We were there four days, and because of their kindness and generosity and because of all the wonderful things they did for us, when we finally had to leave it was like leaving home. Don't let those other fellows make you believe that Ireland was a better landing spot, for I know; I like Scotland best.

From Port Ellen we were taken by water and by rail across Scotland to Glasgow, then to London, where, because of our uniformed appearance we were once taken for Bosche prisoners. From London we were taken to Winchester, England, where our battalion was essembled and re-equipped. Many great meetings took place at Winchester, reuniting of friends, comrades, and brothers who had been separated when the ship went down. Many yarns were swapped and it was a very surprising fact that at least fifty men were the "last" man off the boat.



"Liz" Hicks ('15) right.



Arcoplane View of "La Belle France."

LOG DRIVING IN FRANCE

R. D. Morris (ex-16)

On the entrance of America into the great war, following the example of England and at the instigation of the United States Forest Service our government immediately started the organization of lumbering units to supply the needs of her army.

The first of these units was the 10th Engineers which was mobilized at Washington, D. C., during July and August, 1917, and which was composed of lumber jacks, millmen, and foresters, enlisted from the lumbering regions of the U. S. As the plan at first was to attach this unit to the British army, it was transported to Europe on an English vessel, the *Carpathia*, which sailed the 10th of September and landed at Glasgow, Scotland, the 2nd of October. The men of the 10th were the first Americans to land there along with the 2nd Engineers. From there the 10th was immediately shipped to Southampton, England, to await transportation to France.

After four days' wait at Southampton they were taken to La Havre, France, and from there to Nevers, France, where they remained three weeks while their equipment was being assembled and distributed among the different companies and detachments.

During the passage from America to England, however, it was decided that the U. S. army needed the foresters for themselves so from Nevers they were sent by companies and detachments to different parts of France where the Americans had purchased timber.

Companies B, C and part of company A were sent to Pontenx Les Forges in the Landes district, where, at the request of her captain, Co. B. received a tract the farthest of any from the railroad. It was decided that the logs might be driven about four miles on the Courant River in case the timber was found to be buoyant enough. After an insufficient test the captain decided it was.

The timber was maritime pine (*Pinu maritima*) and closely resembled our Southern pines but was heavier, more brittle and more resinous. It had all been turpented heavily for many years. The middle cuts of the trees did float, but extremely low, while the tops which were cut to a top diameter of 4 feet, for the most part went to the bottom and had to be pulled out, peeled, and decked to dry. A large percentage of the butts which were scarred from constant turpentering and were heavy with pitch, as a consequence also became deadheads and had to be pulled out and decked.

The low buoyancy of the timber made driving hard, as they jammed more easily in the shallow places and because so few of them would carry a man the drivers needed to be extremely nimble and quick on their feet and usually got soaked all over before the day was finished. The cheaper and more practical way would have been to railroad them.

The river itself was small and shallow with sandy bottoms and banks which shifted constantly, causing a continuous need of improvement to keep it driveable. It was also crooked which necessitated a large number of sheer booms to protect the banks. On the upper end of the driving part the water was faster, with several rocky riffles where wing dams were put in to deepen the water enough to permit the passage of the logs.

When the drive first started the river had alternating pools and shallows. After a few months' driving the sand had washed from the shallows into the pool so the river was practically the same depth everywhere and that depth was too shallow.

Every time the logs jammed, the water washed the sand from the banks, widening the river and throwing up a sand bar just below the jam. To remove this a couple of wing dams had to be built, which made the water run fast enough to clear the bar.

The logs were discharged from the river into a lake across which the logs had to be rafted for about one-half mile to the mill.

The river had built up a small delta at its mouth through which were three different channels. The logs were confined to one channel by a double row of sheer booms on each side of the river, which were held in place by piling driven about 10 feet or 12 feet apart. The other two channels were dammed to give sufficient flowage to carry the logs into the lake.

The trail booms for rafting the logs were fastened to the last piling on either side of the river. These were made of fifteen boomsticks each, fastened together by chains and dogs. The sticks were 25 feet long and of the largest trees.

As the channel at the mouth was only about 20 feet wide, in order to change trails a rope was fastened to an end of the full trail and to one of an empty trail, the rope flung to men on the opposite side who pulled it across, closing the full trail and swinging the empty into place where it was fastened by ropes. The full trail was then closed and allowed to drift into the lake where it was picked up by the launch and towed to the mill.

As these trail sticks soon became water logged it was necessary to keep a supply of about 50 extra sticks on hand. The wet ones were pulled out and dried. The trail sticks were all peeled.

During the rainy season, from October until May, the driving wasn't so hard as there was a fair flow of water, but during the summer months when no rain fell the larger logs would drag the bottom in many places, causing numerous jams and in places had to be either rolled or shoved through.

Driving was also made disagreeable by sand sifting into the shoes and stockings where it had an action on the skin similar to what a rasp would have. It was especially bad in between the toes where its presence was followed by an absence of cuticle.

Another disadvantage was our inability to obtain caulks for our shoes which caused a lot of unnecessary and undesirable baths, especially when the water was cold. The best driving shoes we had were the regulation army, hob-nailed boots, and hobnails don't stick extra well on logs especially where the bark is loose or missing.

The French people whom we encountered along the river seemed to think it scandalous for us to get as wet as we did and some of them used to tell us we would get sick and die, mentioning for proof the case of a man who fell in about twenty years ago and died from the effects of his wetting. However, the French peasants aren't used to external applications of water so we attributed his death to that cause. At any rate, none of us suffered any ill effects aside from a few twinges of rheumatism.

The work itself would not have been so hard and disagreeable if we had had sufficient equipment and tools to work with, and this I think was due to the inability and inefficiency of our company commander.

(Editor's Note—The only reason the editor let this paragraph in Morris' story get by was because one night Morris and the editor returned to camp at Nevers, France, about three minutes late and were met at the gate by the company commander who politely informed them that in consequence of their tardiness they would be restricted to camp for a few days and would be requested to do a little extra labor. Therefore the above is "my sentiments.")

The annual banquet of the Forestry Club was held April 29, at the Hotel Sheldon-Munn. This banquet marked the return of pre-war activities as none had been given since the spring of '17. "Ping Bode" acted as toastmaster this year.

*RUNNING RECONNAISSANCE OF FRENCH MARITIME
PINE FOR THE BRITISH ARMY.*

By R. A. Fletcher ('20)

The best thing about this story is, it's true. All the dates, places, people and facts are real and can be verified upon examination. For that reason it may have a little more interest for those people who do not care particularly how a forest reconnaissance is run, but who might be interested to know how two Americans came to be attached with the British for ten months and what they did in that time.

My outfit, the 6th Battalion, 20th Engineers, Forestry, pulled into Castets the 13th of April, 1918, and immediately began the job of putting up a semi-permanent camp. I landed on the job of checking out lumber from a small French saw mill nearby, for the use of the battalion in building our own sawmills and for various other purposes. We were located in the British zone of timber operations and for that reason were more or less under British direction at least as far as logging went, but that I found out later.

Among other things which we had all been asked to do two or three times in the past was the jotting down on a card of whatever kind of work we had done or could do. One thing I put down was surveying, without the least idea at the time of what those few words would soon lead to.

It was the morning of April 26th and I was just on my way to the French mill when Capt. E. J. Gillouly stopped me casually and inquired if I had ever surveyed any timber. I answered in the affirmative and he said there might be a little work along that



The cork trees of Southern France Camp Canonda le, Bordeaux, France

line in a few days. That was all there was said at the time and I went on over to check out lumber. However, the morning was only well started when the orderly came over and told me I was wanted at the office. Maj. F. S. Kellogg and Captain Gillouly were there and the first thing they asked was if I wanted to go out surveying for a few days with a British major, I said "sure" as any change from camp life was welcome. I was told to be ready traveling light, in fifteen minutes, and I was: about the only stuff I took along being my mess kit, soap, towel and shaving outfit. It was then I became acquainted with Maj. C. G. Toogood of the British Directorate of Forestry, his chauffeur, Geo. Hutchinson, and his Vauxhall car. The man who was to be my partner for several months then came on the scene, T. W. Love, a forester from Syracuse and also a member of my company. At the same time I met the interpreter, M. V. C. DeCourcelle, who had been with the major several months. Thus I came to know at once everyone I was going to work with, at least for a month or more. We didn't hesitate after the introductions were over but stepped right in and began spinning the kilometers out behind us at the rate of one a minute, soon leaving the camp far behind.

Neither Love nor I saw that camp again for over a month. We started right in on the job the very first day, stopping at the Major's headquarters at Mimizan Plage for lunch and then making a quick drive up to Audenge to get in some work that afternoon. There was a Canadian company there then, beginning operations, so we ate right at the camp and with the aid of the C. O. did some quick work, as the timber for the most part was laid out in squares. By the next evening we had completed our data and "Hutchy" took us both to the little town on the beach (Plage means beach). As the maps were wanted in a hurry we didn't wait for Sunday to get by but went right after them, finishing the tracing about one-thirty in the morning. That allowed it to get off on the early morning train for Paris where the blue prints were made, the major having no apparatus at that time.

So the jobs went and the weeks rolled by just like they were both on greased skids. A few days here and a few days there and back to old Mimizan Plage to make the maps and finish the details. At first we thought our work with Major Toogood was only going to be for a few weeks, but it wasn't long before he told Love and I that there probably was six months of it ahead of us and maybe more than that. So we went for all our staff at Castets, and got most of it, and settled with the headquarters company of the 4th Battalion, 20th Engineers, who were also at Mimizan Plage.

The methods we used in surveying and mapping soon became very well standardized and were very simple in operation. Because of the custom of the country we used the metric system

only, in all our work. Our measuring was practically all by pacing and Love and I were soon able to step off meters with fine precision. One of us would take the reading of a line with a good hand compass and keep the book, and the other would pace it off in meters. The method of keeping the note-books was adopted from the major. The starting point was indicated by a cross at the center and bottom of the last page in a blank book, and a line was run upward about two inches and another cross made. The angle of the line shot was written along this little line in the book and at its end, on a level with the second cross, but near the edge of the page, were noted the number of meters. Thus each shot was added to the last, indicated by a line, with the degree and length always given, the pages being turned to the right beginning always



Trucks loaded with piling
enroute to French railway
yards. 2nd Battalion, 20th
Engineers near Bruyres,
France.

at the bottom. A few words of description were put on each side of a line to indicate what bordered that boundary and by making the lines start at the bottom of the pages, they were always going in the same direction as the party was moving. Everyone used the same system so that when back in the office some other person than the one who wrote the notes could make the maps.

The map making itself was quite simple and easy also, only requiring care and accuracy all the time. The scale used was 1 over 10,000, a kilometer being thus represented by ten centi-

meters and ten meters by a millimeter. The lines were laid out by means of a T square and protractor with a little metric rule to measure and draw them by. The majority of the timber we surveyed and mapped was privately owned and often in very small parcels so, in an operation with a large number of proprietors, it often required great skill to get them all in correctly and to scale. But it had to be done, so it was.

Of course while doing this surveying (and later we made the maps too while on the job), we were usually living in small hotels or occasionally, when far removed from any village, in some one of the proprietor's houses. Thus we became well acquainted with some of the famous French cooking and I, for one, will certainly say it was most excellent. And the cooking was not all either, for in sharp contrast to the old army bunk after a hard day's work in the woods we had the privilege of those wonderfully soft French beds while out on the job.

But life was not all roses by any means, although we did eat and sleep well as a rule (and with the eating went a lot of wine). There was just lots of things "to take the joy out of life" and some were always present. One in particular, I remember, was a certain kind of bush with stiff branches, that had little yellow flowers in the spring, and produced the sharpest pointed spines ever made naturally. These spines grew thickly on these branches, were about an inch long, and went through any clothing except leather, and when they dried out in the fall they not only went through the clothing with a good stab but broke off at the base and stayed there. After walking through that stuff for a day one's knees looked like they had been pricked a few thousand times with needles. You can imagine how nice a week or two, or month or two, of it felt. Other things hard to get used to were the terrific heat there in the summer and the continual rains in the winter.

Now mix all this up in the proper proportion and you'll have our gay life for the ten months up to February 26, 1919. What did we do? We helped in or did all of the surveying, estimating and mapping for over twenty logging and milling operations of the British in the Landes region. Then after the armistice (which is another story) we went back over those areas which were being worked on and checked them again for the timber still standing. Would you know what we got out of it personally? Principally, a speaking acquaintance with the French language and a fair knowledge of the Maritime region of France and its resources.

20th ENGINEERS (FORESTRY) RECORD OF DEVELOPMENT AND PRODUCTION.

1. The 10th Engineers arrived at Nevers, October 9, 1917.
2. All units of 10th Engineers arrived at their assignments by November 1, 1917.
3. The first mill to operate was a French mill which commenced sawing on November 25, 1917, at Levier (Doubs).
4. First American mill commenced on November 27, 1917, at Mortumier operation, near Gien (Loiret).
5. On December 1, 1917, 3 mills were in operation—2 French and 1 American.
6. Production in December, 1917: Lumber, 321 M. B. M.; Piling, 205 pieces; Ties, 12,031 pieces; Poles, 20,025 pieces; Logs, 33,864 pieces; Cordwood, 4,164 steres; Faggots, 1,500 steres. During December, 1917, 2 American and 4 French mills were operating.
7. 1st Battalion of 20th Engineers arrived November 28, 1917.
8. First mill of 20th Engineers commenced operation on or about January 15, 1918, at Mur-de-Sologne (Loir-et-Cher).
9. The following entries show the production by months and number of mills in operation at end of each month:

JANUARY—10 mills operating. Production: Lumber, 1,369 M. B. M.; Piling, 740 pieces; S. G. Ties, 815 pieces; small Ties, 7,100 pieces; Misc. R. P., 29,740 pieces; Cordwood, 3,303 steres.

FEBRUARY—21 mills operating. Production: Lumber, 2,892 M. B. M.; Piling, 720 pieces; S. G. Ties, 22,345 pieces; Small Ties, 14,856 pieces; Misc. R. P., 460,662 pieces; Cordwood, 12,433 steres; Faggots, 200 bdls.; Road Plank, 1,700 pieces; Bridge Ties, 200 pieces.

MARCH—34 mills operating. Production: Lumber, 6,965 M. B. M.; Piling, 857 pieces; S. G. Ties, 80,099 pieces; Small Ties, 60,100 pieces; Misc. R. P., 270,496 pieces; Cordwood, 15,932 steres.

APRIL—41 mills operating. Production: Lumber, 14,578 M. B. M.; 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.

MAY—48 mills operating. Production: Lumber, 18,253 M. B. M.; Piling, 11,760 pieces; S. G. Ties, 178,988 pieces; Small Ties, 122,797 pieces; Misc. R. P., 221,555; Cordwood, 47,794 steres.

