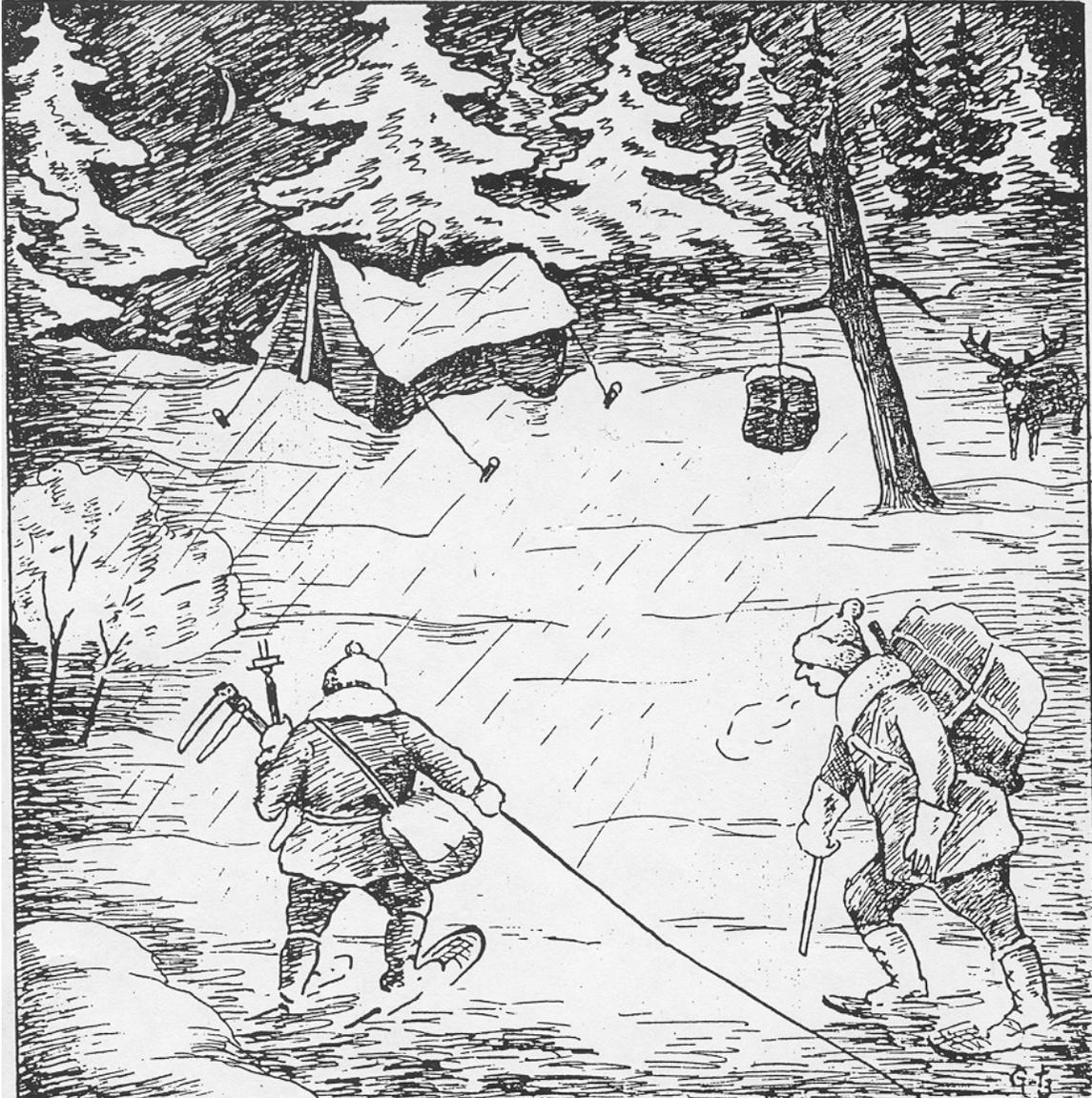


Tough Trips on The Lake States Survey



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1938

STORIES OF THE FOREST SURVEY
IN THE LAKE STATES



As narrated to
and recalled by

Harry G. Gafvert

Several times during the history of the U.S. Forest Service, it has been the task of its officers to prepare an estimate of the timber resources of the Nation. These estimates have been partially based on some actual cruises, but more on the guesses of forest officers within their section of the country.

By 1928, Congress was convinced that these combinations of guesses were no longer adequate and that scientific estimates were of vital importance to the country. With that idea in mind, the McSweeney-McNary Forest Research Act was passed in 1928. This act authorized the Forest Service to undertake a nation-wide forest survey within the following 10 years.

The objectives of the survey were to be five-fold: (1) to take stock of the present timber supply and of the forest lands available for growing timber, (2) to determine rates of timber growth and potential yields under different types of management, (3) to determine the rate of depletion by industrial and domestic users and from fire, windfall, insects and disease, (4) to determine present consumption and probable future trends in requirements for forest products, and (5) to correlate these findings with present and anticipated economic conditions in order to formulate policies for the effective use of the land available for timber production.

At first the work went slowly because funds were not sufficient to carry on a large program. Here in the Lake States, preliminary work was done by Russell N. Cunningham, Suren R. (George) Gevorkiantz, Harold Moser and Bob Anderson. By the time emergency funds became available, the groundwork had been established for a thorough fact-finding job.

During the summer of 1933, funds were made available to hire a force of men to carry on the field work. In September, Jim Girard, Assistant Director of the Forest Survey; Russell N. Cunningham, in charge; S. R. Gevorkiantz, and Harold Moser, after a reconnaissance trip of several days north of Beaver Bay, planned the organization of field work to commence the survey. Edward L. Lawson, who was working with the Minnesota Forest Service at the time, was hired as field chief of the survey.

The system of sampling developed in Sweden was used for the timber inventory.

Lines were to be run east and west across the state with intervals of ten miles. Along these lines a fifth acre sample plot was to be taken of the forest cover every ten chains.



Ed Lawson, with a small crew composed of Robert Anderson, George Olson and James McGlade, estimators, and R. E. Pasco, Edgar Hubbard, Jackson, compassmen, began work on a survey line near Finland early in October.

MINNESOTA

The first snow fell on October 17th. It launched one of the severest winters that Minnesota has experienced in the past decade, with driving winds and blinding snowstorm and temperatures as low as -58° . During one of the early snowstorms, Anderson and Olson became uncertain of their location. Before they had time to determine their whereabouts, darkness had fallen, and they decided to build a fire for the night. Anderson, after hovering over the fire for an interminable period of time, became restless and wondered why day had not begun to break. Voicing his annoyance to Olson, the latter knelt down to the light of the fire with his watch and, in tones full of dismay, announced it was 10 p.m. After a miserable night, seemingly without end before the first gray shafts of light crept into the woods, they found in the morning that they had been less than a quarter of a mile away from their car.

Pasco and McGlade waded through icy streams all along the North Shore during the late fall. On their first pack trip, in October, the packer, Ed Nikula, deserted, leaving food and equipment at the first campsite. They finished out the trip, packing and surveying by themselves.

Early in November, the temperature dropped to zero. During these cold days, Mattson, Anderson, (a Duluth engineer) and I began work as compass men under NIRA allotments. Pasco and Hubbard were advanced to timber estimators. Before the Christmas holidays, Walters, Salo, and Peterson were hired through CWA funds. December 1933 witnessed successive dips of the mercury to -10° , -20° , and -30° . This was before the advent of the CCC's and their road-building programs. Scarcely a day passed but what we deadheaded several miles before

picking up the survey line and topped off the day with a deadhead of five or six miles. We learned to run on snowshoes to get warm between plots. On these occasions we sometimes had bad falls when the meshes of the snowshoes caught in snags that were hidden under the surface of the snow. Rare, indeed, were the days that each man did not fall headlong into a snow bank at least once!

One day as dusk was beginning to fall, when Bob Anderson and I were running post-haste to get out of the woods (about two miles more of deadhead) before darkness, I had my worst mishap. Bob had one bitter experience in the woods at night and did not want to duplicate it. While jumping and sliding down the side of a steep, rough hill, with an avalanche of snow sliding with us, a cedar windfall loomed out of the semi-darkness directly in my path. As I came upon the barrier of stout, springy branches, I leaped into the air and forced one large branch in my way back, back and back. Just as I expected it to break, my snowshoe tilted and released it. It swung back like a whip and struck me squarely in the face. I was dazed for several seconds until my cold nose, which was all too suddenly given feeling, became alive with outraged nerves. Bob was doubled in laughter while I picked my self up out of the snowbank, but he soon became sober when he thought of our haste and we dashed off through the woods again in all seriousness, I, with more caution.

In those months of November and December, the pack trips were as pleasant as possible under the adverse weather conditions by a jovial, Norwegian fisherman, Roy Edwardson, from Beaver Bay, and a strong, silent Finn from Toimi, Felix Rinne.

On one pack trip between Linwood and Wolf Lakes, McGlade and Mattson set out across a small lake on snowshoes. Edwardson and



Rinne followed with the packs about a quarter of a mile behind. All of a sudden McGlade and Mattson heard a cracking of ice and a bellowing from Edwardson. Turning, they saw he had broken through and was clinging to the jagged edges by stretching out his arms. Mattson and McGlade hastened back to him and, with the aid of their snowshoes, were able to approach and fish him out. They set up their tent on the shore of the lake and made a roaring fire for him. The water in the lake, containing some ferric sulphurous substance, was very malodorous, but they thought by boiling it they could dispel its ill-smelling qualities. They made coffee of it, but poured the brew out in the snow when it was finished. Edwardson had taken on a great deal of B.O. from his submersion. The men acted as if he always exuded pernicious odors and insisted there was little wonder they could not use the water after he had fallen in the lake.

In January the temperature continued to decline. There were many pack trips to be made across swamps, beaver flowages, industrial flowages, rivers, lakes, and other areas which would be inaccessible in the summer. We were poorly equipped to combat

the terrific cold. Pitching a silkline tent out in the ice and snow, we crawled into canvas sleeping bags, which we called 'cold packs', for the night. There we twisted and turned sleeplessly, teeth chattering, and welcomed daybreak as a chance to run and get warm once again. Those were long nights, with darkness descending at 6 p.m. and remaining until 6 a.m., in themselves, but to us, they seemed without end. We walked many miles out of our way to avoid those tortuous nights, to logging camps and back-woods, snowbound shacklers and settlers.



We had collapsible tin stoves for heating the tents, but the sections, being twisted and bent badly in transport through the woods, fitted so poorly that smoke from the frozen, snow-soaked wood made their use unbearable. Not having rigged up the tents with asbestos insulation against the smoke pipes, the few times we did use the stoves, we burnt holes of various sizes in the silkline fronts. After the winter's severity had passed, the fiscal agent was duly awakened to the Survey's need of eiderdown sleeping bags by a threatened 'voting for a new fiscal agent.'

Early in January, rather than set out on a 30-mile pack trip from the Rice Lake Road across Big Pequaywan Lake and east into wilderness, I suggested a way to Anderson by which we might make our headquarters in a fairly warm summer cottage for about ten days. In spite of this plan's entailing much arduous deadheading, he fell in with the idea enthusiastically, the thermometer reading -20° at noon.

We received permission from the owner of one of the two cottages on Big Pequaywan to stay at his place. This was almost in the middle of the 30-mile survey line. When we completed the line to the east of the cottage we had a deadhead of twelve miles back, which we made after dark on our snowshoe trail. After eleven days of sub-zero weather, and we had ravenously eaten up our food supply in the attempt of fueling our bodies to withstand the cold, the temperature began to descend to a new low. We planned in the early darkness to travel on a snowshoe trail which we had just made, to reach the survey line at daybreak, cruise five miles of line and then deadhead several more miles west to the Rice Lake Road, where Edwardson and Rinne would be waiting for us with the Dodge. Upon awakening at 4 a.m., the cottage was permeated with a strange, new coldness. The blankets about our heads were covered with hoary frost, and the cold air, which smarted in our nostrils, seemed frightfully heavy.

