The
GOPHER
PEAVEY
1928

UNIVERSITY *of* MINNESOTA

The Gopher Peavey

THE ANNUAL
PUBLICATION OF THE
FORESTRY CLUB

University
of Minnesota

NINETEEN TWENTY-EIGHT

Foreword

This year's PEAVEY marks the dawn of a new era. An era in which we hope to see the PEAVEY published every year indefinitely into the future. An era in which the realization of a new Forestry building will be more than an empty dream. And an era in which the now healthy spirit of Minnesota's Foresters will continue in a sturdy rugged manner.

Five years ago the last GOPHER PEAVEY made its appearance on the campus. Due to and because of financial difficulties publication ceased until this year when a rejuvenated group of Foresters set out to bring the PEAVEY back to life.
You are now reading the results of the efforts of the staff. We started out with only the will to succeed to guide us. We have done our work as best we could and we hope that you will approve our results.

We are greatly indebted to our advertisers who have helped considerably in making possible this publication. We are equally grateful to our contributors who have written much on worthwhile subjects. And we thank one and all who have helped us on.

GOPHER PEAVEY STAFF, 1928.

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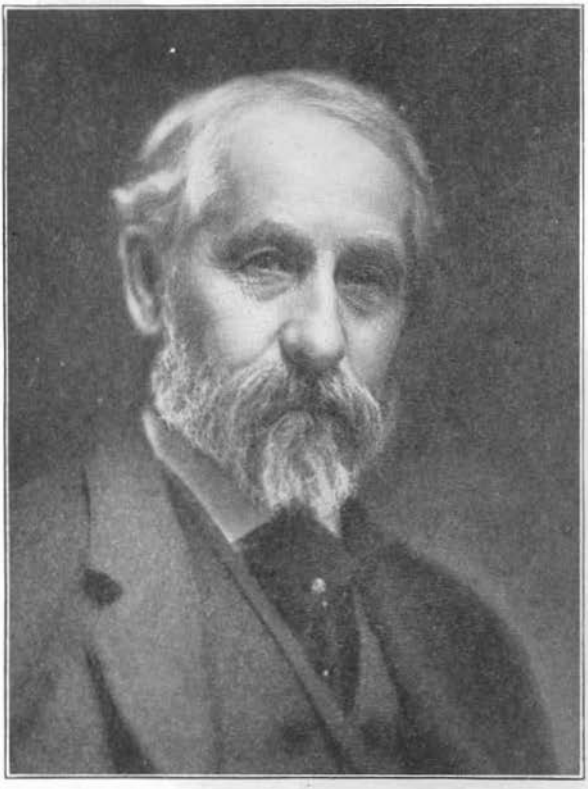
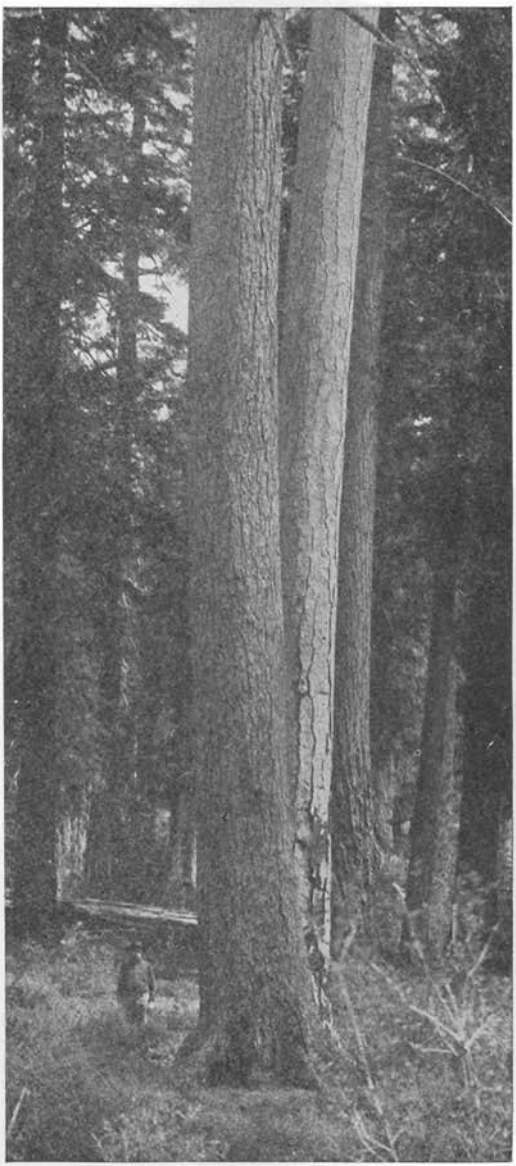


Dedication

To William Watts Folwell, whose unerring vision led him to introduce the following resolution into the meeting of the Board of Regents of the University on January 13, 1881, seventeen years prior to the establishment of the New York State College of Forestry at Cornell University, nineteen years prior to the foundation of the Yale Forest School, prior to the inauguration of the Biltmore Forest School, and, we believe, some years before a similar thought had occurred to any educational institution in the country, this book is dedicated in admiring affection.

Minutes of the Board of Regents for January 13, 1881. A resolution offered by Regent Folwell:

"That the Professor of Agriculture be requested to prepare a detailed plan whereby the advantages of a separate and special school of forestry be offered in the agricultural college of the university."



Beautiful Trees

FORESTRY, A FACTOR IN LAND USE

By W. C. COFFEY

Dean, Department of Agriculture

THE material greatness of the United States is a matter of world comment. Comprehensive explanations of its greatness always contain mention of the vast natural resources our forefathers found here. They found continuous stretches of fertile soil; they found enormous stores of minerals under it, and mile upon mile of potentially valuable timber forests rooted in it. These resources plus an energetic, resourceful, forward looking people with democratic ideals, plus a favorable climate for human progress, constituted the basis upon which the United States, the richest and most powerful nation of modern times, was builded.

Originally, nearly one-half of the total land area of the United States was covered with forests which in quantity, quality and variety of forest products surpassed any other similar area of the earth's surface. They covered an area of approximately 822 million acres. It is difficult for human minds even though they be accustomed to dealing in large calculations to comprehend the vastness of our original virgin forests.

Was it fortunate or unfortunate for us to have so much virgin forest? If the hardy pioneers, who long since passed on, could answer this question, they would say that agricultural progress was held in check by the stubborn resistance of the forests. They would recount the long hours of arduous toil spent in clearing away the forests in order that the soil might be planted to cultivated crops. Many of them would tell how trees were regarded as liabilities rather than assets. They would laugh at the idea that a tree could be a factor in land use. No matter how unsuited a soil might be for cultivated crops, they never would have thought of planting it to trees as an expedient for making that soil productive. The over abundance of forest resources in their time blinded them to any such view.

There could be nothing coming out of the viewpoints of those who first possessed our virgin lands that would assist the present generation in comprehending the place of tree conservation and growth in the national economy. They wasted our forests partly because it seemed necessary to do so in getting land for agricultural production and partly because they could not conceive of a time when there might be a shortage of timber.

The attitude of our pioneers toward the land was about the same as that toward the forests. They could not visualize a time when land would be scarce. When the yielding power of the land they were on declined, they could move to virgin fertile lands and it did not make much difference either to them or to the state because there was so much good land unoccupied. But conditions are different now. All of our land has been fully explored; the best for agriculture is occupied. Considerable areas of the second rate and even the third rate are likewise occupied. Much of the second and third rate have been occupied to our sorrow and we are beginning to see the futility of attempting to farm land which through improper location or lack of producing power is poorly adapted to agricultural cropping.

Over and over again we have paid dearly for the idea that land divested of its forests must be devoted to agriculture. At last we are beginning to pause and to inquire what is the wisest use to which given lands can be put. Are there not other uses than agriculture to be stressed?

It is quite logical for the state to advocate that its lands be used, for it should not maintain land in idleness if it is capable of returning more than is invested in it. There is something truly demoralizing about neglected, barren, waste land especially if it lies within the borders of a commonwealth that generally speaking is well developed. But it is usually worse to apply uses to land for which, under prevailing economic conditions, it is not adapted than it is to let it lie in idleness. In recent years extensive areas of land of comparatively low producing power have been devoted to crops for which the demand has not been great enough to make them profitable. These lands have been handled at a loss and the people living on them have not main-

tained the fertility of the soil. Moreover, the production on them has depressed the price for commodities which logically have been produced on more fertile and better located areas, and, as a result, the returns from these areas were not sufficient to permit of maintaining the producing power of the soil. It has been a case of adversely affecting both the lands put to wrong use and those put to correct use and, therefore, it has been and still is a truly serious matter. Serious, because it is resulting in a general depletion of the soil which is the physical asset of greatest importance to the nation.

As suggested above more land has been devoted to agricultural production of late years than has been needed. This has been impressed upon us by the agricultural depression, and the part surplus production has had in causing it. The costly and distressing experiences of the depression may result in good at the point of teaching us to be more resourceful in finding a number of profitable uses for land. It seems to me that it has been a very real factor in causing us to look into the possibilities of forestry in connection with intelligent land use. Of course, the growing scarcity of timber has also been a factor. The two factors coming into prominence at the same time have given an impetus to the thinking of the people with respect to forestry which will definitely establish it as a matter of importance in the public mind.

I would not minimize the direct commercial importance of forestry, nor its importance in our recreational life, nor its importance in such matters as flood control. In all of these directions it has its strong and peculiar appeal; in them its basic importance lies, and through them it can function as a great factor in land use. But in another sense, it greatly appeals to me. Intelligently pursued it will take large areas of second and third rate lands for agricultural production out of competition with first rate land, and thereby serve as a safeguard to soil because the first rate land will be farmed at such a profit that those who operate it can maintain its producing power. Thus, forestry will play a prominent part in conserving the nation's greatest asset, the soil, and hence from the national viewpoint, its importance will be greater than the sum total of its commercial aspects.

Life seems so sweet! I don't know why—
Unless it's just because the sky
Put on tonight to make me glad
A dress I didn't know she had!

THE FOREST SLEPT

The sunbeams, that had glistened through a summer's shower, had moved away toward the neighboring hill, and had gone to sleep with dreams of tomorrow. Red clouds faded, changed, and disappeared. The day had spent its light, and drifted on. Night had come.

The wind, the birds, and the foresters who lay near the glowing embers of the camp fire, had gone to sleep. Down in the valley it was dark. Black. The night had settled there. But slowly the moon rose, and near the crest of the mountain the moonbeams shamed the light of the fire.

Rain drops, clinging to the pines, reflected the glowing of the moon, and awaking, played with the moonbeams. Pale white, the quiet light above, made deeper the gloom of the valley. And even by contrast, the light seemed that much whiter. Between the dark green branches of great trees, the moonbeams played, and danced, and were happy.

The work of the day had passed, and the men of the mountain slept. Amid all the beauty of the mountains, with nothing to mar their rest, they lay asleep in the moonlight, dreaming, and like the night, their dreams were of beauty. Peace and beauty watched, and guarded their children. Hours passed on. The forest slept.

—CHESTER RANDAL, '31.

Nicollet Cabin—Itasca Park

GREETINGS FROM THE DEAN

DEAN E. M. FREEMAN

College of Agriculture, Forestry and Home Economics

THIS opportunity to greet the alumni, students, and friends of Forestry gives me genuine pleasure. Never have conditions been better at Minnesota nor have prospects for the future ever been brighter. The registration in Forestry has placed us second in the schools of forestry. It has not been a mushroom growth but a steady, logical increase. The quality of that registration is of more importance than the size. Forestry is attracting young men with ideals of service and intelligent ideas of professional opportunities. Of course, some few whose youthful enthusiasm paints forestry as merely a festive round of fishing, hunting, and camping are lost in early years. The residue that comes thru is one in which any faculty may take just pride. These students have demonstrated outstanding ability in scholarship competition. We have every reason to expect constructive leadership from these men in the forestry of the future.

We have made progress in our curriculum. Students are more and more availing themselves of the opportunities offered to profit by special training in the many fields of forestry. Forestry, like agri-

culture, is not a single subject but rather a broad, professional field. Within that field the demand is increasing for men who know thoroughly the subject matter of one or more of the special departments. Minnesota enjoys a splendid reputation for the strength it possesses in many branches of plant science. These constitute a sturdy support for specialization in the various departments of forestry. The future of forestry, especially in the realm of research, will demand and reward men of ability and adequate training in the forestry specialties. Minnesota is second to none in opportunities now available.

We have made progress in our material equipment. We need a building for Forestry, and I am hopeful that this will be obtained in the not distant future. You can be sure that efforts are not lacking to fill this need. We have increased quarters, we are providing greenhouse space, and we have splendid opportunities for the beginning of an arboretum in connection with the University Recreation Field of one hundred and sixty acres. Commodious quarters and added facilities have materially improved conditions for students at both Cloquet and Itasca. Plans for the promotion of fundamental research in forest sciences at both stations are gradually but surely developing.

We have made progress in our faculty. We have added in recent years several new members who have been well trained and who have made significant contributions to their specialties. The faculty is setting a higher and better standard of graduation, and we believe the graduates are improving with the years—and this is as it should be.

The Forestry students have maintained that college and university spirit for which they have always been noted. I am also sure that the alumni are one of the most loyal University groups. When the combined energy of these forces is concentrated on constructive enterprises for the advancement of forestry in the University and in the State of Minnesota, nothing can prevent Minnesota from becoming the greatest educational center of forestry in America. I expect to live long enough to see this an accomplished fact.

Joesting, famous Minnesota fullback, smashed his way to 13 touchdowns and leadership of the Western Conference scorers in the 1926 season, tying the high point record feat of Red Grange's, made in 1924. Unlike Grange and Bennie Friedman, who led the Conference scorers last year, Joesting was a plunger who made the smashing game almost as spectacular as the sweeping end runs of Grange and the open field running of Friedman.—*Official Program and Athletic Review, University of Michigan, November 19, 1927.*

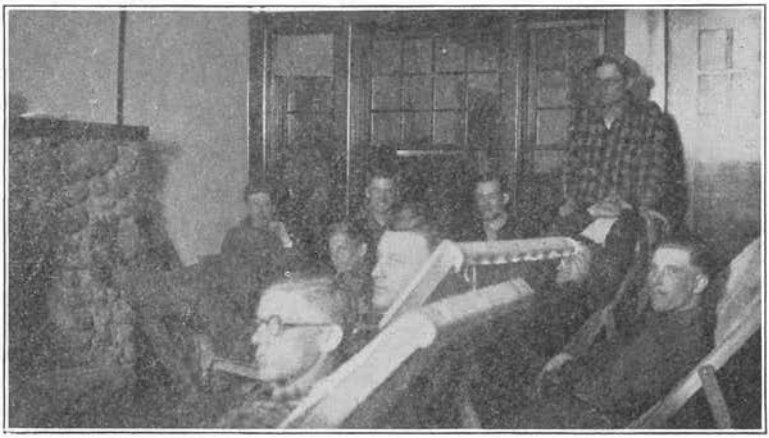
MEET OUR "CHIEF"

AFTER being vacant for several years the headship of the Division of Forestry was filled in July, 1925 by the appointment of Dr. Henry Schmitz.

Dr. Schmitz came to Minnesota from the University of Idaho where he held a professorship in the School of Forestry. He received his bachelor's degree in Forestry from the University of Washington in 1914 and in 1915 was granted the Master's Degree from that institution. After completing his work at the University of Washington, Dr. Schmitz was awarded the Rufus T. Lachland Fellowship at Washington University and was awarded the Ph.D. degree in 1919. He has had practical experience in forestry with the U. S. Forest Service, the State Land Department of Idaho and the Lumber industry in the West.

In the three years that Dr. Schmitz has been here, he has done much to further the interests and promote the welfare of the Division of Forestry. "Doc" is the man whom every Minnesota Forester should know intimately. Unassuming, straight-forward, interested in all student projects and each student individually, Dr. Schmitz is setting out to place Minnesota in her rightful position among Forestry Schools.

"The Best Corporation Ever"



The first guy hasn't a chance here.

Mulligans Out

JUNIOR CORPORATION OF 1927

By E. A. FOSTER, '27

THE extraordinary thing about the Junior Corporation of 1927 is not that it calls itself "the best corporation ever," for every corporation does that, but rather that *it was* "the best corporation ever," and I should know, because I was part of it.

As the Freshman Corporation of 1925 we were the best bunch of yearlings that ever wrecked a muskeg swamp or serenaded the tourists at Itasca Park, and our quiz-burial parade was so far the peer of any other that it lives as a high spot in the history of northern Minnesota.

The crew at Cloquet in the spring of '27 was, with some exceptions, the same crew, tempered by two years more of scholastic storm and one or more summers of woods life in widely scattered places.

From the morning of white new snow when our caravan of flivvers, loaded with luggage and winter-garbed foresters, left the Cities, till the drippy gray June morning when I left Smutt the last man in camp, it was all O. K.

What are some of our claims to distinction? Here are 18—others are all incidental to, and a result of these 18:

"Big Ben" Whitehill—President, keeper of the peace, proponent of bigger and better bull-sessions and player of water-tight bridge.

Wisconsin Slim Krueger—Bush-monkey extraordinary, and as Secretary-Treasurer our Johnny Inkslinger.

"Ma" Deters—Never could play bridge, but never got beat.

"Uncle Joshua" Lee Deen—A real lumberjack. He never will forget how hard it was for Brown and Jiggs to learn to live in lumber camps, nor will he and Deters ever collect that bridge wager from Ben and Foster.

Jerry "Squaw Man" Horton—"The Army." Cloquet thought he was of the R. N. W. M. P.

"Horse Thief" Tom Lotti—How he liked the Leb-a.

"Herr" Rudolf—Never would argue.

"Rainbow Sunshine" Grant—Ulysses S. Swamp angel marvellissimo.

"Hya-coom Gawge" Halvorsen—"Good old Challie, time to oop now."

"Homely Big Czech" Homola—Of Heidelberg. Established a record—went to school at Cloquet and lived in Minneapolis.

"Experiment Station Koik" Kirkham—The "fall of man."

"Tin Pants Jiggs Knute" Knutson—Might have been a preacher, but who'd guess it? As is, an Inland Empire Patriot, Knight of the A. C. M.

Smutt Knutson—The darling of Central Hall. Hero of every bull-fest.

"Flying Finn" Steve Limstrom—Known to science as Bogtrotterum muskegerensis var. hungrioris ultissima, right *now*.

"Babe" Audrey Roan—We all had to take care of "little Audrey."

"Cussin'" J. Niel Van Alstine—Dead-eye Van, vanquisher of snow cottontails.

"Pa" Foster—The only thing that happened to him was when the wood-boring Coleopter got in his head and had to be drowned out with warm water at the Cloquet Hospital—and "where there's wood-borers there's wood"—which seems to have proved the suspicions of several classmates.

"Chuck," "Good ol' Chollie," Hartupee—Only stayed a month, but that was enough to hold up our good name as athletes on the Cloquet "Y" basketball floor.

To even briefly enumerate the achievements of a corporation great as ours would require the whole volume, so I will touch only the high spots, and those lightly, leaving to historians of the future to write the details of our epic chapter in the history of the land.

First, the new bunkhouse. We spent our Saturdays peeling the logs of which it is built, and the "Deacon's Bench" log at University Farm is part of a tree removed to make room for it. And don't forget the historic headpiece in the fireplace—the only truly American, Gopher foresters' Blarney Stone—we dedicate it to greater corporations to come, to better blarney, and more power to our strong men at the traditional sport of "bull-throwing."

Which brings us to "Bull Fests," in which we originated the mighty maxim so true of every meet at the favorite indoor sport, that "The first man hasn't got a chance."

Mulligan's Inns and Outs. As a venture in recreation facilities the numerous spruce bough lean-to lunch camps on the various forties are a monument to inspired genius as it expressed itself in the desire of us primitive woodsmen for comfort even in the wilderness. Mr. Cheyney is not yet quite done figuring out their silvicultural value.

The Blarney Stone. 'Nuf said, except that ours lays no claims to lowly birth in treeless Erin, instead 'tis from a woodsy land where Lincoln green's the proper color (not at all like Irish green, of course you know); and it's a pebble that Paul Bunyan as a very small boy blew from a beanshooter from Cloquet to what is now University Farm, where it lay embedded where it fell until our corporation, with the help of certain of the faculty, took it back to its native habitat, and gave it an honored place in the new home of Junior Corporations.

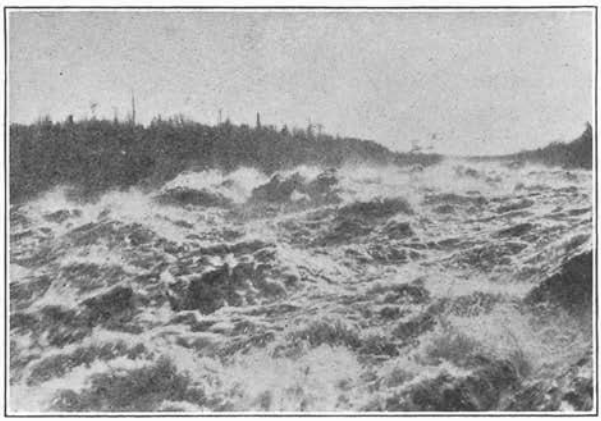
The Foresters' Roost. To Tin Pants Jiggs goes the credit for the persistent, untiring agitation which made the historic dream for a log in front of the Forestry building a bright and shining reality, at last an appropriate loafing place for foresters.

Grub. As presumably the last corporation to feed at the bounteous board of the Stillwells, we would leave a tribute to "the best cook of the best cooking in the world—except mother's." And that picnic

at Jay Cooke Park! There never was such a collection of foods, not even on Paul Bunyan's table. And Mr. Cheyney's version of the Charleston! !