JUNE—59 mills operating. Production: Lumber, 26,727 M. B. M.; Piling, 7,576 pieces; S. G. Ties, 265,151

pieces; Small Ties, 150,359 pieces; Misc. R. P., 190,742 pieces; Cordwood, 67,500 steres.

JULY—59 mills operating. Production: Lumber, 24,102 M. B. M.; 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.

AUGUST—66 mills operating. Production: Lumber, 30,601 M. B. M.; Piling, 1,934 pieces; S. G. Ties, 384,960 pieces; Small Ties, 136,143 pieces; Misc. R. P., 446,069 pieces; Cordwood, 166,339 steres.

SEPTEMBER—80 mills operating. Production: Lumber, 30,307 M. B. M.; Piling, 3,653 pieces; S. G. Ties, 517,178 pieces; Small Ties, 133,896 pieces; Misc. R. P., 574,205 pieces; Cordwood, 144,178 steres.

OCTOBER—81 mills operating. Production: Lumber, 29,134 M. B. M.; Piling, 6,905 pieces; S. G. Ties, 692,208 pieces; Small Ties, 106,588 pieces; Misc. R. P., 248,826 pieces; Cordwood, 151,464 steres.

10. On October 31, 1918, there were 81 mills in operation. Total strength of forestry troops in France that date (20th Engineers plus Service Companies), 360 officers and 18,183 enlisted men; aggregate of 18,543 on forestry work. No record is available as to actual status on November 11, 1918.
11. On October 31, 1918, there were actually 84 going operations.
12. On November 11, 1918, 14 district headquarters were administering the work of the forestry troops.
13. On November 1, 1917, 2 district headquarters were established, one at Pontoux-les-Forges (Landes) and the other at Levier (Doubs), Besancon taking its place.
14. On September 9, 1918, Major Benedict was named as Section Forestry Officer at Bordeaux and took over duties on October 1, 1918. On September 9, 1918, Major Chapman was named as Section Forestry Officer at Nogent-en-Basigny (Haute Marne) and took over his duties on September 16, 1918. The headquarters of the latter were moved to Neufchateau (Vosges) on October 21, 1918.
15. All forestry units combined October 18, 1918, per G. O. 47, S. O. S., of that date.
16. Lt. Col. Greeley arrived in France, August 21, 1917, accompanied by 2 officers and 9 civilians. The officers were First Lieut. Stanley L. Wolfe and First Lieut. Clarence E. Dunston; the civilians (all later commissioned) were Theodore S. Woolsey, Donald Bruce, Swift Berry, R. Clifford

Hall, Ralph C. Staebner, Fred B. Agee, William H. Gibbons, Joseph Kittredge and W. H. Galleher.

17. Lt. Col. Graves and Major Moore arrived June 20, 1917.
18. Forestry Section established as a part of the Engineer Supply Office, September 25, 1917
19. Prior to September 25, 1917, Forestry Section was a part of Office of Chief Engineer, A. E. F. (Gen. Taylor).

By courtesy of "American Forestry."



THE AMES FORESTER

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EDITORIAL COMMENT

The part played by the technically trained man in the World War proved conclusively the value of such training. Men of all professions were called upon to render expert service to the government. The specialist was in big demand. The forester is a trained specialist and when the call came he responded immediately to his country's plea. From the woods, the mills and the office they came, red blooded men, and right nobly did they serve. Their part was no mean one and their record a glorious tribute to the forestry profession. Let us not forget those who went but did not return. May the memory of their sacrifice be ever with us.

* * *

An Ames forester came into the office the other day. He fairly breathed of pine and balsam. Bronzed and sinewy he typified our profession. Coming from Washington state, the home of the stately Douglas fir and the big pine, he left behind him a life he loves to enter the field of farming. "It's a great life, boys. I've only been gone two weeks and I feel the call already." He shook his head regretfully. "I suppose I will never be able to stay away."

He is one of the many that are leaving their chosen profession—perhaps because of circumstances—perhaps because life offers more elsewhere. The forestry profession is yet in its infancy in this country. We are yet pioneers and as such have many hardships, many disappointments, to endure. Yet the future holds great promise for us. Our country is slowly realizing the importance of our forests, the necessity of maintaining our timber supply. We must give our services to our country, which may not at first comprehend the extent of our work, but which will some day pay tribute to our accomplishment.

The Faculty, Forester Staff and Club Officers



Left to Right
Poch, Loy, Moorhead, Mullins
Patrick, Morbeck, MacDonald, Bode
Moravets, Pammel, Mullen, Beach

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The Ames Forester comes to you, we hope, a pleasant reminder of the World War. It brings to your memory the associations and companionships of the past. It is a mirror by which we view the march of events showing how we progress with the years and giving us the proper perspective of our profession and our work. We wish it to be a connecting link between our alumnae and our school, binding more closely together the interests of each. Needless to say we have labored to give you the best that was possible. The combined support of our alumnae faculty, club and advertisers deserve much commendation and the staff welcomes this opportunity to express their appreciation.

FROM THE CHIEF FORESTER.

"The lumbermen and foresters of the United States may well take pride in the men who have represented them on the American Expeditionary Force. Now they are returning, better men for the sacrifices they have made, for the sense of organization and responsibility which they have learned, for the difficulties which they have mastered, and for the understanding which they have gained of forest culture and forest thrift in France. Such a body of trained men represent an asset of the utmost value to the forest industries of America. Let us recognize their worth and their capacity by an intelligent direction of the return of these soldiers to civil life in positions where their experience in national service can be effectively utilized."—Lt. Col. W. B. Greeley, 20th Engineers (Forestry).

By courtesy of "American Forestry."

IN MEMORIAM

Ranger Harley H. Sage died on November 13, 1918, of pneumonia following Spanish influenza at St. Mary's Hospital, Tucson, Arizona. Mr. Sage contracted influenza during the first part of November while in San Francisco to be examined for a commission in the Forest Regiment. His illness, at first not considered serious, developed into pneumonia which resulted in his death. He was never ordered to active military duty because of the fact that the organization of the unit to which he was to have been assigned was dropped when the Armistice was signed.

Mr. Sage entered the Forest Service in this District as a Forest Ranger on the Coronado National Forest in Southern Arizona on September 26, 1916, and served in that capacity and on the same Forest until his death. Previous to that time he had worked on timber reconnaissance during vacations in 1911, 1912, and 1913 in Colorado and California. He was a most efficient ranger and gave promise of developing into a specially valuable man along grazing lines.

Mr. Sage was characterized by Supervisor Pitchlynn, his immediate superior, as without doubt the most efficient Ranger on the Coronda Forest even though his period of service was relatively short. It was felt that the Forest Service lost in Sage a man of unusual promise. He was of high moral character with the highest of personal ideals. All of the men in the District who knew him joined in mourning his loss which was not only great from an official but also from the personal viewpoint.

(Extract from letter written by Paul G. Redington, District Forester in District 3, to the Forestry Department.)

ELVIN MENNENGA.

In response to a letter written to Hampton, Iowa, to ascertain the details of Elvin Mennenga's death, the following letter was received.

"We are sorry to inform you that Elvin died June 20, 1919, from relentless typhoid fever.

Elvin left Ames for Oregon and while there he enlisted in the United States Merchant Marine. While on a trip from Tacoma to New York he must have contracted some of the germs of the disease. He came home on furlough June 6, 1919, and died June 20th.



A PICTORIAL JOURNEY THRU FRANCE.

Photographs by Prof. C. L. Fitch, late of the Educational Corps A. E. F. University.

FOREWORD.

The following series of pictures were taken by Professor Fitch during his stay in France and while connected with the American Expeditionary Force University at Beaune, Cote d'Or, and at Allerey, Saone-et-Loire.

Professor Fitch was a member of the Educational Corps of the army and was stationed at Allerey. He was given the task of studying and interpreting to the faculty and students of this big school, French life, commerce and agriculture as illustrated in the vicinity. Excursions were run to the points and things of special interest and they were discussed on the spot.

—*Editors Note*



Sixty feet in the air at Chauvort on the Saone, cutting kindling and garden stakes and summer firewood. In his place, whom, would you think should own the Saar coal mines, the Germans having destroyed the French mines at Lens.



There are no stumps in France. A white pine log and faggots.



Professor Fitch of Ames, who was in charge at Allerey of the study of French life and agriculture, and soldier students in the forest of St. Gervais. Note the reserved trees marked with straw bands, showing an unusual degree of confidence between the owner and the timber merchant. It is usual to mark the reserve trees with red or blue paint, that cannot be removed without leaving traces.



The ramparts of Beaune in Burgundy, showing the wonderful size, health and productiveness of sycamores on the exceedingly deep soil of the fortifications. High school girls and La Directrice.



Percheron stallions hauling logs from the forest of Fontainebleau to a saw mill in Paris.



Dwarf apple tree and M. Durand, formerly gardener to Baron Rothschild. Dwarf trees are useful to the amateur who wishes to have a variety on a small space.



Village sawmill at Verdun-sur-Doubs. Typical of most of the country. Larger places have larger mills on the same plan. Some logs are rafted and a few shipped by rail, but most of the lumber supply of France is hauled by horses direct from the forest to the mill, and is used in the commune where it is sawn.



Forest Road last March near Allerey. Distant views of St. Gervais. This village and commune of 500 souls, lost 26 men killed in the war. This is the average for France and about 35 times our average. France's loss was about the same as if all men who entered our army and navy had been killed, and none had ever come home.



Harvest time comes once in 25 years. A "moule" of firewood—about half a cord. Timber-cut and reserved. Logs for wooden shoes.



Flood control on the Saone. One of Professor Fitch's excursions out on the embankment studying the management of rivers in France.



Good forestry, and a harvest of oak. The soil near Allerey, that was devoted to forest was not very good. It was stiff, shallow and poorly drained. In other places the timber was much better.



Long lines of poplars line many of the roads of France and provide shade and many stakes for the vineyards and gardens and much light wood. Roadside trees are placed at the edge of the macadam and inside the road ditches, an arrangement that we no doubt will employ when our roads are hard surfaced. Then it is no longer required to take material from the road itself, and in this position the trees do not harm the fields and give delightful shade. The telephone and telegraph wires are put outside the trees. We in America will have a great come-back of road trees when our roads are hard surfaced. One of Professor Fitch's excursions goes through a little flood.



Hauling Firewood as busy work. Most of the hauling to small mills is done this way, and fills in the scraps of time that the farmers and draymen have. In all large towns and associated with all large mills there are, however, regular haulers of timber who use all their time this way.



Returnable and nesting vegetable packages. The French do their best to save all materials. Returnable packages are the rule in all mercantile lines where it is possible to use them. The saving in wood is enormous. The Channel Island growers of potatoes use returnable barrels, fitted with rope hoists, and it was said that returnable willow baskets for tomatoes saved last year 45 cents each over the cost of non-returnable crates,—a net profit of that sum.



A lumber-yard in Paris showing the piling of logs as a unit after sawing. Much of the trade is for logs at a time. The small shops prefer it so. A workman selects a tree that suits him and uses it all up. There is comparatively little standardizing of lumber and cutting to sizes and selecting to grades as with us.



Barracks at Allerey, showing how the panel construction enabled the armies to use small trees and short boards, and to have the panels made up standard anywhere,—in France, Switzerland, or Spain, to be erected when needed and moved if required. French chamber maids.



A plain street in a suburb of Paris, which shows the way the French run wires behind the street trees, and prune them to the rear if required; and how the trolley poles set in line with the trees hardly show at all.



Soldier students unloading boats of firewood for the agricultural school at Allerey. This picture shows also a long stretch of stone protected river bank. Many miles are protected by brick walls. Some silting there still is but it is greatly reduced. Canalization of the rivers and their use for heavy and slow freight is almost universal.



Reprinted with additions from "Some Women of France", by C. L. Fitch of Iowa State College, containing also Agricultural and Commercial Ideas and Photographs of France. Ideals and Morals of France and America. \$2.50 postpaid, Allerey Press, Ames, Iowa, and all booksellers.

STATE PARKS OF IOWA

Dr. L. H. Pammel, Chairman State Conservation Board.

Parks are being needed in every state. The time has arrived when every class of population is demanding recreation in the out-of-doors. Even the agriculturist is no longer content to leave all the joys and experiences of recreational areas, and all the value of scientifically interesting bits of country, to his city cousin. Hence, individual states all over the country are making provisions to meet this demand. Their efforts are particularly valuable, if for nothing else than that they have brought forth two very interesting facts: First, that there exists a demand for recreational areas and opportunity for enjoying beautiful spots of Nature which has not been fully appreciated or comprehended until recently; and, secondly, that it is surprising what a multitude of such areas exist within the reach of every man if they be but sought out and made known.

Although rather young in her efforts toward establishing a system of State Parks, Iowa has made rapid progress, and because of the whole-hearted, unselfish endeavors of those into whose hands this new movement has been placed, she has become one of the leaders.

In a great agricultural state like Iowa, the problems confronting such a body of men are many. Under present conditions of land ownership all available land for farms and pastures has been taken up and title established thereto. There are no places to which the farmer and other rural people can go without trespassing.

Therefore, to make it possible for everyone to enjoy the great out-of-doors, to help lift the burdens from the farmer and the rural people, the State of Iowa has adopted a program of acquiring state parks. The endeavor will be to make these accessible by highways leading from all directions to them, and thus meet one of the great present needs of Iowa's citizens. In this movement the State Fish and Game Department and the Iowa Highway Commission are working in co-operation with the Iowa State Board of Conservation.

Mr. Harlan, Secretary of the State Board of Conservation has said, in this connection: "In Iowa it is but a short spin from prairie lands to fairy lands. Even with moderate roads one can ride from Des Moines in an automobile through certain settlements which resemble parts of the heart of Europe, and others of aboriginal Iowa nature. You can see a natural bridge rivaling that of Virginia; caves of equal scientific interest with that of Kentucky; hills, valleys, plants and fossils the glaciers

left untouched, grottoes in which ice forms while the sun wilts the corn; lakes rimmed with boulders man cannot move."

There is surely material a plenty here from which to build a magnificent system of parks.



Photo by O. M. King
Rock Exposure at The Ledges, Boone County, Iowa.

Iowa is situated between two great rivers: the Mississippi on the east and the Missouri on the west. Its principal streams, the Des Moines, Cedar, Oneota, Iowa, Wapsipinicon flowing in a southeasterly direction, and the Little Sioux, Floyd, Boyer and Nishnabotna flowing in a southwesterly direction, shape the topography of the State and in a measure determine the agricultural pursuits.

Moreover, the State had three important ice invasions: the Kansan, which covered a large part of the State; the Iowan covering northeastern Iowa, and the Wisconsin, entering in Worth county, extending southwesterly from Osceola county on the west and also southeasterly terminating near Des Moines in Polk county. The action of these ice invasions in cutting down and levelling the country has made Iowa a great agricultural state with narrow fertile valleys, rolling prairies and the level stretches of former lake beds, with a fertile soil capable of sustaining a far greater population than it does at present.