I suggested that we put off our eighteen mile trek until a day that was more fitting for the task, but Bob laughed and said it would be like getting accustomed to a cold shower and staying under it. So off we started with a handful of raisins for lunch and a meager breakfast of odd remnants behind our belts. The woods were dark and silent except for an occasional dropping of squeaking and crunching of our snowshoes in the dry snow. When we walked over frozen streams, which

wound along our way, there was a muffled gurgling and splashing under the rhythmic monotone of our steps. We rubbed our cheeks when they ceased to sting and pounded our hands. Just before dusk, blue with cold, we finished the last survey plot of the trip and began the deadhead to the road where the car would be waiting. By the time we reached the road, we were almost done in by fatigue and walked like automations, scarcely sensing the cold. Not finding the car when we came out to the Rice Lake Road, we walked north a half-mile and then south almost three miles before we found Edwardson and Rinne at a logging camp drinking hot coffee. They explained that there had not been enough gas to keep the motor in the car running and that they could not stand the cold waiting for us. On our return to Duluth that night we found that Brimson, near our survey line, had a record -46° that day.

During this early period the experiences of the other estimators and compassmen were no less difficult. McGlade usually worked with Peterson, Pasco with Mattson, Hubbard with Walters, and Olson with Jackson and Salo. All of them had pack trips and long deadheads and, with the exception of Jackson, had the same contempt for inclement weather that Bob Anderson had. Jackson was more like me in his respect for the capriciousness of nature.

In January, Mattson became ill on Pasco's pack trip near Seven Beaver Lake. They moved out to Skibo, whence they drove to Duluth. After Mattson's illness was diagnosed as Typhoid fever, the other surveymen took anti-typhoid serum. The result was a great many sore arms, which brought whimpers from the men when they were jostled in the brush, and high fevers alternating with chills following the serum injections.

In the wild, rough country north of Lake Superior, the men made headquarters in Two Harbors, Brimson, Makkinen, and in farm houses, wood shacks and logging camps.

In the office, Dudick, Johnson, Lyons, Schives, and Youngdahs were hired in 1933 as computers; Moxness and Wick as draftsmen. Early in 1934 Lillie Bodin, who became stenographer, and Wright, were added to the office staff. Wick soon began a canvass of Minnesota wood-using industries.

The Survey shifted its activities from the area adjacent to the North Shore and moved into the spruce-muskeg country near Floodwood. Here, the dense muskeg held up several feet of loose snow. Snowshoeing was difficult since muskeg and snow collapsed with each step, except in rare wind-swept areas, where the snow had formed a firm crust. On very long deadheads we would lie down in the snow to rest frequently when fatigue crept upon us. But before long the muscles in our legs became hard as rocks, and in the evening when we sat down to rest, we often suffered from leg cramps.



In February, Berger joined the Survey to replace Jackson, and in March, Frederickson

and Markkanen were added to the crew. During this period the men stayed at Floodwood, Meadowlands, Cotton, Cronwell, McGrath, Willow River, Hinckley, Pine City, Central Lakes, McGregor and Malmo. With the field headquarters getting more distant from Duluth, considerable clerical work was done in make shift offices. These offices consisted of a bed, a dresser and one or two chairs. Here, work plans were argued pro and con and interpretations were unified examples of isolated middle cases where the compassman was certain that the estimator had gone 'brush-buggy' in classifying a certain stand, culling a certain tree, or moving a certain plot. As a result of these turbulent sessions, some revisions were made in the original work plans. But such arguments as land classification of plots containing jack pine and basswood or Norway pine and sugar maple were left for the small-town bedrooms at eventide. In these unheated abodes, it was often necessary to sleep in woolen stockings, underwear, sweaters, coats, and mittens and tassel caps.

In one such country inn, a farmer, who had walked six miles to town for supplies in a -10 blizzard, appeared at the hotel with icicles in his moustache, frost on his collar and snow on his hat and shoulders and in the folds of his coat. In moving up to the stove in the small lobby, he awakened a tenant who had forsaken a cold room to sleep in a chair by the stove. Upon waking, the tenant gaped at the farmer with great astonishment, exclaiming, "Holy Smokes! What room did you have?"

In addition to two new Dodges, the Survey had two Ford Coaches and a Ford Coupe, which had been confiscated by Revenue Agents in raids on bootleggers. The Fords were not in very good condition, but miraculously would always get to their destination and, after much suspense, come

rattling back. One of these was so much out of alignment that it always made four tracks in the snow, the rear wheels traveling a foot to the right of the front ones. This side ways running vehicle was nicknamed "The Goat", which evolved to "The Goon".

With the coming of mild weather, the crews moved to Onamia, Milaca, Little Falls, Grand Rapids, and Hibbing. I recall the first warm day after that winter of bitter cold. I sat with McGalde and ate lunch on the bottom of an overturned boat on the shore of Lake Mille Lacs. We discussed theosophy for some inexplicable reason, except possibly, that as we stretched out in the sunshine, we felt very much akin to the theme, "God's in His Heaven and all's right with the world."

At this time, April, the survey work was given considerable impetus by the hire of Ron Woolery, H. R. Cline, Earl Gran, Joe Grove, Ed Kron, Orville Matthews, Hans Melius, and Dick Smith. Several new Dodges and a Ford Pick-up were added for the increased crew. The roads were soft, and as the new Dodges were low-slung, they were frequently hung up in the mire. At that time, the high, rattle trap Ford Coaches performed like veteran mudders on a wet race track. I remember one evening having a desire to pat one affectionately after it had carried us over a sea of mud all day without once becoming stuck. One could only marvel at how those old cars stuck together, with parts pounding and rapping noisily, and the cooling system reduced to steam! But they snorted along viciously and did not gasp their last until the work in Minnesota had been completed.

In May, Arthur Aamot, Albert Downs, Ralph Nelson, and Jack Wagner joined the Survey. McGlade's crew moved south from Little Falls to St. Cloud, Willmar, Elk River, Excelsior, and Forest Lake. Fredrickson's crew moved north from Brainerd to Bemidji.

Olson's crew was at Cook and moved later to Cusson and Tower. Early in June I brought a car up to them from Duluth. The fellows were badly eaten up by mosquitoes, especially Markkanen, who had welts on his face as if he had fallen into a hive of wasps. All in all, it was a tough looking crew, and I was glad I could go to Cass Lake where Anderson was going to start me in a study of the merchantability of aspen, - at least I could keep out of the cedar swamps, bogs, beaver flowages, and other insect-dominated hell holes. I remember meeting Markkanen later when he had shifted to court house studies of land ownership and tax delinquency. I asked him if he liked his new job, and as he thought back a moment upon his tough survey experiences, he broke out into a grin from ear to ear.

The surveymen tell a humorous tale of a day Joe Grove let springtime turn his fancy. He had met a girl in Tower by the name of Violet, whom he had taken out several nights when the warmth of spring began to thaw him out and the blood coursed through his veins again, and his eyes carried a moonstruck, sweetly melancholic light even during the day. On one of those days, while Girard,



Lawson, Olson, Berger, Kron, Grove, and several others were out checking their form class and taper estimates, Grove picked up a little violet, which he twirled in his fingers whimsically, saying, "You know, fellows, my girl's name is Violet, too."

Grove and Kron had just come off a pack trip where they had spent five sleepless nights combatting mosquitoes. In addition to having but a handful of prunes to eat the last day of the trip, the packers drank Joe's drinking water when he put down his canteen. He had a long, dry deadhead of twelve miles to nurse his grievances before getting back to Tower.

On the aspen study, a young fellow by the name of Ellertson was assigned to climb trees for me. He became panicky at sixteen feet in the first tree that he was to climb, and I had to help him down and climb the rest myself. He was wrapped up in a study of tree parasites for his Master's degree, and was so absorbed in the subject that I had to keep my eye on him when I was up in a tree so that he didn't wander off. He was a fine fellow, however, and soon had me carrying samples out of the woods while he collected more. When ants got into his samples of Fomes ignarius he cried, and I felt like crying, too, for I was almost as daft about Fungi as he was by that time.

The early summer of 1934 was a memorable one, with McGlane and his crew arguing with short-tempered farmers, 'nice-dogging' ill tempered mutts and running from snorting bulls in the farm country. The crews in the north were having a diversity of types, with pleasant pine flats one day, dense cedar swamps the second, hardwood land the third, muskeg and bog the fourth, and hardwood swamp the fifth, working amidst a terrifying population of mosquitoes, no-see-ums, wasps, and other vigorous insects. They would top

off the week with wading in and out of streams the entire forenoon.

The chief dread of the estimators in the north in following the survey chain, was running into nests of wasps which had been broken open in rotten, hollow logs by the compassmen, who passed on blithely, unaware of the furor they had created. The hives were quick in regimenting an air corps and were in full preparation for war, with bombers and pursuit planes poised in readiness one or two minutes later when the



estimator came upon the scene. The first of several experiences of this sort, depending upon the estimator's peculiar phobias and his ability to disregard advice tendered by other surveymen, 'stand your ground and lock them in the eye', resulted in general paralysis from the waist down until the enemies had struck mobility into their hapless victim. Severe attacks brought on rueful headaches which lasted for more than a week, and with such consequences instilled in his mind, it was not long before the estimator, darting off through the forest at a moment's notice, could safely outdistance the drone of the pursuit planes.

In June, Anderson went into St. Paul and made a study of the solid wood contents of various diameters in the nearby farm wood lots. During this month, Amidon, Duerr, Sharp, Carter, and Holbrook were added to the survey crews, while in July, Richman, Evan Glassbrook and Lohmann were hired.

I learned from Sharp, who went to Fredrickson's crew in Bemidji an account of Pat Cline's encounter with bees. Pat was sauntering contentedly alongside the chain one beautiful day with his Stetson in his left hand and his hand axe in the other. Before he had gone far, his compass men having destroyed a nest of bees, Pat was awakened from his reveries by a violent sting in the forehead. He threw up his right hand instantaneously to brush the bee away, but forgetting to remove the hand axe first, cut himself in the forehead, too. An ignoble flight through the woods from his small assailants helped to bring all the beauties of the day to an abrupt termination for him. Nor did his associates assuage his Irish temper when they saw him come out of the woods with blood on his beard. For when they learned the story, they laughed at him and said that it was a strange way to kill a bee sitting on one's head.

About this time Mattson had recovered sufficiently to join Anderson on check-cruising the work of the estimators. They had considerable difficulty locating a plot on the North Shore until they noticed tree markings about eight feet from the ground. This emphasized the fact for us that breast height in winter is not the same in summer. There were times in Upper Michigan that we had to dig the snow away from trees to get breast height in the following winter.

In the Hardwood District, the chief obstacles to the survey men were cantankerous bulls, mad dogs, misanthropic farmers, and dust storms. McClade, while at Red Wing, after



having spent half a day approaching an island in the Mississippi, had to forego landing because of a mean bull. These large creatures had a way of snorting and pawing the ground in such vicious manner that we never felt safe with them, however friendly these gestures may have been. In fact, when they ran after us, it might have been just to lick our hands, but being neither analysts of the subtleties of the bull's mind, or matadors, we took all latent powers in our sinewy legs into immediate use. Cline, after having argued with several farmers one day, had a plot fall in a hog yard. He debated with himself whether or not to tally the trees, and having decided in the affirmative, had scarcely begun taking measurements when a woman ran out of the farm house with a bristling dog beside her. She stopped at the rail of the hopyard, and setting her arms akimbo, exclaimed, "For pity sakes, what in the name of heaven are you trying to do?"