Social Achievements. Perhaps the outstanding one was the Basket Social at Sawyer, when Jerry's romance with the Indian maid lived its short life, and everyone there had a rather novel good time. Then there were the dances at Central Hall, and that week-end excursion to the cities when we had such a nice time playing with the Engineer boys, and the All-College dance where we presented our version of Paul Bunyan's Black Duck Dinner. For the bridge players the evening at "Shantz" house will be remembered among other good times. The big social events were the games of "highpower" and bridge, and the talk-fests among ourselves, and the night when Steve led us in a war dance.

The St. Louis River Flood. Why and how some of us ever got back alive, Cheyney and Allison don't know yet. The river was putting on a record exhibition, and the corporation was out in full force to get pictures. Some of them have recorded everything but the roar.



Some of them record everything but the roar.

Br'er Rabbit. Chasing rabbits off the reserve and then shooting them was, with touchball, the leading outdoor sport. Van and his six-gun did the most damage, and we don't guess there will be so much damage to pine reproduction this spring.

Work. When it comes to work, the '27 Corporation could do, and did, more in less time than any other. We learned all about logging in three days at the logging camp. Our 100% cruising of 18 forties, wading, swimming, jumping from hummock to hummock in the flooded swamps was far from "hot stuff" in the month of March,

but we learned to like it. The growth studies, the working plan which each man prepared for his own forty, the lines we swamped and chained, the sandwiches toasted over crackling fires for the noon lunch, all in connection with mensuration and regulation during the first half of the quarter, were for many of us the first taste of woods work in winter. The fact that we all liked it speaks well for our professional spirit, because March in northern Minnesota is the least pleasant of months.

The nursery work, from feeding the furnace in the extraction plant to dry cones in the drying chamber, to planting the young stock in the woods, including laying out seed beds, pulling seedlings, transplanting, pulling transplants and packing for shipment was a valuable practical month's work. Our sample plots and silvicultural problems on the ten acre tracts assigned by Mr. Cheyney were the subject of many an argument and much discussion. As evidence of the Corporation's foresight is the very subtle way in which our reports on these plots so fully cover all necessary mental exertion, and provide for the expenditure of lots of manual labor ten years from now, or at least not until next year.

To a man it is the Corporation's verdict, as it has been the verdict of every Junior Corporation, that the field work at the Cloquet Station is the most successful thing in the forestry course, and it takes a good deal to be better than Itasca. The Experiment Station offers wonderful opportunities for studying forestry in the field, and the practical knowledge gained through days of contact with acres, chains, stands, types, sites and growth is far more lasting and of greater value than that gained from lectures and study courses.

Of equal or greater value than the practical experience in important departments of the profession is the contact with agreeable companions of tastes and inclinations similar to your own. The fellowship and the friendships formed in the first three years of College are here strengthened and welded into closer bonds, by more than two months of contact, in field, in quarters, and at the long democratic dining table, where students and teachers mingle with the best of good fellowship. The fine things that are developed here can only grow with the years into more and more pleasant memories, until the day when the Corporation of '27 shall be ancient history and its members, gray of head and slow of step, shall meet and re-live the old days with such as these the choice bits of conversation: "That baked sweet potato concoction of Mrs. Stillwell's. . . . Cheyney and the Charleston. . . . Stroud and the lumber camps. . . . Steve's appetite. . . . Wet weather when we had lectures in the bunkhouse. . . . The Blarney Stone. . . . The war with the Engineers. . . . The first man—not a chance! . . . Jerry's squaw. . . . Those sample plots; wonder what they look like now?"

FRESHMAN CORPORATION OF 1927

By D. THOMAS, *'29*

HUSHED voices, tenseness, scuffling feet, a shout, "Who is it?" An answer, "Get him, too," more scuffling and very shortly afterwards two splashes. Such sounds were heard very clearly one June morning as the best gang of embryo foresters that ever ganged together started its first day at Itasca Park. That day was the fifteenth of June and what happened from then until July twenty-seventh was enough to fill several libraries, but we can only hit the high spots. The forty-nine reasons why this gang can't be beat are shown under the arch, the memorial of THE FRESHMAN CORPORATION OF 1927.

Besides the personnel of the gang, we had the following advantages, or, if you please, disadvantages. When we arrived on the scene, we found an addition had been made to the bunkhouse since 1926. This greatly increased our sleeping quarters and also gave us an inside washroom, shower, or laundry. Then we had a new library in which to study, but which was used mostly just prior to the time our reports were due. And we can't forget the new "Country Club"; said small but indispensable building was christened by "Abe" Keehn. The Corporation had eleven canoes owned by some thirty individuals. There were two cars and eight Fords at our disposal. "At our disposal," yes, but only for Corporation, or better known, "Official business."

Our first general get-acquainted gathering happened about the second week of camp. The sound of one, two, then three splashes resounded over Lake Itasca. These were soon followed by four, five, and six, and on up to forty-nine. When these lumberjacks had had their fun, someone suggested that perhaps our younger "Profs" would appreciate joining us, so, after a struggle or two, representatives of Mensuration, Dendrology, and Botany, namely, Mr. Brown, Mr. Kribs, and Mr. Stoesz, made three more splashes and the party was complete.

Our next party was of an entirely different nature. This time we donned our best woodsmen's clothes and danced in tune to the "hot" music Earl "Breezy" Nielsen coaxed from the keys of our age-old piano. Aksel "Wart" Fauchald, ably assisted by several husky lumberjacks, decorated our ballroom, otherwise our bunkhouse, with numerous species of conifers and also some kinds of moss (the only one we can remember now is that known as *Sphagnun sphagnum*). Pine needles were used to make a rough and very much cracked floor and hobnail boots danceable. Klaas "Pete" Peters, our "stomach robber," supervised the refreshment department. Douglas Lodge, the Tourist Camp Ground, and other points furnished the other halves, and the dance was on. Man, what a dance! It was so good that none could

compare. So we thought we'd try it again, and three weeks later we "threw" a dance that beat our first one all hollow.

The fourth of July, the Glorious Fourth, furnished a convenient break in our muskeg wanderings and brush racing escapades. The old Fords were cranked up and their radiator caps pointed in all directions while at the same time canoes and pack sacks pushed out from shore. The whole Corporation anticipated a rip-snorting week-end. It was just that from what we learned in the bull sessions that followed. We never did settle who had the best, biggest, or any other kind of a time.

Like all Corporations, we did our best to do justice to the day of the Burial of the Quiz ceremonies, and we think we did our duty well. Elaborate preparations were made for this, the day of all days. Everybody from "The Babe in the Woods" Milford "Cowboy" Riggs to "Tobacco Stunted My Growth" Edward Niles paraded to the Tourist Camp Ground and back to camp. Reverend Edwin "Roses" Thormodson read the services as the Quiz was buried under the sod. In the roll that represented the quiz was a report, the first Mensuration report due Mr. Brown. Many sighs of relief could be heard as the earth covered it from sight. We had put a good one over on Brown—until the last week of camp, when, instead of three reports, we were required to hand in five.

The remaining festivities of the day consisted of a very solemn service held at sea. Poor old Rules and Regulations was buried in a watery grave off our diving tower. We could not endure such sadness, so we closed the day with canoe races, swimming and diving, and, best of all, the lumberjacks' true sport, log rolling.

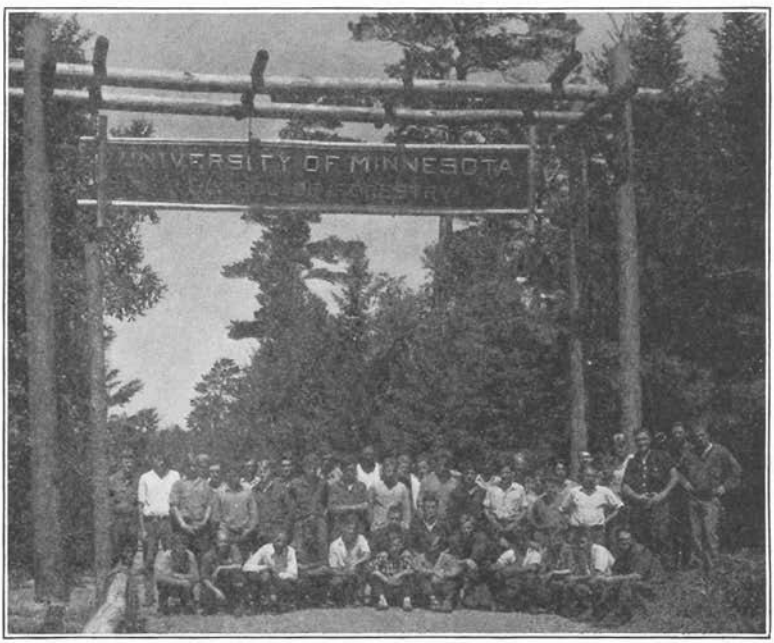
Eynar "Ike" Benson, the builder. "Ike" started his Itasca logging career by floating small Popple logs, Birch logs, twenty-pound sledges, etc., until he had built a dock out in front of the bunkhouse. Then "Ike" became restless. He scratched his head and wondered what he could do to keep busy. Finally he found an old sunken barge near the boathouse. This he pumped out, floated around a little with miscellaneous bits of lumber and poles, and with the help of a dozen or two of the boys turned out as fine a diving tower as ever sailed Lake Itasca.

Up to this time we had no definite idea about a memorial. Every Corporation leaves its memorial and we had to leave ours, too. So, like the foresters that they are, the Corporation pushed over a few Norways, logged them up to the bunkhouse, and set to work to construct a real memorial. "Ike" had the idea, put it on paper, did the blacksmithing, supervised construction, and saw to it that everything was done properly. The entire Corporation helped to build this arch, but we feel that we should give Frank "Porky" Anderson due credit. "Porky," our yodeler de luxe, was responsible for the letters on the sign, which were cut from Birch saplings. Then, too, there was Edward "Skipper" Iverson, Corporation painter, who did his stuff

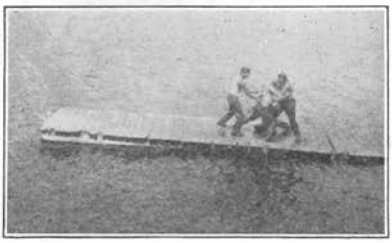
in that department. We think we did an excellent job. We feel that our memorial is representative of the Corporation that built it.

This yodeler of ours was also a detective. He liked to detect anything detectable, so one day when we heard of some lost girls "Porky" jumps right up and says he'll have to find them. "Porky" and "Wart," the Watson of the pair, got over to the Bohall Trail where they hiked, stumbled, and crawled northward to a swamp which contained the lost damsels. Splashing, stamping, fighting their way to the middle of the swamp, "Porky" and "Wart" spied the girls in a cloud of mosquitoes. "Porky" being the larger of the two heroes, wanted to get there first. He rushed up as best he could, but before he reached them he stumbled and made a beautiful splash as he lit face first on the bog. Consequently "Wart" won out. What the reward was, we do not know, but we just wish that we had been there.

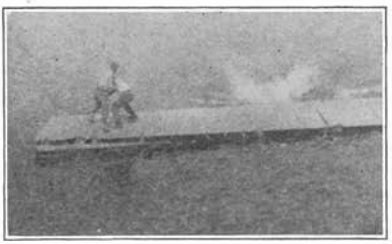
As the last days of camp drew near, every one of us was busy with his reports. We felt that we'd learned enough without being burdened with report writing, but once they were done we could forget about them—that we did willingly. Our last night in camp was spent around a huge bonfire, a bonfire fed with incidental old hats, shoes, socks, shirts, pants, and plenty of the wood that we had been studying. We sat around the fire and pondered over what had taken place during the preceding six weeks. We had recollections of Douglas Lodge, Snyder's, Headwaters Inn, Wegman's Store, the



1927 Memorial



Hamman, Joesting
Riggs, Porky



Riggs, ?
Hamman ?

Tourist Camping Ground, Nicollet Cabin, Squaw Lake, Long Lake, Desoto Cabin, camping trips, serenades, The Hairy Chin Club, log rolling, horse shoes, tennis, football, baseball, swimming, fishing, and canoeing. We had more recollections of clotheslines consisting of red shirts, striped underwear, boots, hats, outlawed pajamas, and what not, hanging some fifty feet up on the trunk of a *Pinus resinosa* and Harry Brannigan's climbers nowhere to be found, of K. P. duty, and in line with it Mrs. Harsha's marvelous cooking, of the parade to the tourist camp, the Burial of the Quiz, two excellent parties, Breezie's piano playing, etc., ad infinitum.

Yes, we had a profitable time at Itasca Park. We were richer for the knowledge we had gained, for the associations we had made, and for the general all-round experience. We were glad that we could know our faculty as man to man.

J. P. Wentling—"J. P."—His interest was our welfare. Chief, counsellor, and our best possible friend.

Dr. C. O. Rosendahl—"Rosy" or "Doc"—For whom we sought rare orchids.

E. G. Cheyney—Cheyney—For whom we hiked far and long to study forest types.

J. H. Allison—Allison—For whom we mapped the campus.

A. D. Stoesz—Stoesz—"Doc's" assistant (species ? damfino).

D. A. Kribs—Dave—"J. P.'s" assistant. We wish you were still here, Dave.

R. M. Brown—"Draw a Curve Brown"—For whom we drew many a curve.

The twenty-seventh of July found the gang crating canoes, packing pack sacks, bidding each other "goodbye," cranking Fords, and heading North, East, West, and South. The last Ford sputtered and coughed, the motor started, the exhaust purred, gears ground, wheels moved, dust flew, and THE UNIVERSITY OF MINNESOTA'S SCHOOL OF FORESTRY disappeared in the background as George "Sleepy" Dennis and Dan "Prexy" Thomas sped southward.

THE CAMP LINEUP

By PORKY OMTVEDT HAWKSHAW ANDERSON

D. THOMAS "Prexy"
President
Our prexy sure was one great guy,
Noted for his dizziness.
If the atmosphere was "wet or dry,"
There was always official business.

E. NIELSEN "Breezy"
Vice-President
Paderewski is an artist rare,
And they say he smokes "El Teanoes."
But our dear "Breezy" sure was there,
When it came to wrecking pianos.

L. AAMOT
Treasurer
Our treasurer was a quiet bloke,
With a voice as sweet as honey.
He thought it was an awful joke
To grab off all our money.

R. KELLETT (Sec.) and I. JUNG
"Lodge Hounds."

K. PETERS "Pete"
Steward
Pete bought all our bread and meats,
And bossed the cook around.
He always seemed to have good eats,
If such things could be found.

E. DAHL "Peewee"
"Say, peewee, what is this weed they call 'poison ivy'?"

W. ANDERSON "Stampede"
"Pile 'em up, pile 'em up,"
A voice cried out one night.
"Throw the !?? ??! in the lake!"
It sure was one great fight.

E. BENDER "Slim"
When bedtime stories came around,
And the "bulls" were all in session,
Ripofapiece Bender was always found
With the best seat in possession.

G. DENNIS "Sleepy"
Sleepy Dennis was his name;
His clothes were never tidy.
One day we found him fast asleep
In a bed of poison ivy.

A. MADSON "Matty"
Quite a lumberman, this boy "Matts,"
With peavey, cant and pike.
A "cleaver" man with wedge and axe,
But his smokes were sure a fright.

E. THORMODSON "Parson"
"Can you imagine that?" the parson cried.
The boys all rocked with laughter.
"Roadwork," he yelled, and ran outside.
The boys all stumbled after.
The bugs were thick, the road was tough,
The air was foggy and wet.
"Halt, you guys, we've had enough.
Time out for a cigarette."

S. PIRAS
Horses, horses, horseshoes, HORSE-FEATHERS!

R. QUICK "Rusty"
A quiet bozo who knows his stuff.

W. ROYER
"Wild Bill" and a balky bed.

M. RIGG "Cowboy"
"How about a little kiss, Cecelia?"

C. CHASE
VOICE FROM THE DARK—
"Hey, Chase, you got to get up!"
CHASE—
"yyyYA!"

W. GRADY "Cyclone"
Cyclone Grady, a ladies' man.

E. PIERSON and R. GABLE
"Me and my shadow."

Z. HATHAWAY "Snake"
"Hey, Dennis, dance like a cat."

G. FORUS
A real tough guy who rolls his own.

H. LEMMER
"My one-man canoe and me."

A. MAYER
The horseshoe champ of the whole darn camp.

F. DOLENCE
"My, what tough beards these guys raise!"

M. FORDER "Happy"
"Happy" went to Wegman's store,
Because his girl was there.
Papa Wegman then got sore,
And "Happy" took the air.

H. KEUHN "Rabbi"
"Rabbi" was a peppy gink,
And when his black beard grew,
To look, most anyone would think
That "Rabbi" was a Jew.
But when he shaved that beard away,
And let his mustache sprout,
One would look at him and say,
"Here comes the Dutch, look out!"

C. RISBRUDT "Ris"
"There's dirty work in camp. Where's Ris?"

E. PUPHAL
"He was the man who was diddlin' around."

D. GIBNEY "Spaniel"
FRIEND—
"Where to, Spaniel?"
SPANIEL—
"To Bagley, my boy, to Bagley."

L. NELSON
"My, how big these trees are."

C. WIESE and R. FISHER
WIESE—
"Say, Twogun, there's bottles clinking in yon wood!"
TWOGUN—
"Aye, aye, sir, and shall we sleuth about a bit?"

B. PURVES
"I DON'T say much, but I know a lot."

J. LUEDKE
"I just have barrels of fun with barrels.
Fact is, I get barreled quite often."

H. STRITMAN
"The boys said I should be the cop,
And watch the bunkhouse nights.
But I'll be !?? /?! if I can stop
These nuts from burning lights."

V. HALLIN
"Ask me, I know."

D. STEWART
The boy with the eveready smile.

S. HAGEN
We went to chop the Norway tree,
No other scene can match it.
It didn't take us long, you see,
'Cause Hagen brought his hatchet.

T. PETTYJOHN
They say if you eat poison ivy
A mouthful of soap is good.
So Ted sure stepped right lively
To make the soap act as it should.

E. IVERSON "Skipper"
"HAW, HAW," he cried; and writhed about.
His laugh was ever long.
But when that turtle touched his feet
He sang a different song.

E. NILES "Hercules"
Hercules slept next to me,
And uttered fearful snores.
Such vibration, you can see,
Nearly wrecked the floors.
Some nights he muttered in his sleep,
Or tore the covers to pieces.
And the things he'd say were short and sweet.
There sure were some pretty speeches.

C. ANDERSON
A quiet kid. Calm, cool and collected.

A. FAUCHALD "Wart"
A cute little feller was the "Wart,"
A frisky little scamp.
He'd climb right up on Porky's back
And ride right into camp.

E. BENSON "Ike"
Full of ambition, pep and bull
Was the contractor known as "Ike."
A wiry guy, and a buildin' fool
Who always did things right.

C. OLSON "Ole"
Ole, the mail man, tall and thin,
A great long-legged goof.
Always stooped when he came in,
So his head wouldn't hit the roof.

R. WITTENCAMP "Whitey"
"Whitey" pulled some clever tricks,
And always seemed to be happy.
He hid his Ford out in the sticks,
And then gave it to Hattie.

H. ENGSTROM "Leneas"
HIS BATTLE CRY—
"In the lake! In the lake!"

F. ANDERSON "Porky"
Poet, Omtvedt, and Hawkshaw.

Before the Parade

THE FORESTRY BANQUET OF 1928

By DALE CHAPMAN '29

The 1928 Forestry Banquet was a great success. It was held at the Leamington Hotel on March seventh and was attended by one hundred and fifty foresters and lumbermen, the largest turnout for the annual event in the history of the college. The affair this year differed in many respects from those of former years—a more formal and professional atmosphere being lent to the occasion by the presence of several ladies and a number of representatives from the lumber industry.

After the fine steak dinner was over and the cigars were lighted, Dr. Schmitz, master of the evening's ceremonies, called upon Harry S. Cheney of the Backus-Brooks Lumber Company for a talk upon the Boundary Waters Dam Proposal. Mr. Cheney explained the project and pointed out the advantages that would ensue from the proposed development of the Lakes Region. Then for the first time in the history of the College, a lady spoke at a Forestry Banquet. She was Miss Jane Oakley, our first lady forester. Miss Emily Speechley Whitacre, the donor of the new Forestry Scholarship Loan Fund, and Mrs. Mary D. Akers, of the Federal Women's Clubs, also spoke briefly on the efforts of the clubs in the conservation movement. Dr. Nellie Nelson, of the Minnesota Conservation Council, then answered Mr. Cheney of the lumber interests and urged the conservation of our forests and lakes in northern Minnesota.

Mr. David Clark of the Osborne-Clark Lumber Company, was next and gave a very interesting talk on the place of forestry in the hardwood lumber industry, and the opportunities for young foresters in the wood utilization end of forestry. George Lewis, one of our old alumni, and at present the cranberry king of Wisconsin, spoke next, and told the audience about the first annual Forestry banquet in 1912 and pointed out the great progress made by the College since he was an undergrad.

Another thing then happened which made this banquet different from those of former years. Dean Coffey, in concluding his splendid talk on the importance of Forestry in a program of land use, stressed the great need for a new Forestry building, which brought forth a loud burst of applause from the students and faculty. Mr. Middlebrook, comptroller of the University, was then called upon to talk about the new building, but avoided the issue by reading a bunch of very original letters commenting upon Dr. Schmitz's radio speech. These clever and very humorous letters kept the audience in a continuous uproar.