Iowa is, therefore, essentially an agricultural state, for more than ninety per cent of even the untillable land can be used for pasture purposes. It is for this reason that the fringe of timber on the streams and lakes has largely been removed. All of the land in Iowa has been taken up and fenced. The State only owns the land in the meandering lake beds, and larger streams, except the Des Moines, where the lower part was declared navigable and hence became the property of the National Government.

It was no longer possible for persons to take an outing in the woods without trespassing. So a movement was started some twenty-five years ago by Dr. Thomas MacBride, of Iowa City, and others, to have some of the scenic and historic places in Iowa dedicated to the use of the public. Some years ago the Iowa legislature passed a comprehensive drainage law permitting the draining of swamps and lakes. Many of the seventy or more lakes, some quite shallow, were in the process of being drained. In some cases persons wilfully enlarged the natural outlets so that these little lakes soon became swamps and then, under this act, drainage petitions were started. Sometimes there were vigorous protests to the draining of these lakes. In some cases public spirited citizens, as in the case of Medium Lake near Emmetsburg, started to dredge these shallow lakes instead of draining them, thus making them beautiful sheets of water.

To stop this wholesale drainage of Iowa's lakes, the State asked the Highway Commission to make a survey and report to the legislature. A comprehensive survey was made, and it is to the great credit of the Iowa legislature that they accepted and approved the findings of the Highway Commission and the drainage of lakes was stopped.

A third constructive policy of the State was inaugurated during the thirty-seventh general assembly, when the chairman of the Fish and Game Committee introduced a conservation bill creating a Board of Conservation, and creating state parks, and appropriating \$50,000 annually out of fees obtained from the license of hunters in the following words: "The State

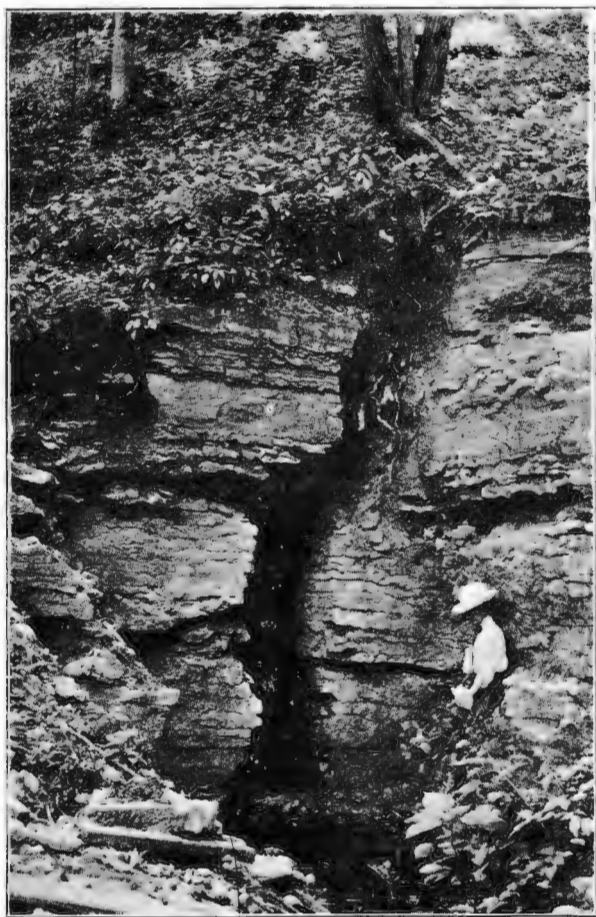
Board of Conservation, by and with the written consent of the Executive Council, is hereby authorized to establish public parks in any county of the State, upon the shores of lakes, streams or other waters of the State, or at any other places which they have by reason of their location become historic or which are of scientific interest, or by reason of their natural scenic beauty or location become adapted therefore and said Board of Conservation under the supervision of said Executive Council, is hereby authorized to improve and beautify such parks."

Under this act the Board had the right to acquire land by condemnation proceedings. This measure had the active support of many friends in the Senate and House and passed without difficulty. During the fall of 1918 Governor Harding and the Executive Council who were greatly interested in this park movement appointed Hon. Joseph Kelso of Bellevue, J. F. Ford of Ft. Dodge, and L. H. Pammel of Ames, members of this Board, Mr. E. R. Harlan of the State Historical Department being an ex-officio member.

This Board, as one of its first steps, recommended the purchase of an area in Delaware county, locally known as the Devil's Backbone. It embraces a part of the scenic Maquoketa river. There are few more picturesque places in the State. There, are to be seen high limestone cliffs, a few dozen remnants of white pine some two hundred years old, fine springs of clear water, a clear, running brook in which brook trout are common and which is one of the few trout streams in Iowa. There are some 1,200 acres in this tract.

The Board recommended further the purchase of another area of 1,123 acres in Van Buren county, in what is known as the Horseshoe Bend of the Des Moines River. It contains a large number of interesting plants, and, although the wild life of the region has been greatly diminished, there are still left some wild partridges. This beautiful bird has become well nigh extinct in Iowa. The citizens of Keosauqua, many of them farmers, contributed \$6,400.00 toward the purchase of this area, and, furthermore, the farmers for a mile beyond the boundary of the park voluntarily gave the State the right to make of the adjoining area a sanctuary of wild life. In the same county the citizens of Farmington and vicinity purchased a 100 acre tract for park purposes. This tract contains a lotus bed of some 40 acres while the surrounding hills are covered with fine oaks, hickories, maples, elms, basswood and ironwood. Two nature-loving women of Davenport, Clara and Emma Brandt, who owned a fine tract for park purposes in Muscatine county, donated to the State some 57 acres. The citizens of the surrounding country,

Davenport and Muscatine, expect to raise a considerable sum of money to be turned over to the State so that the area can be increased, with the aid of the State, to nearly 250 acres.



Limestone Rocks—McGregor, Iowa, National Park Region. Photo by Ada Hayden

There are now more than 150 applications for state parks on file with the Board. These include such areas as Cedar Bluffs on the Des Moines River in Mahaska county, Red Rock in Marion county, the Palisades in Linn county, the Ledges in Boone county, Wild Cat Dean and Woodman's Hollow in Webster county, the Devil's Backbone in Madison county, the caves and

natural bridges in Jackson county, the ice cave near Decorah, the Yellow river region in Allamakee county, Oakland Mills in Henry county, Steamboat Rock and Idle Wild in Hardin county, Happy Hollow in Fremont county, Falling Springs in Fayette county, Pilot Mount in Winnebago county and Oakland in Pottawattamie county. In addition to these there are petitions for lake parks from nearly all of the lakes: Spirit Lake, Okoboji, Rice, Eagle, Iowa, Swan and Twin Lakes in Calhoun county, Wall Lake and Twin Sister Lakes in Wright county, Medium lake near Emmetsburg, Silver Lake, etc.

The park movement is not entirely a city movement. The farmers of the respective areas are greatly interested and in many cases, as in Boone, Calhoun, Henry, Muscatine and Van Buren counties, have shown their interests by offering to buy some of the land for the State. The farmers realize, more than anyone, that the monotony of their daily labors must be combined with recreation. The farmer, too, is liberal in his donations.

It is the plan of the Board to establish three kinds of parks; first, state parks, larger areas accessible by good highways, which will become regional parks and will be so located that they will supply the needs of several counties. In the case of the Devil's Backbone in Delaware county, 125,000 people live within fifty miles of this park. Although not advertised by the Board, 10,000 people visited the park last summer, coming by auto, on foot and with teams. This shows a local interest in the park and that it serves the farming community. Such regional parks will no doubt be established in Linn, Hardin, Boone, Henry, Jackson, Webster, Dubuque, Madison, Woodbury, Fremont, Mills, Marion, Lee, Hardin, Keokuk, Davis, Muscatine, Jones, Harrison and other counties where there is something unusual from a standpoint of science, history and recreation.

The second type of park will be the lake park. The policy of the state is to preserve the lakes. Except for a small tract of land on East Okoboji the state owns no land where people can have free access to the lakes. The lakes, as far as possible, will be skirted with highways and enough land will be acquired so that future generations can use the waters belonging to the state unmolested.

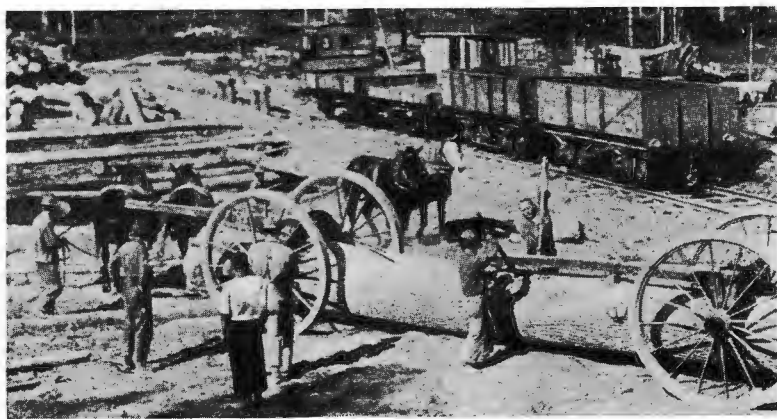
The third type of park is the highway park. These will be of smaller extent, twenty-five to thirty-five acres, usually land of not much value for agricultural purposes, ideal, however, for park purposes, and will supply the communities with places for wholesome recreation. At Oakland some fifteen acres are offered to the state, provided the state will increase the area to twenty-seven acres. Some 50,000 people at various times during the past summer visited this wooded park. These parks are

community enterprises and the State has a right to ask that the local community shall interest itself in this undertaking as the people of Oakland have. These community parks will allow free camping for the people who do not wish to go to the hotel. Good healthful sport, like baseball, football, etc., will be permitted. Good water and other conveniences will also be provided. It is hoped that they will encourage the outdoor life.

There may be established a fourth kind of park—prairie parks. To the pioneer the wild flowers of Iowa were a solace. In no place in the world could there be found a greater profusion of asters, goldenrods, blazing star, blue stem and blue joint than on the prairies of Iowa. Some of these prairies should be preserved to let future generations know what the prairies of Iowa were like in all their glory.

The park movement has had the active support of the Iowa legislature and the Executive Council, including Governor Harding, who have more than once in public addresses made a strong plea for state parks. Public sentiment in the state favors a vigorous and large program with the feeling that places for recreation, historic and scientific value must be obtained before the advance of civilization has removed the landmarks in our history or destroyed areas of great scientific value. The feeling prevails that future generations are entitled to the heritage given to us and that we must preserve it.

With this comprehensive program ahead, Iowa is giving to her people a valuable demonstration of an asset which heretofore has been generally overlooked by the busy masses of her citizens. Iowa will not have to travel outside her own borders to enjoy nature as lovely as can be found anywhere in the world.



An Oak Log on way to Mill—Eclaron, France.

FIRE PROTECTION ON THE SUPERIOR NATIONAL FORESTS.

R. G. Schreck, Forest Examiner, Superior Nat'l. Forest.

Annually there comes to every Forest force that very important question of fire protection, and annually when viewed by the casual observer there is apparently very little added of seemingly little value to previous plans. In spite of the fact that this phase of Forestry is without doubt one of the most important factors in our present Forest policy, efficiency seems to grow with remarkable slowness, yet when one stops to consider that the Forest Service has only been established for a very brief period of time, fire protection work has increased with such rapid strides as to be almost remarkable in comparison to the magnitude and size of the whole question involved.

The seeming slowness in developing our fire protection system is by no means due to any lack of ability on the part of the men in charge of fire protection work, nor is it due to any haphazard methods involved on the individual Forests, but the slow development is due, as stated above, to the size of the problem itself which involves volumes of detail on which to formulate any successful plans. Only the men in charge of fire protection can grasp with any degree of appreciation, the vast magnitude of the work required to put our fire protection on the basis on which it now stands. So many things are involved, and so many things arise each season that warrant changes in previous plans, that have been laboriously prepared with considerable thought and effort by our most experienced men.

Since the Superior National Forest was established in 1909, there has been considerable accomplishment toward the establishment of an efficient fire plan, but even now after eleven years of experience and study, years which have covered several periods of very severe fire conditions, the present plan we know is lacking, and full of loopholes which can only be filled and determined by further study and experience. Years will elapse before a plan will be perfected that will stand the acid test of efficiency in fire protection.

Of the million and a quarter acres comprising the Superior National Forest, two hundred thousand acres are water, not in one body, but scattered uniformly over the entire area in lakes and rivers. The forest itself is vastly different from any other Forest in the United States, and stands alone in its individuality and peculiar conditions. It lacks the severity of the western Forests in that its contours are more gently formed. No ranges of broken hills, rugged mountain peaks, deep valleys, or extensive views are present. The country is generally flat, with



A severely burned area showing the underlying granite from which all soil covering has been burned. Years will elapse before sufficient ground covering will accumulate to encourage young growth. Superior Nat'l. Forest.

only slight moderate rises in elevation appearing throughout the area. The whole lies within a glaciated region of lakes, swamps, and granite strewn uplands, whose severely scarred areas contain very little soil, the granite boulders always monotonously in prominence.

With such a large percentage of the Forest involved in water and swamp areas, and with a very generous annual rainfall, it would seem that the entire land area would be fairly oozing with moisture, and that the fire hazard would be exceedingly low, but such is by no means the case. The opposite however is true, and the fire hazard in Northern Minnesota is far greater than any other Forest region in the United States, with very few exceptions.

Each spring a very luxuriant vegetation appears throughout the entire Forest area with remarkable quickness. The excess moisture in the ground at that time of the season seems to fairly push the variegated growth from the thin but productive soil. As the warm summer days approach, and the soil has lost considerable of its moisture supplied by snows of the previous winter, repeated rains are necessary to replenish the very light, sandy soil, and to replace the excess evaporation caused by numerous granite covered areas. As summer approaches further, and the rays of the sun become more direct and more noticeably warm, the thin soil becomes extremely dry, and the exposed granite boulders and underlying strata absorb heat to such an extent that they become a very decided factor in driving moisture from the immediate and surrounding areas. Finally the loss in moisture reaches such a stage that nothing short of a continuous downpour of rain of several days' duration will check the



Fire burning over an area the second time thus completely destroying all desirable growth and retarding future production for many years. Superior Nat'l. Forest.

extreme dryness. Unless such rains occur frequently the dense vegetation becomes extremely dry, and forms almost inflammable material when fires occur. Also the mature growth of the Forest itself seems to fairly invite fires for the representative conifers seem to fairly absorb heat and dryness, and permeate resinous liquids to aid in their destruction.