Early in July, Berger and Kron started out on a pack trip at Nett Lake. They had beautiful country for the start of their trip, but ran into a bog between the Littlefork and Big Fork Rivers. One night they set up camp in the bog and the tent sank into water during the night. Prior to starting on another trip, Andrew Peterson a sturdy fellow who, on a hardwood

study near Onamia, spiked his way up trees as most people walk on the ground, was hired to help the pack. The day before starting out, Lawson, Kron, Peterson and I carried two packs of food down to Larson Lake and cached it there in wooden boxes which we wired to the limb of a snag out of reach of prowling animals. We learned at the State Ranger Station that there were many bears in the region, so upon the following morning, Lawson prevailed upon us to carry his guns. He gave Berger his .45 and me his Colt Woodsman.

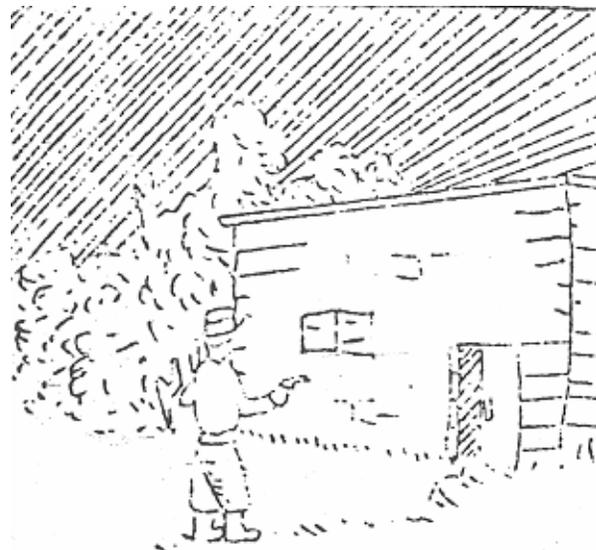
Lawson arranged with the ranger at a federal transient camp to haul Peterson and me about six miles along a trail, marked on a map, to an old logging site where we were to make camp. I had weighed in my pack before leaving Sturgeon Lake and it tipped the scales



Out of reach
of prowling animals

at 118 pounds. I had tried it on my back in the store, but it didn't seem nearly so heavy to me then as it did now that I had waved goodbye to the ranger and was gazing at the hot sun above the trail ahead, which wound in a maze of swamp conifers and windfalls below the old logging spur.

As dusk was falling we reached the end of the trail. There was an old, ramshackle frame building which I thought might be used as a camp. I walked over to it, drawing the Colt and cautiously setting it for action, for I knew that abandoned shacks frequently became dens for wild animals. With the automatic set and thrust before me, I approached the half-open door and pushed it wide open. I had no



I approached the
half-open door

sooner stepped in than I heard a scurrying in one corner, saw a dark body rush toward me, and in the same fleeting instant felt it brush against my legs as it scampered out of the door. It was fully 10 minutes before I could close my mouth and breathe again. My hair had begun to lie down upon my head, but my pulses still pounded in each of my fingers so violently I was afraid the gun would go off. And a dismaying realization came over me that all my panic had been caused by a woodchuck!

I left the old, floorless building, which had been used as a stable some 20 years earlier and was a rank-smelling hole, literally alive with all sorts of creeping things. After helping Peterson set up the tent, I went off on

the trail in the direction of the survey line and met Berger and Kron who came out of the woods when everything was just about dark.

The trip was a tortuous one all through the week. Insects were maddening, the water everywhere was stagnated and musty (the taste of it stuck to our dry tongues long after we drank it) and we drank through our teeth to keep the polliwogs and red and green wrigglers from slithering down our throats. Sometimes we were in tangled mass of spruce and balsam windfalls. Oftentimes we were places where the branches we clung to or the rotten main stems broke, and we fell with the heavy packs. Towards noon, when we began to get tired, we fell more frequently. From this maze of growth we would get in to soft peat and stumble as our legs oozed into the muck up to our hips. The packs would fall forward, pushing our heads into the mire. We were very strange looking, now that I think back upon it, but we were much too weary to see anything humorous about it then. Sometimes we had to cut poles, carrying them out into soft bog that we could not cross with the packs. On these occasions we would carry out the poles, setting in a few, then return for more and walk over those previously laid until we had built a walk to a point where we could start again.

We were all interested in getting out as soon as possible. The insects sang in our ears all day while the sun beat down on us. At night a cold mist settled over the swamp until we shivered in the tent. So each day Berger and Kron pushed the survey line ahead as far as possible. Camp locations were always indefinite, as we could not tell in advance where we could set up the tent. But each night as dusk fell, they came out of the dark void as if by magic. One day we came upon an unsurveyed lake, which we named Kron Lake. We had already carved our inscription into several trees:

*"Witness all ye who come here,
that this lake shall hereafter be
named Kron Lake, after Edward
Kron, gentleman and scholar.
7-7-34"*

when Kron came into camp in as ungentlemanly and unscholarly a fashion as possible. He stood before us, scratched and bruised about the face and arms, grimy with sweat, and the only article hanging to him, which was not in tatters, was a carrying case.

By the end of the week we reached Larson Lake. There we found our cached food intact, and Berger, Kron and I celebrated Saturday night by taking a teamster-size pinch of Peterson's snuff. About 10 minutes later when I went to spit mine out, I didn't have any left in my mouth. At first we planned to rest over



Sunday, but we thought better of it and plunged on with the work. I was rather sick on Sunday, either from drinking from pitcher plants which hold dew (intermixed with drowned insects) or from swallowing the snuff on the day before. But we built a raft and poled and paddled the packs across

Larson Lake, and by nightfall I had worked off the illness, which seemed threatening in the morning.

The country west of Larson Lake was even more difficult than that which we had crossed. Peterson and I bogged down more frequently with the packs in muck, and the forest was less dense so that Berger and Kron could get more line surveyed. On the last day I saw them we planned to set up camp at the first stream we would encounter shown on the Jewitt Map. If the stream were dry, we would try to bring the packs on through to the second stream shown on the map. Progress was almost nil that day. We kept sinking in bog and falling with almost every other step. When we came to the first stream, we almost cried, for there was nothing but a mess of black mud to greet us. Peterson was all for pitching camp there anyway. I told him Berger would reach the second stream for the conifers were small, making tally easy. I climbed up in a snag and saw taller trees to the north. Hoping there would be firm ground in that direction, we moved a quarter of a mile north.

During this time Berger and Kron went past us with the survey line. I angled back to the line again after travel was no better to the north. Peterson and I fell more frequently with the packs as exhaustion crept upon us. I fell into a rotten log, disturbing a swarm of bees and was stung in the arm before I got away. Returning to get the pack, I was stung again in the neck before I retrieved it. We continued on to the second stream where we had to carry more poles to get across the bog. We crossed the stream to a marsh where we could set up camp.

It had grown quite dark and I built a fire which I hoped would be a signal to Kron and Berger. But they had already tramped south and then far north along the stream looking

for us, and had started back to the first stream shown on the Jewitt Map. I thought I heard a call to the north of me and hollered back. My calls seemed to get replies from all directions. I walked about a mile north along the stream in the wet marsh grass. I thought I heard Lawson's .45 fired to the east, then to the south. I argued with myself against the futility of finding them, but finally returned to Peterson and helped set up camp. I lay awake a long time thinking that each call of the night birds, the bark of wolves, and the blow of deer was Berger or Kron, and I crawled deeper into the blankets when I thought how miserable they must have been in the cold, mist covered swamp, but finally I fell asleep.

Early the next morning they crossed the winding stream on which we had made camp, but as we were too far south for them to see the tent and still deep in sleep, not hearing their calls, they plunged on 10 miles west to Big Fork through an entanglement of blowdown balsam, spruce, and aspen. Kron found six raspberries for breakfast and lunch on their second day of hunger. They arrived at Big Fork looking like specters and spread a story about that the packers were lost. Peterson and I reached town a couple of hours later while Berger was getting ready to go back and make certain that no accident had occurred. Peterson, who had spent many years in the woods, vowed to me grimly that he would not go into the woods again so long as he lived.

On the following day, Berger and Kron went back to Sturgeon Lake, and Cunningham, Lawson and I got up early and set out for the line, which had not been completed on the pack trip. The stretch was sufficiently provoking to draw an outburst of "Damn it!" from Cunningham, and that, you know, is going some!

During this same month, Richman and Melius made a pack trip east of Cusson toward Vermilion Lake. On one of the last nights of the trip they set up camp and spent much time chasing mosquitoes out of the tent before going to bed. On the next morning when they had gone a short distance from their camp, they found a fisherman's shack with table, chairs, fireplace, coat hangers, and all the trimmings of the luxurious world. They kicked themselves several times at the thought of the many inconveniences they had suffered, while this abode had been nearby.

At about this time, a freak accident took the life of Jim McGlade near Rochester. While driving to work he was hit a glancing blow by a car coming out of a brush-hidden road. When the car overturned, McGlade, who was driving, was killed, while Duerr, Downs, and Wagner, who were along, escaped with minor injuries. McGlade had made many staunch friends on the survey, but none was more broken up at losing him than Pasco, who had fought through the adverse conditions of the preceding winter with him. Pasco heard about the accident just before leaving the survey for an appointment on the west coast.

Up to this time, Melius, who had dashed around the north country recklessly on his motorcycle, having frequent upsets, had spent much time working with Pasco. Melius was always one to break through dense growth rather than to go around it. He had been a fitting partner for Pasco, who had an equal contempt for hardship, and they always chose the most difficult trips for themselves. When Pasco went west in July and Melius returned to school in October, they carried away with them many scars of their work in Minnesota and the high respect of their associates.

In the north country, Woolery had been made a party chief and located at Northome and Big Falls. Frederickson had moved to

Warroad, Baudette, and later to Washkish. Olson, between trips to the office in Duluth, where he was acting as computing foreman, was moving his crew further north to Ray and Littlefork. Berger had been made a party chief and located at Big Fork and Sturgeon Lake. Gran, made chief of party, located at Bena.

Woolery recounts a pack trip taken in the late summer of 1934 with Jack Wagner, from Washkish to Big Falls. One of the boys drove them to the starting point, but before they reached there it started to rain one of those dreary, drizzling rains that don't amount to much, but can get one awfully wet.

"Upon arriving on line, we found an old, deserted barn, with a semblance of a roof still remaining, so we unloaded and sent the driver back to town. After a couple of hours the rain stopped and we started out. The area is rather extensively ditched with drainage ditches on nearly every section line, and the packers decided they would have easier going if they followed the ditch-banks.

It wasn't long before we were wet to the waists from the wet bushes and up to our ankles in water.

The farther we went the deeper the water got. To you who know a beaver's work, the cause was simple. They had taken to damming up the drainage ditches - hence all the water.

By the time we had negotiated the second mile, it was starting to get dark, and we had to find some place to set up camp along the ditch bank. We set up the tent, and then stood in water up to the knees in the swamp, cutting grass with which to build up our beds above the ooze and slime.

The night passed without incident, and the new day dawned bright and clear. Though we

were rather wet and a bit cold, a good breakfast fire cheered us up a lot. We started out, for the sooner we got started, the sooner we would get through. While we were still wading in water anywhere from our ankles to our hips, the going was fairly easy, (if one can call wading through sphagnum moss up to your knees, easy.)

The evening of the second day found us still in the swamp, ankle deep in water. We decided that a knoll would make a nice camping spot, and finally arrived at a clump of trees, but failed to find the knoll we had expected. The only difference was that we weren't ankle deep in water. Just the same, if you stood very long in one spot, the sphagnum settled and you were standing in water.