George Critten and Tom Youngblood, prominent hardwood lumbermen, gave splendid talks; we had never dreamed that lumbermen knew so much poetry and Paul Bunyan lore, and could present it so effectively as did these two men. Thad Parr was next, and expressed the appreciation of the students for the interest shown by men of the

lumber industry. In the absence of Lieut. Governor Nolan who was ill at the time of the banquet, Mr. Levine, secretary of the State Forestry Commission, gave a fine talk and told us what the state legislators were doing to further the progress of private and public forestry in Minnesota.

Dean Freeman was the final speaker of the evening and surprised us very agreeably when he unrolled a large map of the campus and the surrounding property owned by the University and unfolded an elaborate plan for a new Forestry building and arboretum. This "Just Supposing" talk, as he named it, marked the first definite step taken by the administration for a new Forestry building and was a fitting climax for the Forestry Banquet of 1928.

TRADITIONS

Ben Whitehill, '28

A SCHOOL without traditions is like a big banquet without a dessert. Traditions are not a necessity, but they do help to sweeten up the daily routine of lectures and study. Not only are they events of pleasure to the students, but they are also an indicator of the spirit and good fellowship between students themselves and between the students and their faculty. Our Forestry School has had traditions as far back as the School has been established, but most of them have been so shamefully neglected and mistreated that they hardly are recognizable as such. There have developed some ideas that are wonderfully adapted for traditional use, but to be put over as such they must be more carefully planned and entered into with more of a spirit than has been the case in the past.

Surely the bonfire, early in the fall quarter, is worthy of the patronage of every student of every class in the college and every faculty member and administrative officer connected with the college. What better place can old pals, who have been separated all summer, find than around a roaring, smoking fire to tell of their summer experiences in the sticks. What a wonderful chance there is for the new students to get a birds-eye view of what Forestry students look like and act like when they are all together and by themselves. And faculty members can size up the new gang they will have to contend with all year. Yea, the bonfire should be our big event of the fall quarter and therefore should be more elaborately planned than in the past. A committee should be selected in the spring quarter so they can begin work on it the first day of school. If some of the committee members happen to have look-out jobs during the summer, they perhaps will find it pleasant pastime during slack fire seasons to think of new ideas to be presented at the first get-together after school starts. Not only should the freshmen be thoroughly informed of this event, but everyone else interested. To those of you who have taken surveying, the lagoon may mean a lot, but to a total stranger it may be a puzzling thing, especially when one hears that it is a place where something is going to happen. Perhaps it would be a good idea to meet at the Forestry building and then proceed as a body to the place where the bonfire is to be held. In this way none are liable to stay away because they don't know where to find the place.

The other event in line for the fall quarter activities is the Foresters' dance. Sooner or later we must get acquainted with the Home Ecs and other of the feminine gender and as this would be their first admittance to a Foresters' playhouse we should be careful that they are impressed with the sociability and happy spirit that is found in most of the men who love the outdoors and who are often considered roughnecks.

Then the traditions should be sufficient for the fall quarter while we are getting back into the harness of books and lectures and while we are getting acquainted with the newcomers.

In the winter quarter there are many ideas, worthy of any group of students, that could be worked up into traditions, but there are three which seem to appeal to the majority of students at this time. The Forestry College has in the past published an annual, but this was discontinued for a few years. Beginning this year, the Forestry College is going to publish the Annual, annually and indefinitely in the future. It is the College's messenger to its alumni. "Alumni, tell us if the Peavey is worthy to be called the Annual of one of the largest and best Forestry Colleges in the country, your college and Alma Mater?" To publish the Peavey so that it will rank equal to other forestry college annuals, it is necessary for all students to be interested, and to contribute to its make-up. Here's for more and better Gopher Peaveys as the years roll by.

The second tradition of the College during the winter quarter as suggested here would aim to bring in an event which would interest the whole University, and here again we must look for the ladies and music and dance to attract such a large group. As tried for the first time in several years it was a big success this year and a boom to the Forestry Club treasury. Many will look forward to the Foresters' All-University Dance next year.

The annual Forestry Banquet has been the last treated and taken care of of all our traditions or would-be traditions. The Banquet, at which the Peavey should make its appearance each year, will undoubtedly always be *the* big event of the year. Everyone knows about it and everyone is for it, so nothing further need be said about it.

So far the spring quarter has produced no undertaking by the Foresters which would rank it as a tradition. Nothing has been heard of making the scrap with the Engineers last spring such an event, but other suggestions have been made from time to time. One of these, suggested by our Chief, Mr. Schmitz, is a barbecue at some outlying lake. Many of the Seniors graduate at the end of the winter quarter, and those who don't are busy trying to locate themselves permanently after they do graduate. The Juniors are at Cloquet all spring, which suggests that this would be a good chance for the Freshmen and Sophomores to take the main responsibility to put something across each year; something that would bring everyone, even the Juniors from Cloquet, out and together again before they disband for the summer. How about it, Freshmen and Sophomores?

In thinking about these, our own traditions, we must not forget those of the University as a whole and those of the College of Agriculture, Forestry and Home Economics. We all know what they are and should enter into the spirit of them just as we do our own.

Just as the "pop" of a cork indicates the strength of the contents of the bottle, so will our traditions and public service to the College indicate the strength and health of the Forestry students.

HERE AND THERE

By THAD PARR '29

From a spring quarter of intermittent work and fun either at the Cloquet Experiment Station, or at the Campus at University farm, the Minnesota Foresters transported themselves by various and sundry means to their summer work. It has been estimated by the various railroads running between the Twin Cities and the coast, that during the two weeks immediately following the closing of school last spring, the percentage of bums was increased enormously. It was reported from the barber shops in the several towns in which were located the offices of the Forest Service to which the men were to report, that the number of shaves gotten by many apparent bums during the third week in June was considerably increased, but that the number of tips for the barbers did not increase according to the number of shaves.

Bumming was not the only way that the men reached their summer jobs however. The Lorenz twins, after negotiating, navigating, and otherwise propelling their flivver through South Dakota mud for a few days, sold the darn thing and rode the rest of the way by side door Pullman. Schweiger and Bob Hegg actually managed to drive clear through to Troy, Montana and get there on time. Schweiger didn't drive back though, he rode the cushions.

Foster and the Swede drove clear to the Mount Baker National Forest in a dilapidated Ford coupe, and Deters, "Shirt" Andrews, Homola, and Roan made it all the way to the Angeles and back with Deters's old calliope.

Perhaps the saddest, most heart breaking journey of any of the foresters was that made by Dannie after he left the "hungry four" at Butte, and walked clear to St. Anthony, Idaho. At any rate, he got into good training for cruising (or cursing) timber for the rest of the summer.

The Blister Rusters—meaning those who undertook to eradicate the pestilence and make the world safe for the white pine—were George "Pudge" Olson, Lawrence "Sparrow" Ritter, Eugene Graham, Wilfred "Morty" Mortenson, Arvid "Tes" Tesaker, Robert "Clooge" Clough, Hugo Pawek, Lowell "Cut the white pine" Farmer, Rolland "½ twin" Lorenz, and Ralph "½ twin" Lorenz. Farmer proved himself the engineer of the bunch by constructing a nice log bridge across a creek, only he used a big white pine for the bridge. Dame Rumor has it that George Olson used up more cans of Copenhagen than any other man in the west last summer. When a Minnesota Forester concentrates on anything, it generally gets done, but when ten of them concentrate on Blister Rust, it spells no good for said rust.

The "Hungry Four," being Dannie Bulfer, Paul Blatter, George Olson, and ye scribe, transporting themselves to their places of work via the box car route—for scenery, sensations, peculiar to the art of bumming, and interesting companionship unsurpassed—proceeded to permit the Milwaukee railroad to carry them as far as Missoula, then, being dissatisfied with the service on that line, gave their patronage to the Northern Pacific. Dannie says that the sweetest words he ever heard were those of the Supervisor in St. Anthony, shortly after he blew into town, when he said "Well, let's eat." He is still estimating the number of miles he walked during the summer and early fall taking the tally of millions and millions of Lodge Poles.

Blatter held down the top of a mountain out of Elk City, Idaho. He doesn't say whether he used the pack rats he shot while on the lookout for good or not, but if the hunger accumulated while on the way to Spokane was not appeased by that time, the rats may have been eaten.

Ole, after tucking the first real feed of the trip under his belt at Sand Point, Blister Rusted all summer, taking his victuals and vitality from Uncle, and his everready can of snuff.

Parr learned that a grub hoe was not something to eat with, building trails on the Kootenai. The cook on the trail crew maintained that he (meaning

Parr) never did get over the habit of being starved, and that he cost the Forest Service more in grub than any other two men in camp. He found out also, that army hobs will NOT hold on a slippery log, and that an adz is NOT a mattock. But he wasn't the man who spent all one Sunday searching the woods for an almost extinct species of—the whippletree.

Dick Delaney, assistant ranger on the Sylvanite district of the Kootenai, seemed to know more girls in and around Troy, Montana than any other man in the Service. As a promoter of Fourth of July prize fights and wrestling meets Dick takes first prize. Any other enterprises that Dick promoted would be censored anyway, so why write them?

Being lookout on the Mt. Baker National must have affected Forster's eyesight, for verily he did mistaken an Whistler for an old and oversized grizzly bear. Perhaps this comes from the drinking of melted snow water in that part of the country.

"Roaring" Bill Hallin demonstrated the potentialities of a Minnesota Forester in trail construction on the Kootenai. Bill had no opportunity to become acquainted with any of the fair sex in Troy, principally because Dick Delaney monopolized the line all of the time.

Bill Schweiger, also on the Kootenai, is reported to have been extremely interested in the departure of one black bear from this world, and so the report says, did assist nobly in the killing of said bear by dashing up at the most opportune moment with a fire shovel.

George Seaberg, on the Wenatchee, and John Neetzel, on the Selway, did labor mightily on the construction of trails. The amount of trail built by Minnesota men last summer is something tremendous.

J. Neil VanAlstine fought gnats and buffalo flies on a lookout on the Flathead, then learned the rudiments of trail making and the intricacies of the so-called "Rabbit Runs" now being made in that country, while not so many miles away, on the Cabinet, Frank Kaufert held forth on a good healthy mountain top, in constant search of fires. It even seems that Frank used to get up in the middle of the night to see if any fires had started while he was in among the blankets.

Forestrom and Porisch made trails or tracks or something like that down on the St. Joe. Forestrom isn't back yet, but Porisch learned other things than merely making a mattock act as if it was in operation while the boss was looking.

Clough, it seems, after working all summer in search of the elusive ribes afflicted with spores of blister rust, and after collecting all of his summer's wages from the bureau of plant industry, did proceed to call his girl over long distance from Spokane. After talking to the "better half" in St. Paul for something over the allotted three minutes, the operator gave him his bill. Verily, it was $13.75.

The four who migrated to the Angeles, it seems, did go through numerous towns along the way with their heads hanging out the sides of the car, and the cow bells ringing. Whether the heads were hanging out because of travel sickness, or to view the scenery, or from some other cause, neither "Ma" Deters, nor "Shirt" Andrews, nor "Homey" would state. The boys left Audrey Roan out there, making firebreak and swearing at the chaparral, scorpions, tarantulas and other pestiferous insects, probably including a few Mexicans.

Gerald Horton, in the Bitterroots, did cavort around considerable in search of many and varied species of bugs, beetles, worms, grubs, sawflies, or what have you, in the employ of the Bureau of Entomology, department of Forest Insects.

"Herb" Joesting held forth at Camp Lincoln, Brainerd, Minnesota, teaching the small boys the ways of the woodsman, the names of the trees, and other things too numerous to mention.

Clarence Knutson was chief of party on a planting survey in district one last summer. He spent a good deal of time looking over the Kaniksu, trying to find a few places where it would *not* be necessary to plant trees. Carl Krueger was with him, learning the tree planting trade. Calvin Stanton, from Missoula,

was in our camp for a week, and we learned ALL about Clarence Knutson. Dick Delaney used to call us up once in a while and tell us that Clarence was on the verge of getting married, but the last we heard, he was still single.

Dayton Kinkham was at the Allegheny Experiment station at Washington, D. C. We never can tell whether Kirk did or said anything out of the way, because he was the only one there from Minnesota and he absolutely refuses to tell things on himself. Modesty doth have its virtues.

Ray "Smut" Knudson was cruising pulp wood for the Manitoba Paper Mills, in Manitoba, Canada. It seems that "Smut" had some considerable time getting to the border, and after he got across, he was threatened with being sent back to the States, but he must have told the conductor on the train a good afterdinner story, because he let him through anyway.

"Steve" Gustaf Lindstrom was with the Forest Service in Minnesota. We have a picture of "Steve" with a seventy-five pound pack on his back, and really, he looks as if he were ready to give up the ghost. "Steve" made an accurate count of all of the birds in the Superior National last summer, and is engaged now in compiling all the data he collected on them. We have reason to believe that this will be published as soon as he has passed the J. F.

Ben Whitehill stalked up and down over a good part of the Natural Bridge National, in Virginia. Ben claims to have walked nearly as many miles as Danny did, but we don't know, Ben told his story first, and the first man hasn't a chance. Anyway, mapmaking seemed to agree with Ben, because he ate lots of corn bread and hot biscuits and came home with a Ford roadster. Lots of fellows start out with a car, but Ben is the only one we have heard of who acquired one after working for the Forest Service for a summer.

Williams spent the summer building dams and damns for the Montana Power company, at Mystic Lake, Montana. We gather that Dave was working for his uncle, and that said uncle had an Auburn Straight Eight. How does one acquire these soft jobs anyway?

Ken Karrow and Uno Martilla spent the summer with the State Service, here in Minnesota. Ken got himself engaged, and Marty got himself a job in Liberia, West Africa. Let's all try working for the state for a summer or two.

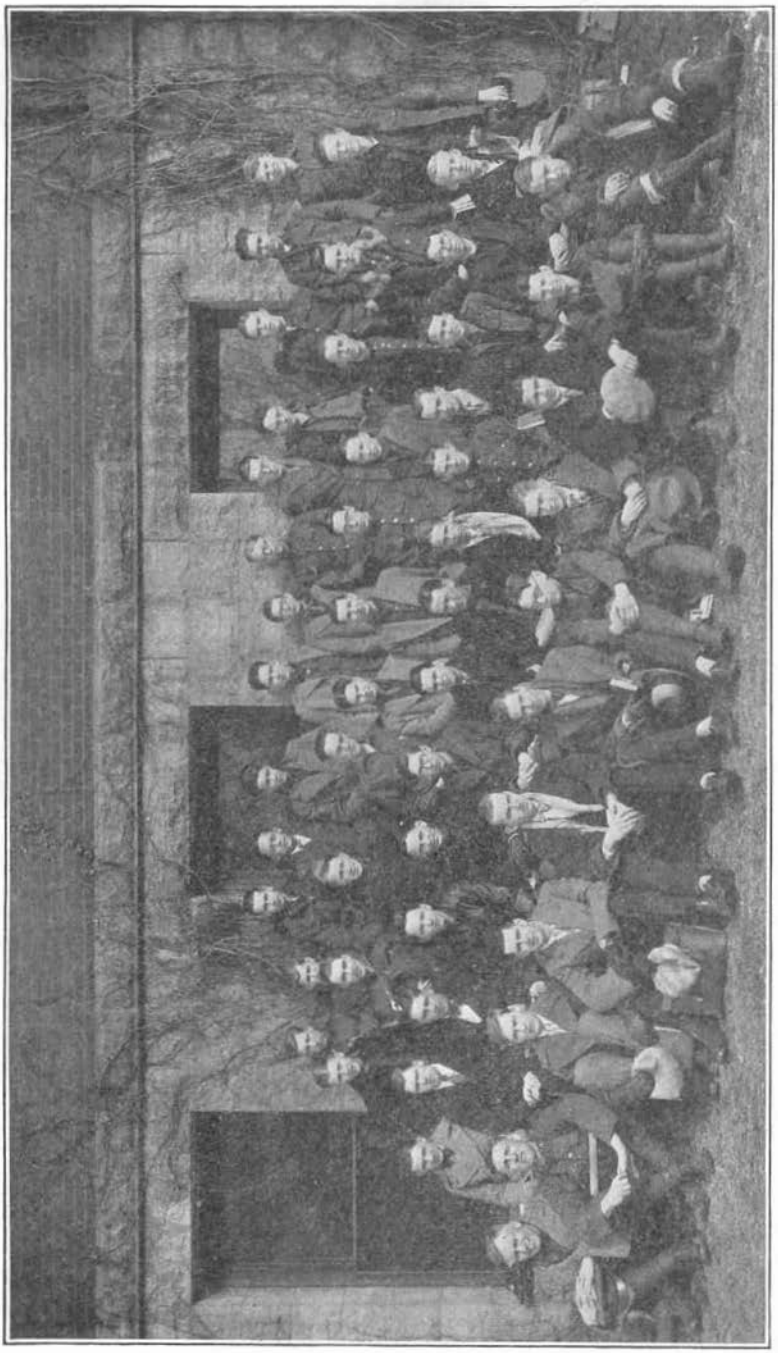
Paul Rudolph, on the Malheur National, in Oregon, put in the summer cruising timber, real timber, not a bunch of measly lodge pole or spruce pulp stuff. However, Paul is not a man to throw the bull, so he ranks third among the three, Smut, Danny, and Paul, in relating experiences of timber cruising.

Ernest George, so far as we have been able to ascertain, is the only man who worked in anything connected with the government last summer from Minnesota who drove a car. And George maintains that he covered something like 8,000 miles in looking over plantings on the Great Plains region.

From all parts of the country they come; to all parts of the world they go; whether they are in the field, in an office, with the government, or with a private company, or in business for themselves, Minnesota men have set a standard for others to follow. The motto of the school of Forestry at Minnesota is: "Minnesota Men Make Good," and darned if they don't.

Puritan Girl—Smoking in public! How shocking! I would sooner become intoxicated.

St. Paul Home Ec.—Who wouldn't?



Freshmen Foresters 1927-1928

The Freshman Corporation of 1926 Goes on Parade

WOOD

By THAD PARR '29

HAVE you ever stopped to wonder, as through life we rather blunder, of the things, their names are legion, occupying every region, that are of wood?

Why the chairs in which we sit, covers 'tween which notes are writ, are made of wood. And the mouldings in our halls, and the panels on the walls, are made of wood. Take our highly polished floors, and the casings of our doors, they're made of wood. And the lofty spars of ships, and a girl's new Rayon slips—they're made of wood. And the pipes we sometimes smoke, or this so-called Koppers' Coke, that once was wood. When you're spanked into this clime, you're in a cradle for some time that's made of wood. And when you're ushered out, you know, why the box in which you go, is made of wood.

So if you're inclined to scoff, or to laugh and laugh and laugh, at my profession—growing wood, just remember, that the books in which we read, once were just a little seed—that grew to wood. And the casks that hold your wine, or the clothes pins on the line, they all are wood. And the cedar chests we keep are made of wood. The mattress on which we sleep, is stuffed with wood. And the handles of our knives, or the rolling pins of wives, *They're* made of wood. And our pencils with their leads, and it's said that even heads—are made of wood.

So remember as you scoff, or just laugh and laugh and laugh, that from the time you see this earth, take my tale for what it's worth—until through life you're swiftly whirled, this would be a darn poor world without the wood.

(Apologies to Tom Youngblood)

DESCRIPTION OF COURSES

As a Student Sees It

By GEORGE SEABURG, *'29*

It takes gobs of perspiration
For to learn of Mensuration
And the fundamental principles of curves;
And to put a tree on paper,
Not forgetting form and taper
Is a task that's very trying on the nerves.

We develop mental powers
For another couple hours
While we learn to make a slippery elm slide,
Looking through the microscopes,
Laughing at the same old jokes,
—And they blame the college men for suicide!

Then there's Silviculture, where
The only thing that's fair
Is our recent acquisition from the South.
Here Perfesser walks the floor
Keeping time to Sparrow's snore
And he tells us how the woods prevent a drouth.

Advanced Dendrology's a drudge
—Just another page from "Judge"
And he's clever, when his mind to humor trends.
"But we'll have to hurry, boys,
For I've got a lot of noise
To make, before this hectic quarter ends."

Forest Finance, Logging Crews,
Are enough to give the blues,
Not to mention Bugs and Wood Technology.
Plant Pathology's a dream
With a basic nightmare scheme.
—With God's good grace and four years' time we've a degree!

And then—Ah! then we take our places with the noble cultured swells,
And we figure curves and methods on the padding of our cells.

XI SIGMA PI

XI SIGMA PI, honor forestry fraternity, was founded at the University of Washington in 1908, and has since become a national organization, with chapters in the forest schools throughout the country. It is composed entirely of foresters and is the oldest honorary forestry society in the United States. The objects of the fraternity are to secure and maintain a high standard of scholarship in forest education, to work for the upbuilding of the profession of Forestry, and to promote fraternal relations among earnest workers engaged in forest activities.

It is the intention of the Xi Sigma Pi to honor the student who is doing good work in forestry and who has a personality that would tend to make him successful in forestry work. The fraternity aims at stimulating scholarship in forestry and at bringing together in good fellowship those students who have shown exceptional ability. As a national fraternity it has done much to bring in closer contact the forest schools of the country, and to establish a spirit of hearty cooperation among them in the upbuilding of the forestry profession.