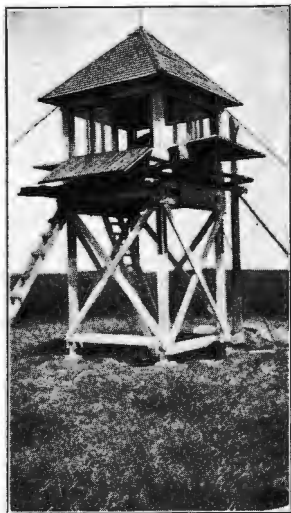
The fire season on the Superior begins May first and continues until October 31st or occasionally into November. During this period the entire force composing the personnel of the Forest is constantly on the alert and are prepared at all times to give the protection of the Forest first consideration over all other forest work. Six lookout towers now control the Forest area. All are situated at good points of vantage and where the greatest possible area may be controlled with accuracy. Five of these towers are manned continuously throughout the fire season. The sixth acts as a secondary observation point and only used when conditions require.

The duties of the lookout observer are fairly well understood by the average student of Forestry. The main qualifications are perseverance, loyalty, and sound judgment. Too much credit cannot be given the efficient men employed in this branch of the protection program. Their work requires long, monotonous days of ceaseless vigil, and much of their time is spent alone; and the only break in their period of watchfulness is the arrival of supplies and mail, the occasional visits of the patrol crew, and the daily telephone conversations with the ranger or Supervisor.

The five permanent lookout towers are connected by trails, and telephone with the ranger stations and the Supervisor's office. The present fire plan on this Forest would be sadly inferior

were it not for the 160 miles of telephone line that have already been built by the Federal Government. These telephone lines are as jealously guarded during the fire season as the areas controlled from the lookouts. Without these connections the lookout towers on the Forest would be practically worthless.

Early in the season all telephone lines are thoroly overhauled and put in first class condition before the fire season begins. After this overhauling process is completed, three guards patrol these lines continuously. These guards are equipped with tools and supplies to repair any break or resulting damage that might happen at any time and thus sever connections with our most valuable form of detection; that of the lookout tower. When trouble occurs on any line during the season every means are resorted to to locate the break and put the line in condition without delay.



Two types of Lookout Towers used on the Superior National Forest. Note construction.

In addition to the lookout observers and guards employed on telephone maintenance, are men engaged in canoe patrol along the water routs thruout the Forest. This means of patrol is only applied, however, to those waterways frequented by the numerous tourists who visit this Forest annually. In spite of the fire warnings conspicuously placed along the canoe routes the campers thru extreme thoughtlessness leave their camp places without taking the precaution necessary for the complete ex-

tinguishment of their camp fires. It is not deemed advisable to condemn the average tourist because of the number of camp fires that are left burning thruout the season. In many cases the action is merely thoughtlessness on the part of the tourist. The average out-of-doors enthusiast does not wish to destroy the advantages of the Forest that furnish him with the best recreation possible.

As a rule the season starts with 15 guards, which number is increased if necessary as the summer advances and conditions become such as to warrant putting on an additional number. The Forest is divided into seven Districts, each supervised by a ranger. Each ranger is given sufficient guards to furnish his district with ample protection. These guards work under the direction of the ranger and are responsible to him for all the work which is accomplished by them. Due to the existing conditions on this Forest and to our peculiar modes of travel one man very seldom, if ever, travels alone on the water routes. This necessitates employing one guard to work and travel with each District Ranger.

Each ranger draws up his own fire plan for his district. Everything that will possibly make his plan a success is thoroly thought out before the season begins. He knows the number of guards that will be allotted to him and he determines the help which he will be able to secure in case of forest fires, knows how they will be reached and the length of time it will take to put them into action. His methods of transportation are also outlined and every automobile or truck owner has submitted a price list of all trips that can be possibly made thruout his district. In case of emergency he knows where the most efficient men can be obtained to act as foremen on fire crews. He knows where every tool cache is located, and the number of men each will supply. He has typewritten lists of supplies sufficient to equip any number of men for the average time a fire crew is kept in action. Arrangements have been made with store keepers to furnish these supplies on a moment's notice. The ranger has informed his lookout observer as to the duties with reference to observation. He explains everything as far as possible, that will give the observer a line up on distances, land marks, and anything that will benefit the ranger when smokes are reported. He has impressed the other guards under his supervision on the importance of their sound judgment and quick action in case of fires, and that their efforts must be unceasing in case fires occur, and continue so until the fires are thoroly extinguished.

A copy of each ranger's fire plan is in the Supervisor's office. From these plans the Supervisor has a check on each district when fires occur. In addition to the ranger's plans the Supervisor has a plan drawn up that will apply to the Supervi-

sor's headquarters, and is similiar in every respect to that of the rangers'. Too much consideration cannot be given to the plans drawn up on the Forest for it is realized that upon these plans depend the success or failure of the fire plan for the Forest.

It has been found from past experience that the old methods of canoe patrol formerly in vogue on this Forest were entirely too inadequate to compete successfully with the present system of well equipped lookout stations. Patrols on the water routes have their good points and this Forest will probably never be without such protection. Due to the ever increasing tourist visitors it is very essential that the more popular routes be protected and the good derived will fully warrant such plans being involved in the entire plans for the Forest. Patrols on the water-routes have their views obstructed very greatly by the very dense tree growth along shore lines of lakes and rivers. Also naturally such travel means that only the lowest country is traversed and the view thus obtained is very limited in proportion to the efforts and expense of maintaining such a patrol. From experience it is found that only fires of very large proportions could be readily discovered unless circumstances happened that caused the fire to occur close to the waterways. Even after the fire is discovered considerable time must elapse before a telephone can be reached and action can be started towards the extinguishment of the fire. Such delays in a region of extreme fire hazard are expensive and dangerous. It was also found further in the development of our fire plans that the correct location of a fire could not be located with any degree of accuracy from a single lookout without further aid than that of the judgment of the observer. Instrumental aid was introduced during the season of 1919 in form of the Osborne fire finder, but due to the lack of permanent landmarks such as mountain peaks, valleys or other physical features whose locations were accurately known, it was found that the instrument would not fit in successfully and furnish the Forest the necessary accuracy which is so very essential in this country of low relief.

The location of fires by the triangulation system has been in vogue on this Forest for several years, and it was found after experimenting with the Osborne fire finder that the triangulation system should be improved upon wherever necessary and maintained in the protection plans of the Forest. This system of locating fires has proven without doubt that it is the only system which can be inaugurated under our present conditions. Each lookout tower has been accurately located by the use of a transit. Meridians have been established thru the towers, and map boards have been oriented as minutely correct as instruments and man can make them. The oriented map board shows

the entire area that can be controlled from that particular station. The lookout point is accurately located around which is a graduated circle divided into divisions of one degree and numbered in units of 10, from 1 to 360 degrees. An alidade is used for sighting smokes one end of which rests in the slot directly over the lookout point on the map. The instrument is then free to be moved entirely around the graduated circle, and the chance of error is obviated by the observing end of the alidade being attached firmly to the lookout point. When a smoke is reported, the radio and degree point is read direct from the circle. This reading is at once reported by telephone to the ranger and Supervisor. In a very few minutes a report is received from another lookout on this same smoke. A fire map is prepared in the Supervisor's office showing the accurate position of each lookout tower around which are placed graduated circles similar in every respect to those on the lookout maps. Each lookout point is pierced on the map thru which a strong black thread is placed at one end of which is fastened a sharp tack. As the radio



Cache equipped with fire-fighting tools. Superior National Forest.

readings are received from the lookout observer these threads are pulled taut over the readings and the point of intersection is the approximate location of the fire. After almost continuous use of this method of fire detection and with occasions arising to

test its accuracy, it has proved a very satisfactory and efficient method of detection, and will continue to be our chief mode of detection.

The Forest is well equipped with a very complete and extensive supply of fire fighting equipment all of which is kept in the very best condition so that it will always be in readiness when fires occur. Many tool caches are located conveniently thruout the Forest and are equipped to supply from five to twenty-five men. At the Supervisor's headquarters sufficient outfit is on hand to equip from five to thirty men crews, all of which is packed and labeled for immediate transportation when fires occur. The entire fire plan of the Forest is outlined to such an extent and every detail is covered so thoroly that the greatest amount of efficiency will result when fires are reported. This with immediate action, and sound judgment on the part of the Forest force when the smoke is reported is absolutely necessary where travel conditions must continue to be slow at the best, away from our few miles of good roads.

The co-operation in protection which has been received and is being received from the Minnesota State Forest Service, the logging operators, and other Forest users has been wonderfully valuable to this severely burned area. The co-operation thus received has done much to prevent the complete destruction of the remaining mature timber and has saved the very desirable young reproduction growing so abundantly on previously burned areas. Such co-operation will be needed more urgently in the future and the personnel of this Forest will continue to lean heavily on this most valuable good will of the Minnesota State Forest Service, Forest users and others.



WHITE PINE BLISTER RUST.

C. J. Baker ('20)

The white pine blister rust is a destructive disease of five needle pines. It is caused by a parasite fungus and like some other rusts, it requires two distinct host plants in order to complete its life cycle. These are first, the five needle pines and second, the cultivated and wild currants and gooseberries.

The disease came to this country from Europe through imported white pine seedlings, a few as early as 1900 but in great numbers in 1909. The seedlings were widely distributed before the presence of the disease was discovered. At present it is most abundant in the New England States and also Ohio, Indiana and Minnesota.

White pine blister rust finally kills the attacked trees or parts of them and if they are twenty-five years of age or less they are liable to be entirely killed. If the tree is older than this the top shoot or some branches will be killed when attacked. The greatest damage, however, is done to the young reproduction or to young plantations or nurseries, but if the disease becomes very prevalent, it is obvious that mature trees may be seriously crippled if not killed by it. There are twelve American five needle pines and nine foreign ones, any of which will take this disease.

In the eastern part of the United States the danger from this rust is very great in that Eastern white pine is a very valuable species. The present stand of mature eastern white pine has been estimated at approximately \$186,000,000. Beside the present value of the mature timber, it is of great importance because nine-tenths of the reforestation work in the north-eastern states is done with this species. In the area worst affected by gypsy moth this species is being planted almost exclusively, for it is most valuable which is not seriously damaged by this insect. In many sections of this country, white pine is the most valuable for future forests. Its loss would be felt keenly for no other tree is a good substitute.

If the disease is not eradicated or at least checked it will finally spread naturally from Minnesota eastward and from Canada to Georgia and Alabama. If this takes place there will be little hope of coping with it unless public opinion becomes very highly aroused. Unless complete authority is given state officials to take measures to stamp out this serious disease, it will escape and probably become a permanent menace to the country.

In the western forests two of the most important lumber species are threatened by white pine blister rust. These are

sugar pine and western white pine, the combined estimated value of the mature stand being \$240,000,000. Both of these species have been seriously attacked in Europe but are little grown in our eastern states where blister rust is present. So we cannot estimate the damage the disease would do to these trees in this country. These two species reproduce readily and everything points to the fact that they will form a very important part of the future forests. Reforestation in the United States may largely be done with these species.

The danger from white pine blister rust would be great if it once reached the Pacific coast or Rocky Mountain regions for it has been found by experiment that the ribes in these localities are susceptible to the disease. Conditions are such in these native forests, that if they once become infested it would be practically impossible to control the disease.

These western forests, however, are separated from the infected eastern ones by the Great Plains so that the only way which the rust could reach them would be through shipment of diseased nursery stock. Therefore it is of extreme importance that these shipments be prevented. It is urged that all five needled stock be grown from seed in the locality where the trees are to be planted, and that the states co-operate in enforcing proper quarantine laws.

The most characteristic symptom of blister rust on pines is the presence of irregular swellings in the bark, especially at the lower branches if the tree is small. In large trees the condition is similiar, the swellings commonly extending to the base of smaller side branches and sometimes into the latter. Often this swelling is not tapering but very irregular, the bark having a disrupted appearance with rounded swellings at leaf scars. Trees three or four years of age are often stunted by the disease so that they appear abnormally compact. This is not so evident upon larger trees while occasionally but rarely the leaves upon the affected parts become yellowish. These affected parts finally die and become noticeable as they stand upright and do not droop as in the case of frost or certain insect injuries. The work of the white pine weevil may be confused with that of blister rust but the former usually kills only the top lead shoot down to the first branches, while the latter usually kills the entire top of the tree and side branches as well.

The fruiting bodies of the parasite furnish a most certain symptom for the detection of the disease. They form upon the thickened bark in the spring from the later part of April until the middle of June, depending upon the weather conditions and the locality. At first, these bodies thrust themselves out through the bark forming whitish blisters as large as a child's finger nail which are usually somewhat longer one way than the other. Aft-

er a few days the outer membrane breaks and the top falls off and exposes the bright yellow dusty spores inside. After a few weeks these are completely blown away from the cavities, the white membrane also disappears leaving only the rounded hollow which has a whitish, granular appearance. These are very characteristic and as easily distinguished as the fruiting bodies. On young trees the disease girdles the trunk by killing the affected bark in which case the bark becomes scaly while on the green parts it is still smooth. Sometimes after being girdled a tree will live for several years, the part above the canker growing until considerable swelling has been produced. The fruiting bodies form each spring both above and below the dead area the disease progressing each year until two or three feet from the original point of entry.

On ribes the parasite attacks only the leaves and has two distinct forms which may be found on either the currant or gooseberry or both. The summer form occurs on the lower surface of the leaves in the form of a small, mealy, powdery, bright-yellow masses no larger than a pin head. Upon shaking the leaf this material is set free and forms a yellowish cloud. This type of the parasite may be found from the middle of June until the leaves fall being most common in July and August.

The autumn form of the disease occurs as short, hairy outgrowths about a quarter of an inch in length generally arranged in small circles. They may be scattered or so abundant as to form a hairy coating on the entire under surface of the leaves. These hairs are brownish in color but in moist weather become a grayish brown. Both of these forms occur upon the lower surface of the leaf and must be examined on that side for the symptoms do not generally show upon the upper surface.

The white pine blister rust found upon pines is called *Peridermium strobi*, while the form found upon ribes is known as *Cronartium ribicola*. The parasite has a very complex life history and has a large number of related fungi.

An incubation period follows the infection of pines which may vary from one to six years or more no visible symptoms of the disease being noticeable. Then the bark begins to swell and the healthy green color changes to a yellowish to a reddish color. On these yellow patches small drops of a clear, sweet tasting fluid are pushed out of tiny openings. This liquid is found to contain great numbers of spore bodies the function of which has not been determined. These spores are called *pycnospores*. After they are produced the real fruiting bodies push themselves out thru the swollen bark and appear as white blisters already described. After a time these break open and the bright-yellowish powdery masses of spores are set free. These reproduce the disease by attacking the leaves of ribes and not by attacking pines upon

which they have no effect. In most cases after fruiting, the bark is killed where fungi entered but sometimes it remains alive a year afterward. Each spring a new crop of these spores are produced, which are set free to infect ribes leaves. These spores are known as aeciospores or peridermium spores.