Jack and I hung the tent between two of the larger trees and then cut enough boughs to almost completely fill the whole inside of the tent. There was a struggle to get even the blankets in. We downed several trees so we would have something to sit on; while all four of us got in, the boughs had lowered to a considerable degree, but boy oh, boy, was that a bed! Only in the morning did we realize how much we had "sagged" during the night we were a scant six inches above our water table.

As the trip progressed, we got used to lifting our knees clear to our chins to clear the sphagnum. If you've seen a pussy cat on the 'stalk', you'll get the idea. The first white man who saw us after we got out, crossed over to the other side of the road to let us by. He thought we were drunk and trying to climb stairs."

The men working north and west of the Iron Range were leading a pleasant life on one day on the shore of some beautiful lake, and on the next were plunging into a tangled swamp.

The juneberries were ripe and gleamed at one in large black clusters at every turn of the head on the hardwood uplands. Long after the surveymen had eaten their fill of them, although they knew they would rue it later, they could not resist eating more and more of these delicious berries. And for several nights a half-dozen surveymen lay wide-eyed in the ramshackle Big Fork Hotel, not daring to go to sleep. All night long doors could be heard opening, rattling noisily against bed posts, loud hurried steps sounded in the hall and the old stairway at the rear of the hotel creaked violently as someone descended in increasing haste. Silence ensued, and then the stairway creaked again, slower footsteps were heard in the hall, and soon a door closed softly. Throughout the night, the sound of doors being opened with a racket as if the hinges had been torn loose, alternated with moments of quiet. And sometimes there was more than one in the hall at once, and soft steps were almost indistinct as a door burst open and racing feet rushed past. And one heard the gentle tread stop as someone backed up against the wall, out of the way.

The late summer was characterized by many drizzling and misty nights in the northern part of the State. The brush was wet in the morning and the effect of it upon us was much the same as being hit with a cold wet towel several times after breakfast until we were as wet as if we had fallen in streams. Lawson went about from crew to crew getting the men accustomed to working in the wet brush rather than waiting for it to dry out. And so it was that we gradually shifted to working in rain, for there was little difference. On cold wet days in the fall, we ran through the woods between plots and when we stopped to tally the timber, small clouds of steam crept out of our warm, damp garments. And we realized as the fall drew on that there was much wet weather and there was much truth in Lawson's cautioning, "If

we wait for fine weather, we'll never finish the survey."

Berger, Grove, Richman and Lehman left the Koochiching swamp for studies in the prairie district. This was pretty easy in comparison to their earlier tasks, but not without difficulties. In Roseau County, while walking across a smoking peat bog, Berger broke through a shallow crust of peat into the fire below. Some very hasty action on his part prevented serious burns, and he suffered no injuries other than a loss of dignity in his mad scramble from the inferno.

During this period of late summer and fall, the northern survey lines were finished with headquarters at Big Falls, Little Fork, Ray, and International Falls. Gran's party, which I had joined at Bena, after mapping near Grand Rapids for the general forest cover map, moved from Bena to Park Rapids and to Lake George. Here we awaited forms and supplies from the Duluth office. Finally a letter came, addressed:

Earl Gran,
Lake George, Minn.

Upon opening the letter, Gran scratched his head and passed us the letter, which we read:

"Dear Gran:

There is no such post office as
Lake George. Where are you?

Mose"

After working from Wadena and Henning, where we got in some pheasant hunting, we moved south to Alexandria, where Lawson stopped in on our crew one evening. We had been in the heart of tourist country for three months, amidst people seeking their annual fling. Upon learning that a crew was being

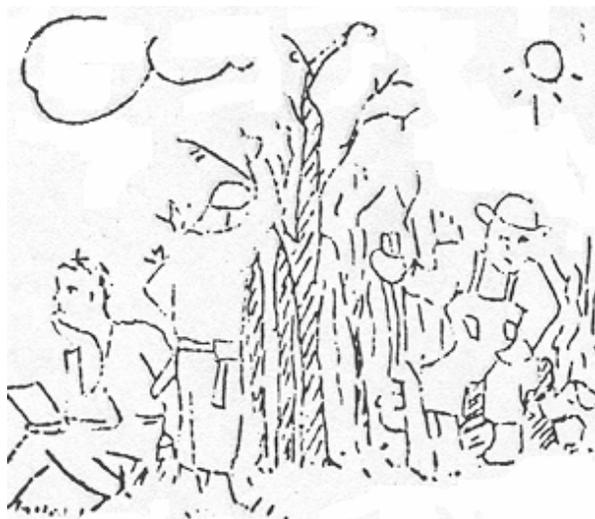


sent up into the forests of Upper Michigan, Gran exclaimed, "Don't send me, Ed, I'm having the time of my life." Where upon I explained that I was tired of night life and would like to go deep into the wilds of the Upper Peninsula. In two days we received a letter stating that Gran should come into the office preparatory to leaving for Michigan, and I was to remain at Alexandria. Cline replaced Gran as chief of party, and Evans, Lehmann, and Richman from Woolery's crew, and newly hired Dolton and Kimball, joined our crew. At Alexandria I met Bob Anderson who had Diemer out for a month becoming familiar with survey work prior to becoming computing foreman in the office. Olson, who had been acting as computing foreman much of the time, had given notice of accepting a permanent appointment in Tennessee.

Frederickson's crew was the first to go over to Michigan. With him were Matthews, Kron, Berger, and four new men: Day, Kissin, Margolis and Werner. They made the first headquarters at Marquette. Woolery's crew picked up some survey lines in the Hardwood district before moving into the new State. With Woolery went Aamot, Amidon, Glassbrook, Gran, Grove, Smith, and two new men, Stoddard and J. B. Smith, to

Ironwood. After headquarters at Henning and Alexandria, Cline, Sharp, Evans and I moved south into the hilly farm woodlot country with headquarters at Montgomery, Rushford, and Caledonia. Richman was made a chief of party and moved to Preston, with Lehmann, Kimball and Dolton.

For the most part, the farmers were jovial and interested in the survey and its objectives. Some, however, were not and they emitted profuse outbursts as to why a survey was no good, or how a survey should be made. On one of these 'off days' in the heart of belligerent country, I was accosted several times by misanthropic hecklers. My patience was getting short in the afternoon when a farmer burst upon us as Sharp and I had a plot



Outdid him
by far in cursing

half tallied. The farmer had two evil-looking bloodhounds with him and a double-barreled shotgun in his hand. He strode up to me with a profusion of cursing, demanding to know what I was doing on his land with my "high-powered guns," pointing to my Abney level, increment borer, and hand axe, which were hanging from my belt. With every other word he pounded the stock of his shotgun on the frozen ground, the barrels staring directly

at my face. With each pounding of the gun I moved my head sideways, fearing the gun would discharge. Finally, becoming wild, I shook my finger in his face, and outdid him by far in yelling and cursing. He backed up to stump, where he sat down meekly. While taking the remainder of the tally, I explained the purpose of the survey to him. Just before we went on the next plot he said mildly that he thought it was a fine idea and asked why I hadn't explained it to him at first.

As October ended, so ended, the survey of Minnesota. Downs, Duerr, and Melius had left the survey to return to school, and Holbrook left for a CCC job. When we returned to Duluth, new men - Holcomb, Knight, Lindeberg, Sauer, Tesaker, and Ellstrom- joined us as we left for the Upper Peninsula.

Compilation work has been sped along by the hire of Pierce and Tye in July; McCullough, Hayes, McDonald, Erickson, McDougall, Cutliff and Dutcher in October; and Lepak, Chessen and Quick in November. White was appointed to supervise forest-drain studies in September.

So it was that the field work in Minnesota was completed and the figures we had obtained from tortuous days of hardship and despair to beautiful, serene days began to form new figures. And to many, they were impersonal things like figures in textbooks, but to us they were rich and meaningful, connoting many blue skies and waters, the brilliant red of sugar maple leaves in October, the deep red of oak, white and deep green of snow-laden spruce, and the silver of aspen, purple of sumac, red of dogwood, gold of small willow; the yellow of dry marshes, the darkness of pine forests, the charred black of burnt wastelands. We had viewed millions of acres that had changed from a beautiful and abundant land to devastated wilderness in

three-fourths of a century. We saw remnants of waste from early logging operations that lumber companies today would have prized as material of highest grade. And over this vast expanse of land we saw a valiant nature patiently setting out upon a program of many centuries of land and forest redevelopment. And in very small corners of this vast expanse we saw men with hoes and seedlings coming to her aid.



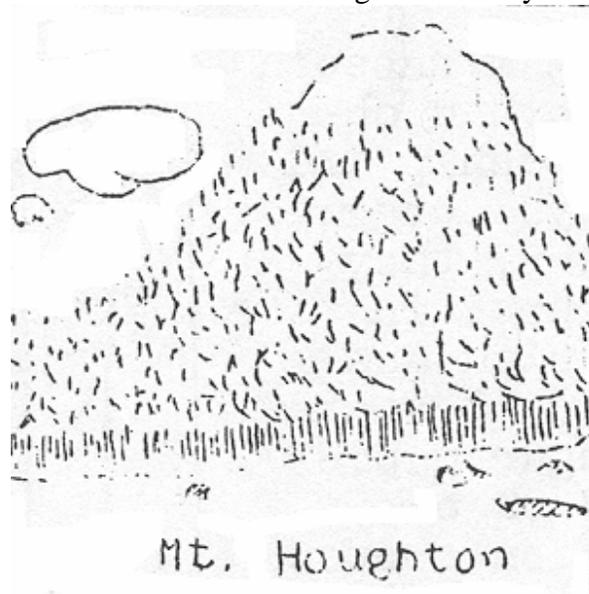
MICHIGAN

Early in November 1934 there was a general round-up of all crews in Michigamme, where Day, who had been made chief of party, had located with his crew. To this round up came Frederickson's crew from L'Anse, Woolery's crew from Ewen and new men and crews of Richman and Cline from the general office in Duluth. Cline remained in Minnesota, where he had made studies in fuelwood drain and mapped types for the general forest cover map. After the meeting at Michigamme,

Woolery moved to Ontonagon, Richman to Houghton, Day to Trout Creek and Frederickson to Iron Mountain.

Berger and Lawson went up on the Keweenaw Peninsula one day and scouted a pack trip which I was going to take on the northern most tip of the State. From Copper Harbor they paced along a trail about seven miles south and set up an approximate location on line. Near this trail the sawtimber had all been logged off, and they returned to Houghton, telling me I would find cordwood sized trees in the area I was to cruise.

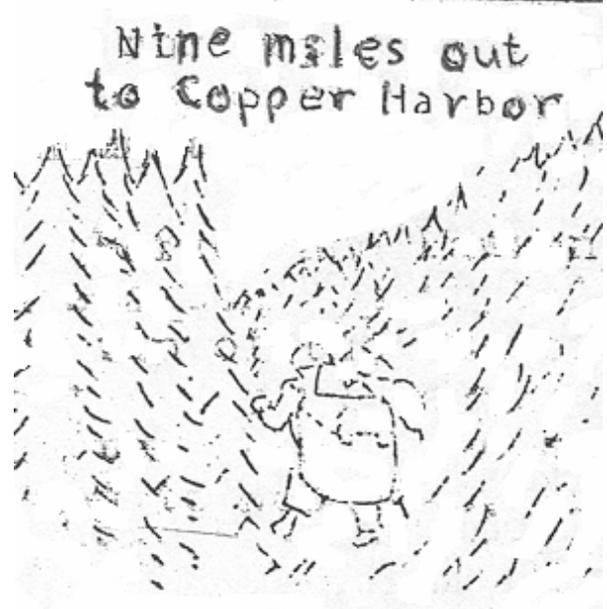
The 15-mile trip was, to all appearances, quite an easy one, for although it stated in dense cedar, I was quite certain this soon would give way to "cordwood" on the hardwood uplands. On Monday, November 19, I drove up to Bete Grise with Dolton (who was making his first trip), two packers, a stove, a tent fitted with asbestos insulation, and enough food for a seven day trip, although I figured it would not take more than five. At the lighthouse I tried to get the keeper to take us out on the peninsula with food and equipment. He refused, saying that he could not make a landing on the rocky



shore in such strong, easterly winds. We waited a day and a half for the wind to go down at Bete Grise, when I finally became impatient at the delay. I helped the packers in the deadhead around Mt. Houghton, where Dolton aided in setting up camp. In preparing a location from which we could run our line east, I climbed in a blinding snowstorm to the peak of the mount, which I had located from G.L.O. notes. In the falling snow I could not see my whereabouts, but kept climbing up and up, until I reached a point where the rocky outcrop descended in all directions. I assumed this to be the peak.