Delta Chapter was installed at Minnesota on March 25, 1920, by Mr. S. V. Anderson of Beta Chapter at Michigan. For the past seven years the fraternity has played a big part in the forestry activities at Minnesota and we feel that the local chapter has fulfilled to a high degree the expectations of our charter members. During the past year, Delta Chapter has been honored as the National Chapter with Dr. Schmitz as the Forester. It is our ardent wish that Xi Sigma Pi shall continue to grow as it has in the past and attain in a still larger measure the ends for which it was created.

MINNESOTA FORESTERS, MAKE GOOD!

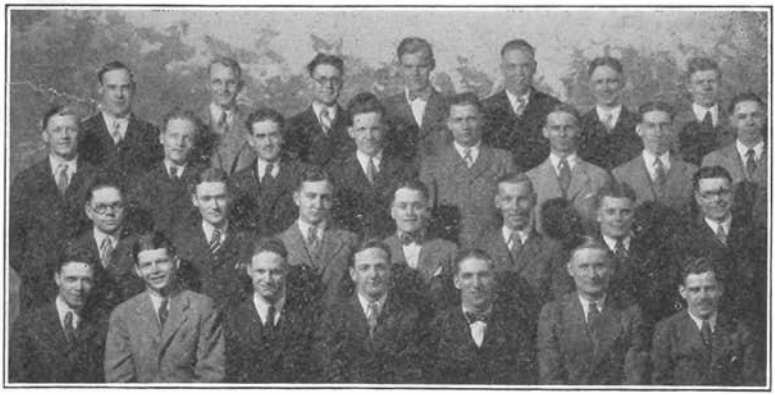
By WINFIELD N. ROBINSON

Minnesota Foresters, Make Good!
Isolated in the northern woods
Neath the towering fir,
Never shirking, like a cur,
Even though the flies
Sting and torment their very lives.
On they push
To cruise and map
All the timber in the bush.

Foresters of Minnesota, Make Good!
Out west in the realms of Mt. Hood
Reeking with timber and tun,
Eaten by the No-see-um,
Swinging the pick and the hoe,
Tending a fire, a forest foe,
Enduring the heat and the smoke,
Resting assured that they will smote
Sir Fire and make him the goat.

Minnesota Foresters, Make Good!
All around the world they go,
Keeping the name of Minnesota so good,
Even to the realms of the Archipelago.

Great and ever greater we must strive to be
On the land of Uncle Sam's, or across the sea,
Our duty, this, To thee,
Dear Old Minnesota, let it be.



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JAMES R. SCHULTS
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The Minnesota Beta Chapter of Tau Phi Delta, the only social-professional national Forestry fraternity in the United States. The Minnesota chapter organized in 1926, with the turning over of the old Forestry Club into a fraternity.

Tau Phi Delta promotes scholarship, interest in forestry and allied subjects and activities, and good fellowship among foresters throughout the world.

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are obtained by
using 120 line
engraving for the
cuts.....
Thank you.

The Gopher Peavey

THE GOPHER PEAVEY *is the annual publication of the students of the Division of Forestry, University of Minnesota*

WITH THE EDITORS

FORESTRY'S BIG NEED

When the comprehensive building program for the University of Minnesota was formulated some years ago, but thirty-nine students were enrolled in forestry. It was only natural that the idea of a building for Forestry did not then receive serious consideration. The situation has, however, changed profoundly during the past five years and Forestry at Minnesota is no longer the "baby" among the professional schools. It has reached man's estate and it has all the energy and virility that are the foresters.

Already we are attempting to house the second largest forest school in the United States in one and a half floors of a small building. Our instructors trek out to two other buildings to conduct classes, our laboratories are overcrowded, our graduate students have no place in which they can study or work; there are no laboratories or work rooms where faculty members may conduct research; there is no museum, the library will not accommodate a quarter of the students.

The need for additional buildings at Minnesota to provide space for the tremendous growth of the University is well recognized. It behooves those responsible for the allocation of the funds provided by our legislation to meet this situation to carefully consider the needs of Forestry. We are certain that this will be done and we are doubly certain we will be provided for as have the other technical and professional Departments of our University.

LOAN FUND FOR FORESTRY STUDENTS

In the fall of 1927 there was established at the University of Minnesota a loan fund of $4,000.00 for students in the Division of Forestry. This loan fund was established by Mrs. Emily Speechley Whitacre to commemorate the work in the Fifth District Federated Women's Clubs in behalf of conservation. It has been called the Mary Dwight Akers' Loan Fund for Forestry Students in honor of the Chairman of the Outdoor Life Committee of Fifth District Federated Women's Clubs.

A gift such as this serves to call attention to the opportunity for private benefactions to promote the great cause of forestry. As the years go by it is hoped that Mrs. Whitacre will get no small amount of enjoyment out of the fact that she has made it possible for many men to complete their education who otherwise might not have been able to do so. More important still she will have made it possible for them to prepare themselves to render greater service not only to their country but to humanity.

It may not be amiss to call attention to the fact that this is a particularly opportune time for any benefaction which a private individual or corporation may feel disposed to make in the interest of forestry education and research in the University of Minnesota. Such benefactions will amply justify the investment and redound to the honor and credit of the donor.

FIRST MINNESOTA FORESTRESS

Traditions as old as Paul Bunyan were broken with a smile and put in the attic when Jane Oakley, our fair forestress from the South, invaded our campus and our classrooms and calmly announced in a catching drawl her intentions of becoming our first lady graduate. Not a whit taken aback by the array of stag shirts and hobnail boots, which provide atmosphere on the campus, she quietly took up her ways and took them successfully. If femininism has heretofore been a symbol of incompetence in our profession, it is now due for a complete and thorough revision and the standards which have broadened out in other lines of endeavor have undergone a similar change here. Thoroughly warned by Dr. Schenck when he was here and led by her own good judgment she may yet prove that a woman's place is where she wants to make it, whether it be running a nursery of quiet and altogether profitable trees or another kind perhaps less attractive. Certain it is she could not qualify for active forest work without some training in brush vocabulary, but if she did set out to do so we would back her to the finish and the well wishes of the Division of Forestry are behind her in her hope for a successful career.

FUTURE FORESTS AND THE CLOQUET STATION

Gypsies, seventh sons of seventh sons, mystics, crystal gazers and—foresters all foretell the future. An all seeing Providence has mercifully drawn an impenetrable veil over the future humans. But to the forester is granted a special boon not given the other soothsayers. He looks into the future with a clear eye. His ability to do so is based on fact, not fancy; on sober judgment, not fantastic dreams. Sober though it may be, foretelling the future is fascinating.

Future homes from future forests. There is no alchemy, no mysterious potion, no crystal gazing involved in the forester's method

of foretelling the future—just plain common, or maybe it is uncommon, sense. Understanding and studying the past he foretells the future of trees and forests—of course, not of men.

Twenty years ago the idea that finally took form as the Cloquet Forest Experiment Station began. Almost twenty years of forest practice, proper management, good silviculture and fire protection have worked wonders with the area. All of the surrounding country has been logged, burned and reburned. The Station forest still stands.

It looms up in the distance for miles as you approach it. An apparently unbroken block of timber. Once within its boundaries you are impressed by the fact that there are no idle acres here. Trees are everywhere, young trees just beginning their career, sturdy youthful saplings, mature stands ready for the harvest and here and there real old timbers. You are struck by the equal proportion of these various age classes. The forester has kept the balance in adjustment by harvesting the crop at the proper time, not by leaving it to nature to regulate.

The future of our forest lands of the North, that is what the Station forest is showing. It shows the way as a beacon light to perpetual forests. It shows the way of proper harvesting, complete stocking and proper distribution of age classes. It shows the value of complete protection from fire.

The leaven is working. Already industry is convinced that trees grow. Manufacturing operations are being based on supplies of raw material from forests not yet grown. Provisions are being made for the creation of commercial forests to supply these industries. Before long changes in the method of harvesting will take place. Consideration will be given to the future forests. And all because in the past there were foresters who had the ability to see the value of a demonstration in the practice of forestry.

THE PASSING OF A LANDMARK

The resignation of Harry Branigan as nurseryman at the Itasca Park Station on April 15 will strike a note of sadness in the hearts of all those who have visited the Forest School there during the past fifteen years.

In the winter of 1912-13, Harry came out from his home near Hobart, N. Y., to work for the Forest Service in Itasca Park. In the next summer he worked for the university as nurseryman. From that day to this he has been an indispensable part of the organization at Itasca Park.

His revival hymns floated out on the morning air about 5 o'clock. From that time on till dark, he was sure to be busy somewhere about the place. His cheery "Hi!" unfailingly greeted everyone who found him.

Scarcely anyone has ever been to the place who has not experienced at least one example of his helpfulness. Whether one was

struggling with a burst water pipe, looking for a lost wheelbarrow, trying to trap a woodchuck or hunting spare parts for a Ford he invariably ended up at Harry's house and always got what he was after. His tireless industry was surpassed only by his marvellous ingenuity in overcoming all obstacles.

He has resigned to give his undivided personal attention to a little private nursery on his farm near Alida. Students, faculty, Boy Scouts, and itinerant tourists will all miss him, for he was to all of them alike, both friend and adviser.

They have not yet succeeded in finding the two or three men who will be necessary to fill his place.

AN ALL-AMERICAN FORESTER

In Herb Joesting our forestry school has contributed a member to the national hall of fame who will be remembered and talked about as long as football and men are parts of university life. His fighting spirit that would not be beat, how he played and led his men against indomitable odds and won, how he came back from defeat to win for us the brown jug and the championship all plant him as a man and a hero in the hearts of his fellow students, and gave him the well-deserved acclamation of a nation. Twice all-American fullback and forever one of our greatest contributions to college sports, he was a good forester. He was initiated into the profession with the rest of us at Itasca Park and had fully his share of poison ivy and midnight lake plunges, he knew the rites of the burial of the quiz, as every good forester does, and he has humbly peeled spuds in the old log mess hall, and sneaked off of more than one field trip with the rest of us to go swimming or up to take a census of the tourist camp. It is still more to his credit that while he was winning an undying name in the football world he was at the same time holding down an outside job to pay his expenses through school, besides hitting the line in his scholastic work; not easy even for those whose activities in sport are limited to watching the team on Saturday afternoons. Now he is in charge of publicity for the Ten Thousand Lakes Association, out boosting his state and his school, and both before and after leaving he has contributed greatly to the fame of our school and has done no less for forestry than forestry has done for him. Big as he was in football he was also big enough outside of it to make a host of friends here at school who like him and admire him as much for himself as for his athletic accomplishments and there will be a long time before we have another like him.

Another who is already becoming famous is his past running mate, Harold Barnhardt, who played his first year in Big Ten competition this year and played it remarkably well, as all the followers of the sport attest. Though not as well known as Herb, Barney was one of the most important cogs in the machine by which Herb made his sensational advances and his fight and drive should carry him a long way in forestry as in football.

THE ORIGIN OF THE MINNESOTA NATIONAL FOREST

By H. H. CHAPMAN, '99, *Professor of Forestry, Yale University*

THE Minnesota National Forest, situated on the headwaters of the Mississippi River, occupies a unique place in the history of forestry, not only in Minnesota, but in the United States. The Chippewa tribes of Indians, always friendly to the whites, had been allowed to retain title to vast areas of forest land in northern Minnesota. By a subsequent treaty, these lands were ceded by them back to the government, on conditions which provided for the allotment of selected homesteads to individual Indians, and the sale of the timber and of the remaining lands for the benefit of the tribal funds.

The pine on the four reservations, which lay in a single body around Cass, Leech and Winnibigoshish Lakes, was of more than usual value, and constituted a rich plum for those who could secure it. This pine, as well as that on the Red Lake, White Earth and other reservations, had to be estimated and offered for sale by the Indian Service.

The late Dr. Filibert Roth, Director of the Forestry Department, University of Michigan, is authority for the statement that the first officials appointed to cruise this Indian pine had little practical experience in such work and were selected largely for political reasons, and that the resulting estimates were grossly inaccurate, in one case a forty being given as heavily timbered which was entirely covered by a lake. The timber was sold by open bidding and the purchasers, with their own estimates to guide them, were quick to take advantage of such errors when the true estimate over-ran the official figure. A better class of practical cruisers was soon substituted for these politicians, and the estimates for the timber on the Mississippi reservations were pushed to completion, and the sale date set for March, 1899.

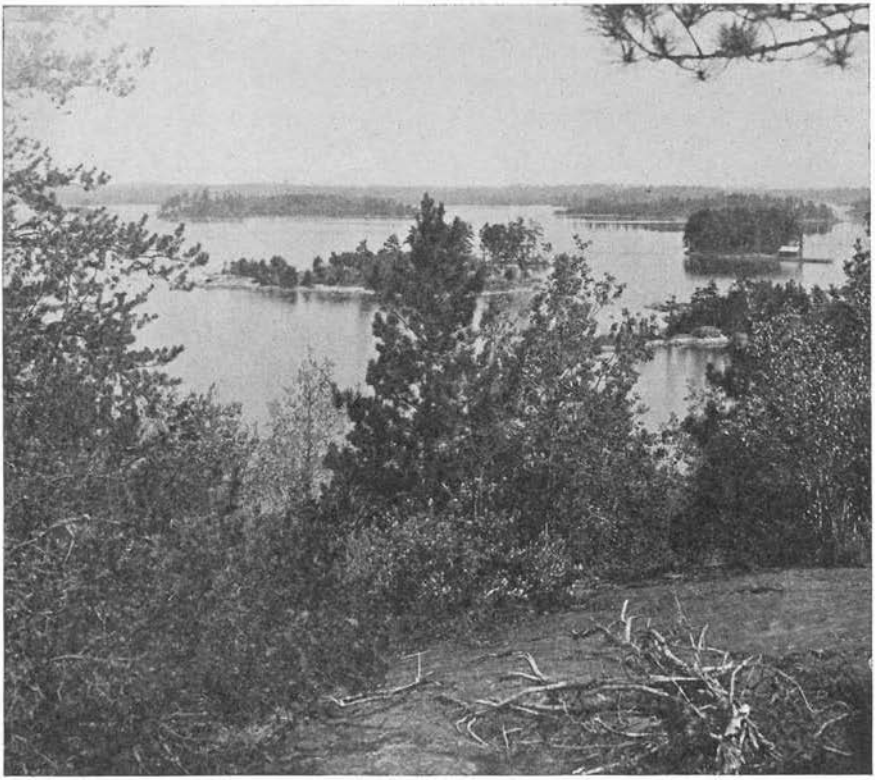
Meanwhile the logger could not wait for this consummation. Under guise of benefit to the impoverished Indians, a law was passed in Congress which permitted the logging of "dead and down" timber to salvage it and thus conserve the property and funds of the tribes. A good idea in itself, this clause was administered with scandalous corruption, being but a cloak for the denudation of large areas of prime, green timber, some of which was paid for at the lower rate of dead pine, and the rest stolen outright. One of these areas is located on Little Winnibigoshish lake and the cruiser who measured the trespass for the government, Leroy Wheaton, is still living at Grand Rapids, Minn. The Federal Government, in a suit against this firm, collected $85,000 in payment for timber stolen, but owing to the prominence and respectability of the parties concerned, all mention of this case was kept out of the press.

Some of these depredations were no doubt due either to incompetence or complacency on the part of Indian agents, else they could not have occurred. But one agent, a Mr. Walker, made violent protest, and from this seed of honest effort to protect the Indian rights, finally grew the Minnesota National Forest. The public attention, always sensitive to wrongs, real or hypothetical, done to the Indian, was caught by these statements. With the approach of the date of auction of the Indian pine, a great agitation sprang up to save this timber for a park, based on sentiment and backed by this suspicion of injustice to the Indian. A popular organization was formed to work for the measure and Dr. Cyrus Northrop was elected its president. This organization took no action and accomplished nothing. The backbone of the fight was the Federation of Women's Clubs of Minnesota, of which two women, Mrs. Lydia P. Williams, and Mrs. William E. Bramhall, bore the brunt. Mrs. Williams' role was that of popular agitator, appealing strongly to sentiment. This was illustrated by a famous incident. An excursion was planned by the propagandists for the park to visit the reservation. The press came along and also several lumbermen, whom it was said were willing to see this auction postponed until a later date, as they were not quite ready at that time to compete for the timber. On this trip, Mrs. Williams and others landed from a steamboat on Sugar Point in Leech Lake and, in a fire-scarred cavity at the base of a big white pine, she discovered a torch concealed, such as fishermen were wont to use in illegal operations at night. At once the idea leaped to her mind, "This is the way the pine trees are burned down so they can be stolen," and overnight, the picture of the lady and the torch was spread over a continent. Although founded on an error, this was first class publicity, and if lumbermen had actually hoped that when the storm blew over they would get this pine free of restrictions, it is undoubtedly true that the widespread public interest in securing a fair deal for the Indian, which such publicity aroused, was the unlooked for element which upset their predictions.

Mrs. Bramhall, succeeding Mrs. Williams, brought to bear on the problem a trained intelligence and a capacity of the highest order, earnestly seeking a practical solution whereby the legal rights of the Indians to receive the cash value of their pine and land could be harmonized with the objective of establishing a public park or forest. The opponents of the sale had succeeded in getting the Secretary of the Interior to postpone it indefinitely. Three years went by in a stalemate. But during this period the way was being prepared for the final solution. The new element was forestry as embodied in the Forest Service in the person of Gifford Pinchot. The writer of this article, through fortunate circumstances, served as the reagent which crystallized the solution. Following the advice of the late Willet M. Hayes,[1] he had pursued forestry wherever it was to be found, and

1 Former Professor of Agriculture, University Farm, St. Paul, Minn.

since the fountain head was at Washington, he had spent a winter there, with Mr. Pinchot, and others, and by 1902, had worked out a theory for the Minnesota situation, involving the sale of the timber with the reservation of seed trees, the preservation of the pine on the shores of the lakes to serve as the park, and the placing of supervision, of marking timber and of slash disposal in the hands of the Bureau of Forestry, under Gifford Pinchot. As Mrs. Bramhall, and through her the Federation, had been brought to agree to these theories, the stage was set. But when, in the fall of 1901, Congressman Page Morris of Duluth introduced a bill which provided for the unconditional sale and disposal of every acre of land and every stick of timber on the reservation, all the proponents of the park were at once up in arms. At this juncture, it seemed to the writer that if Mr. Morris would accept the reservations outlined, his bill was just as good as an opposition measure, and he proposed this to Mr. Morris in writing, outlining the plan. Morris sent for him and expressed absolute approval of the principles proposed and at his request, Senators Nelson and Clapp were seen and the other congressmen of the Minnesota delegation, including Eddy, Tawney, Stevens, and



A Recreational Paradise in the Arrowhead

Fletcher. A conference was soon called by Mr. Morris at which delegates were present representing all interests, even the town of Cass Lake which sent A. G. Bernard and Ed Warren, who gave their approval to the plan. After a hard fight and a close call in the Senate, the bill known as the Morris Law passed Congress in 1902, setting aside about 275,000[2] acres of land, reserving 5 per cent of the standing white and Norway pine as seed trees, and preserving all the pine on Star Island in Cass Lake, on the islands in Leech Lake and on Sugar Point, and in addition 10 sections of land which were selected to surround Pike Bay in Cass Lake and extend northward to include the grove of timber known as Norway Beach.

Although the Federation of Women's Clubs had been greatly alarmed at the original Morris proposals and were hostile to any compromise with him, yet events moved too swiftly for them, and with the bill in its final form, they realized it was what they had already agreed to in principle. Its passage was universally approved.

This law did not create a National Forest but provided that the Indians should ultimately be paid for the reserved pine and land, and on the consummation of the deal the National Forest would be established. It took over 20 years before this was brought about. Meanwhile, the law was the first which gave to the United States Forest Service, then the Bureau of Forestry, actual authority to supervise cutting on government land. Some three years later, Congress passed the act transferring the jurisdiction of the National Forests from the Interior to the Agricultural Department, and the writer personally heard Senator Nelson state in a semi-public informal talk that it was the efficiency shown in managing the timber operations on the Minnesota National Forest that had convinced him of the prudence of this move.

This efficiency was due to Eugene Bruce, an Adirondack lumberman, who became associated with Mr. Pinchot in the early days, and to whom was entrusted the job of initiating the Minnesota lumbermen into the possibilities of slash disposal. No better man could have been selected. He knew lumbering inside and out and was absolutely fearless. The slash disposal under his supervision was so well done that the most violent opponents of the reserve were unable to find flaws in it.