Distribution of these spores is done mostly by the wind but may be done by small animals. The spores attack ribes leaves; unless the weather is very dry enough moisture is usually present. They send their root like tubes into the soft tissues of the leaves, the roots spreading within. With the most favorable amount of moisture and best weather conditions, it requires twelve to fourteen days to produce a new crop of spores. These appear upon the lower surface of the leaves in the form of tiny masses, hardly larger than a pinhead of very fine, orange-yellow powder. One of these masses is formed by the infection of a single peridermium spore. These new spores are called uredospores and are quite different from those on the pine. These spores unlike the pine spores can reinfect the leaves of ribes and therefore this is called a repeating stage. This repetition goes on the remainder of the season, a new crop of spores being produced every two weeks. The amount of progress made by the parasite during this time depends upon the amount of ribes near the infected one. This stage of the disease is generally found from June first until the leaves fall.

After the latter part of July another form of fruiting body and spores are formed upon gooseberry and current leaves. The new form appears in groups of from three to twelve short, stout threads about a quarter of an inch long and generally arranged in circles. Upon these threads teliospores are produced and unlike the uredospores cannot reattack the ribes leaves. They must attack the bark of the white pine, germinate and grow in the inner bark during the incubation period. This pine infection must take place in late summer or fall and if conditions are favorable pycnospores may be produced the next spring. This completes the life cycle of the parasite.

In the work of controlling the disease, special emphasis has been laid upon separating the two host plants, since each is dependent upon the other in the life cycle. State officials must have authority to destroy such current or gooseberry bushes as they deem necessary. Without adequate state laws, little can be done in the way of eradicating this disease.

THE PLANTS FOUND IN A BEAVER SWAMP.

By L. H. Pammel, Professor of Botany, Iowa State College.

The American beaver was, at one time, numerous in the Rocky Mountains and at many points in the north. The great value of the fur has greatly lessened this fine fur-bearing animal. In many parts of the Rockies and in the north, geographic names indicate the abundance of the animal, such as Beaver creek, Beaver dam, etc. The presence of the beaver is often indicated by arms built, many of them long ago, and the impounding of water in the form of little lakes. A fine series of these was observed by the writer last summer on the Grand River beyond Ouray. Another small series was observed by the writer on Spruce creek, a tributary of the west fork of St. Louis creek, just above the summer camp of the Ames Foresters near the ranger station, at an altitude of about 9,200 feet. Spruce Creek



Dr. Pammel taking the air on a mountain peak in the Rockies.

is a small stream of clear water, fed mostly by springs. There were four of the little ponds situated in a little expansion of Spruce Creek. The ponds are located about a quarter of a mile back from the west fork of St. Louis Creek. The ground is somewhat higher and is covered mainly with the lodge pole pine a few open spaces where the bunch grass (*Festuca scabrella*),



Beaver dam, west fork St. Louis Creek Arapaho Nat'l. Forest, Colorado.

red fescue (*Festuca rubra*), Valerian (*Valeriana edulis*), switch grass (*Agropyron sp.*) and hair grass (*Deschampsia caespitosa*) were growing in profusion. On the border of the lakes were good-sized trees of the Engelmann spruce (*Picea Engelmannii*) and on the hillsides Arnica (*Arnica cordifolia*), fire weed (*Epilobium spicatum*) and twin flower (*Linnaea borealis*). The dam in each of the little lakes was overgrown with willows and here and there a young Engelmann spruce. On the dry borders and drives adjacent to the old swamps were hair grass (*Deschampsia caespitosa*), wild barley (*Hordeum nodosum*), Gentiana (*Gentiana sp.*), foxtail (*Alopecurus geniculatus*), manna grass (*Glyceria nervata*), alpine timothy (*Phleum alpinum*), larkspur (*Delphinium sp.*)

In the swamps created by the beaver, I found swamp birch (*Betula glandulosa*), lungwort (*Mertensia sibirica*), aconite (*Aconitum columbiana*), rush (*Juncus sp.*), luzula (*Luzula parviflora*), gentian (*Swertia palustris*), green hellebore (*Veratrum speciosum*), twisted stalk (*Streptopus amplexifolius*), cress (*Cardamine cardiophylla*), saxifrage (*Saxifrage punctata*), parnassus (*Parnassus fimbriata*), trollius, (*Trollius albiflorus*), sedge (*Carex eburnea*), orchid (*Limnorchis viridiflora*), Cow parsnip (*Heracleum lanatum*), (*Pyrola chlorantha*), Avens (*Geum macrophyllum*), reed grass (*Cinna pendula*), groundsel (*Senecio triangularis*), *Epilobium adenocaulon*, *Polemonium occidentale*, *Calamagrostis*, dock (*Rumex densiflorus*), Blue joint (*Calamagrostis canadensis*, and *C. acuminata*). Several species of willows were observed. Some of these growing on the artificial dams, and others—the swamp.

I observed a quaking aspen four inches in diameter cut off by the beaver. I was told that the beaver feeds on the bark of the quaking aspen and that their dams are constructed near aspen groves. Aspens were abundant in the vicinity. It is probable that bog conditions have been largely preserved by the beaver in making lakes and ponds.

The fourth annual convention of the Intercollegiate Association of Forest Clubs was held at New Haven, Connecticut, February 27 and 28 of this year, the Yale Forestry School acting as host to the other clubs in the association. The Ames Forestry Club was unable to send a representative this year but expect to be on hand next year at the convention which is to be held with the University of California.

PLANTING RECONNAISSANCE IN DISTRICT I.

By F. J. Poeh, Chief of Party.

Due to the great devastation to reproduction and young growth caused by fire and lumbering (the former by far the greater cause) District I of the United States Forest Service has for a number of years past, resorted to artificial regeneration or forest planting.

In order that work of forest reforestation may be carried out in an efficient and economic manner, some method whereby the deforested areas might be located, mapped, and recorded had to be devised. To this end Planting Reconnaissance was developed.

The work divides itself into two departments namely: Extensive and Intensive Reconnaissance, the former a forerunner for the latter. To explain the organization of, methods of procedure, and forms used in this work I will resort, from time to time thruout this article to the "Extensive and Intensive Planting Survey Instructions" as used in District I.

Reconnaissance for planting was first taken up in District I in 1916 and was during that year, more of an experiment in both organization and operation. The methods used however, were so effective that the organization and operation of the party remained practically the same for the following years.

During 1918, due to war conditions, no reconnaissance work was carried on, but in June, 1919, the work was again resumed. The following report, taken from the "1920 Annual Planting Report, District I", shows the number of acres covered and costs per acre for the years 1916-1919 inclusive.

SUMMARY OF PLANTING SURVEY ON DISTRICT I.

Extensive Survey

In 1916, 20,480 acres were examined of which 9,220 were found to be plantable, the total cost of survey amounting to \$.011 per acre.

In 1917, 169,513 acres were examined, 32, 923 acres of plantable acreage found and the total cost of survey calculated to be \$.0082 per acre.

In 1919, 118,620 acres were examined, 2,764 of which were plantable and the cost of survey was \$.0048 per acre.

The total acreage examined in the three years amounted to 314,613 acres of which 44,907 were found to be plantable. The average cost of survey per acre for the three years was \$.0071.

Intensive Survey



Campus at Iowa State.

In 1916, 34,669 acres were mapped of which 20,861 were plantable. The total cost per acre was \$.0730.

In 1917, 14,107 acres were mapped of which 4,761 were plantable, the total cost of survey being \$.083 per acre.

In 1919, 19,993 acres were mapped of which 4,686 were plantable. The total cost per acre was \$.0613.

The total acreage mapped was 68,709 acres, of which 30,308 were plantable. The total cost being \$.0717 per acre.

OBJECTS OF WORK.

The chief objects and aims of extensive surveys are:

- (1) To obtain a general knowledge of the country in question.
- (2) To obtain information relative to reproduction (whether sufficient or not).
- (3) To locate all available planting ground.

Intensive surveys are a direct result of the data collected from extensive, for, from the information gathered, provided sufficient planting ground has been found to warrant the expense involved in planting) the next step is to obtain in detail the information for the actual planting. In order that a better understanding may be had of the work, I shall take up each phase separately, explaining first the organization of the party, then the methods used in the reconnaissance.

ORGANIZATION OF PARTY.

CONTROL.

The planting survey organization is maintained and controlled by the District Forester in the best interests of efficiency and economy. The crew is assigned to the Forest on which the work is to be done, and the Supervisor is responsible for the transportation of supplies, for handling the accounts and purchase of supplies, and for the general conduct of the men of the party, and in emergency, has complete control of the crew. The Chief of Party is held directly responsible to the District Forester for the quality and quantity of work performed.

All correspondence between the District Office and the field is carried on through the Supervisor's office. All vouchers are initialed by the Chief of Party before payment, in order that he may be currently informed as to the project finances. The officer in charge is held responsible for the proper care of all equipment supplied to him.

The organization of the party is the same for both the extensive and intensive surveys and is as follows:

Organization of Party.

District Forester

Supervisor

Chief of Party (Topographer)

1. Compassman.
2. Cook and Packer
3. Compassman
4. Topographer

The District Forester has control over all parties in the district, the supervisor controls all parties on his forest, and the chief of party supervises the work of the party in the field and generally is chief topographer.

EXTENSIVE SURVEYS

When a *U. S. G. S. or other good contour map is available no control is necessary for the mapper can determine at all times his approximate altitude and direction. If however, no topographic map is available the following steps must be observed:

1. Both horizontal and vertical control must be run with abney chain and compass.
2. Stations should be left at least every cardinal mile, preferably in the center of each section.
3. If however, the country is of such a nature that it be advisable to cover the area more intensively, stations should be set at more frequent intervals.
4. Strips will be run at least once through a section.

DUTIES OF MEMBERS OF EACH CREW.

Compassman.

The compassman runs compass, drags chain and collects the following planting data and records it on diagrams scaled $\frac{1}{4}$ inch to the mile.

1. Soil:

S—sandy, G—gravelly, R—rocky, L—loam, C—clay

2. Brush, Windfall, Standing Dead Timber.

L—light, M—moderate, H—heavy.

Mapper.

The mapper "snubs" chain and carries elevations when necessary, and makes the map. When a U. S. G. S. or other good topographic map is available, mapping should be done directly on it as a base. If no such map can be had, mapping should be done on the following in order of preference:

1. White photostat reductions or lithograph copies of G. L. O. plats on a scale 1 inch=1 mile.
2. Blank township sheets, Form 974, scale 1 inch=1 mile.

*United States Geological Survey.

TYPES.

The following types and their symbols should be shown on this field map:

Plantable areas by species	Y. P.
Green timber	
(seed producing trees)	G
Brush prohibitive to planting	B
Reproduction sufficient	R
(-00 trees per acre)	
Too rocky for planting	K
Alienations	A

FINAL MAP

The final map should be similar to the one made in the field. The boundaries of all types should be indicated by dotted lines and the types themselves colored according to the following legend:

Type	Crayon Color No.	
G—Green timber	63	green
B—Brush prohibitive to planting	87	brown
R—Reproduction sufficient	2	yellow
A—Alienations	72	pink
Plantable areas	—	y. p.

COSTS AND REPORTS

All costs are compiled on the "Planting Survey Cost Sheet," a plan of which is as follows:

Forest										Watershed		Date	
Name	2	2	3	4	5	6	7	8	9	10	30	31	Salary
Total													(a)



Central and Morrill Hall.

The work is divided into two classes, namely; Effective and Non-effective.

Names	TOTAL	
	Days	Amount
Effective		
Rate per day		
Office Work—Mapping	(c)	(c')
Control	(e)	(e')
Field Mapping	(g)	(g')
Supervision and Inspection	(h)	(h')
TOTAL	(i)	
Non-effective		
Bad Weather	(j)	(j')
Moving	(k)	(k')
Sick Leave	(l)	(l')
Annual Leave	(m)	(m')
Sundays and Holidays	(n)	(n')
TOTAL		
Total (Effective	(o)	
(Non-effective		

- (p) Total No. days covered by report.....
- (q) Ave. crew (exclusive of cook, packer, etc).....
- (r) Ave. No. days effective work per man per month
 $(i \div q) + 30$
-
- p

EXPENSES

COSTS

Travel	(N) Control per acre
Wages—Cook	(B ÷ K)
Wages—Packer	(O) Mapping per acre
(t) Subsistence	(C ÷ K)
Material and Equipment	(P) Supervision per acre
Freight, express and hauling..	(D ÷ K)
Misc.	(R) Total office cost per acre
	mapping (E ÷ K)
	Total cost per acre,
Total	(N + O + P ÷ R)

TOTAL EXPENSES OF PROJECT

(u)	Total expenses .....	.....
(v)	Ave. exp. per day effect. work ($u \div i$) .....	.....
(x)	Total No. rations served .....	.....
(y)	Ave. cost per ration ($t \div x$) .....	.....
(z)	Total cost of party ($a \div u$) .....	.....
(A)	Ave. cost per day effect work ($z \div i$) .....	.....
(B)	Total cost control ($e \times aA$) .....	.....
(C)	Total cost field mapping ($g \times A$) .....	.....
(D)	Total cost supervision ($h' + h \times v$) .....	.....
(E)	Total cost office work mapping ($e \times A$) .....	.....
(F)	Miles control .....	.....
(K)	Total acres mapped .....	.....

Following is a copy taken from the 1920 Annual Planting Report of District I showing the costs of the various projects of the year 1919.

On the Cabinet Forest in the Swamp Creek locality, 19,230 acres were examined, 481 found plantable and the total cost per acre determined to be \$.003. In the Little Beaver and Big Beaver localities, 18,088 acres examined with cost of \$.003 per acre.

On the Lolo Forest, 13,721 acres were examined in the Twin and Rock Creek localities, of which 0 plantable acres were found the cost being \$.0090 per acre. In the Silver Creek locality, 10,051 acres were examined of which 768 acres were plantable, the cost being \$.0017 per acre.

On the St. Joe Forest in the St. Joe River locality, 57,600 acres were examined of which 1515 were plantable, the cost amounting to \$.0072 per acre.

A total of 118,620 acres were examined of which 2,764 or 2.3% were plantable. The average cost of both field and office work amounted to \$.0048 per acre.

All maps and reports are submitted in triplicate for the Ranger's, Supervisor's and District Forester's files. The following General Summary Sheet is submitted with the Planting Survey Cost Sheet.

.....National Forest Date.....
Watershed

T.R.Meridian

1. Location and Accessibility.

(Geographic location with reference to towns, rivers, etc., and brief discussion of trails or roads to area.)

2. Condition of Area. Discuss briefly the following)

- a Soil.
- b Brush.
- c Windfall.