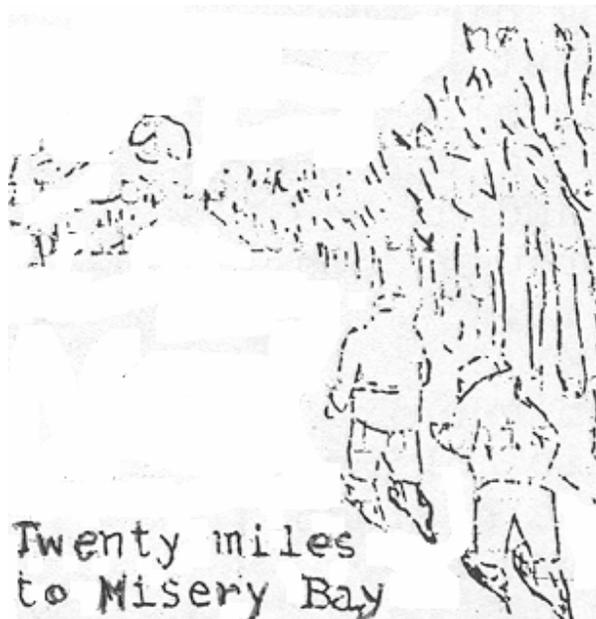
The first morning the tent almost fell in on us under 18 inches of snow. In this area the timber was chiefly a mixture of sugar maple and yellow birch, running 15 to 20 thousand board feet to the acre. When I found Lawson's tag, about 50 feet off line, I was aware that it was simply a cut adjacent to the trail and that we would not finish in seven days. In this dense timber much computation was necessary, since we figured board foot volumes by species and diameters at each plot. I told the men that night that we could start rationing the food, having a little each day, or we could eat our fill in the chance that the line would give way to cut-over forest. In either case, I cautioned them that we would finish the line before us, or it would take another pack trip to finish what we left. They elected to eat heartily, however, and on the ninth day we ran out of food, all except for a little pancake flour.

On the tenth day we each had a pancake for lunch and a small meal of them in the evening. On the eleventh day, Thanksgiving, we had one cold pancake each. Dolton could not eat his, and although I argued with him insisting he should try, he explained it was no use. So I ate his too. On two nights Dolton and I did not find camp until we had wandered in the dark woods for several



hours. We had had variable weather, with snow, intense cold giving way to warmth and rain, then more snow and cold. The last day we had rain and sleet. I had two eiderdown sleeping bags which were sufficient for three people, and one "coldpack". I slept in the "coldpack", but it was rather easy, for I sat up late and kept the fire going, drank tea and worked on tally sheets by candlelight. About midnight I would crawl into the canvas sleeping bag in a warm tent. About four, when I was usually awakened by the cold, I woke the cook and crawled into his place in the warm, luxurious eiderdown. When we packed nine miles out to Copper Harbor in sleet, on the twelfth day, with all the equipment wet and heavy as lead, I changed off with the packers, and Dolton carried a small pack which I had carried along the line. We were wet, hungry, and fatigued when we reached town, but I thought, all in all, it was comparatively easy when one considered the trips in Minnesota. Therefore I was rather surprised when Dolton, who had kidded me and laughed us out of the severest tests of the trip, said seriously, "In my wildest dreams, I never imagined that anything could be so tough!"

Work was hampered in the entire Upper Peninsula by a snowfall of about six feet. The county systems, impoverished by four years of much relief, could not afford to plow out roads which were normally kept open to traffic. After pleading in vain with the highway commissioner to open up roads, I planned to go with Kissin, who would have his first experience on snowshoes, over a snowbound road from Toivola to Misery Bay.



We started before daybreak with the aid of a flashlight, reached Misery Bay, a distance of twenty miles, by noon, and ran a mile of survey line through dense sawtimber in the afternoon. In the evening we dined on venison and remained over night in the home of a C.W.A. worker. On the following day we ran several miles of line and deadheaded back to Misery Bay. On the third day we deadheaded in to our last plot, completed several miles of line, and deadheaded north to the snowbound road by dark, where we went east to Toivola and were picked up by Richman at about 9 p.m.

On another trip, Werner and I avoided a tangled maze of swamp growth by snowshoeing on a long lake which ran in our

direction. A thin layer of ice had been kept from thicker formation by a heavy layer of snow. We ran on the ice, which broke with every step, as far as we could, and when our snowshoes became bogged with wet snow, we ran for the swamp. When the difficulties there became too great, we chanced racing on the lake again, knowing nothing as to the depth of the water beneath us. Werner had been quite venturesome in his first trips on snowshoes and ended up with a record number of spills.

At about this time, the hilarious, ne'er-a dull-moment "Smyth" (J. B. Smith) gave an exhibition in marksmanship for Holcomb and Stoddard. On a pack trip, with all hands eager for fresh meat, Holcomb spotted a snowshoe rabbit. Braced against a tree, Smith fired three shots at the rabbit, which ran over to Stoddard. Stoddard inveigled marksman Smith into giving him the pistol and killed it with one shot.

In marksmanship there were off days for gun-collector Sharp as well. While riding to work in the back of USDA 18-830 one day, Sharp had the driver stop so that he could shoot a crow. He rolled down the window, and taking careful aim, fired. Although his sight cleared the glass, the bullet went through the top of the window.

Ellstrom offered to pack on a difficult December trip in cedar swamps out of Gwinn, where Berger and I arrived late, and to Frederickson's dismay, wearing spats. On the pack trip, however, all troubles in the world descended upon Wimpy (Ellstrom) at once. Haugen, who was helping him pack, broke a snowshoe the second day out, and most of his load was added to the already overburdened Wimpy in the form of a top-pack. This pack frequently dislodged, and he had to return time and time again through dense barriers of swamp growth to get it.

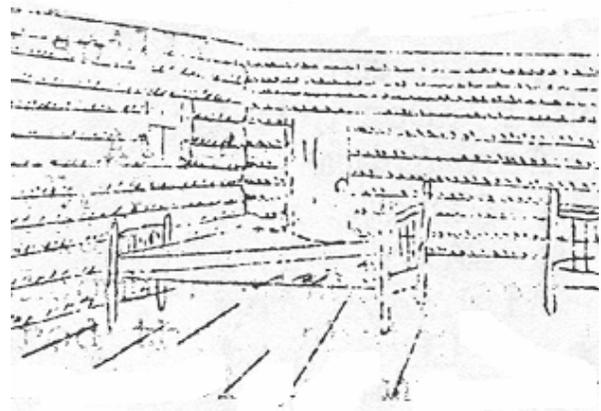


Wimpy takes
a top-pack

On one arduous day, after ripping open his cheek in running into a sharp snag, he cut open one of his new boots while making camp. When Sharp and I came into camp, he was sitting on a stump, glaring ferociously at a kettle of pea soup. The complete story of the mishaps and hardships for the day was written on his pale face, and he sat by the campfire gritting his teeth. I liked to tease him when he was very wild, so instead of offering any condolences, I said, "You're the homeliest and trampiest forester I've ever seen!" For a minute I thought he would chase me out of camp, but he sat down again on the stump, cautioning me he was in no mood for fooling. For once I took him at his word. We tried the peas innumerable times, and although we were still cooking them long after dark, they showed no signs of softening. Finally we threw the kettle in a snowbank and, without having had dinner, crawled into our sleeping bags for the night. In the morning the pea soup was frozen solid. We set it over a roaring fire, and the minute it became warm, the peas were soft. After eating this great breakfast, we faced the new day with renewed vigor.

One day Knight and Sauer set out on a stretch of survey line planning to reach by evening a road which, unbeknownst to them, was unplowed. The first night they found a tarpapered frame with on roof. Here they built a fire; Sauer, in drying out their socks let Knight's burn, so that they fell apart when he tried to put them on. On the second night of their trip, they found a hunting shack by another unplowed road. They cooked a rabbit which they had found hanging on the wall. They could not eat it, however, hungry as they were, and also found difficulty in swallowing a few tasteless pancakes they had made from a small amount of flour they salvaged. They slept in beds this night, but as there were no blankets available, they used the mattresses for covers. On the third day of

Used mattresses
for covers



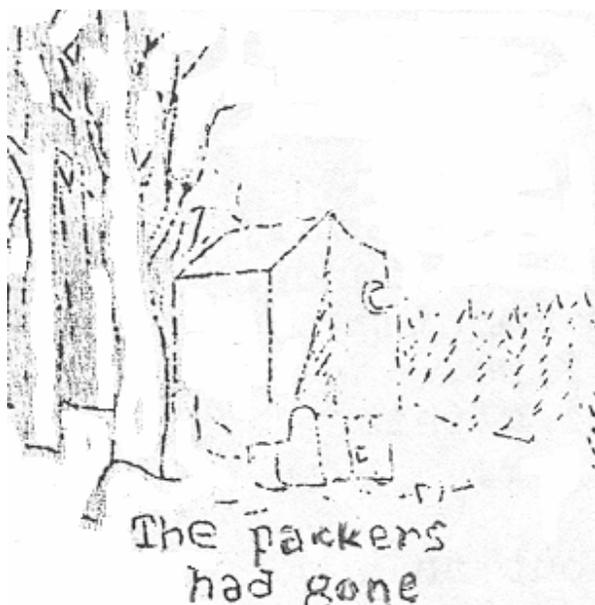
their adventure, Frederickson, who was much alarmed at their not having deadheaded south to a highway where a car awaited them, took the entire crew and went out in search. On the third road, they found a survey tag with information that led them to a tent, where Knight and Sauer were having tea. As Frederickson had brought lunch for them, they were finally able to break their long fast.

On another day Sauer fell and cut open his leg with an axe. The men found him in his room sewing it up himself, taking seven stitches in the gash with a common needle and black cotton thread.

While Cunningham was visiting Woolery's crew one night, Glassbrook, the proud possessor of a new .45, offered his revolver to him for examination. Although Cunningham demurred, Glassbrook insisted, so he finally took the large revolver, and holding it at arms length, asked softly, "Do you suppose a man is safe in the woods with only one of these?"

Stoddard and Holcomb came into camp one night expecting pack chuck, when Nick Zarlotti, their packer, served them an abundance of venison steaks. On another trip, with Gran, Holcomb was not so fortunate, however. On the second day out, north of Amasa, the packers left camp and equipment in the woods without giving notice of intent to leave.

In December Schatz was appointed to make studies in tax delinquent lands and forest ownership. He and Markkanen worked together. About this time Stoddard left the



survey to go to work on the NRA Lumber Code at Oshkosh.