In 1908, an amendatory act was passed which, while throwing open certain lands lying south and west of the town of Cass Lake as a concession to the promoters, secured as an offset the increase of the seed tree reservation to 10 per cent, and transferred the jurisdiction of the park lands from the Indian Service to the Forest Service. This latter move was probably necessary, but unfortunately was rather promptly followed by the commercialization of these priceless areas of park timber through the leasing of building lots for private cottages and hotels, in itself an absolute violation of the fundamental public purpose of these reservations as shown by

2 Later reduced by state selections, etc., to 190,000 acres.

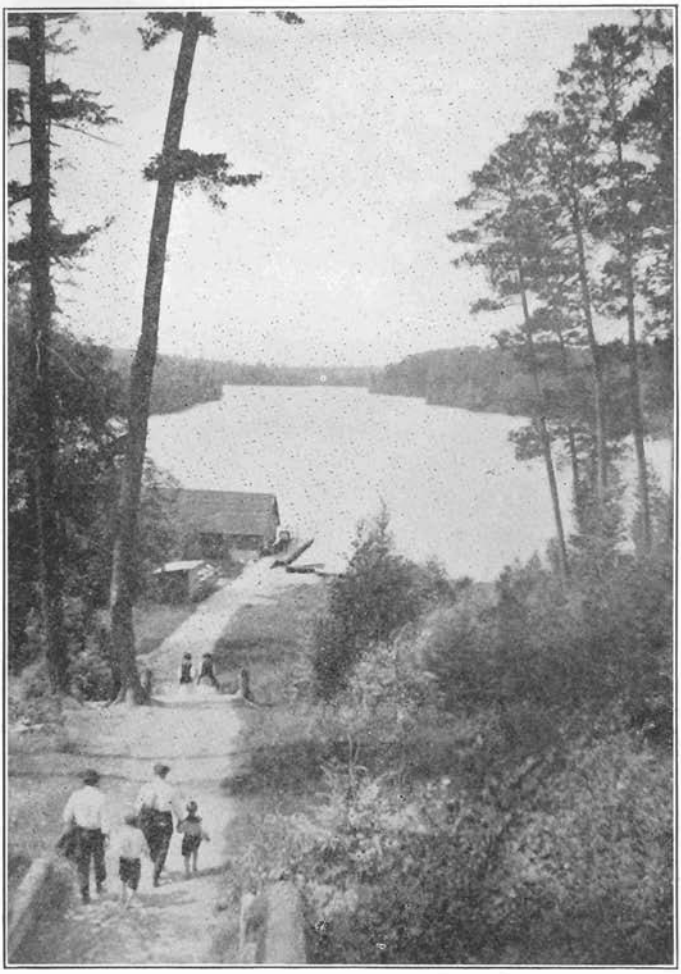
the history of this movement, and an indication that the Forest Service had in this instance failed to grasp this purpose or to mold its policy for the "greatest good to the greatest number in the long run." It was really a case where a general administrative policy adapted to temporary conditions in the western National Forests was applied without foresight to a local, eastern condition which it did not fit.

As to the silvicultural results of the practice of leaving seed trees, the issue remained long in doubt. Great losses of these trees occurred through blowdown, due largely to their over-maturity. These could be salvaged because of unusual accessibility to water of most of the area. As time passed, it became more and more evident that the surviving seed trees were actually restocking the land with pine. In the case of Norway pine, most of this restocking occurred during heavy seed years at six- or seven-year intervals. Today, nearly all of the Norway and Jack pine area is heavily stocked with young trees and if fire is kept out, success is assured. With white pine, the tale is different. But little of this land has re-seeded to pine. Instead, poplar or aspen had taken possession of the soil. In all probability, the natural method was not followed, with this species. But the white pine areas constitute the smaller part of the forest, and aspen is a commercial species.

In the original bill, the boundaries of the Forest were outlined as they stand today, except for the relinquished area near Cass Lake. Nothing was known by its framers of the state claim to swamp lands in this area. The state later successfully established this claim, took title to over 70,000 acres and proceeded to denude the land, and, in some cases, where the pine had been cut previously, leaving seed trees, these seed trees were sold and cut, leaving all the state lands in a devastated condition which will require artificial planting to restore the forest thereon. In the last legislature, these state lands were, for the first time, definitely set aside as state forest reserves.

The reforestation of the Minnesota National Forest area would have been brought to naught if even a small percentage of the fires common on other adjoining areas had been permitted to burn. But while not free from fire, the percentage of success has been so great that, with the continuation of equal efficiency, the young pine will for the most part reach maturity. Since Gene Bruce's retirement, Ed Marshall has been supervisor of this forest, resigning only this spring to take a position with the Cloquet interests in their forestry program. His successor, Howard Hopkins, is a trained forester, a graduate of Yale in 1923. The forest is now generally regarded as offering probably the greatest opportunity of any National Forest, acre for acre, as an ultimate revenue producer. Meanwhile, the sale of timber under the terms of the Morris law placed several million dollars in the tribal funds, and the conditions preserved on the National Forest area give to the Indians as near an approach to the continuance of the old privileges as could be hoped for. The provisions of the Morris law may fairly be said to have been wise and constructive,

avoiding on the one hand the ruthless destructiveness of forest denudation, and, on the other, the fanatical locking up of excessive value not needed for such purposes by the public. Congressman Eddy remarked somewhat heatedly at one time, "If any plan can be devised which will satisfy the Indian Service, the Federation of Women's Clubs and the lumbermen at the same time, it will be nothing short of a miracle." Yet just this miracle happened, for the simple reason that neither extreme partisan group was strong enough to have its own ruthless way. Both were willing to listen. The resulting compromise gave each group all it was entitled to in the public interest and the result was of the greatest permanent benefit to the public, both for the present and for generations to come.



Lake Itasca Among the Pines

THE LATEST FORESTRY IMPLEMENT

By HOWARD R. FLINT, *Special Student, University of Minnesota, District Forest Inspector, District One, U. S. Forest Service*

THE plot thickens. Present-day forestry students may well be appalled when they look over the modern forest school curriculum and note the number of "ologys," "ometrys" and "isms" with which they must gain some familiarity. That is only half. It takes a novice longer to learn properly to sharpen and use an axe than it does to master trig or general botany, and to the novice, to the innocent onlooker, and to the forest, the badly wielded axe is the more dangerous tool. Then there are saws, saddle horses, pack mules, hodags, psychrometers, T. N. T., rattlesnakes, camp-stoves, pressure torches, telephone climbers and the various types of footwear; all to be mastered and made useful—all of them temperamental, tricky, loaded-when-you-don't-expect-it. It is truly a wonder that any student survives his novitiate. As a matter of fact, only a few of them do get by. If some overzealous "Prof" doesn't bump them off in a cultural way, a light-footed pack mule with rotatable ears and hyper-universal-focus eyes is pretty sure to pick out a spot of physical weakness to sudden impact, and terminate a promising career before the boss finds out that it has started. All that is "just too bad"; but now comes another handicap.

Most recent indications are that some of the foresters of the near future must develop gyroscopic stomachs, an appetite for the thin air of moderate and high altitudes, and an infallible instinct for finding, with great dispatch, the exact location of the rip-cord of an aviator's emergency parachute. Probably foresters' insurance rates, at least, will remain up indefinitely.

This latest implement of great importance in forestry is the airplane. Leaving all levity aside, it can truthfully be said that the plane has been tested rather superficially in forestry work in a number of places and ways during the last seven or eight years. Its use has grown, is growing, will grow, slowly perhaps, and without bringing about any great revolutionary change in the way of doing most things in forest work. The extent of its growth and its usefulness will depend very largely on the development and improvement of the planes themselves and on the pioneering spirit, enthusiasm and technical capacity of the foresters who take to the air.

In the Northern Rocky Mountain District of the United States Forest Service, planes have been used, experimentally, in forest fire control, and incidentally in some other forest activities, during the past three seasons. The planes have given no promise of supplanting the ground forces. They have shown encouraging possibilities of being a valuable supplement, particularly in the matter of prompt discovery

and reporting of fires in areas of rough topography remote from roads and railroads.

Lightning is the most common and dangerous cause of forest fires in many of the forested areas of the West. Lightning fires come with short warning and often a large number of them may strike in a relatively small area within a few hours. In 1926, a single storm delivered more than 150 lightning fires in one northern Idaho forest of less than a million acres within a twelve-hour period. Many of these fires smoulder or spread very slowly for hours or days under a dense canopy of green timber in some remote and unseen mountain gulch before breaking out at some exceptionally bad time. Here it is that the airplane enters the arena.

A Supervisor or other administrative officer telephones into the air patrol base that a lightning storm has passed over certain drainages; he wishes to have them scouted. There are certain deep canyons and areas of rough topography into which his lookouts cannot see. Plane, pilot and observer are waiting in readiness. Maps are selected. The observer is a forester familiar with the region. He lays a course in pencil on two maps. For navigation, quarter-inch-to-the-mile or smaller scale maps are used. For determining and plotting the exact location of any fires that may be discovered a half-inch-to-the-mile contour map has been found most satisfactory. Larger scale maps are sometimes useful in scouting and mapping individual large fires.

At a rate of about 85 miles per hour and from an altitude of 1,000 to 2,000 feet above the terrain, a plane covers a lot of territory in three or four hours. It matters not at all how rough and inaccessible the ground is, or how hot the day. Using time as a basis, the observer keeps a log of the trip in a specially adapted triplicating notebook. Both men keep their eyes "peeled" all the time. If a smoke is seen, the plane circles near it until the observer has determined its location by reading the map and relating it to topography. He must read quickly and accurately. In brief notes he describes the location, size, and behavior of the fire. A copy of the log and his notes, perhaps also a tracing-paper map, are placed in a message dropper. The plane flies to the nearest forest telephone station, seldom more than five or ten minutes' flight distant, circles low, and the written message is put down. Safe landings within the forest are usually impossible because of lack of suitable fields. The message is dropped, and the plane roars on its way.

The forest employee who receives the message goes to the fire or telephones the word to the man whose duty it is to get that particular fire. If one fire that would otherwise have escaped and become large is thus averted by prompt discovery and action, the air patrol may easily have paid its way for an entire season.

Planes are useful also in scouting large fires of a thousand acres or more in extent and giving information about them to the ground forces. The outlines of the fire may be sketched on the topographic map. The map of the fire is then taken off on a previously prepared

tracing paper, and, together with the observer's notes, is put down to the ground forces in a message dropper. For such work, it is desirable that the observer be also a skilled fire fighter. By this means information may be secured in an hour that would require a day of the hardest of hiking. Time is the essence of fire fighting. Of course, all of this is not quite as simple as it reads, but it has been done a good many times with a considerable measure of success. It can be better done as planes and technique are developed.

A vertical aerial photo for forest mapping. Taken about 10,000 feet above terrain, scale about 6 inches to 1 mile. Forest types and age classes can be mapped from this in detail.

Photo by Author, Courtesy U. S. Forest Service.

Quick transportation of men and supplies is ever a problem in fire control in the mountain, or other inaccessible, forests. Here is a possible field for the plane that is as yet barely scratched. On one or two occasions a supply of some thirty pounds of bacon, beans, and other durable items on the grub list has been delivered promptly to a remote lookout station by having it wrapped securely and shoving it overboard at just the right second. Luckily the man didn't order eggs. A crew of firefighters in the mountains of California slept in blankets delivered to them out of the blue sky miles from a road—"air beds." In a few cases urgently needed supervisory officers have been transported by plane, "overhead men," so to speak. These uses of the plane have not been of great practical value because of scarcity of landing fields and lack of suitable equipment. Such obstacles may prove not to be insurmountable.

Aerial photographic mapping of small or large forested areas has passed the experimental stage and is now an accomplished fact, although it has by no means been developed to the full extent of its possibilities. A series of overlapping pictures are taken with a special camera mounted vertically in the plane. The strips are planned and the exposures timed so that each picture overlaps those immediately adjacent to it by about fifty per cent. This is to guard against trouble due to misses, distortion and other irregularities. The completed pictures may be pieced together to form a mosaic or "composite" picture representing a vertical view of an area of any size, or they may be used to furnish data for a line map. Of course, a certain reasonable amount of instrumental ground control is necessary if a fairly accurate map is to be made. The survey control work may be done either before or after the pictures are taken. Within reasonable limits the scale of the pictures can be decided upon in advance and regulated by the altitude at which the plane is flown. The area covered by each picture is directly proportional to the altitude above ground from which it was taken. Ordinarily, vertical pictures for mapping are taken from an altitude of 10,000 or more feet above the terrain. Cover, culture and drainage are shown with remarkable detail, clearness and fidelity by good vertical aerial photos.

Lake States forests with their level terrain, numerous lakes, abundant roads and section lines, and few, well-defined types should lend themselves admirably to mapping by this method. In the high, rough mountain regions there are many complications and difficulties to overcome that would not be encountered over a more even terrain.

Sketch mapping from a plane of the boundaries of broad general types for extensive timber surveys has been found to give worth-while results for areas on which extensive data are needed. This work can be done with astonishing rapidity if a fairly good drainage map of the area is available on which to draw the type lines.

The spruce bud worm has recently become an important factor in some of the Northern Rocky Mountain forests. In the latter part of July and in August, a skilled observer in a plane can easily place

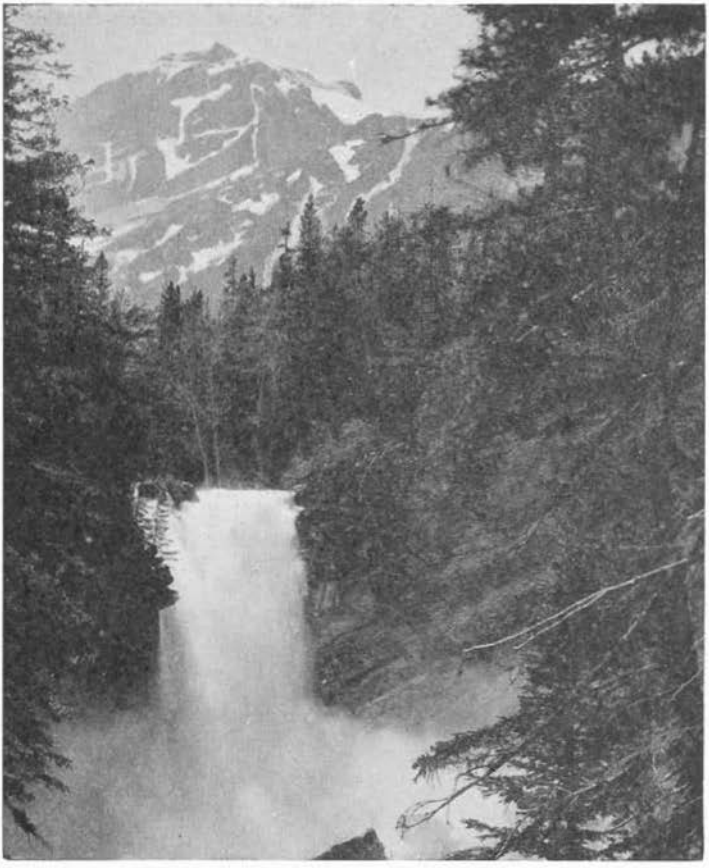
the outlines of heavy bud worm infestations on a topographic map. Likewise, at any time after the foliage has faded, it is possible for a skilled man to determine with reasonable accuracy the location of clumps of trees or individual trees killed by bark beetles. Information acquired very quickly and easily by this method can be used to great advantage by administrative officers or by scouts whose task is to secure much more detailed information by a field examination.

Insect control by dusting the infested areas with an insecticide spread from a low-flying airplane has been practiced on a considerable scale by the U. S. Department of Agriculture in a campaign against the cotton boll weevil. Some promising experiments have very recently been made in Europe and in the United States in combatting by this method defoliating insects that attack shade, orchard and forest trees. A very fine poisonous dust, usually an arsenical compound, is spread from the plane by special mechanical apparatus and allowed to settle on the endangered foliage. It seems probable that where valuable areas of timber are at stake this method of insect control may be used by foresters. It has not yet been tried in the national forests.

From the foregoing, one may gather that there are a number of avenues of usefulness open to the airplane in forestry and that several of them have been at least superficially explored. A wider use of the plane will come about with development of the machine itself—safer and surer flying, shorter landings and take-offs, cheaper operation—and with a wider recognition on the part of foresters that here is a new tool which has possibilities that they cannot afford to ignore.

During the last three seasons in the Northern Rocky Mountain district of the U. S. Forest Service alone, 928 hours of forest and mountain flying has been done with equipment generally recognized as obsolete. That there has been no injury to personnel or planes is high tribute to the ability and skill of pilots and mechanics who kept the old Army and reconstructed Postal Department De Havilands in the air through smoke, thunderstorms and rough winds, often many miles from any safe landing chance.

It would be presumptuous at this time to predict the future of the airplane in forestry. It is desirable, however, to call attention to the phenomenal development of aviation during the past year and to recall that fifteen years ago no forester in the mountain regions used an automobile or a truck on official business or gave very serious thought to the possibility of their use. Today we regard it as impractical to manage most forest units without one or more motor vehicles. In many places, better maps are essential to efficient forest protection and management. There are some rare advantages about vertical photos in determining what grows on vast areas of rugged, slow-travel country. Would it seem amiss for foresters to keep a finger rather closely on the pulse of aviation and to have among their numbers a few men with some practical knowledge of the present-day possibilities and limitations of aviation?



Amid the Forests of Mt. Baker

SOME DO'S AND SOME DON'TS IN MAKING A FOREST SURVEY

By A. E. WACKERMAN, '21, *Forester, Crossett Lumber Company*

THE groundwork for any kind of forest management is the forest survey and though it is a tedious and time-consuming job, a forest survey must be completed before the forester can make his plans. And because the forest survey or inventory of the timber tract is basic to the practice of forestry the work must be carefully thought out and so planned that when it is all over the information wanted will be ready to use.

Also, because a forest survey of any considerable area is an expensive undertaking (400,000 acres at $0.05 an acre for the field work means $20,000) the crews must be organized and the work planned so it will progress as expeditiously as possible.

Because I am now in the midst of a forest survey which I hope to complete by spring and have had to organize and plan and direct the thing, I may be able to emphasize a few points about forest surveys in general that will be of help to others, particularly to student foresters who will, sooner or later, if they stay in the forestry game, have a forest survey of their own to nurse.

I will not attempt to treat forest surveys thoroughly, that is left to the professors, but no matter how fully the professors lecture on forest surveys and no matter how many survey strips one has to run, there is always something new and unforeseen popping up for immediate solution. And there are also many chances for serious omissions unless the work is thoroughly planned. All that I will try to do in this short article will be to give some suggestions more or less at random in hopes that some of them may some time be of value to somebody.

Forest surveys on the National Forests are fairly well standardized, I believe, at least by districts, so that anyone conducting a forest survey for the Forest Service will probably be told what to do. But the forester who goes into private industry often goes alone and does not have anyone to tell him what to do. He is supposed to know. He must plan it all and be responsible for it all. He must foresee what he will want when he is through and start off right and not have to change his plans and begin again.

Industries are seeking foresters, and because they have not had foresters before and usually do not know much about their timber lands (aside from their cruisers' estimates) the foresters going into industrial forestry must be prepared to conduct intelligent forest surveys. These hints are for those who are planning to engage in forestry work with the industries.

First, know your stuff. Unless you know what your professors have lectured to you about and have tried to pound into your heads,

you will have a tough proposition to get away with when you get off by yourself with a bunch of hard-boiled lumbermen and timbermen looking over your shoulders. You cannot get by on half-baked knowledge.

Then know what information your company wants and plan your survey accordingly. Your company may want only one thing, perhaps just an estimate, but you must anticipate what they will want to know after they have the estimate, because it, in itself, will suggest to them other desirable information. So, in planning a survey, arrange to take all the information about your timber lands that you reasonably can, because you will need it. Tally trees so you can make stand tables to use in predicting growth. Classify the types so you will have the right information later in planning management and silvicultural operations. Take notes on the timber and reproduction; they will come in handy in a dozen different ways. Decide with the management of your company upon what utilization standards to base your survey estimate and get approval for your plans before you go ahead.

The tally sheet is important. Make it handy by keeping it small and by using only one side of the sheet. This saves a lot of time in the field and in the office as well. The form for the tally sheet will vary with conditions, but it should always have plenty of room for the tree tally, preferably from 4 inches D. B. H. up, and for heights. When trees are tallied by D. B. H. alone, a space should be provided for the heights of enough trees to make a height-on-diameter curve for use in computing volumes. Then leave room for descriptions and for totals after computing the tally in the office. Each sheet should carry all its computations so it can be readily referred to and checked. It is also important to have a place to note the chainage for the type. Using one sheet for a type often means 3 or 4 for a forty and if the chainage for each sheet is recorded, the strip area can be put down on the tally sheet with the type area (from the map) and everything will be together. The survey sheets should be kept separate by types and "forties"; they can later be consolidated in as large blocks as are desired.

My impressions of forest surveys, before I started one, were that they consisted of mountains, horses, pack-animals, wilderness camps and earthen beds. But such surveys are only hang-overs from the Forest Service days our old-timers like to talk about. Forestry has come down out of the mountains of the West and most of the private forestry work, at least, is now in fairly well developed localities.

This means that arrangements other than camping and "hoofing" can often be made for the survey crews. The forester must go over his area carefully and decide on his field headquarters. Frequently he can work from good towns where comfortable quarters can be secured for the crews and they can then go to and from work in Fords. There is little excuse, to my mind, for quartering field crews in forsaken hovels or primitive camps in out-of-the-way places when

comfortable quarters can be found not far off. In any event field quarters should be of the best. Forestry is a dignified profession and, in order to keep it dignified, foresters must treat themselves and their brethren like modern human beings.

After the survey is under way, it is necessary to be in constant touch with the work to keep the crews "like-minded" in recognizing types and accurate in pacing and estimating. Occasional check estimates of some of the forties are valuable in keeping the crews on their toes. An analysis of the checks will indicate whether any of the crews are getting off their strip widths, diameters, heights or mapping. If such is found to be the case, they can promptly be corrected. Also, the psychological effect of checking is valuable.

As soon as possible after the field records have been taken, they should be checked, computed and filed handily by sections and townships, ready for summarizing. If any errors are found, or the tally sheets and maps do not coincide, the crews can be questioned while the forties in doubt are still fresh in their minds.

Always keep the territory in advance of the survey crews well scouted. Trace out all roads and locate as many section corners as possible for use as starting points. The more familiar you are with the base features of the country you are to cover with the survey, the more time and trouble you can save. A few days spent in this way will save many for the crews.

In the office there is a lot to do. A clerk should be at work computing while the crews are in the field. Accuracy is imperative in office work and too much care cannot be taken to keep out mistakes. Make a multiple volume table; it saves time and prevents mistakes in computing the tally.