- d Standing Dead Timber.
3. Area Examined.

Species. (Scientific Name)	Acreage
Total acreage to be planted.	
Green timber mapped.	
Reproduction sufficient.	
Too rocky for planting.	
Brush prohibitive to planting.	
Alienations mapped.	
Total acreage mapped.	
Total cost per acre.	

4. Remarks.

INTENSIVE SURVEYS.

All topographic planting surveys will be made in accordance with the instructions given in the "Topographic Surveys" manual.

Strips will ordinarily be run 20 chains apart or once through a "forty". Exception may be made to this where the Chief of Party deems it advisable to cover the area more intensively or where non-plantable areas are covered merely to complete the map.

Ties must be made to a Land Office corner at the end of each day's work in surveyed country.

The topographer will keep the record of closure of each strip on the "Error of Closure" sheets. He will also keep a record on the map of all corners, for which search has been made, and record the data as follows:

Solid diamond for corners found.

Hollow diamond for witness trees found but no corners.

Circle where search reveals neither witness trees nor corner.

DUTIES OF MEMBERS OF EACH CREW.

Compassman.

The duties of the compassman are similar to those mentioned in extensive surveys except that planting data is kept by "forties."

Topographer.

The topographer carries elevations with the Abney, "snubs" chain and makes the map and tracing, using standard atlas symbols. The map will be made on a scale of 4 inches=1 mile with either 100 foot contour interval and 50 foot intermediate, or 50 foot contour and 25 foot intermediate. The intermediate contour will be used only to bring out additional detail.

MAPS AND TRACINGS.

The symbols used in the field tracing are similar to those mentioned under "Types" in the extensive surveys, with these additions:

Proposed camp sites Y Y p. c. s.

Proposed trails —x—x—x—x—x—x

(Trails should be shown to the p. c. s.)

Proposed roads —x—x—x—x

(If existing roads run near the p. c. s. they should be continued to the site.)

Planting areas.

The planting areas should be outlined according to the species, age-classes, and spacings to be used.

Y.P.
Example—1-2
8x8

Species in order of importance	Age Classes.	
	Best sites	Medium and poor sites
White Pine	2-0	1-2
Yellow Pine	2-0	1-2
Engelmann Spruce	3-0	2-2
Western Red Cedar	3-0	2-2
Western Larch	3-0	2-2
Douglas Fir	3-0	2-2

Spacing should be as follows:

Best sites 8'x8'	680 trees per acre
Poorer sites (7'x7')	890 " " "
Poorer sites (6x6)	1210 " " "

The 8'x8' spacing will be used on the best sites for all species except Spruce. Spruce will be spaced 7'x7' on best and increased accordingly on the poorer ones.

When ready for the engineering department, the final field or base map and the tracing, which have been done by the Chief of Party (who is also topographer in charge) should be in colored ink and on tracing cloth respectively, and should show all detail as gathered in the field. From the tracing all planting work is done.

COSTS.

Costs are kept on the "Planting Survey Cost Sheets." The following report taken from the "1920 Annual Planting Report" of District I gives in detail the costs of the various projects during 1919.

LOLO FOREST.

Location	Total	Plantable	Cost per Acre		
	acres mapped	acres mapped	Field	Office	Total
Saltese area	2891	567*	.0610	.002	.0630
Randolph-Brimstone	9372	1588	.0500	.002	.0520
W. Fork Big Cr.	3190	2128	.0797	.002	.0817
Loop Cr.	4030	347**	.0541	.002	.0561

ST. JOE FOREST.

Sec. 26	450	56	.1583	.002	.1603
Totals and averages	19933	4686***	.0593	.002	.0613

*An additional 174 acres have already been planted.

**An additional 347 acres have already been planted.

***26.1% of total acreage mapped.

Canyon Creek area, Cabinet Forest (mapped in 1916) was typed in 1919 at a cost of .037 per acre.

REPORTS.

Monthly Report.

Monthly reports are submitted in duplicate to the Supervisor, the original being sent by him to the District Office.

If work on a project occupies six weeks or less, no Monthly Report need be made the Project Report being sufficient. In case the work extends beyond a period of six weeks, the Chief of Party should submit a progress report at the end of each month. The monthly report is a concise statement of the progress made, the number of acres covered, and the approximate cost per acre.

Project Reports.

Reports (a) and (b) should be submitted in triplicate for the Ranger's, Supervisor's and District Forester's files.

Report (a) is an Intensive Planting Survey Report showing the condition of the area in the amount of distribution of brush, windfall, and standing dead timber by forty acre tracts.

Report (b) summarizes the planting area as to the proposed species to be planted, the age class, the spacing to be followed, the character of the soil, the number of acres to be planted and the number of trees necessary. Questions are to be answered as to the amount of green timber mapped, the amount of brush prohibitive to planting, the amount of reproduction on the area and the several soil distinctions mapped. The total number of acres mapped with the cost is included.

A SUMMER ON THE ARAPAHO

By Prof. G. C. Morbeck.

The forestry at Ames includes in its curriculum a summer quarter of 12 weeks held away from the college, usually in the forest region of the north, or in the west. During this period such subjects are taught as cannot be satisfactorily handled in the class room, or laboratories on the campus. Experience along practical forestry lines is attained in its fullest extent in the great out-of-door laboratories of the mountains, streams, lakes and forests, and in the mills and factories which transform the great masses of inert wood into useful articles of commerce.

Each year about the time the ground-hog is supposed to look for his shadow, the forestry department and the students begin thinking of summer camp. Some time later when the robins and blackbirds by their presence on the campus herald the approach of spring, the task of choosing a location for the summer session is actively begun. Correspondence is initiated with National Forest officers, managers of lumber companies, and others, in regions suspected of having desirable camp sites as well as the other necessary facilities for satisfactory field work. From the mass of evidence received, the possible camp locations are selected. One by one, for one reason or another, places are eliminated until finally but one or two remain in the running. It is often difficult to select the exact site from a dis-



Preparing dinner on the banks of Grand River, near Hot Sulphur Springs, Colo.



Summer camp of the Ames Forestry Students near the Byers Ranger Station.

tance, so it is sometimes necessary to dispatch a scout to look the ground over carefully before final decision is made.

The first summer camp of the Ames foresters was conducted on Star Island in Cass Lake, on the Minnesota National Forest. Subsequent camps have not all been permanent, but rather have consisted of more or less protracted stops at points where various phases of forestry could be studied to advantage. An arrangement of this kind enabled the foresters in 1916 to study practical forestry operations on government and private lands in practically all the Western states and in Minnesota. Other camps have included a shorter itinerary with longer stops. The war made desirable a change in the conduct of camp during 1918. Able-bodied men could not conscientiously be withdrawn from productive employment, so the summer camp students were placed in the woods and at the mill of the Crossett-Western Lumber Company at Wauna, Oregon, and patriotically did what they could to "can the Kaiser" by assisting in getting out ship timbers and aeroplane stock.

The summer camp of 1919 was located in the heart of the Rocky Mountains of Colorado. Professor MacDonald preceded the party to select the site. After conferring with Forest officers at Denver, and upon looking over the country with particular reference to the requirements in the work to be given, a location on the Arapaho National Forest was chosen. The Arapaho lies

on the western slope of the Rockies in north-central Colorado, and entirely within the drainage area of the Grand River and its tributaries. The forest comprises about 700,000 acres of land, mostly rough, rocky and inaccessible, yet with many areas of fine, unbroken timber at the lower elevations. The headquarters of the forest is at Hot Sulphur Springs, a small town which is also the county seat of Grand County.

The "Moffat" road crossing the divide at Corona, follows a winding course from the summit to the valley below and thence continues in a more orderly fashion through the Forest westward to its terminus at Craig. The Midland trail, the main highway from Denver, reaches the crest of the mountains and enters the Arapaho at Berthoud pass and follows the tortuous Fraser river on its way westward to Salt Lake.

The exact site of the camp was at the confluence of Spruce Creek and West Saint Louis, about a quarter of a mile above the Byers Ranger Station, and about five miles southwest of the small town of Fraser, located on the railroad and also on the main highway.

A winter logging road, which had been improved somewhat but was still in poor condition, led from town to camp. Supplies were quite easily transported over this road during dry weather, and at no time was it entirely unserviceable.

For the study of forestry and related subjects the location of the camp was ideal, and probably a better site cannot be



Look Out Timber! Arapaho National Forest.



The end of a "live" chute on a timber sale area near Mt. Byer.



Ames Foresters studying timber-line types on Mt. Byer.

found in all Colorado. The camp itself was pitched at one edge of a small opening in a willow thicket, nestled among the intermediate heights of the great Rockies, at an elevation of 8,900 feet. On all sides are heavily timbered slopes of lodgepole and spruce, while to the south looms the great snowy peak of Mount Byers about five miles distant.

All of the requisites of a good camp site were present at the Byers Ranger Station. Pure cold water from the forest-clad slopes and the great snowbanks of the higher ridges, flowed along one side of camp to swell the waters of the main Saint Louis a half mile below. Wood was plentiful and ready cut, waiting to be used; fresh, bracing air filled the lungs, and beautiful scenery delighted the eye at every turn.

The camp consisted of a row of 7x9 wall tents, each accommodating two persons, fronting the small patch of open ground. At one side of the camp were the cook, dining and supply tents and at the other across a small stream were the tents of the instructing force. Lumber obtained from a mill at Fraser was used in making floors and sides for the tents, beds, tables and other camp furniture and equipment. Flies were provided for most of the tents, and canvas bed sheets under and over the blankets on each bed aided much toward comfort in sleeping.

The open plot in front of camp was used to good advantage. Space was reserved for the nightly bonfire, and nearby were

“horseshoe” ranges that were always in use when two or more fellows had nothing particular to do. On sunny afternoons the “patch” was often ablaze with color, with comforters and blankets airing or drying after spells of damp weather, especially during the latter days of camp.

The regular camp work consisted of practical exercises in camp technique, forest mensuration, field silviculture and lumbering. The work in camp technique was along lines which would enable one to fully take care of himself in the woods. Students at the beginning were required to do their own cooking, and during the entire summer were required to assist in the work of preparing meals. During the second six weeks one of the boys devoted most of his time to this work. The importance of knowing something of camp cookery is obvious. In regular forestry work it is often necessary for men to prepare their meals for days at a time.

The kitchen and dining equipment and facilities, of course, were not such as one would expect to find in a modern house, but the essentials were there—pots, pans, enameled tableware, stoves, tables, benches and such other necessities as are to be found in a regular camp. Running water from the snowy mountain peaks, and dry wood, the waste in tie making, were close at hand. Embryo cooks supplied these requisites, washed dishes and performed other necessary camp labor, thus becoming familiar with the culinary end of camp life.



Lined up for the final assault on Mt. Byer. Ames foresters above timber line.

Other phases of camp craft were also considered. Forest officers demonstrated the saddling and handling of riding animals, and the packing of horses for the trail. The "throwing" of the common hitches was also carefully demonstrated and explained. Camp fire talks on camp food and camp cookery and other topics were very interesting and instructive. The aim in camp technique is to teach the student the proper attitude toward camp life, and to attain a certain woods bearing, which only comes through experience. The ability of one to adapt himself to any camp conditions encountered determines pretty largely his measure of success in field forestry work.



The main body of the Arapaho Glacier. Prof. McDonald in the foreground.



The face of one of the many glaciers on the slopes of the Arapaho peaks.

Conditions in the vicinity of the camp were almost ideal for work in forest mensuration. Thousands of acres of virgin timber lay all about us. Resurveys of the country enabled the students to contour and otherwise map the region very accurately. Solid blocks of timber were convenient for estimating. Logging operations close at hand provided an ideal outdoor laboratory for the study of volume and instruction in scaling logs, considerable of which was done in the course of the summer. By following the fellers closely and scaling all the timber in a tree before any logs were removed, accurate volume tables were constructed.

Sample plots in typical stands were laid out and worked over in various exercises, to illustrate methods of estimating, extensively and intensively. Trees were elled and measured to

verify results and were afterward used in stem analysis, volume and form factor work.

The exercises in lumbering and forest products were conducted at operations near camp, and the students had excellent opportunities to study the various phases of the industry from the felling of the tree in the forest to the loading of the finished product on cars ready for shipment. Logging operations were covered in detail. Each operation was gone into thoroughly—felling, skidding, loading, hauling, fluming, and the minor operations necessary in logging. Tie and prop making were also studied.



Felling lodgepole pine, Arapaho National Forest.

Milling in central Colorado is conducted at small stationary or semi-stationary plants usually located in or very close to the forest. The mill at Fraser is typical of the class and was studied carefully by the students, both as to construction and operation. The logs were delivered to this plant by means of a flume about five miles long, and practically the whole supply came from National Forest lands.

Field silviculture consisted very largely in a study of the composition of the various stands and types of timber in the region, and the relationship existing among the various tree species. Reproduction studies were carried on in various parts of the forest, especially on cleared, burned and logged off areas. Practical silviculture operations in brush piling on timber sale area and the marking of trees for cutting afforded the students

fine opportunities to acquaint themselves with forestry as it is conducted by the Forest Service.

Intensive silvicultural studies were made on the Medicine Bow National Forest at Fox Park, Wyoming. A number of students made the trip from camp by automobile. The distance was around 100 miles. The students were engaged in making detailed studies of sample plots which had been laid out by the Forest Service some years previous. The plots were maintained chiefly to determine the rate of growth under various methods of treatment, and to observe the effects of the common methods of cutting on reproduction. Opportunity was given to study the seed extraction plant located at the ranger station near by.



Students at work on timber reconnaissance on forest area near camp.

In addition to the prescribed work, many interesting trips were made with Dr. Pammel of the Botany Department, on which the flora of the region was studied. Dr. Pammel is greatly interested in forestry and the forestry students and each year spends a week or ten days in camp, during which time he is constantly engaged in botanical research and instructional work. The tramps over the hills with him are always instructive and intensely interesting.

Forest Service officers were all eager to make the camp as pleasant and profitable as possible to both students and instructors. Talks on forest administration, as conducted in both office and field, gave the students a good insight into the way



Applied Silviculture. Fox Park, Wyoming. Students making seedling counts.

National Forests are handled. In many other ways the forest supervisor and his assistants contributed to the success of the camp and the general welfare of its members.