With the approach of Christmas 1934, many men took leave. Because of difficult travel conditions in the Upper Peninsula, the east half was left for more favorable climatic conditions and the crews moved into the southern part of the State. Here the estimators were confronted with a conglomeration of new species to be keyed--yellow poplar, sycamore, sassafras, the gums, the locusts, new oaks, osage orange, catalpa, and many others. Headquarters in the district were Benton Harbor, Dowagiac, Kalamazoo, Sturgis, Hillsdale, Grand Rapids, Lansing, Ann Arbor, Detroit, Flint, Saginaw, Howell, Jackson, Battle Creek, Alma, Birmingham, Mt. Clemens, Mt. Pleasant, Sandusky, and Bad Axe. The winter was rather mild, and many rains and mists made highways icy and travel hazardous. The woodlots were grazed and park-like, and cruising here was a holiday for the estimators compared to their work in the maze of forest entanglement they had just left.

Early in January, the survey men who had taken leave met in Manitowoc after the Christmas holidays and crossed Lake Michigan in a car ferry. There was a violent wind from the north, and as the ship rolled alarmingly, Berger took great delight in narrating for Sauer and Kimball the dire histories of ferries that had capsized.

By February the crews had gradually moved up into the north half of the Lower Peninsula. On one sub-zero day I failed in an attempt to pole-vault a stream and slid waist-deep into the water, much to the delight of Dolton. But Wagner, beyond doubt, had the major pole-vaulting catastrophe in the unrecorded file of survey narrations. Not being the sort of fellow to get his feet wet in a knee-deep, wide stream, one time in Minnesota, he elected to

pole-vault across. He cut for himself a long, slim aspen pole, then, after backing away, he charged the stream with a great burst of speed, so that he might gain momentum enough to carry him to the far bank. The moment the pole was subjected to strain, it snapped and Wagner sprawled headlong into the stream.

Anderson and Mattson went into the Upper Peninsula to check the cruising of the estimators. There were eleven feet of snow in Houghton County by this time, and Mattson recalls kicking about in the snow for plot center tags.

During March, while the men were at Evert, Manistee, Ludington, and Big Rapids, most of the field men were brought into the office, which had been moved from Duluth to St. Paul. They were glad to be away from the "cauld, angry airt," but when a warm sun put in its appearance during the month of April, they were impatient to get back in the woods. They sat in the office and gaped out the windows. The odors of pine, cedar, and muskeg served to enhance the images in their reveries. Bill Duerr, who was computing foreman at the time, was much dismayed at his great motley crew of temporary "office clerks." Irene Sleizer, who was operating the coding machine, complained of drafts from the windows, cynically informing the men that they were no longer in the woods and could come to work without their heavy woolen underwear and sweaters and jackets.

In April, as the field men were leaving several at a time for Michigan, (to the envy of those who remained), a large staff of clerical workers were added to the regular office force to speed up computation and to replace some of those who had left. The men hired at this time were Armson, Cary, Duffy, Garvey, Heidenrich, Hill, Marazzane and Sullivan.

On April 15th I went over to Cadillac, where Knight, newly married, was headquartering. From Cadillac I went to Traverse City, but before leaving, I met Wilder for the first time since his appointment in January. He was sharpening a double-bit axe, which Tesaker maintained he used for shaving. I was not there long enough to learn much about his quaint phraseology, but heard him speak daily about Frederickson's typewriter as "that new-fangled, portable word-factory." I made the trip to Traverse City with a newly organized crew working under Frederickson. At this time we had to cross many streams, swollen by the melting snows. The Au Sable River was our greatest obstacle, in one area snaking back and forth across our survey line for a distance of twenty miles. We waded and swam its icy waters for a week before completing that stretch.

It was here that Ellstrom was almost cured of sleeping in automobiles. One day after Frederickson had dodged Wimpy's bobbing head innumerable times, driving along a snaky jack pine trail for several miles, he came upon a steep cliff in Interlochen Park. He drove the car off the road to the edge of the precipice, where all that could be seen through the windshield was a vast expanse of land hundreds of feet below. Here he raced the motor until it roared, and with pretended horror he cried out, "Look out, Wimpy!" Wimpy awoke, his hair standing straight on his head, his eyes popping out of their sockets, and his mouth a great soundless cavern. Frightened as he was, however, it was only a few days before he was again falling asleep to the lull of the engines.

Kimball, who had developed some kind of cat-walk which was supposed to resemble that of an Indian, had almost given up the practice at this time, but he still wore his ornamental buckskin jacket and tasseled boot

laces. These made him the subject of much bantering and heckling.

In the early summer of 1935, the crews moved north to Gaylord, Alpena, and Cheboygan. With the advent of warm nights and cherry blossoms, many of the men took a romantic turn. On Memorial Day, Gran was married at Peach Lake, and at this time he gave up snuff chewing, and began combing his unruly hair. On the same day, Frederickson's crew challenged and lost to Day's crew in a close game of kittenball at Alpena.

While at Gaylord, Amidon and Ellstrom found a day-old fawn. Wagner and I, who met them as they were coming out of the woods with it, kidded them and asked which one of them thought he would be a better mother than its doe. Mrs. Frederickson, who was at Gaylord with her baby, proved to be a great help in the crisis, and we were able to care for the fawn for a month of its infancy. When we left Gaylord, we brought it to a State park where wounded and domesticated deer were kept.

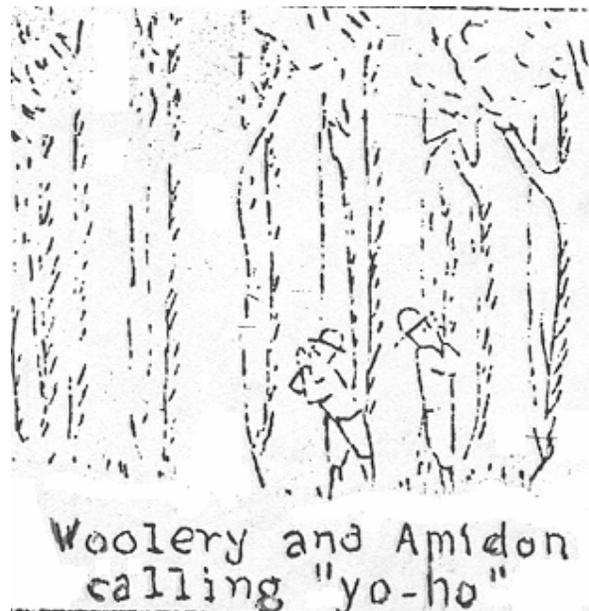
In June, Duerr went into the Upper Peninsula to make growth studies with Evans and a new man named Renaud. They headquartered at Houghton, Gladstone, Wakefield and Newberry, and in August moved into the Lower Peninsula, where they took growth samples around Gaylord, Mt. Pleasant and Hastings.

During the same month the survey crews had moved north into the Upper Peninsula again, with headquarters at Munising, Newberry, St. Ignace, and Escanaba. After but several weeks' work in the new unit, a curtailment of federal funds made necessary the transfer and furloughing of half the men. Because of the many friendships which had been made and strengthened through common pleasures and

ordeals, there were many sad leavetakings at this time. The remnants of the four crews were consolidated into two crews.

Mattson had been made computing foreman in the office. Here Danforth and Frost had been added to the clerical staff in June, Himmelwright, C. Peterson, and Pelsler in July. Holcomb and Stoddard shifted over to drain studies, Stoddard making the canvass of wood-using industries in the Upper Peninsula, and Holcomb making the studies of farm wood consumption and aiding the University of Michigan in the canvass of industries in Lower Michigan.

Wagner, Ellstrom and I moved down to Escanaba, where we joined Woolery. Good packers were difficult to get. Woolery and Amidon lost their packers, who were inexperienced, and were forced to abandon



the trip. They started out with the men again and this time spent two days in the woods looking for them. Without food, they wandered about the woods calling "Yo-ho" in all directions, while the packers were already in town with food and equipment. On one pack trip which Anderson took, the cook

asked him if potatoes were done when the water began to boil. In view of the bad luck with packers that other estimators had, in this vicinity, I avoided all short pack trips by starting out at daybreak, about 4 a.m., and running line until dusk about 9 p.m. I had Woodworth surveying with me, and as, after a recent recovery from pneumonia, the doctors had recommend rest for him, we finally arranged for Woodworth to work with Grove in recording diagrams of the merchantable and cull sections in sample trees.

Before Lawson arranged this shift of Woodworth into Ellstrom's position with Grove, I got into trouble with the brass hats. On Tuesday, Woodworth and I worked sixteen hours running nine miles of line in rain. We stopped over that night in a logging camp north of Nahma Junction. On Wednesday it continued to rain, but we ran seven more miles of line in twelve hours. It took us three hours to make our way back to Escanaba. Thursday was a beautiful day, and I spent it working over 128 tally sheets and correcting the township maps for discrepancies in the line we had run. Woodworth received a much needed rest, and it so happened that at noon he walked into Belle's Coffee Shop, all dressed up, where the potentates of the survey were eating lunch. The result was a decree to the effect that henceforth I would abandon the long hop-skip-jump system whatever difficulties were lightened thereby, in the future to plod my way to martyrdom with a keen regard for appearances and public impression.

During the summer, Kaufert made a study in the utilization of aspen for pulp and box lumber. Grove made separate utilization studies of other species as taken by the various industries, and the merchantability of standing timber.

One pleasant morning I set out on a stretch with Anderson and Downs, who had just rejoined the survey. We came to a cold, spring fed stream where, after having looked in vain for a windfall or some shallow place in the waist-deep water, we realized that our only means of getting across was to wade. I suggested that we flip coins, odd man carrying the other two across, rather than all of us suffer the wet discomfort. Downs lost, he descended into the stream, teeth chattering violently, and crossed with Anderson on his back. Then he returned for me. I did not



know Downs very well at the time, but I could not resist this golden opportunity for calling him "my good man" in supercilious tones. When he carried me across I kept on heckling him so that he almost slipped twice. I never could determine whether or not he had slipped purposely, but I recall that I rode the rest of the way in silence.

One hot day during the close of August, Margolis ran amok. He complained that perspiration kept running down his glasses, and although he could not see without them, he could not see with them, either. Although it was intensely hot, Wagner ran the line

through the hardwood lowland at full speed, trying to get away from the maddening insects. Margolis, inhaling small insects with every breath, ran into a springy cedar snag which catapulted him through the air. He snorted like an infuriated bull when he got up and charged the snag with a wild burst of speed. The snag did not break, however, but threw him backwards in the brush again. This time he ran at it with his hand axe, exclaiming while he hacked, "There, damn you,---take that, and that!" and when it came down, triumphantly, "and THAT!"

On September 10th, Lawson and Knight set out from St. Ignace to run a line on St. Martin's Island. They embarked in a 24-foot boat which they had hired, and the young pilot had a small skiff in tow. A wild storm came up and the skiff broke loose. As the pilot swung the launch to retrieve his father's boat, the rudder chain broke. They pitched at the mercy of the winds, taking in water for a half hour. Lawson, who had broken a finger on a pack trip, baled frantically, nonetheless. At the height of the storm Knight said, "Ed, we're in the hands of God!"

By the middle of September, we had completed the last lines around Munising. On the last day, before leaving for Manistique, Amidon, Wagner and I set out for the last stretch. The morning was cold, and I ran ahead with the chain at a brisk rate. I jumped through some dense brush and almost fell into a deep stream which was perfectly hidden. I knew what would happen to Wagner, who was snubbing the chain, if I hurried him at that point. After crossing the stream on a log, I raced ahead with the chain. In only a few seconds I heard a great splash, and amidst much blubbering, I heard Wagner liken me unto all vile and low forms of life and call upon God to visit me with righteous wrath, long overdue. While Wagner walked off to the side, talking to himself between

plots, Amidon began snubbing the chain. The slow-moving, deep, dark steam wound around in front of us again. There was an island in the middle which I could make in one jump, but it looked a little suspicious. Upon testing it with a pole, I found that it sunk and was nothing but a floating sod of grass which had broken away from a bank upstream. After crossing in another location, I pulled the chain ahead and returned to the stream as Amidon and Wagner came out of the woods. I saw Amidon eyeing the "island" with a goodly amount of doubt, so I called across to him "When you jump to the island, land with both heels. I nearly slipped off."