Accuracy in office computations does not mean undue refinement. Usually if the estimate is rounded off to the nearest thousand feet for types and forties, it will be consistent with the degree of accuracy observed in the field for ten to twenty per cent estimates, at least. Likewise, type areas need not be computed closer than to the nearest acre. The slide rule is a great help in many of the computations and every forester should own a "slip-stick" and know how to use it as it will save him days and days of tedious figuring.

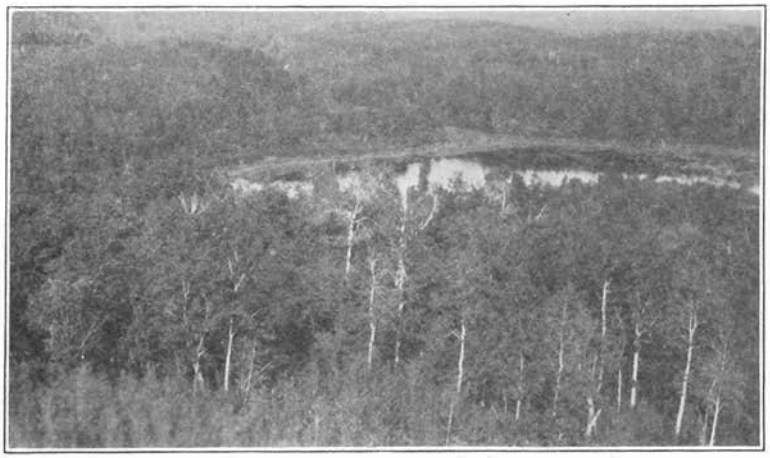
In presenting your report on the findings of your survey, always bear in mind that you have mighty important and useful information for your company and make every effort to present it in a clear, concise and practical form. Type maps in color are pretty but they do not, in themselves, mean so much to the management. Of course, they are important and necessary in silviculture and management and will be used by the forestry department. But the company manager is interested in and can understand better what it is all about if maps are prepared showing the amount of timber by forties. For instance, from such maps logging operations can be planned. If the forties are colored to indicate the amount of timber they have the manager

can visualize his timber tracts, which is something he has probably not been able to do before.

A presentation of timber facts in this way enables the forester to build his report around present stand, types, growth, stand tables and age classes, and makes it intelligible because he is building on something that is readily understood. Type maps, for instance, can be traced on thin paper and super-imposed on the stand map to show the relationship between timber and type. Present your stand tables, growth, type areas, and whatever else there is to tell, in the form of graphs. They are much more intelligible than mere columns of figures. But do not make the graphs too technical; make them simple, concise, and clear.

Remember always that the report should be useful and really informative; that it must be worthy of the amount of cold cash the company has invested in it. Another thing, do not allow the impression to get abroad that when the survey is finished that there is nothing much more to do. The survey is just the beginning. Then the real job begins, for, after all, the survey is only an inventory to find out what you have to deal with in formulating a plan of management and in putting it into practice.

I have reserved until the last perhaps the most important consideration, at least one of the most important, and that is to get along with the folks with whom you will have to deal. If you make any serious efforts to put your forestry knowledge to good use for your company, you are bound to run up against lack of understanding on the part of others that will develop into prejudice rather than respect, if you cannot be diplomatic, considerate, and fair to all. And once that happens, your job is more than ever up-hill. So be agressive but do not be aggravatingly aggressive, and, above all, be right and, if necessary, prove that you are right, but do it diplomatically.



Itasca Park, the Students' Laboratory

UPPER MISSISSIPPI WILD LIFE REFUGE

By WILLIAM T. COX, '06

What can bring more hope to our furred and feathered friends than the thought of wild life refuges? The same thought among fishes no doubt makes them leap with joy. And now even humans are taking an interest.

Some millions of Americans have heard of the great National Wild Life Refuge being built up on the Upper Mississippi River. This reservation is of particular interest to Waltonians since it is one completely in accord with the principles and objects of the League. In fact, the League fathered the project and successfully championed it through the halls of Congress until an enabling act was passed and a million and a half dollars authorized to purchase the necessary land. Conservationists and sportsmen do not need to be told that there was great need for the establishment of some such refuge. The gradual, and in some cases rapid and even tragic, diminution in the number of wild creatures of various kinds has awakened the public to the urgent necessity for action to save our game and fish and fur-bearing animals before too late. We have long needed a great object lesson like the Upper Mississippi River Wild Life and Fish Refuge which, for this country, is in reality a new type of public forest managed with a view to the fullest protection, development and use of all the resources inherent in wild lands and waters.

Fortunately an almost ideal strip of country remained available for the very purpose in mind. It was situated in the right part of the country; it extended in the right direction and served as the natural route of flight for our wild fowl in migration. It had once been a great game and fur district teeming also with fish. It offered opportunities for rehabilitation in these respects and could be obtained at reasonable, one might almost say nominal, cost. On top of all this the strip of country so peculiarly and outstandingly adapted for the purposes of a wild life and fish refuge by great good fortune happened also to be one of the most beautiful regions in all America. Those of us who have sailed the Hudson, traveled the trails of Glacier Park and the Yellowstone and scaled the peaks of the Selkirks do not feel that the scenery of the Upper Mississippi suffers by comparison. Anyone who has not threaded that maze of islands or looked down from the Winona Hills, from Trempealeau Mountain or from the bluffs above McGregor at the majestic Father of Waters winding his way among the hardwood forest and lakes of the bottom land may well thrill at the thought of a joy he is yet to experience.

It is pleasant to climb one of the great hills overlooking this Refuge and from the top of some sheer cliff that drops off hundreds of feet to the valley below, allow one's mind to travel back historically for the space of a few generations. In the time of our grandfathers Indian signal fires burned on those hills. On the bench lands and

in the bottoms at various points up and down the river there were wigwam villages of the Winnebagos, Sacs and Foxes, Potawatomi and Sioux. These tribes long contended for possession of what to them must have seemed a happy hunting ground on earth. The early French and English explorers had come through this way—Carver, Hennepin, La Salle, Marquette. In what was then Upper Louisiana Napoleon granted lands for settlement. That was on the west side of the river. Down along the east side came the voyagers of the Hudson Bay Company visiting the posts that were established as far south as Prairie du Chien. It was not until about 1840 that the treaty establishing the present northern boundaries of the United States was arranged and these trading posts were abandoned. Shortly before that time the American Fur Company had built its posts here and taken over the rich fur trade of the Upper Mississippi.

This was then the eastern edge of the Buffalo Range. Herds of elk and deer wandered over hill and valley. Wild turkeys filled the woodland. Passenger pigeons darkened the sky while geese and swan and a host of wild fowl swarmed in the lakes and marshes and the river itself. Beaver and other valuable fur-bearers, though somewhat reduced by the earliest trappers, were still the chief asset of the region. Travel was by canoe and bateaux and the traders, trappers and Indians, as they plied their light craft over the Mississippi and its tributaries, the Wisconsin, the Rock, the Black, the Root, the Zumbro and the Chippewa, could see beneath them countless fishes of great variety. For these waters then were clear and pure, flowing out from untouched forest and unbroken prairie.

Later came the trek of the prairie schooner. Settlers filled the open country. Farms replaced the Buffalo Range. There was an era of steamboat transportation, then railroads came and bridges spanned the Mississippi. Villages sprang up along the river, each with its saw mill or group of mills. Lumbermen brought down rafts and booms of logs from the pineries. Cities came into being with consequent pollution of the river. Game was slaughtered for the market. Commercial fishing depleted the waters. Lumbering, fires, cultivation and grazing on steep slopes, ill advised and unregulated drainage, brought in millions of tons of silt. Then came Gifford Pinchot with his constructive ideas of conservation and Theodore Roosevelt to give them nation-wide significance. The Izaak Walton League came into existence and luckily chose the Upper Mississippi as a field of first endeavor. The League rallied to its support practically all of the conservation organizations of the country and on June 7, 1924, President Coolidge signed the act providing for the purchase of lands for the Upper Mississippi River Wild Life and Fish Refuge.

The area which the Refuge is to embrace includes the bottom lands of the Mississippi and islands in the river from approximately the foot of Lake Pepin to Rock Island, Illinois. This strip is nearly 300 miles long and from 1 to 3 or 4 miles wide. It embraces about 200,000 acres of territory of the character that Congress intended

should be included in the Refuge. The area has long been known as one well suited to various forms of wild life. It has been notorious also as a district in which there has been much illegal shooting and fishing, for it lies along the border of four states where conflicting laws, questions of jurisdiction and frequent changes in administration have made game law enforcement exceedingly difficult. The only solution of this interstate problem, which for a generation had remained unsolved to the serious detriment of wild life, was to ask the co-operation of the Federal Government. This was done. The states of Minnesota, Wisconsin, Iowa and Illinois enacted legislation permitting the Federal Government to acquire lands for the reservation in these several states and to delegate to the United Stats Biological Survey the task of protecting the area and developing the wild life and other resources within it.

Some of the provisions of the Federal Act are of special interest: a maximum price of $5 per acre was prescribed; the lands may be acquired by gift, purchase or lease; only lands subject at times to being overflowed by the Mississippi river can be included. The Biological Survey of the Department of Agriculture is given charge of the acquisition work, the protection and development of the game, forests, fur-bearing animals and miscellaneous plant and animal life, while the Bureau of Fisheries of the Department of Commerce is given charge of the fish and other aquatic animal life in the Refuge.

The water area which does not have to be bought is very extensive and is probably just as valuable, acre for acre, as land areas for wild fowl and fur production purposes. The possibilities of the waters of the Refuge for fish culture are exceedingly great. This has been a region of important commercial fisheries and has also been and is capable of again becoming a prolific source of game fishes such as the Black Bass and Crappie.

Today, after 80 years of settlement all around it, this strip of semi-wildness persists. How fortunate that it is to continue.

It is true that some of the creatures of the wild have gone, never to return. Others are sadly reduced and rarely seen. But practically all of the kinds of mammals and birds originally found in this type of country and in this region have managed to survive despite the most persistent hunting and trapping. The same furs that brought the early traders into this territory are still taken, though in reduced numbers, in the bottom lands. From the woodland there comes a burst of song. Among birds there are the ruffed, pinnated and sharp tailed grouse, the quail, ducks of several species, snipe, rails, coots, the pileated woodpecker, the cardinal, the bald eagle, the osprey, the kingbird, the great blue heron, the indigo bunting and many other songsters, game birds, insect eaters, waders and birds of prey.

The Mississippi, with its broad waters, its timbered swamps, its marsh land and bluff, for centuries has been the great water and aerial highway for the semi-annual flights of the feathered folk. Year after year, in sunshine and in storm, they have winged their way

up and down this mid-continental landmark. By moonlight they have followed the course of the Mississippi and even in the darkness the glimmer of its surface has helped to guide them on their way.

Throughout the area there are the nuclei of breeding herds. Muskrats are found here and there in marshes and sloughs all along the river and it will require only a few years of protection to stock the Refuge with these productive animals. Raccoon, mink, foxes, skunk and some other fur-bearers will also increase rapidly if protected. Other species like the beaver and otter, while a few specimens exist here, will need help through the introduction of small numbers to stock the most promising areas if we are to expect a satisfactory and early increase. Deer also will need to be introduced although a few exist in the bottoms.

Since the autumn of 1925 we have had a valuation engineer and a force of purchase negotiators and land appraisers at work examining lands for purchase and determining the boundaries of areas already in government ownership. In addition the Solicitor has detailed title attorneys to the Winona office to investigate titles and the buying of lands has progressed steadily. A considerable number of important areas have been taken under contract. Such for example are the Wabasha Flats, the Winneshiek Bottoms, the Rice Lake District and Minnesota Marsh. The state of Minnesota has presented to the Government its land within this territory. An interdepartmental agreement has been signed turning over to the Refuge the control of wild life on the Savanna Military Proving Ground on the Illinois side of the river. This area aggregates 12,000 acres. Negotiations are under way for the acquisition of several extensive preserves and semi-public reservations. Up to this time several hundred privately owned tracts have been taken under purchase agreements. These range all the way from a few acres to over a thousand. At the present writing, therefore, the area under government control approaches one-half of that contemplated.

Most of the area to be included in the Refuge is in small tracts owned privately and it is a slow process negotiating with the farmers, many of whom do not live on the land and have to be located at points widely scattered over the country. Numerous farms extend from the upper country down across the benches and out into the bottoms. In such cases it is necessary to survey the portion subject to overflow and buy that part only from the owner.

The farmers occasionally insist on reserving dead, down and defective fire wood for their personal use. In other instances land owners had either sold their timber prior to the government's entry into the market or else before selling their land to the United States insisted upon the right to remove some of the merchantable timber. There is nothing in the law which enables us to prevent the present owners from cutting trees on their lands. Some parts of the Refuge contain timber of high value. Logging operations have been conducted within this region for a great many years to supply the

woodworking industries along the river which depend wholly or in large part on the bottom lands for their supply. Manifestly it is not possible to buy these more valuable timber tracts at five dollars an acre. What we have succeeded in doing, however, is to prevent the owners from cutting clean and instead to control the manner of cutting on some of these areas. Wherever it is at all possible, we buy the land outright, timber and all, as we were fortunate enough to be able to do in the Winneshiek, The Wabasha Flats, and other important units. Some lands are tax delinquent and titles in many cases are none too good. Condemnation proceedings have been found a satisfactory way of clearing title.

Since many people have an imperfect idea of the situation along the river and of the land buying problems encountered by the government, it may be well to add a word about the economic conditions prevailing. There is a population of 650,000 in the counties along which the Refuge extends. In the cities and villages within the boundaries of the Refuge there are long established woodworking industries with many thousands of dollars invested in plants which rely on timber obtained from the bottoms to produce their products. Many people are employed in these plants. Thousands of farmers have used the bottom lands more or less intensively for grazing purposes and as a source for their timber and wood supplies. Many thousands of dollars are invested in summer homes, cabins, fishing stations and camps. All these things have to be considered and measures taken in fairness alike to the present owner and to the government.

Now as to what may be expected of the Wild Life Refuge: Its restoration to the primeval state or the nearest approach to that ideal is the fond hope of the officers of the Biological Survey who have a deep interest in this project, which is one of the biggest ever undertaken by this Bureau. Personally I believe that this Refuge, in addition to playing an important role directly in conserving and developing wild life in America, will serve as a great biological field laboratory. There is much to be found out with regard to conditions even in this area itself. This applies to animal life of all kinds, to vegetation, both land and aquatic, to the river with its sudden changes in level, its shifting channels, its problem of pollution and its load of sand and silt.

Many possible improvements suggest themselves, such as the extension of forest and brush cover, the maintenance of the remaining deep lakes and sloughs, the propagation of various species, the development of food supplies, and other steps designed to attract, support and increase wild life.

While much of the Refuge will have to be closed to shooting in order that game may increase, other portions will be open under proper restrictions so that the citizen and his boy unable to belong to a private shooting club may still have an opportunity for healthful and lawful sport. The beautiful hardwood forest will be protected

from destructive logging and from fires such as have injured it in the past. Tree planting will be carried on to make productive the barren areas, to provide cover for game and to improve the appearance of places that floods and fire have rendered unsightly. It is believed that wild fowl in particular will be greatly benefited by having large areas along down the river where they may rest undisturbed and where certain species again may nest where they used to years ago. Local game will be allowed to breed up until again it teems in the bottom lands. The beaver and other fur-bearing animals, over which John Jacob Astor and the great Canadian Company fought in the early days of the fur trade, again in thousands will occupy marsh and slough and woodland. Fish will come forth in countless millions from what can be made some of the greatest hatcheries in the world to populate these waters and furnish sport and food.

With a railroad and an automobile highway along each side of the river and a steamboat channel up the middle, it can hardly be said that this is, in any real sense, a wilderness area. Yet there are wilderness features. The swamp jungles, the wild rice fields, the lotus beds as well as some of the choice timbered flats should be preserved along with the game, the fish and the fur so that outdoor Americans may enjoy these things without seeking them at the ends of the earth.

Paul Bunyan

CRUISING IN THE U. S. AND SWEDEN

By ERIK OSTLIN, *of the Swedish Forest Service*

WHEN I was in the States on my trip in 1926-27 I did a good deal of cruising, most of it, however, rather extensive and largely from the cushions of one of the well known model T masterpieces of Mr. Ford's construction. I had as pilot, one of Paul Bunyan's Gopher story-tellers.

From these statements the reader will understand that my equipment was up-to-date and well-fitted for the job. Regarding the American cruise, I wish to refer the reader to the article "Vacation Ho!" which recently appeared in the *Gopher Countryman*. It is the work of my pilot.

After this short introduction, let me take you to the northern end of my own country to do some real cruising in the Land of the Midnight Sun. Poets and a few other people have the privilege and gift of painting things in rosy colors and pleasant aspect—we all know that it can be and is mighty cold and dark in the North Country in winter. But let us not talk about the weather—let us rather get to our task of counting all the trees in Sweden. It certainly would take a long time to record each tree, so we arrange in the following way. Strips 33 feet broad, 6.2 miles apart, stretching from the Norwegian boundary to the Baltic Sea, are cruised, and only the trees falling on these strips are counted, which means that every tree counted represents 1,000 trees in the forest. The cruise depends for its accuracy on the great area covered and the care with which the strips are cruised. About each one-hundredth tree is a sample tree which is studied in detail from both the outside and inside, in order to know not only its form and shape, but also the history of its growth and the quality of its wood.

Who does all the work of this cruise? Well, first there is a man with a compass and a long tail, the tail being a 100-foot rope which shows the middle of the strip. On each side of this rope two gentlemen armed with iron calipers do the actual cruising. In order to keep the strips exactly, and not maybe, 33 feet broad, these fellows each have a light bamboo pole 8¼ feet long, by means of which the proper width is maintained and all the trees that should be counted are counted and those near the border are definitely determined to be either on or not on the strip.

Next, there are two youngsters that measure the distance with a 20-yard steel tape. According to the data from their occupation the distance traveled averages 3.5 to 4.0 miles a day.

Then there is a ranger whose work reminds one of a mocking bird; he has to repeat the calls of the two caliper-armed men and record their cries on a tally sheet.

Furthermore, there is one boss sample-tree investigator and one assistant boss sample-tree investigator.

In all, there are 8 gentlemen and a party leader, who is father and mother and sister and brother and charge d'affaires for the whole bunch.

When I started my diplomatic career as a forester I thought "Gimminy crickets, this method can't give any good results." Sometimes we would just pass by the side of a nice dense stand and I would think of all the thousands of trees that would not be counted. Then someone explained to me that if I wanted to count how many peas there are in a cubic foot I could take it easy and still get a reliable count by only investigating how many peas there are in 1/10 of a cubic foot, and then multiply by ten. The scientists call this kind of figuring Calculus of Probability. (But if one reads only each tenth page of Prof. Tuomey's *Silviculture* the chances are that one's examiners will ask one question, the answer of which will be found on the nine intervening pages. I mention this to show that science (calculus of probability) cannot be used without discrimination.)

As the GOPHER PEAVEY doubtless has some girl readers, I will now talk a little about how one is dressed in the woods. Very few use suspenders and the faces, or calling cards, are very unsmooth on account of beards and tar which is used to keep the mosquitoes away. The beards serve to keep others away except on Sunday, when Mr. Gillett's invention is used.

Cooking is done by turns unless someone especially clever at the culinary art is permanently drafted for this purpose. Following are some valuable suggestions and facts concerning the all-important forester's food problem.

When making cool buns use a couple of handfuls of wheat flour, a certain amount of salt, and mix well with a little water; the result will be a paste, which is fried. Oatmeal which is cooked with plenty of water is used as the foundation upon which to live until dinner, which is conversely and for variety's sake comprised of plenty of water with oatmeal. Hardtack is good for the teeth and aids digestion. Coffee is cooked in the Lapp manner, i. e., with a little salt to add flavor. We do not get pineapples, ice cream, pop, and other American dishes in our forestry work. But if you keep on smiling you will live until you die and that is what we foresters do—on both sides of the Big Pond.

Mr. Cheyney (on the phone)—I've a lot of work to do up here at the office tonight, dear, and won't be home until late.

Mrs. Cheyney—Can I depend on that?

RUBBER

By W. F. PEEL, '25, *Firestone Rubber Co., Monrovia, Liberia*

IN THE following article I will try to give some idea of the procedure and work involved in the opening of a rubber estate, from the felling of the jungle up to the establishment of the young rubber and the maintenance of the same. I will not try to explain the work involved nor the factors which determine the suitability of an area for the growth of rubber. However, it may be of interest to know that the selection of these areas is determined by a soil expert, forester and an engineer, the forester to be especially trained along ecological lines.

Laying out of the area is perhaps the primary step in the opening of an estate. This is accomplished by bounding the area and blocking it off by renticing around 40 acre blocks. This renticing is done with a gang of three or four natives and one compass-man. These rentice lines later become block paths and are used intensively in reaching easily and quickly the various parts of the estate. These block paths are four to six feet wide and should be so constructed that motorcycles could run along them. It is important that these block paths should remain open and clear of fallen timber during the felling. In order to insure this a wide enough swath is felled along either side of the center of the block path.

Felling gangs are made up of from 25 to 50 men under one headman. The tools used in felling are axes and cutlasses; very few saws are used. It is necessary, before felling the native timber, to send cutlass gangs through the jungle, cutting the undergrowth. The undergrowth in the virgin jungle consists mostly of vines which wind in and out among the trees. Without cutting this growth it would be impossible to penetrate the jungle. These vines are so interwoven among the mature timber that felling is made much easier, as it is only necessary to nick the small trees surrounding the larger ones. When the larger trees are felled the smaller ones fall with them, making large openings in the jungle. However, felling is a much more dangerous operation than it is in our coniferous forests due to these vines. Many of the trees in a rain forest have flared buttresses which necessitates the building of scaffolds high up the trees in order to fell them the easiest way, which also makes the operation a dangerous one. While the felling is in progress small gangs of natives follow up, lopping the branches off the fallen trees and generally preparing the area for burning.