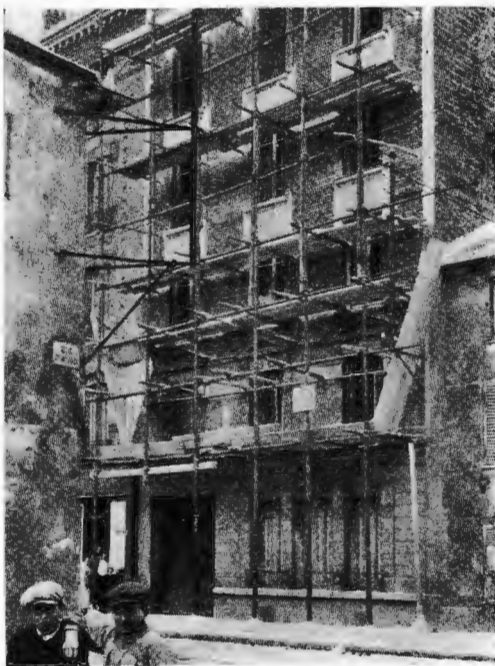
A very important part of camp life and one which was thoroughly enjoyed by the students and faculty, were the trips taken to various interesting points and places in the vicinity. Mountain trout were supposed to have been abundant but they departed to parts unknown upon our arrival. Reports of generous catches in streams some distance away lured the boys thither with indifferent results.

Game was plentiful—grouse, deer, elk and bear, and all were observed by various members of the party, which added interest to the rambles over the hills. Jaunts to high, rocky peaks, Mount Byers and Bottle mountain, and the Saint Louis Lake country were full of interest and disclosed ever shifting scenery as far as the eye could reach. Great rugged peaks, broad green valleys and intervening forest clad slopes, offer a picturesque landscape that delights the eye.

At some distance from camp were the Arapaho peaks and under the protection of their rugged crags lie the great glaciers of the same name. Surrounded on all sides by steep cut-over slopes lies Monarch Lake. Farther to the north is Grand Lake, the largest natural body of water in Colorado, and one, too, of great beauty. Specimen mountain with its goods and brightly

colored rocks, and flocks of mountain sheep, lies yet farther north and marks the physical limit of our rambles during the summer.

The forester's camp closed the last week in August and the students returned by various routes to their respective homes after twelve weeks of profitable as well as pleasant experiences, on a great National Forest in the heart of a great mountain range, to await the time when college again opened for the new year. The summer camp of 1919 was thus ended, but the flavor lasts and the memories linger.



In France. A sample of construction work.



Lover's Lane. Campus.

THE FORESTRY COURSE AT THE IOWA STATE COLLEGE

The forestry course at the Iowa State College has developed as the need of forestry training became more pronounced. The present course represents the changes and additions of twenty years. In fact, as early as the year 1879 a course of forestry was taught which made use of Bryant's "Forest Trees" as a text. At this early date the college was maintaining forestry plantations and a nursery for instructional and experimental purposes. Also a collection of American and exotic woods had been accumulated for instructional purposes. In 1880 the college had a department of instructor of Horticulture and Forestry. At this time this combined course included a subject, "The general principles of forestry," which required Fuller's text. Up to the year 1904 the forestry work offered at the college was general, including the principles of the subject, identification of trees, woods, etc., and it was in 1905 when the more specialized work in forestry began to be developed. At this date, in addition to a general course in farm forestry offered to the agricultural students, the students of horticulture and forestry were offered separate courses in elementary forestry, silviculture, forest management and policy, and wood technology. From 1905 to the present time, many additions and changes have been made in keeping pace with the rapid development of the forestry profession.

In the development of the forestry work at the Iowa State College it has been the purpose of the institutions to meet the needs of both the state and nation in this important field. This means that the forestry work as now outlined provides for general instruction in farm forestry for the students in the various courses in the division of agriculture and also for a thorough technical training for forestry students who expect to make forestry their professional work.

At the present time a four-year technical course in forestry, leading to the degree Bachelor of Science in Forestry, is offered. An additional year of graduate study, for those desiring advanced work, leads to the degree Master of Science in Forestry.

In the technical course in forestry provision is made for a good grounding in general and fundamental subjects which every college graduate should have. The necessity of not permitting the strictly technical subjects to crowd out the fundamental non-technical work is recognized, since the student who over-emphasizes the technical branches at the expense of other important subjects is often seriously handicapped after leaving college.



Central.

The technical forestry course is open to all students who have had sufficient preliminary training to admit them to a college or university of first rank. This means that the course is open to graduates of standard high schools.

In the first year of the technical course the work is mostly fundamental or non-technical. Throughout the three quarters of this year the student is given a general subject in forestry, the purpose of which is to outline the field of forestry. English and general chemistry are also continued through the entire first year. General Botany is included in the first two quarters, which lays a foundation for the later botanical work of the course. A preliminary course in surveying is offered in the third quarter of this year, as a foundation for the three courses in surveying in the second year. A course in mechanical drawing and courses in college algebra and trigonometry make up the balance of the work for the first year of the forestry course.

At the conclusion of the freshman year the technical forestry students go to summer forestry camp which continues for a period of three months. The camp is usually conducted on a National Forest either in the Lake States, Rocky Mountains or Western States, where forest conditions and operations may be

studied to best advantage. This summer work consists of timber estimating and mapping, scaling logs, marking timber, type studies and other field work. The purpose of this work is to give the beginning forester some actual experience in practical forestry work.

In the second year of the course a number of strictly technical subjects are given. These are forest mensuration, dendrology, logging and lumbering, silviculture and forest nursery and planting. A practical course in surveying is carried through the entire year, which gives the student thorough work in this branch. Applied organic chemistry is taken for two quarters of the year and courses in plant physiology and history complete the work of the second year.

In the third year technical courses are offered in the minor forest industries, timber preservation, study of woods, forest soils, chemistry of forest products, ecology and forest mapping. The technical work of this year is supplemented with courses in general entomology, landscape architecture, systematic botany, physics, technical journalism and public speaking.

At the close of the third or junior year the student selects one of two groups to complete for the fourth year. These groups—forest management and lumber marketing, have a number of studies in common, including forest management, forest valuation and finance, history of forestry, municipal forestry, forest economics, timber testing, forest pathology, general bacteriology, and forest insects.

In addition to the above the forest management group includes physics of forest soils, general geology, and shade and



State Field.

street tree management. The lumber marketing group of the senior year, in addition to the subjects common to both groups, includes woods of commerce, lumber markets, and business law.

During the third and fourth years a student who desires to specialize in some branch of forestry or closely allied work is given an opportunity to substitute other work for certain courses, provided this has the approval of the faculty. This permits students to elect more work to fit them for grazing positions, work in forest products, forest pathology and other lines.

Throughout the entire four years of college work the students meet once a week to discuss topics of current interest in the field of forestry. Before graduation the student must supplement his training with at least three months of practical work on a national forest or in other forestry work.

Students desiring to complete the work for the degree Master of Science in Forestry, continue for one year in advanced subjects and research courses. This additional year permits the student to secure preparation along the special line of forestry work which he is to follow.

In brief, the forestry course at the Iowa State College is designed to give the student a good grounding in the various branches of forestry but at the same time to include sufficient fundamental work in other branches to give him a well rounded out college education. The importance of linking up the theoretical with the practical is in keeping with the college motto "Science with Practice."



HERE AND THERE WITH THE AMES FORESTERS

By F. J. Poch and Roy Yeager, Associate Editors.

Abel, R. M., 1923, Waterloo, Iowa.

With the American Library Association at Camp Dodge., during war.

*Allen, Shirley W. 1909, Yreka, California.

Deputy Supervisor, Klamath National Forest, from May 1, 1918, to November 1, 1919. Allen was Industrial Examiner in the Forest Products Laboratory at Madison, Wisconsin, and assigned on wood preservation, water resistant glues, and plywood manufacture.

Avery, N. A., 1921, Alexander, S. Dak.

During summers of 1918 and 1919, Avery was on timber-reconnaissance on the Montezuma Forest in Colorado. He spent six months in the 9th Co., 3rd Bn., Infantry training and replacement troops at Camp Grant, Illinois.

Baker, C. J., 1920, St. Paul, Minn.

Beam, Donald, ex-1917, Ames, Iowa.

*Betts, Edward G., ex-1915, Calipatria, California.

Betts was captain in the 20th Engineers and spent 18 months of his 24 in the service in France in the Vosges and Landes region. Betts is in the retail lumber game.

Board, Lynn B., ex-1919, Hudson, Iowa.

Board enlisted in 1917 in the aviation section and was stationed in England. On his trip across his convoy encountered three subs, two of which were sunk. Board spent 13 months in the army and had a rank of Sergeant, First Class. Since leaving the army he has turned his attention toward tilling the soil.

*Bode, Irwin T., 1915, Ames, Iowa.

With the Field Artillery Officers' Training Camp, Camp Zackary Taylor, Kentucky. Bode is a member of the faculty of the Forestry Department, Iowa State College.

Bogen, Alfred J., 1923, LeMars, Iowa.

Spent two years in the Army with the 34th Division.

Brown, David K., ex-1913, Maloy, Iowa.

Entered the government school of aeronautics at the "U" of California, Berkeley, in 1917 and received his flying training at Rockwell Field, San Diego, California; Langley Field, Hampton, Virginia, and Toliaferro Field, Fort Worth, Texas. Lieutenant Brown spent 20 months in the service and while overseas had an interesting stay in Germany. Since dropping his wings, Lieutenant Brown has become a tiller of the soil.

Buck, K. J., 1921, Omaha, Nebraska.

Summer camp in Colorado and Wyoming took up most of



Buck's time the past summer.

*Barrett, Robt. L., 1911, Koshkonong, Mo.

During the war he was a member of the agricultural exemption claim board. At present he is managing a farm.

Cardle, Earl D. 1922, Blue Earth, Minn.

Carr, K. L., ex-1922, Clarion, Iowa.

Clark, Hal B. 1913 Sioux City, Iowa.

Lieutenant Clark spent one year with the 4th Infantry in the United States. He is a member of the Sioux-White Motor Company of Sioux City, distributors of White trucks.

Cormany C. P. 1921 Chicago, Ill.

During the war was Lieut. of Infantry.

Cornell, Harvey H., 1916, Cambridge, Mass.

Cornell is a graduate student in the School of Landscape Architecture at Harvard University.

His army record gives him 13 months of service with the 163rd Depot Brigade at Camp Dodge, Iowa, with the commission of Second Lieutenant.

Davis, Edward M., 1918, Marion, Ohio.

Lumber inspector for Erie Railroad.

Davis enlisted with the 20th Engineers. After spending several weeks in Winchester, England, he was sent to the pine woods of the Landes region where, he says, his first job was cutting firewood for the cook, but later he graduated to sealing. In April, 1919, he was made instructor in Forestry at the University of Beaune, which position he held until the school closed. Davis spent 19 months in the service with the 17th Co., 20th Engineers.

Deming, Milo H., 1920, Clarence Iowa.

Sergeant Deming's army travels took him through England, France and Italy. He spent 11 months in the service with Co. F., 313th Engineers and later with a machine gun company of the 351st Infantry, 88th Division.

Dunn, P. M., 1923, LeMars, Iowa.

Sergeant Dunn went to the border with "K" Co., 2nd Iowa Infantry. After spending a year at Camp Cody, New Mexico, he left for overseas with the 133rd Infantry. Dunn spent 23 months in the service.

Eggers, William C., 1921, Davenport, Iowa.

Eggers spent one year as a "Gob" on the U. S. S. C. 155 chasing subs along the east coast of the United States and around Ireland.

Fennell, Robert E., 1923, Allerton, Iowa.

The past summer Fennell spent with the Ames Foresters on their summer camp.



Fisk, Vernon C., 1921, Peconica, Ill.

For one year Fisk was with the Headquarters Hospital Center, Savenay, France.

Fletcher, R. A., 1920, Marshalltown, Iowa.

In Ireland, England and France with the 17th Co., 20th Engineers. For 20 months was Corporal Fletcher's record of service with Uncle Sam.

Geisler, Max, 1916, 5001 Prairie Ave., Chicago, Ill.

Geisler is Merchandise Manager of the World Tire Corporation of Chicago.

Goode, Walton, ex-1923, Ames, Iowa.

Grogan, William K., 1923, Ames, Iowa.

Grogan received his naval training at the Great Lakes and Hampton Roads, Virginia. Twelve months of his sixteen of service he spent aboard the U. S. S. Martha Washington, making eight round trips in the transport service.

*Hadlock, Frank D., 1918, 205 S. Spring Ave., LaGrange, Ill.

Hadlock is with the Mechanical Methods Division of the Western Electric Company, on dry kiln work. He had 14 months of service with the 4th and 10th Bns., 20th Engineers.

Hamilton, Tom E., 1923, Hampton, Iowa.

Hamrick, Clarence E. 1923, Walters, Okla.

Handley, R. Deane, 1923, Tipton, Iowa.

Handley spent 10 months in the U. S. at Jefferson Barracks, Missouri; Camp Taylor, Kentucky, and Camp Kearney, California. He held the rank of Supply Sergeant.

*Hansel, H. E., 1915, Bloomfield, Iowa.

Engaged in county engineering work.

Harley, William P., 1915, Indian Service, Dulce, New Mexico.

Deputy Supervisor of Forests, U. S. Indian Service.

Sergeant Harley had 20 months' service with "E" Co., 10th Engineers.

Hartmann, George B., 1917, Noble, Louisiana.

Nineteen months in the service, 16 of which were overseas with the 21st Co., 20th Engineers is the record established by Hartmann. While in France he did cruising work for the entrance of American engineers in the Cote D'Orr District. From April 1919, to the time he left France, Hartmann was instructor in the College of Forestry at the University of Beaune.

After graduation Hartmann was with the Bureau of Plant Industry on the White Pine Blister Rust work. At present he is with the Long-Bell Lumber Company, as clerk and yard man.

Hassel, W. C., 1914, Ely, Minnesota.

Ranger, Superior National Forest.

*Hayes, Ralph W., 1914, Cooley, Arizona.

Deputy Supervisor of Forests, Indian Service, in charge of forestry work on the Ft. Apache Indian Reservation.

Helm, Harley J., 1921, Council Bluffs, Iowa.

First Sergeant Helm was in "C" Co., 1st, Bn., Replacement Training Center, at Camp McArthur, Texas, for eight months. Helm has spent two summers on grazing studies on the forests of Arizona.

Henry, A. S., 1917, 803 Telephone Bldg., Omaha, Nebraska.

Lieutenant Henry had one year of service in the United States with the Air Service. He received his ground school work at the University of Illinois and his flying at Ebert's Field.

After graduation he was with the Northwestern Telephone Company, as Assistant Construction Engineer, and at present is materials engineer for the Nebraska Telephone Company.

*Hensel, R. L., 1913, Agronomy Dept., Manhattan, Kansas.

Professor of Pasture Management at the Kansas State Agricultural College.

Hesner, Harold H., ex-1920, Strawberry Point, Iowa.

The 829th Aero Repair Squadron was Sergeant Hesner's outfit for 23 months, 14 of which he spent at Romorantin, France. His present vocation is that of a mechanic.

*Hicks, Lowell E., 1915, 519 Cadillac Ave., Detroit, Michigan.

Timken Detroit Axle Company.