He backed away from the stream, and then, after gauging the distance for a moment, came running back. He made a perfect leap, and Wagner and I saw "island" and Amidon sink out of sight. Wagner could not help but laugh, even though he shivered in his own wet clothes. I nearly burst, for standing where I was I could see the woebegone expression on his face as he sank into the cold water. I was something like Caesar must have looked when he was stabbed and faced his friend, asking, "et tu, Brute?"

At Manistique we joined Knight's crew in the last of the survey work in Michigan. The men had a party at a night club for Nelson, who was leaving for Missouri. They had a gay time, and had a hearty laugh at Markkanon who received an unprovoked poke in the nose from a pugilistic woman. We related the tale in diverse ways later when Markkanen was near. Each successive narration portrayed him more and more villainously. We usually told this story when there were ladies present and everybody enjoyed our concoctions very much, except Markkanen, who sat uneasily, waiting for the "story" to unfold so that he could learn what terrible role he was to play in our creations.

After one year's work in the State, we completed the last lines in October, 1935. There was a mixed feeling in all of us that last day, - pride in a sense of accomplishment, and regret that this colorful and interesting task was completed. There were still vast tracts of virgin forest in the Upper Peninsula. We had visited pure hemlock stands with luxurious carpets of centuries of needles and towering, giant hardwoods with a cool, mossy floor. Packing through them day in and day out, we carried away with us the memories of their unforgettable splendor. One night in the fall, while preparing to go to sleep in a tent, I heard a mother wolf teaching her cubs to hunt deer. They yipped brazenly as they pursued a deer past the front of our tent and I heard the mother bark fierce warnings to them. I restrained the packer from shooting at them and long into the night heard the deer pounding their light hoofs on the frozen ground, and the young wolves yip-yipping at them deep in the forest.

We came upon clear, spring-fed pools where great trout abounded, out of the reach of man. And when we compared these wonders to the hills of Cadillac, where all that remained of a great forest was a panorama of charred stumps and sun-baked sands, or to other vast expanses of burned and desolate land, we left with a feeling of dismay. For as we prepared to leave for Wisconsin, the ring of the axe was much in our ears, and we knew that to clear cut and get out was still considered 'practical' by this little thing, men.



WISCONSIN

Werner, Smith and I moved to Hayward, where we joined Duerr in making growth studies. For a little more than a month we collected data on timber and cordwood volumes in undisturbed stands of various ages. We took samples around Park Falls and Viroqua. Because we had an insufficient number of samples of large spruce and cedar, Werner and I went up to Grand Marais, Minnesota, and took such plots as were needed to round out the study.

Woolery began survey work in the new State with Wagner, Lohman and Smith at Durand. Simonds, who worked with Scholz at the La Crosse experiment farm, joined the surveymen in an endeavor to collect information on soil erosion. Highlight of November was the afternoon Smith put on a burling show in Plum Creek at the close of the month. The act was a great one,



especially in the final scene when he brought down the house by falling in. Lawson and I spent the month at Park Rapids and Detroit Lakes finishing the general forest cover type map of Minnesota, which Cline had left in

accepting a permanent appointment at Lake City. In December Lawson and Scholz helped Simonds and me get started in special farm studies in the vicinities of Richland Center and La Crosse. Mrs. Edwards, who had been working at the University Farm office, shifted to Forest Survey, taking the place of Lillie Bodin who was about to be married to Harold Moser.

After the Christmas holidays, Woolery continued survey work at Arcadia, where his crew was increased by Ackerman, Dolton and Werner. Knight and Downs, with a new man, Quick, went to Viroqua. The two crews worked in this hilly section for a month before retreating to the south away from cold and snow. Here Woolery made headquarters at Monroe and Mount Horeb, Knight at Mineral Point and Baraboo. While working out of Monroe, Woolery's crew was hampered by drifting snows. The roads, having been cut into the rolling uplands, were veritable traps for snow which blew across the fields. In one storm the men got stuck and abandoned the car. On the following day, when they returned to shovel it out, it was completely covered by a drift.

In March, Lehmann started out with a crew at Baraboo, circling around in central Wisconsin through Mauston, Friendship, and Oshkosh then south to Beaver Dam, Waukesha, Burlington, and West Bend. In July he moved into northern Wisconsin with his crew (Quick, Werner and Bensed) and stopped at Medford, Ladysmith, and Phillips.

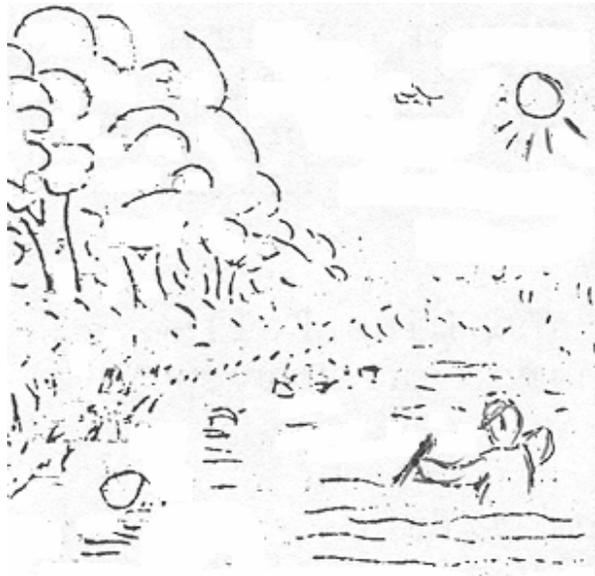
Day, with Ackerman, Sharp and Kimball, established headquarters at La Crosse. Here, during April, they fought their way over hill and through valleys, frequently digging themselves out of mud holes.

One day, as Kimball was driving, the gears locked just as the car sank deep in mire. With

only a hammer and chisel for tools, they took off the floor boards and transmission cover and released the gears. Since they were returning from work when this occurred, the evening was entirely spent by the time they had reached La Crosse and cleaned the mud off themselves. Ackerman set an all time high for the crew by getting towed out of mud holes three times in one day.

The crew continued working north in the western part of the State throughout the summer and early fall. They made headquarters at Black River Falls, Stanley, Bloomer, New Richmond, Frederic, Rice Lake, Hayward, Ashland, and Solon Springs. At Ashland, gun collector Sharp made a remarkable shot in the presence of Ackerman. Seeing two squirrels in a tree quite far from the car, Sharp fired. As one of the squirrels fell out of the branches, Ackerman lauded him for his prowess. Instead of beaming at this tribute, Sharp sat looking at his revolver in bewilderment. Finally he explained that he had shot at the other one. Dugas, Folsom, Jaskoviak and MacMaster joined the crew after some training under Woolery at Wisconsin Rapids. Folsom later joined Schatz with Case in land ownership and tax delinquency studies.

In the latter part of May, I was called off farm studies to pick up survey lines in the Wisconsin and Mississippi River bottoms, lines which had been left by the surveymen due to high water in the spring. The Geological Society had recently made excellent topographical maps, and I used them as a base for locating sloughs. As thousands of tons of silt from the loam hillsides choke up the channels each year, however, and the flood spreads across the lowlands cutting new deep waterway, the bottomland had been entirely transformed. I found many sloughs that had been stagnated by this shifting of river beds. Those that had



not been reached by fish rescue wardens contained large carp and catfish. The moment I would appear their fins cut furrows in the dark water as they streaked off. As I broke through dense willow, there was hanging about my head dried slime and debris which had been collected during spring levels. Mud turtles, snapping turtles, soft-shelled turtles jumped from dead heads and banks when I broke through the brush. Bull snakes and garter snakes glided over the dark, rancid water, devouring fluttering dragon flies. Frightened cranes forsook their feast of polliwogs and chubs and beat the air clumsily with their great wings. Hell-divers, coots, snipes, thrush, swallows, sparrows, preyed upon the multifarious small creatures which were bred in the warm water, and, in turn, afforded abundant prey for hawks that soared overhead, and owls that were perched in the dense foliage.

I came out of the lowlands so malodorously each day for two weeks that I could not return to La Crosse until I had washed away much of this stench by pouring fresh water over me. But for all its nauseating odors, I enjoyed the experience very much, for in the entire Lake States there is no other place where small

wild life is so abundant. There was a constant chatter, screeching and singing by the birds, and the water was ever kept in motion by pursuing and pursued.

The summer of 1936, coming in the wake of several years' drought, was one of intense heat. Sharp and Kimball took a pack trip out of Hayward during a heat wave early in July. On the trip Sharp wrung water out of sphagnum moss to drink. At this same time the temperature rose to 108° at Plymouth, where Woolery's crew was working. Dolton became ill from the heat just before the crew moved to Shawano, where they did office work for several days awaiting a respite.

Knight's crew, Downs, Smith and Livens, made stays at Black River Falls, Monomomie, Stevens Point, Appleton, Fond du Lac, Waukesha, Marinette and Antigo from March through August.

Woolery's crew changed from time to time. From the time of leaving Richland Center, where it initiated two new Chevrolets to the survey by frequent mud baths, until it reached Sturgeon Bay in June, the crew was much the same, composed of Wagner, Amidon, Dolton, Kobas and Alrick. Through the spring and early summer the men stayed at Wisconsin Rapids, Wausau, New London and Green Bay. At Sturgeon Lake Arnie Hanson replaced Amidon, who went on vacation. The crew went south to Manitowoc and Plymouth before going to Marinette.

Mrs. Edwards gave up her stenographic position, and Miss Keller, who was transferred from the Farm office, took charge of survey stenographic work.

On September 1, 1936, another curtailment of survey funds made it necessary to furlough many of the men. Shortly after that there was a general exodus from the office to help clean

up as much line as possible before snow fell. Duerr, Holcomb, Frost, and Anderson, who had been mapping, were added to Woolery's crew in Laona, while Schatz and Danforth went with Lawson's crew up in Iron County.

Shortly after Ron received his high-powered help, he moved up into a camp on Fay Lake in Florence County. Ron and his wife had their trailer, Bill Duerr and his wife moved into the upper part of a lake cabin, and the four "batches" (probably in the hopes of getting some good hand-outs) moved in downstairs.

The four batches consisted of Frost, Anderson, J. B. Smith and Holcomb, who became self-appointed cook. He had always talked a good meal, but everybody found to their satisfaction that he not only could make Spanish rice, but could make it in quantities large enough for an army.

Everybody worked hard trying to clean up as much lines as possible before snowfall. Frost, who had never admitted being a woodsman, did a fine job as compassman, Every day he pounded line with men who had the advantage of age and experience, and even though he came in wet nearly every night, his only comment would be, "I'd just as soon be home." Perhaps his homesickness was accentuated by Holcomb's cooking.

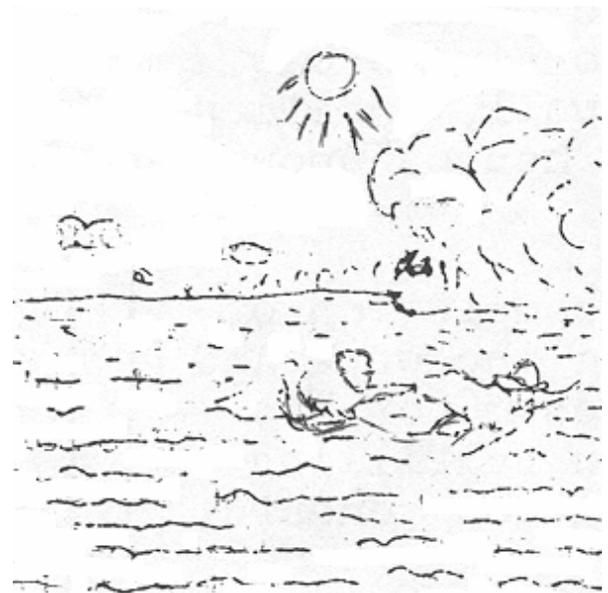
Ron's crew had some badly cut-over country to work in, but for the office "slickers", it was a real vacation. A few pack trips, one through Goodman's holdings, made the fall's work pleasant. Anderson and Holcomb ran the last pack trip there through Menominee Indian Reservation with an Indian packer, Bob Deer.