The burning is usually done after the felled material is dried out. Due to a scarcity of undergrowth which is the more highly inflammable, it is oftentimes difficult to get a clean burn, which is sought after by all planters, as his clearing costs are dependent upon it. In burning off, the natives are lined along a block path, one chain apart, and each supplied with a torch. At a given signal, the torches

are lit and the men walk through the fallen timber touching it off as they go. Burning is usually done in the morning after the heavy dew is off the ground.

After the burn it is necessary to clear the unburned material still remaining. Gangs of natives are sent through the areas, clearing the remaining timber and stumps. Clearing is an important operation in the opening of a rubber estate, or in the opening of any area which is to support a pure stand of growth. All remaining logs and more especially stumps may be hosts for fungus diseases which might become of epidemic form and destroy acres of the growth. All logs and stumps are piled on the area and burned.

Before planting, it is necessary to line and hole the area. Lining gangs are made up of from seven to ten natives and one overseer. A long rattin, marked the distance trees are to be planted apart, is used to line the trees in. The length of the rattin would depend upon the distance the trees are to be planted apart. Opposite each mark on the rattin, sticks are pounded in the ground. Every effort is made to get straight North and South lines. Where the topography is uneven it is oftentimes difficult to get straight East-West lines.

The depth and width of holes for planting is dependent upon the physical condition of the soil. Tropical soils are oftentimes characterized by laterite subsoils which often form hard strata. These hard strata are impenetrable to roots and as the rubber tree has a tap root it is necessary that these holes should be dug below these strata. Holes are dug with mahocks and cutlasses by gangs of 50 to 75 men under one headman and overseer. The overseer is a semi-educated native and it is his duty to see that the work is up to standard. The headman gets the work done as quickly as possible. After holing is completed, the holes are left open for a short time, then filled with top soil. Holes are left open so that all bugs and insects will be driven out. After the holes are filled, they are ready for planting.

Planting is done in the rainy season. The crew consists of 10 to 15 natives and one headman. Small gangs and close supervision are necessary to get the best results. Planting material consists of stumps from a nursery or seeds to be planted directly in the field.

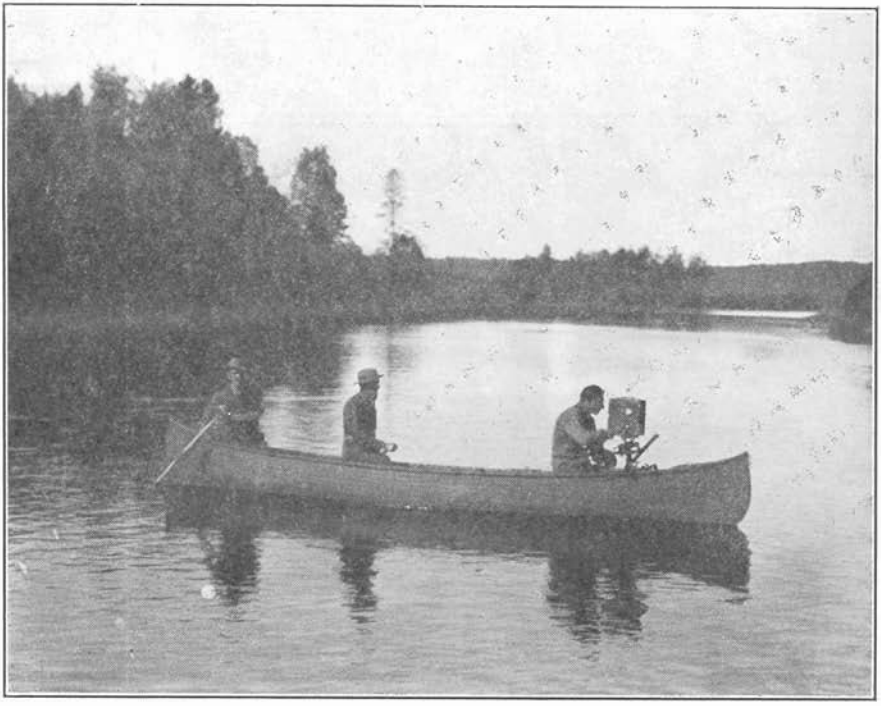
Every estate has its nursery from which the plantable area is supplied with stumps. When the nursery plants are about six months old they are pulled by hand and the lateral roots with a portion of the top root are cut off. The top is cut off, resulting in a balance between stem and root system. The stumps are carried to the field and with a dibble stick are planted in the prepared holes.

Rubber seeds should always be planted with the clefts down. If this is not done the seedling may be crooked, resulting in a tree which would be unsuitable for tapping. Seeds planted directly in the field are usually planted four to the hole. The best seedling is left and any remaining are transplanted, if of good size and shape. These transplanted seedlings are treated similar to those taken from the nursery to be transplanted as stumps.

It has been found that the young rubber transplanted as stumps results in a tall growth with no branching, while those from seeds branch normally. This lack of branching with the stumps is no doubt due to disturbing the normal growth of the plant when the roots and tops are cut off. It may be interesting to know that branching is brought about by stripping the sapling of its leaves and not by pinching the terminal bud or girdling.

After the rubber is planted and a good stand is assured, the remaining five to seven years before tapping are devoted to maintenance work. Weeding during the early growth of the rubber is perhaps the most important work. The object of weeding is to prevent the young rubber from being choked out. This work is perhaps not practiced by foresters but is necessary with rubber trees. I correlate all work of the rubber planter with that of the forester because I believe this is a forestry problem pure and simple.

The various methods of weeding are ring-, strip- and clean-weeding. Ring-weeding is simply cleaning around the trees. This is the most economical of the three methods. The weeding method practiced depends a good deal on local conditions.



Trying to Photograph Nature

THE BLACK HILLS BEETLE

By ARTHUR L. NELSON, *Class of '23, U. S. Forest Service*

LAST year witnessed a large increase in the destruction of yellow pine timber on the Colorado National Forest by the bark beetle known as Dendroctonus ponderosae. With a knowledge of what has happened in other localities where this same beetle has been at work, the Forest Service began control work this spring with the objective in mind to bring the epidemic to a close as soon as possible. As a result, practically 10,000 infested trees were successfully treated in last spring's operation. This work is by no means new, as a large number of projects have been directed towards the control of western bark beetles since the first control work was done in 1905 against the Black Hills beetle in South Dakota.

Forest insects are one of the destructive agencies that are continually at work in every forest. Some of them act as scavengers to destroy old, weak, and useless trees and make room for new ones. But others do much more than this, and kill the healthy and strong and, from man's standpoint, the most valuable part of the timber stand, viz., the mature trees with their large volume of high quality timber.

Contrary to public opinion, the destruction of forest trees by insects is not of recent origin. All the species of importance in our western forests are indigenous to this country and have been present in our forests for many ages.

The two types of infestation, the passive and aggressive, have been termed respectively "endemic infestation" and "epidemic infestation." The latter is the present stage of the infestation of the Black Hills beetle in the yellow pine of the Colorado National Forest.

Like fire, the Black Hills beetle concentrates its work on certain areas, that is, it kills small groups of trees and these infested groups are found scattered through our yellow pine timber stands. This makes control work difficult and costly, but good results were obtained last spring and control work was again undertaken this fall.

In order to better understand the control measures practiced, a brief sketch of the life history of the Black Hills beetle is necessary. This beetle is one of the many bark beetles of the genus "Dendroctonus" and the particular species found on the Colorado is the "ponderosae," so named because it works only in our yellow pines, botanically known as "Pinus ponderosa."

Dendroctonus ponderosae are small, black, hard shelled beetles about one-quarter inch long. They bore through the outer bark to the inner bark, and then bore nearly straight egg galleries up the inner bark, with the exception of a slight crook or turn at the entrance. Along these galleries, one to three feet in length, the eggs are laid. The adults enter the green tree some time in August and keep busy laying their eggs until the next spring. The eggs soon hatch into very

small, cream colored larvae which proceed to live on the inner bark or cambium layer, working at right angles to the main gallery. During the latter part of May and early in June, the larvae change to naked pupae and pass a short time (about three weeks) in this stage before slowly changing into adult beetles. The wings develop and the bodies harden slowly, changing from white, soft pupae to black, hard shelled adults capable of leaving their present host and attacking a green tree.

The beetles attack the green tree in great numbers as the success of the attack is dependent upon enough beetles entering the tree to stop the flow of sap in a short time. With the sap flow cut off, the tree soon dies but does not, as a rule, turn color until the next spring.

A very interesting feature about the beetle is that it seems to be attracted by the odor of pitch. This is proven by watching a tree being attacked. First, a pair of beetles will bore in and the pitch will ooze out. Soon another pitch tube will appear and in a few days the tree will have hundreds of them, marking the entrances of the beetles. How, except by the sense of smell, are the late comers attracted to that particular tree when nearby is a tree that looks equally as good as the one they are concentrating upon? Another thing that bears this out is that the beetles will attack trees which have been wounded and which have fresh pitch flowing from the wound. This summer, Boulder County reconstructed a short stretch of road near Long's Peak Inn from Meeker Park to the Big Owl Tea Room and in doing so had to cut the roots of a number of yellow pine trees. Practically all the trees so wounded were attacked by the Black Hills beetle this fall, while the trees untouched by the road workers were left alone by the bugs.

Control measures are based on the nature of the beetle. Having only one generation a year, control work can take place any time after most of the eggs are laid and continue until the pre-adult stage which is usually the next July in Colorado.

As these beetles live in the inner bark next to the wood it has been found that merely peeling the bark from the infested portions of the tree exposing the insects to the elements will soon kill them. This was the method used last spring on the Colorado.

A crew of three men worked together. They felled the infested trees, peeled the bark from the infested portion of the trunks, and trimmed the limbs off the tops. Trimming or lopping the tops was a fire control measure and is a required practice in cutting National Forest timber. It has been demonstrated by previous experimentations that tops so treated rot sooner than when tops are left intact. The brush, when scattered, lies closer to the ground and does not leave near the fire hazard that the tops would. Tops will throw fire high in the air and allow sparks to travel considerable distance with only a slight wind.

Two crews of three men each were in charge of a Forest Officer who spotted the infested trees, marking the same with white cloth

tags, giving each tree a number. This made them easily found and gave a record of the number of trees treated. The spotter would go through the timber in a systematic manner so as not to miss any of the infested groups. There were several such outfits working most of the time last spring.

Besides the government crews at work, a number of the private land owners treated the insect-infested trees on their property. This co-operation is necessary as it is practically useless to clean up part of an area, as the trees not treated will release beetles that will re-infest the treated areas. All owners of land having yellow pine on it were urged to do control work if their timber was infested.

An infested tree can be spotted this fall by the small pitch exudations or pitch tubes where the beetles have entered, and sometimes only by the brownish sawdust near the base of the tree. The trees attacked this last summer will not change from the green color until next spring. Trees that are now in the sorrel color were killed in the fall of 1926 and the beetles have left them for green trees. There is no need to treat the 1926 killed trees now.

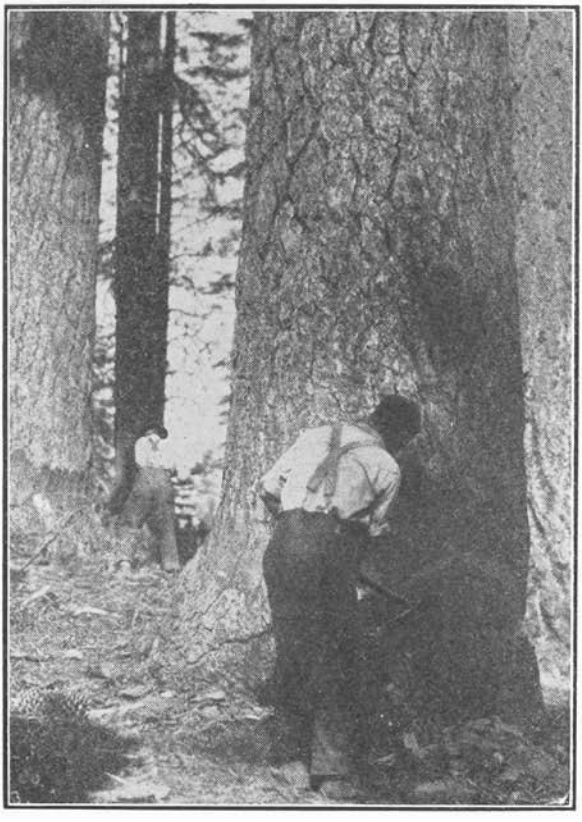
Most of the control work was concentrated in the Big Thompson River drainage, as this was the largest known infestation. Fall work was also in this vicinity and in the Little Thompson and St. Vrain areas.

Investigations and studies carried on this summer indicate that the infestation of the Black Hills beetle is not on the increase, but is merely holding its own. This is encouraging and with what control work the Forest Service and the private land owners will do, we may look for the extermination of the infestation next year.

Some folks may question the advisability of attempting to control this beetle epidemic, but, when one considers the value of the timber destroyed and the possible extent to which the beetles can destroy timber, considerable expenditures can be justified. Take the Black Hills epidemic during the year 1905 and earlier. Here the same beetle that is at work on the Colorado, absolutely cleaned a strip approximately 25 miles long by about 10 miles wide of all living trees. From 1920 to 1923 a Black Hills beetle epidemic in Arizona on the Kaibab National Forest did the same thing before it was controlled. Various other areas of smaller size have been likewise cleared. Is it any wonder that foresters are concerned and the government is willing to spend thousands of dollars to control the beetle? Just think of how the mountains would look if most of the yellow pine trees were killed.

The control project on the Colorado cost $13,000 including Forest Officers' time last spring. This made an average cost of $1.50 per tree treated. This fall 2,500 trees have been treated to date at a total cost of $3,500, and it is estimated that $6,150 plus the remainder of the $5,000 available this fall will place the quietus on the Black Hills beetle on the Colorado.

A Haunt of the Hungry Forester



Pinus Lambertiana

FOREST MANAGEMENT IN PENNSYLVANIA

By Dr. J. V. Hofmann, '11, *Pennsylvania State Forest School*

IT HAS been said that Forest Management is common sense applied to the woods. This is true and forms the basis for continuous forest production, providing that common sense includes a thorough knowledge of the soil and climatological requirements of the trees to be grown.

Too often the cutting is guided by the method of utilization and the future need of the forest is set aside for the immediate use that can be made of the products at hand. The successful forester is he who sets his standard high and resists the temptation to lower it. He does not crowd the market with immature timber. He does not add to the lumber production in a region where the supply already equals or surpasses the demand, thus placing him in the position with those who adulterate their products in order to be able to sell at a lower price. Such success is temporary at best and he who is unwilling to break faith with himself proves that he will not be tempted by the temporary success of others.

It is such faith as this that is needed at present to rehabilitate Penn's Woods.

Forest Management has not become a reality in any country except under the unrelenting hand of necessity.

European Forest Management was established when a timber famine was imminent. The growing of forest products was forced upon each community because of the threatened fuel famine, the lack of transportation and especially the inability of the sovereign states to co-operate. In Pennsylvania, we have adequate transportation facilities connecting with distant regions and there are no barriers to securing our lumber supply from the Pacific Coast or the Southern forests. Consequently the bugaboo of a nearby timber famine does not arouse us, and rightly so. Not that the future timber supply concerns us less, but that the present concerns us more.

The growing of timber *now* is the only way to turn the millions of dollars expended in freight bills into home industry for the state. Lumber grown in Pennsylvania at the same time furnishes all of the by-products of the forest. Growing timber will supply homes for thousands of families. Even during the first steps of forest improvements one permanent workman will be required for approximately every 500 acres of forest land. Think of the latent possibilities of the 13,000,000 acres of forest land in employment alone.

A forest management plan in this region consists largely of a feasible method of building a forest from the wreck that exploitation has left in its wake. The best species are often entirely destroyed and large areas contain very few timber producing species of trees. Such conditions bring to the fore the problem of soil quality and ecological requirements of any trees that may be produced on the

area. Although a magnificent virgin forest of white pine made a certain locality the center of lumber production a few decades ago, it by no means follows that the same locality should be restocked with white pine today. Had a conservative forest policy been in practice, the same region could be producing the same high grade quality of white pine now. But the removal of the forest and successive burning has changed the site so completely that if white pine were planted on the area, establishment would be doubtful, and the growth would be unsatisfactory. The site must be restored to its productive capacity through a succession of species until the soil moisture and temperature are again suitable to white pine. These shortcomings of man are being corrected by nature wherever natural conditions are left undisturbed. Hardwoods are taking possession of the soil and are improving the site by crowding out the shrubs and scrubby tree growth, such as scrub oak. Scrub oak is a good soil builder and in many cases is a beneficial forerunner of other species. Hence, the first principle of forest management, that of getting a timber producing species on the area, is aided by the natural succession of shrub and tree growth on the non-productive land. An area, that could not be converted to white pine within a reasonable cost at present, can be gradually converted after it is stocked with timber producing trees. On the Mont Alto Forest, the rock oak is the best competitor of scrub oak and, in turn, the rock oak may be converted to other species by underplanting. Rock oak gradually develops into a mixed oak type, including scarlet oak, white oak and red oak. These permit regeneration of white pine under their canopies, and thereby an establishment of an understory that later may be liberated and the type converted.

White pine plantations planted with 2-0 stock in 1921 and 1922 under a stand of commercial size mixed oak with a canopy of .4 to .8 are well established and making an annual height growth of from 2 to 5 inches. These are hardy enough now to withstand complete liberation and a cutting of the oak stand is contemplated. Such a cutting would be a long step toward conversion and would result in a mixed oak-pine stand for the next cutting cycle. Then another step may be taken to favor the more desirable proportions of species. Such methods as these will make the present forest growing stock much more desirable at the end of the first cutting cycle. With waste land or culled land forming the greater part of a possible working cycle management presents a discouraging problem. However, many of these areas are not so far removed from forest production as they appear at first glance. Too often an area is discarded because it has no trees of the species that formed the valuable commercial stand, although it has a potential forest of other species that will redeem it and prepare it for continuous production. The first essential is an improvement cutting to remove undesirable species and prepare the forest for better quality of growing stock and as far as possible establish the more desirable species.

The working plan for the Pennsylvania State Forest School of 23,000 acres at Mont Alto shows a serious deficit in growing stock and distribution of age classes. It will require at least one cutting cycle of 30 years to correct this to the point where the increment will be the principal guide to the annual volume to be cut. At present the area method is the tentative guide with no material weight put upon volume, since all undesirable material must be cut in the improvement cutting. Then the question arises as to what shall constitute a cutting cycle. On this forest rock oak grows from one 2-inch diameter class to the next in 11 years; white pine in 12 years; tulip poplar in 6 years; scarlet oak in 11 years; hemlock in 10 years. Hence, a cutting cycle of 30 years would mean an average increase in diameter of about 6 inches.

At present a cutting in a 35-year-old stand of rock oak, scarlet oak, maple and a few trees of other species is being made for the purpose of improving the growing stock. The stand contains 160 mine props and 9 cords of wood per acre, of which 75 mine props and 5 cords per acre are being cut. The props have a gross value of 46c each and the wood $4.00 per cord, making a gross value of $54.50 for the material taken out. This will leave a stumpage value of $7.50 per acre for the improvement cutting.

There are very few trees above the 12-inch diameter class on this cutting area and the majority of the trees that are left are in the 8- to 12-inch class. Hence, a 30-year cutting cycle will produce a considerable percentage of saw timber for the next cut. Such cutting leaves about 600 cu. ft. of growing stock per acre. This stand is all of good quality and is given adequate growing space. The increment should be about 4% per year, although the present increment is only about 2.5%. At the end of the first cutting cycle it will be possible to leave a growing stock of 1200 cu. ft. per acre which will be a long step toward the goal of 2000 cu. ft. per acre which should be taken as normal for the forest. With a stocking of 2000 cu. ft. per acre there should be an average annual increment of 2.5% or 50 cu. ft. per acre and per year. On the 23,000 acres this would permit an annual cut of 1,150,000 cu. ft. or about 12,800 cords.

Soil conditions cause as great, or even greater, variations in increment as do species. Forest management plans must include as accurate soil surveys as farm management plans in order that the forest crop may be regenerated and grown to the best advantage. Crop rotation, which has made possible continuous production of agricultural crops, cannot be ignored in timber crops. The forests of Saxony in Germany are a striking example of the old method of farming by continuous growing of the same crop. There five and six rotations of spruce were grown consecutively, which depleted the soil so seriously that further growing of spruce was impossible, whereas beech made a good growth on the same area. The best growing conditions of various species can be determined only by a correlation of forest growth and soil. This should be the first step

in any plan of continuous forest production. On the Mont Alto Forest, Professor J. T. Auten has determined five soil types. The behavior of the same species on the different soil types shows that increment predictions must include a knowledge of soils. Briefly, these types are as follows:

1. Rhyolite Loam—a residual soil weathered from an outcropping acidic Rhyolite flow.
2. Weverton Sandy Loam—derived from the Weverton sandstone, the first sedimentary layer laid down on the igneous rock.
3. Kettle Springs Mountain Sand—formed from the disintegration of the Mont Alto quartzite.
4. Little Mountain Coarse Sand—weathered from the coarse textured Antietam sandstone.
5. Staley's Cove Sand—a coarse white sand on the surface and a sandy clay subsoil. Covered with a heavy layer of peat.