Nineteen months in the army, 16 overseas with "A" Co., 3rd Detachment, 10th Engineers in the Pontet les Forges region is Hick's army record.

*Hoffman, A. F., 1911, Mancos, Colo.

During the war Hoffman was a Liberty Bond and W. S. S. salesman. He is Forest Supervisor of the Montezuma National Forest.

Holmes, A. E. ex-1916, Bend, Oregon.

Horton, F. V., ex-1913, Bend, Oregon.

Grazing Examiner, United States Forest Service.

Howe, H. W., 1923, Pasadena, Calif.

Hoyer, V. B., 1920, Battle Creek, Iowa.

Ireland, England and France were visited by Hoyer while with the 18th Co., 20th Engineers, during the 18 months he was under the Eagle's wing. He was stationed at Castets, Landes, and Captieux, Gironde, France. At present in retail lumber game at Ida Grove, Iowa.

Ineck, Chas. H., ex-1916, Winner So. Dak.

Ineck saw 16½ months overseas with the 17th Co., 20th Engineers, most of which was in southern France. Since his discharge from the army he has entered the hardware and implement business.

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Puyallup Wash.

A. R. McCOLLEY
President

C. B. McCOLLEY
Secretary

Jager, H. F., ex-1921.

*Jones, Glen C., 1916, 715 Hippee Bldg., Des Moines, Iowa.

Jones was with the 209th Engineers of the 9th Division.

His present vocation is writing insurance for the Berkshire Life Insurance Company.

Karr, Thomas, 1923, Brooklyn, Iowa.

Koob, Roseoe W., 1923, Brayton, Iowa.

*Kupfer, Carl A., 1907, Forest Service, San Francisco, Calif.

During the war Kupfer was detailed to the Forest Products Laboratory at Madison, Wisconsin, working out and demonstrating methods for conditioning or drying artificially, wood for airplanes (both army and navy), gunstocks, artillery wheels army wagons and carts.

Lerdall, Floyd A., 1923, 2319 Knapp St., Ames, Iowa.

Lerdall was a "Gob" for six months.

*Lessel, L. R., 1912, Flagstaff, Arizona.

Forest Examiner, Coconino National Forest.

Ling Wen Ming, 1921, Hinghwa, Fukien, China.

Ling says the foresters are "very much roughneck". He invites all the foresters to call on him at his home in China.

Loy, Elmer C., 1920, Avoca, Iowa.

Lieutenant Loy enlisted in the 109th Engineers and saw service on the border. He was later transferred to the Air Service, in which branch he received his commission. He had 22 months of service in the United States.

*Martin, Robert G., ex-1919, Scott's Ferry, Florida.

Martin was a cadet flier in the U. S. Army and saw 19 months of service. He is at present engaged as a mechanic.

McCarthy, C. C., 1916, Winner, So. Dakota.

*Merritt, Melvin L., 1904, M. S. 1910, Portland, Oregon.

Merritt was associate member of the legal advisory board during the war. He is now in charge of improvement work in the Forest Service, for Oregon, Washington and Alaska.

Moorhead, J. W., 1920, 317 Lynn Ave., Ames, Iowa.

Moorhead was with Sec. 545, Ambulance Corps, for six months and then at the Third Officers' Training Camp at Eugene, Oregon.

Moravets, F. L., 1921, 131 Campus Ave., Ames, Iowa.

"Swede" was at Camp Taylor, Kentucky, with the 8th Observation Battery, F. A. C. O. T. S. The past summer he has been on experimental work at Fox Park, Wyoming.

Morris, Roger D., ex-1916, Goshen, Indiana.

Twenty months with "B" Co., 10th Engineers, for Morris. He has given up the Forestry idea and is now in the hardware

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game. Before and after going to France, Morris spent considerable time in Forest Service work.

Mullen, F. E., 1922, Presho, So. Dakota.

Scotland, England and France was Mullen's routing during the war with "B" Co., 10th Engineers. Of his 20 months' service, 18 were overseas. The past summer he spent on "Fire" on the Superior National Forest in Minnesota.

Munson, H., 1921, Manchester, Iowa.

Was in lumbering work on west coast.

*Nagel, W. M., 1914, Houseman-Spitzley Corp., Detroit, Mich.

Since July, 1917, Nagel has been assistant to the Chief of Planting, District 1, having charge of seed collection, planting surveys, and inspection of field planting work. He recently resigned his position to enter the real estate game in Detroit.

During the war Nagel was with the 472nd Engineers as instructor in topographic mapping, and later was assigned to Coast Defense mapping at Fort Barrancas, Florida. He held the rank of Sergeant, First Class.

*O'Banion, A. C., 1912, Moorhead, Minn.

County Agricultural Agent for Clay County, Minnesota.

*Olmstead, R. A., 1912, Dundee, Oregon.

Olmstead is following the forestry line by growing fruits and walnuts.

Paine, Charles R., 1922, Eagle Grove, Iowa.

Summer camp took up Paine's time last summer.

Pammel, Harold, 1922, Ames, Iowa.

"Pete" was in Honolulu. Has switched to Landscape Architecture.

Parke, L. S., 1911, University of Arizona, Tucson, Arizona.

State Director of boys' and girls' club work.

During the war his work was given special recognition as valuable in the food production and conservation program.

Patrick, O. K., 1920.

The summer of 1918 Patrick spent in Oregon with the Big Creek Logging Co., and the Corssert-Western Lumber Company. Summer camp and work on the Arapaho Forest in Colorado took up the summer of 1919.

Plagge, Homer H., 1916, 509 Welch Ave., Ames, Iowa.

At present, Assistant in Pomology Section, Iowa State Experiment Station. During 1918 he was with the Bureau of Plant Industry on cereal disease survey, and for 6 months in 1919, on barberry eradication.

Poch, F. J., 1922, Atlantic, Iowa.

Poch saw service in France with the 5th Air Park, 2nd Pursuit Group, 1st Pursuit Wing, in the Saint Mihiel and Argonne-



FRONT VIEW



BACK VIEW

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Meuse sectors. He had 17 months of service, nine of which were overseas. The summers of 1917 and 1919 he was on Planting Surveys in District 1, U. S. F. S.

Poshusta, D. C., 1919, Mason City, Iowa.

Sergeant of Infantry for 11 months, Camp Gordon, Georgia.

Pohle, E. H., 1916, Dexter, Iowa.

Quint, Harley J., 1916, Laurens, Iowa.

Rehmann, Theodore W., 1918, 663 49 th St., Des Moines, Iowa.

Lieutenant Rehmann was with the 29th Co., 20th Engineers; Headquarters Co., 101st Engineers; and Section Engineer Offices at Paris. His wanderings took him thru France, Germany, Italy, the Meuse-Argonne drive and the Verun sector.

At present he is in the real estate and investment game.

*Richmond, A. H., 1912, Hot Sulfur Springs, Colo.

Rinehart, John Marshall, ex-1917, Iowa Falls, Iowa.

Of Rinehart's two years in the army, 18 months took him thru France and Germany. Will be back to school next year.

*Ringheim, H. I., 1913, Elrose, Sask, Canada.

Traveling Superintendent for the Monarch Lumber Company Ltd. For 8 months of the war he was at the Navy Yard at Puget Sound.

Rutter, Frank J., 1923, Monroe, Iowa.

Schreck, R. G., 1914, Ely, Minnesota.

Forest Examiner, Minnesota National Forest. Schreck has been stepping right up in the Forest Service since leaving Ames. Lately he has become greatly interested in recreational work on National Forests.

Schultz, F. M., ex-1921, Erie, Penn.

With Air Service during war.

*Sherman, E. A., 1896, 930 F. St., Washington, D. C.

Sherman is Associate Forester, U. S. Forest Service.

During the war he remained in Washington as one of the skeleton force absolutely necessary to keep the Forest Service intact. It is men such as he who have helped to build up the Forest Service to its high standard.

Smutz, Hugh H., 1923, Ames, Iowa.

Steffen, E. H., 1913, Pullman, Wash.

Head of Forestry Dept., Washington State College.

Stokes, R. R., 1916, Clarkia, Idaho.

Logging camp foreman, Edward Rutledge Timber Company.

For 19 months he was with "E" Co., 10th Engineers and the 36th Co., 20th Engineers.

Stumpf, A. C., 1923, Earlville, Iowa.

Trenk, Fred B., 1923, Dubuque, Iowa.

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*Truax, T. R., 1912, 1919, 1902 Madison St., Madison, Wis.

Truax is wood technologist in the Forest Products Laboratory, doing investigational and educational work, especially in veneer and built-up wood construction. Truax became a member of the Forest Products Laboratory in June, 1917, and for a year and a half worked on problems connected with National Defense work and aircraft work in particular.

Van Boskirk, S. S., 1914, Ft. Valley Exp. Station, Flagstaff, Arizona.

In charge of Fort Valley Experiment Station. Van Boskirk spent 18 months in France.

Wall, Lloyd A., 1920, Alta, Iowa.

Wall was in the 384th Infantry of the 96th Division for six months. During the summer of 1918 he was foreman of the Cass Lake nursery, Minnesota National Forest, and in 1919 was on the White Pine Blister Rust work in Iowa.

Watkins, Eugene W., 1923, Ames, Iowa.

Watkins was at the O. T. S. at Camp Pike, Arkansas.

The past two summers he has been engaged in forestry work at Halsey, Nebraska.

*Watts, Lyle F., 1913, Wilser, Idaho.

Forest Supervisor at Wilser.

Webber, B. S., 1922, Lester, Iowa.

Webber spent 23 months with the 62nd Artillery and saw service in England and France.

Wygle, L., ex-1913, Keokuk, Iowa.

Wygle spent a number of months in France with the 20th Engineers. Before entering the service he was a Ranger in the U. S. Forest Service. At present on a farm with his brother.

*Whitham, J. C., 1911, Mason City, Mont.

Forest Supervisor, Custer-Sioux National Forest.

*Wilcox, H. F., ex-1912, Greenville, Calif.

Wilcox is a Forest Ranger.

*Wolf, Ernest T., 1914, Cody, Wyoming.

Forest Examiner, Washakie and Shoshone National Forests.

*Wolven, Ray M., 1914, Santa Ana, Calif.

Walnut rancher in California.

*Yeager, W. R., 1920, Kansas City, Mo.

Yeager has entered the creosoting game. He spent more than a year in France with the 20th Engineers.

*Married.

H. L. MUNN

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Data regarding the following men is not authentic, due to failure to answer the "Questionnaire" sent out by the staff. If any information regarding any of these men is available, it would be greatly appreciated by the Forestry Department of the College.

- Allen, E. L., ex-1917.
Atkins, J. W., ex-1919, Columbus, So. Dak.
Balthis, R. F., 1907, Flagstaff, Arizona.
Deputy Forest Supervisor, Coconino National Forest.
Baxter, W. G., 1908, (Yale) Aspen, Colorado.
Forest Supervisor, Soper National Forest.
Cassidy, Hugh O., 1916, Mimbres, New Mexico.
Ranger, U. S. Forest Service.
Cronin, L. J., Sibley, Iowa.
Dallmus, Carl, ex-1919, Strawberry Point, Iowa.
Davidson, O., ex-1917, Omaha, Nebr.
Donahoo, J. F., 1918.
Evans, John H., ex-1918, Marshalltown, Iowa.
With 10th Engineers in France.
Feltus, Van M., ex-1917, Correctionville, Iowa.
Freeman, F. G., ex-1911, Santa Ana, California.
Santa Ana Wholesale Grocery Co.
Haefner, H. E., 1908, Grants Pass, Oregon.
Forest Examiner, Siskiyou National Forest.
Hawcote, Wm., ex-1918.
Hess, George, ex-1919, Washta, Iowa.
Hughes, Andrew, ex-1919, Boone, Iowa.
Isch, D. H., ex-1917, West Bend, Iowa.
Koepke, W. C.
Lent, Archie, ex-1919, Valparaiso, Indiana.
Lorenzen, H. A., ex-1917, LeMars, Iowa.
Mast, W. H., 1900, (Yale 1905), Davenport, Iowa.
Davenport Nursery Work.
McGrew, T. M., ex-1919, Cloquet, Minn.
McCullough, T. E., (Yale), Flagstaff, Arizona.
Forest Examiner, Coconino National Forest.
Plagge, N. O., 1916, Barrington, Illinois.
Ray, F. C.
Reynoldson, L. A., 1911, Primghar, Iowa.
*Rumbaugh, W. R., 1916, Deerfield, Illinois.
Schmidt, H. O., ex-1917, Renville, Minnesota.
Smith, R. P., 1915.
Smith, W. A., 1912, Ogden, Utah.
Superintendent of Canning Mill.
Smith, P. T., 1911, Deadwood, So. Dak.
Forest Examiner, Black Hills National Forest.
Sterrett, J. C., 1914, Raymond, Washington.

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Veach, C. H., 1917, Des Moines, Iowa.
 Veach, A., ex-1920, Iowa City, Iowa.
 Warner, D. H., ex-1919.
 Welden, Neil, ex-1918, 618 White Bldg., Seattle, Wash.
 Co. E, 2nd Engineers in France for 2 years.
 Wiewel, Ronald, ex-1919, Rolfe, Iowa.
 Wilkins, J. P., ex-1919, Monticello, Iowa.



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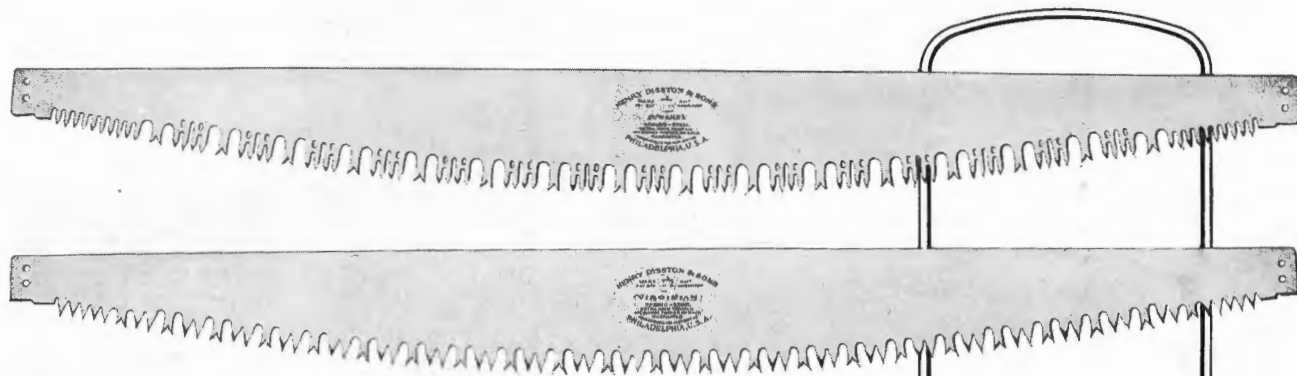
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