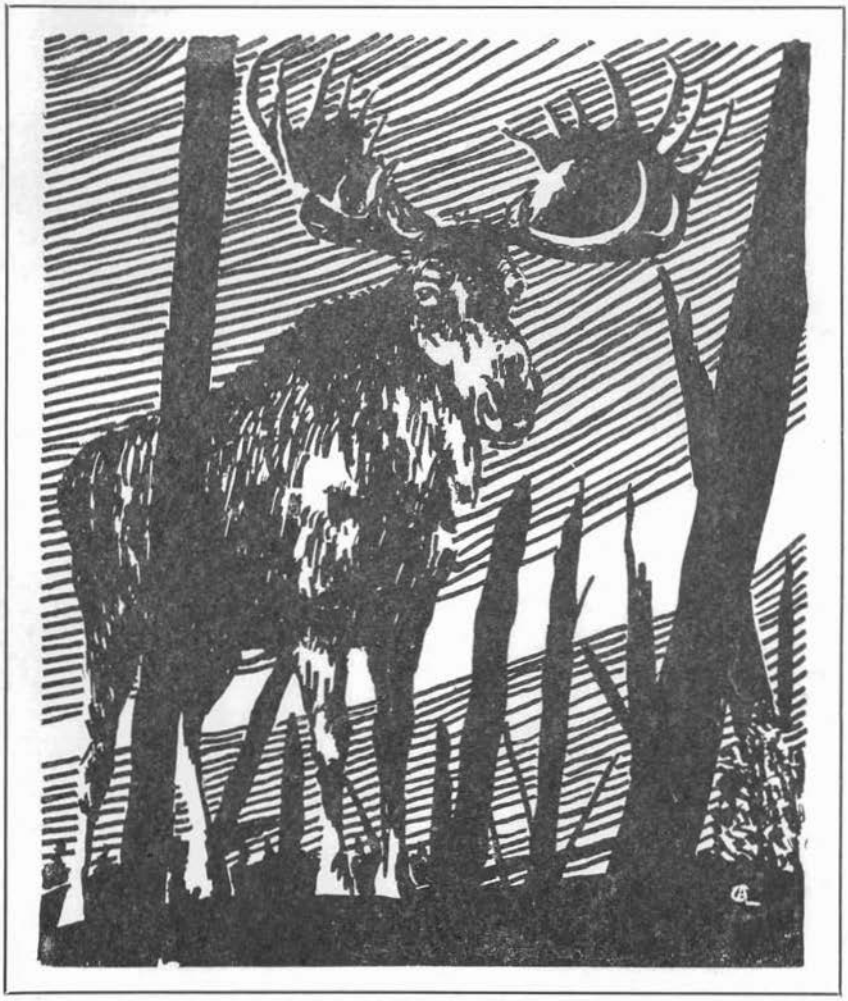
This illustrates the variety of conditions on one forest unit and emphasizes the possibility of wide variations in different regions even though the same species form the forest types.

Pennsylvania offers the best possible situation for intensive forest management because of the opportunity to utilize small material in many of the forest regions. Mines and woodlands are invariably in the same locality, which makes a market for mine lagging, props, ties and lumber. Also the location in the densely populated Eastern United States provides a market for forest products.

The greatest need for putting the depleted forests on a continuous production basis is large utilization centers. A centralized plant that would manufacture lumber, boxwood, lath, clothespins, toothpicks, pulpwood and other products could use all of the material brought from the forest. This is exemplified by the group of wood-using industries at Cloquet, Minnesota. To support such plants requires large areas of corporation and state timber lands, supplemented by small holdings and woodlots, to provide an assured supply.

Fire control has been so efficiently organized that the whole movement is ready for the next step in forest production. Cutting must begin now if the future growing stock is to be improved or increased. The culled forest lands will gradually improve with adequate fire protection but they will contain inferior growing stock and the increment will remain below normal until improvement cuttings have been made. This applies equally to mature timber or cut-over areas. In mature timber the primary species are invariably crowded out by the secondary species. Virgin stands of white pine have very little white pine young growth, but often have an understory of beech, hemlock or other shade enduring species.

It is only by cutting and actual use that they can be improved. Even though the cutting must be made without profit, so long as it will pay expenses it should be done. The gain is in the future quality and quantity increment.



MINNESOTA ALUMNI

1899

Chapman, H. H., School of Forestry, New Haven, Conn.

1903

Erickson, M. L., 2028 W. 24th Street, Los Angeles, Calif.

1905

Cuzner, Harold, College of Agriculture, Laguna Province. Los Banos, P. I.

1906

Cox, Wm. T., Federal Bldg., Winona, Minn.
Detwiler, S. B., Chief, Office Blister Rust Control, Bureau of Plant Industry, Washington, D. C.
Rockwell, F. I., 243 Security Bldg., Minneapolis, Minn.
Tierney, D. P., Castle Rock, Minn.

1907

Canavarro, Geo. de S., 2736 Huuanu Ave., Honolulu, Hawaii.

1909

Moore, Walt M., Fairfield Air Intermed. Dept., Air Service, Fairfield, Ohio.
Orr, Geo. R., deceased.

1910

Baker, Norman M.
Benson, Arnold O., Forest Products Laboratory, Madison, Wis.
Berry, J. B., Winter Haven, Fla.
Brewster, D. R., 28 Blymer Bldg., Cincinnati, Ohio.
Jacobson, N. G., 630 W. Lumberman's Bldg., Portland, Ore.
Krauch, H. G., Ft. Valley Exp. Station, Flagstaff, Ariz.
Lewis, C. L., Jr., Beaver Rock, Wis.
Underwood, C. L., 305 N. 4th Avenue, Yakima, Wash.
Derring, Robert, Ferry Bldg., San Francisco, Calif.

1911

Arrivee, David A., St. Anthony, Idaho.
Beard, F. W., 913 N. 7th Street, Kansas City, Mo.
Bowen, C. W., Jr., Route 2, Box 1, Fullertown, Calif.
Brownlie, J. R., Thompson Yards, Livingston, Mont.
Campbell, Hugh B., Prairie, Wash.
Eisenach, Walter, 1410 E. 10th Street, Duluth, Minn.
Gilles, R. R.
Hamilton, C. L., 806 Merchants National Bank Bldg., St. Paul, Minn.
Hauge, A. G., McNary, Ariz.
Hofmann, J. V., State Forest School, Mont Alto, Penn.
Kenety, W. H., Cloquet, Minn.
Martin, D. W., 1843 South St. N. W., Washington, D. C.
Oppel, A. F., 1523 Branston, St. Paul, Minn.
Underwood, Wm., Pullman, Wash.
Weber, Henry, Minnesota Forest Service, Duluth, Minn.
Williams, Donald.
Young, J. Paul, Sumas, Wash.

1912

Beyer, W. F., 59 Maiden Lane, New York City.
Blodgett, H. P., 1376 Portland Ave., St. Paul, Minn.
Clymer, W. R., 1626 Laurel Ave., St. Paul, Minn.
Conzet, G. M., Commissioner of Forestry and Fire Prevention, Old Capitol Bldg., St. Paul, Minn.
Harris, S. Grant, Jr., Page & Hill Co., Minneapolis, Minn.
Hodgman, A. W., Westport, Ore.
Norman, Sigvald, Escanaba, Mich.
Orr, J. E., Big Bay, Mich.
Pearce, Wm. R., Botsford Lumber Co., Faribault, Minn.
Pettibone, H. M., 500 Webster Place, Milwaukee, Wis.
Spellerberg, F. E., deceased.
Stevenson, J. A., Office Forest Disease Invest., B. P. I., Washington, D. C.
Wilson, Robert, Govt. Experiment Station, Mandan, N. D.

1913

Buhler, E. O., 1069 Laurel Ave., St. Paul, Minn.
Erstad, Andrew, Fayette Lumber Co., Barber, Idaho.
Griffin, Thos. A., 3529 Humboldt Avenue S., Minneapolis, Minn.
Hall, Edwin H., 1800 Columbia, Eugene, Ore.
Haworth, Robert, Red River Lumber Co., 702 Slauson, Los Angeles, Calif.
Henchel, Norman, Bushong, Kan.
Moir, John, 1501 Pioneer Bldg., St. Paul, Minn.
Nuffer, Harry, Oak Ridge, Ore.
Renshaw, David, deceased.
Rogers, Ernest, deceased.
Savre, Oliver M., Thompson Yards, Springfield, S. D.
Simpson, Chas., Loto National Forest, Missoula, Mont.
Tobin, Paul, Lewiston, Idaho.
Wiggin, G. H., c/o Tierney-Wiggin Co., Castle Rock, Minn.

1914

Aldworth, Donald, 456 Fourth Avenue, New York City.
Braden, Kenneth.
Cummings, Thos. S. C., Fort Benton, Mont.
Freeman, George, 50 Trinity Place, c/o Charlton Hall, New York City.
Graham, S. A., School of Forestry, U. of Michigan, Ann Arbor, Mich.
Lindeberg, Geo. C., 206 Lumber Exch., Minneapolis, Minn.
Mueller, A T.., Princeton, Wis.
Ringold, Stanley L., 2124 St. Clair Street, St. Paul, Minn.
Rose, Logan, Mankato, Minn.
St. Marie, A. A.
Spink, Harold W., H. R. Smith Lumber Co., Kansas City, Mo.
Torgrim, J. R., deceased.

1915

Chance, Jenner D., 719 7th Street S. E., Minneapolis, Minn.

Dennis, Henry M., Tacoma Lumber Co., Deming, Wash.
Dunn, Frank M., 3110 Fourth Street S. E., Minneapolis, Minn.
Hansen, Thorvald S., Forest Experiment Station, Cloquet, Minn.
Hawkinson, Carl, Jr., Virginia, Minn.
Sischo, Paul C.
Wyman, Hiram, Kerman, Calif.

1916

Bartelt, Harry, 2091 Buford Avenue, St. Paul, Minn.
Bell, Ernest, deceased.
Blake, Philip, Glendora, Calif.
Broderick, Martin, 305 Hammond Bldg., Detroit, Mich.
Crane, Leo F., Post Recruiting Office, Fort Sam Houston, Texas.
Gjerlow, Atle B., Nicaragua Mahogany Co., Bluefields, Nicaragua.
Hyde, Luther, 1005 6th Avenue S., Apt. 201, Minneapolis, Minn.
Johnson, Oscar
Rhoads, Ralph, Scott Paper Co., 415 Newman-Stern Bldg., Cleveland, Ohio.
Schwartz, E. R., 1821 Liberty Street, Marinette, Wis.

1917

Burnes, J. D., 5008 Vincent Avenue S., Minneapolis, Minn.
Forsberg, Carl, 3444 32d Avenue S., Minneapolis, Minn.
Tuttle, L. S., Odell-Tuttle Lumber Co., 1645 Hennepin Ave., Minneapolis, Minn.

1918

Danson, Robert, 627 Water Street, Albert Lea, Minn.
deFlon, Leland L., Forest Products Laboratory, Madison, Wis.
Hauser, Geo., University of Minnesota, School of Medicine.
Pendergast, Earl, 5729 Lawton Street, Detroit, Mich.
Swanson, Herb, Champion Fibre Co., Canton, N. C.

1919

Backus, Romayne, 1953 Cheremoya Ave., Hollywood, Calif.

1920

Brayton, S. C., Itasca Paper Company, Grand Rapids, Minn.
Frudden, Clyde M., Greene, Ia.
Grabow, R. M., Sunset Point Rd., Route 7, Madison, Wis.
Isaac, Leo A., U. S. Forest Service, 514 Lewis Bldg., Portland, Ore.
Palmer, Paul, Benson, Minn.
Schmid, Walter W., 50 Church St., New York City.

1921

Anderson, P. O., Room 7, Haecker Hall, University Farm, St. Paul, Minn.
Dwyer, Daniel E., 969 Goodrich Avenue, St. Paul, Minn.
Ericksen, Leyden, 258 Pleasant St., Oak Park, Ill.
Grapp, Lloyd, Indian Agency, Keshena, Wis.
Ostrowski, Francis, Waldorf Paper Co., St. Paul, Minn.
Person, Hubert, Box 3010, Stanford University, Palo Alto, Calif.
Wackerman, A. E., Crossett Lumber Co., Crossett, Ark.
Whiton, Arthur L., 572 Elmwood Ave., Apt. 19, Buffalo, N. Y.

1922

Anderson, Alvin A., 1332 Logan Ave. N. W., Canton, Ohio.
Nelson, Ralph M., Appalachian Forest Exp. Sta., Asheville, N. C.
Sheehan, John A., Cudahy Packing Co., Duluth, Minn.
Thayer, Burton, 2400 Bourne Avenue, St. Paul, Minn.

1923

Burton, Sidney S., N. D. School of Forestry, Bottineau, N. Dak.
Chesebrough, Herbert S., West Liberty, Iowa.
Dockstader, Chas., 2338 Marshall Avenue, St. Paul.
Fegraeus, Thorbern, deceased.
Fenger, Gunnar, U. S. Forest Service, Federal Bldg., Denver, Colo.
Frost, Orcutt W., Cloquet, Minnesota.
Hamilton, Herbert, McCloud, California.
McCreery, Otis, Dean of Men, Drake Univ., Des Moines, Iowa.
Nelson, Arthur L., U. S. Forest Service, Ft. Collins, Colorado.
Probstfield, E. E., c-o Holland-American Plantations, Kiseran, Asahan, Sumatra, D. E. I.
Stevens, Raymond, Minn. Forest Service, Old Capitol, St. Paul, Minn.
Streinz, Augustine, 706 Quapaw Ave., Hot Springs Nat. Park, Ark.
Sunday, Clarence W., 1955 Univ. Avenue, St. Paul, Minn.
Tilden, Floyd, 412 Prior Avenue, St. Paul, Minn.

1924

Berggren, Harold, Cloquet, Minn.
Betzoid, Harold, 678 Snelling, St. Paul, Minn.
Bryan, Philip H., Ark. National Forest, Hot Springs, Ark.
Christopherson, Clifford, 1129 West Lawrence, Appleton, Wis.
Hoar, Walter G., Coeur d'Alene Nat. Forest, Coeur d'Alene, Idaho.
Kribs, D. A., Yale Forest School, New Haven, Conn.
Leffelman, L. J., Experiment Station, Wooster, Ohio.
Lynne, Victor A., City Forester, P. O. Box 382, Winona, Minn.
Maturen, Hubert, Goodman, Wis.
Nelson, Albin C., McCloud Lumber Co., McCloud, Calif.
Ostergaard, Harold, Baudette, Minn.
Pillow, M. Y., Forest Products Laboratory, Madison, Wis.
Ritchie, Wm. A., Badger Glove Mill, Neenah, Wis.
Sheffield, Ernest F., Robbinsdale, Minn.
Upton, Nelson, 4505 York Avenue S., Minneapolis, Minn.
Weswig, Carl, 1456 Branston Street, St. Paul, Minn.
Youngers, P. W., 4540 Vincent Avenue S., Minneapolis, Minn.

1925

Barrett, Wilford, College Inn, 1316 4th St. S. E., Minneapolis, Minn.
Baumhofer, L. G., Forest School, Ann Arbor, Mich.
Blandin, H. M., 546 River Street, Niagara, Wis.
Cooper, Geo. Proctor, United Fruit Co., Almirante, Republica de Panama.
Flanagan, Clement, Paine Lumber Co., Oshkosh, Wis.
Gay, Chester, Moose Lake, Minn.
Gordon, J. R., 1511 Belmont Road, Duluth, Minn.
Jensen, Victor S., Yale Forest School, New Haven, Conn.
Litchfield, Wickliffe, Mankato, Minn.
Maughan, Wm., 420 Walnut Place, Syracuse, N. Y.
Peel, Wm. F., Firestone Plantations, Monrovia, Liberia, W. Africa.
Racey, Chas., 1003 8th S. E., Minneapolis, Minn.
Thomson, Roy B., Yale Forest School, New Haven, Conn.
Wilson, Walt, Firestone Plantations, Monrovia, Liberia, W. Africa.

1926

Bjornstad, E. G., 1734 7th Avenue, Lewiston, Idaho.
Blage, Arland C., 396 Curtis Street, St. Paul, Minn.
Christianson, D. A., Hinckley, Minn.
Erickson, Eugene T., 896 18th Avenue S. E., Minneapolis, Minn.
Everts, Ambrose, Madera Sugar Pine Co., Madera, Calif.
Goldberg, Hyman M., 711 Dayton Avenue, St. Paul, Minn.
Henry, Leslie, U. S. F. S., 514 Lewis Bldg., Portland, Ore.
Hyatt, H. H., 3700 Penn Avenue N., Minneapolis, Minn.
Ilstrup, Marshall, c /o F. Murphy, Tower, Minn.
Jackson, Lyle, Office of Forest Diseases Investigation, B. P. I., Washington, D. C.
Janssen, G. R., 911 Carroll Avenue, St. Paul, Minn.
Kelsey, H. B., 2817 17th Avenue S. E., Minneapolis, Minn.
Kuenzel, J. G., Minn. Forest Service, Old State Capitol, St. Paul, Minn.
Lindgren, R. M., 847 Cook Street, St. Paul, Minn.
Lystrup, Herbert, Warrendale Greenhouse, Como Ave., St. Paul, Minn.
Manual, Ronald, 114 Orlin Avenue S. E., Minneapolis, Minn.
Shadduck, Nobel, Mendocino, Calif.
Sargent, Geo., U. S. Forest Service, Tuolumne Ranger Sta., Groveland, Calif.
Umbehocker, Kenneth, 4633 Oakland Ave. S., Minneapolis, Minn.
Watts, Paul Kenneth, 619 Washington Ave. S. E., Minneapolis, Minn.
Whitchurch, Gale M., 2618 Polk Street N. E., Minneapolis, Minn.
Zierke, E. A., Princeton, Minn.

1927

Carlson, C. Homer, c /o Anderson Lumber Co., Bayport, Wis.
Chapman, Roy A., N. E. Exp. Station, Amherst, Mass.
Clement, Raymond, Minn. Forest Service, Hibbing, Minn.
Duclos, E. P., 3225 Bryant Avenue S., Minneapolis, Minn.
Eaton, J. J., 2228 Langford Avenue, St. Paul, Minn.
Hartupee, Chas. H., Red Wing, Minn.
Himebaugh, W. K., Route 2, Hopkins, Minn.
Holmberg, R. E., Hastings, Neb.
Horton, Gerald S., Yale Forest School, New Haven, Conn.
Kaner, Arnold, Cloquet, Minn.
Knutson, Clarence E., Blair, Wis.
Kolbe, Ernest, Glencoe, Minn.
Krueger, Carl G., 315 E. Front Street, Missoula, Mont.
Lawson, Edward L., Minn. Forest Service, Tower, Minn.
Leaf, Geo., 932 Westminster Street, St. Paul, Minn.
Marttila, Uno, Eveleth, Minn.
Nelson, Stanley C., 3241 18th Avenue S., Minneapolis, Minn.
Orr, Leslie W., Division of Entomology, University Farm, St. Paul, Minn.
Sheridan, E. P., Westwood, Calif.
Swanbeck, H. J., 813½ 12th Avenue S., Minneapolis, Minn.
Verrall, Arthur F., Division of Forestry, University Farm, St. Paul, Minn.
Whitney, Fenton, Prairie City, Ore.
Wilson, Earl G., Division of Forestry, University of California, Berkeley, Calif.

The Red River Lumber Company, The Gopher Countryman, The Minnesota Technolog, the U. S. Forest Service, and The University News Service have been kind enough to loan us various cuts. We hereby thank them for their courtesy.

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TWO

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THREE

To establish the spoken word on the basis of the written bond.

FOUR

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FIVE

To conduct ourselves and our business so that we may render service to society.

SIX

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SEVEN

To assist liberally and sympathetically all that seeks to elevate humanity, by charity of action and thought and by justice to all men through the "Square Deal."

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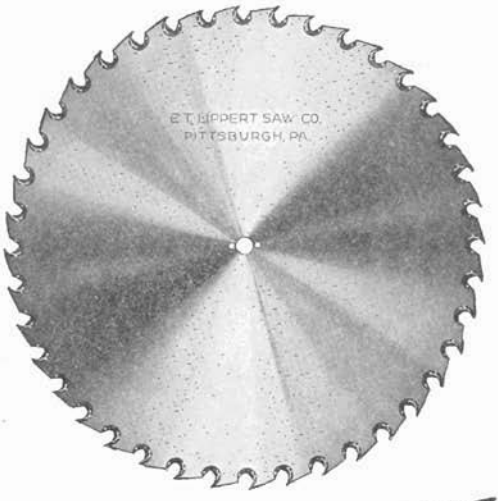

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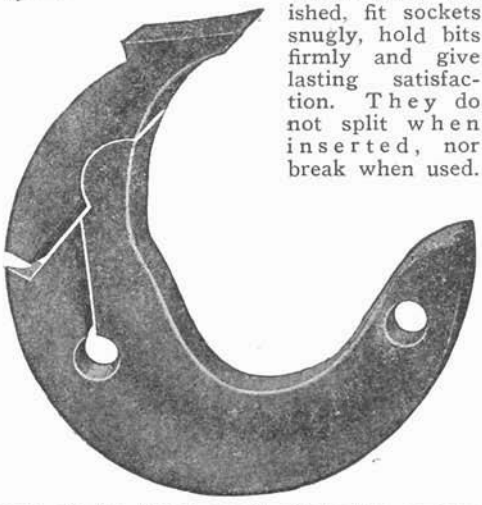

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