Up in Iron County, the tough men of the survey made their last assault on virgin timber and cut over - burned over land.

Lawson, Schatz, Grove, Ackerman and Danforth had beautiful quarters in a hunting camp from which they ventured forth each morning to make their "record" runs. Grove found that Schatz's long legs were hard to whittle down, and Danforth became convinced that there were parts of Wisconsin that no one had ever seen before.

Even though the "pencil-pushers", as Joe considered them, didn't clean up all the remaining line before they returned to the office, Cunningham felt that they hand helped a lot. The month or so of work had certainly been good for the swivel-chair foresters.

Gevorkiantz went out and helped Woolery run a stretch that entailed crossing the Namekagon seven times in one day. (Whenever Gevorkiantz went into the field he had to fight water. In the South it was the rivers and swamps.) After a difficult day in



dense brush, they waded the river for the last time on line. As they needed to wade the river again in deadheading out of the woods they took great pains to run an accurate line back to the river so that they could locate a shallow sandbar that they had found before.

When they returned a little while later, they were stunned at the sight before them. There, on the same line they had just surveyed, lay a lake stretched out for half a mile. Little, choppy waves danced on the top of it in the sunlight. George later described his reaction as being similar to what Balboa's must have been when he gazed upon the Pacific. As the lake stretched far north and south of them, and they would not know where to go if they forsook their compass, they strapped their clothes in bundles on their shoulders and swam across. In the evening they learned that a large dam upstream had opened its gates during the afternoon.

Through January and February, 1937, survey work stopped entirely. Lawson, Woolery and Ackerman worked on a canvass to determine the cut of forest products on the farms. Ackerman and Lawson visited their first farm on this study together. After having debated with Ackerman for a long time as to who should make the first interview, Lawson finally stepped out of the car, only to be bitten twice by the farmer's dog. It was difficult for the men to take time to explain the objectives of the survey to the farmer and still make sufficient progress on the task to satisfy themselves. Frequently they were faced with the problem of trying to win over disgusted and disgruntled individuals, of whom there were many, especially amongst the impoverished people in the barren sands north of Baraboo and on the cut-over, rock and clay lands of the northern part of the State.

Late in February the forest survey was resumed. New men, Miller, Beckert, Ostrander and Kaye, were hired to aid in completion of the lines. After a month of arduous snowshoeing, the last plot was taken near Tomahawk in March.

Wisconsin had presented a new picture in the mismanagement of forests. Here, spurred by the upswing in business, many of the large wood-using industries were cutting out the last of their timber holdings, and the people in many small towns were facing the future with dismay as their mills were being dismantled. In Minnesota desolate "ghost towns" were a thing of the distant past, with buildings and wharves crumbled and burned, avenues and railroad grades grown over with hazel, dogwood and alder, and small industries existing on second-growth timber. In Upper Michigan the extent of virgin hardwoods was great enough so that the people need have no fears for the immediate future. But in Wisconsin we saw "ghost towns" in the making, and in towns like Blackwell, families peered out of the cracked windows of their unpainted houses upon a deforested horizon.

At a dinner dance in St. Paul, celebrating the completion of the survey, many episodes were recalled in portraying the work and life of the surveymen. Said Field Chief Lawson in resume of his address, "It's been a big job and a long walk, and in fulfilling this task many friendships have been formed that will long endure."

Name	Job	Length of Service	
Amot, Arthur L.	Estimator	May 1934 to	Dec. 1934
Abreu, Edward ¹	Typist	Aug. 1935	July 1935
Ackerman, L. Wayne	Estimator	Oct. 1934	Aug. 1937
		June 1938	June 1938
Alrick, Adrian J.	Computer	April 1936	June 1936
Alstatt, George E.	Computer	Oct. 1934	Oct. 1934
Amidon, George B.	Estimator	June 1934	Oct. 1935
		April 1936	Sept. 1936
		March 1937	March 1937
Anderson, Esther ¹	Typist	April 1955	July 1935
Anderson, Frank ¹	Compassman	March 1934	April 1934
Anderson, Robert	Draftsman	Dec. 1933	July 1934
Anderson, Robert G.	Packer - Computer	Nov. 1933	Dec. 1933
		Jan, 1935	Feb. 1935
Anderson, Robert T.	Compassman - Mapping	Oct. 1933	Aug. 1937
Anderson, Victor E.	Computer	Jan. 1935	Feb. 1935
		Dec. 1935	Aug. 1936
Armson, Fred K. ¹	Computer	April 1935	July 1935
Bahr, Frank R., Jr ¹	Computer	Sept. 1935	Oct. 1935
Baker, Charles	Packer	Nov. 1933	Nov. 1933
		Nov. 1935	Nov. 1934
		July 1935	July 1935
Baker, Roy	Packer	July 1935	Aug. 1935
Barron, Lester	Packer	Oct. 1934	Dec. 1934
Basden, Irene ¹	Computer	Feb. 1934	April 1934
Bateson, Allen R.	Student Assistant	Nov. 1938	Dec. 1938
Beckert, Wilhelm M.	Compassman	Feb. 1937	March 1937
Beier, Herbert H.	Jr. Agri. Aid-Census study	May 1939	June 1939
Bensend, Dwight W.	Compassman	April 1936	Aug. 1936
Berger, Hlding E.	Estimator	Feb. 1933	July 1935
Bergquist, Elmer	Packer	Dec. 1934	Dec. 1934
Bodin, Lillie	Clerk	Feb. 1934	Jan. 1936
Bouchier, Reginald ¹	Computer	April 1935	July 1935
Brinkman, Herbert	Computer	May 1936	July 1936
Carter, Roy	Compassman	June 1934	Sept. 1934
Cary, LeRoy ¹	Computer	April 1935	July 1935
		Dec. 1935	Jan. 1936
Case, James M.	Ownership Survey	Feb. 1937	April 1937
Challacin, Alex	Packer	Dec. 1934	Dec. 1934
Chessen, Ben	Computer	Nov. 1934	Feb. 1935
Chilen, Hilbrand D.	Kansas Survey	April 1936	June 1936
Cline, Henry Ray	Estimator-Depletion Survey, Mapping	April 1934	July 1935
Connolly, Richard ¹	Computer	Nov. 1935	Nov. 1936
Cooper, H. K.	Kansas Survey	July 1936	July 1936

Name	Job	Length of Service	
Cummingham, R. N.	In charge, Forest Survey	Sept. 1933	
Cutliff, Benjamin F.	Computer	Oct. 1934	Feb. 1935
Cutting, Maloolm C.	Editor	Feb. 1937	Aug. 1937
Dalen, Gilbert C. ¹	Computer	May 1937	June 1937
Danforth, Gordon H. ¹	Computer Foreman	June 1935	Aug. 1937
Day, Maurice W.	Chief of Field Party	Oct. 1934	July 1935
		Jan. 1936	Oct. 1936
Deer, Robert	Packer	Oct. 1936	Oct. 1936
Diemer, Jack A.	Administrative Assistant	Sept. 1934	
Denny, Eleanor	Typist	Feb. 1936	May 1936
Dolton, Richard L.	Compassman	Oct. 1934	July 1936
Donovan, Harold ¹	Computer	Feb. 1937	July 1937
Doth, Albert L. ¹	Computer	Nov. 1935	May 1937
Downs, Albert	Estimator - Computer	May 1934	Sept. 1934
		July 1935	Aug. 1936
Dudick, Victoria I.	Computer	Dec. 1933	June 1938
Duerr, William A.	Estimator, in charge of Growth studies	June 1934	Sept. 1934
		Jan. 1935	
Duffy, James ¹	Computer	April 1935	Dec. 1935
Dugas, Wilfred S.	Computer	May 1936	June 1936
Duncan, J. L.	Kansas Survey	May 1934	June 1936
Dutcher, W. J.	Computer	March 1934	April 1934
		Oct. 1934	Feb. 1935
Edwards, Gordon L.	Draftsman	July 1938	Aug. 1938
Edwards, Kathryn	Clerk	Dec. 1934	Aug. 1936
Edwardson, Roy	Packer	Oct. 1933	Feb. 1934
Ellertson, Birger	Cull study	June 1934	June 1934
Ellison, John C.	Packer	Aoril 1934	April 1934
Ellstrom, Raymond	Estimator	Nov. 1934	Oct. 1936
		July 1936	Aug. 1936
Elzig, Gerald	Packer	Aug. 1934	Sept. 1934
Erickson, Arnold T.	Computer	Oct. 1934	Nov. 1934
Eshbaugh, Delbert E.	Kansas Survey	May 1936	June 1936
Evans, Thomas R.	Estimator	July 1934	Sept. 1935
		Dec. 1935	Jan. 1936
Everett, George	Packer	Sept. 1935	Sept. 1935
Farle, Hellene ¹	Computer	March 1934	April 1934
Farnham, Carlton	Draftsman	Feb. 1935	June 1935
Felton, Lawrence	Compassman	June 1937	June 1937
Flower, Harold D.	Draftsman	Dec. 1938	Dec. 1938
Folsom, Orrin J.	Ownership surveys	May 1936	June 1936
		March 1937	Sept. 1937
Frederickson, Franklyn T.	Chief of Field Party	March 1934	July 1935
Fritz, Anne ¹	Typist	Aug. 1936	July 1935
Frost, Howard E. ¹	Computer	June 1935	Aug. 1937
Frowine, Pauline	Typist	March 1937	March 1937

Name	Job	Length of Service	
Gafvert, Harry G.	Estimator-Depletion survey	Dec. 1933	Dec. 1938
Garvey, Michael ¹	Computer	April 1935	July 1935
Gervin, Bruce	Packer	Aug. 1936	Aug. 1936
Gevorkiantz, S. R.	Collaborator, Mensuration studies	Sept. 1933	
Glassbrook, Lee	Estimator	July 1934	March 1935
Graham, C. C.	Kansas Survey	May 1936	June 1936
Gran, Earl	Estimator	April 1934	Oct. 1935
Granson, John E.	Depletion surveys	April 1937	April 1937
		June 1937	Aug. 1937
Grove, Joseph O..	Estimator-Cull and Utilization	April 1934	Aug. 1937
Greene, Mary C.	Typist	July 1937	Aug. 1937
Gallman, Wallace	Packer	Dec. 1934	Dec. 1934
Haley, Mary	Typist	July 1935	July 1935
Hall, Joseph	Packer	Aug. 1936	Aug. 1936
Halverson, Harlow W.	Student Assistant	Nov. 1938	March 1936
Hanson, E. Arnold	Compassman - Draftsman	May 1936	July 1936
Hanson, Edwin A.	Computer	Feb. 1937	July 1937
Hanson, Marvin	Packer	Aug. 1936	Aug. 1936
Hart, Anne Q.	Typist	March 1937	March 1937
Hayes, Durell L.	Computer	Oct. 1934	Feb. 1935
Heidenrech, Michael	Computer	April 1935	July 1935
Hill, Fred	Computer	April 1935	July 1935
Himmelwright, Emil	Computer	July 1935.	July 1935
Hitchings, Jim R.	Compassman	Oct. 1938	Nov. 1938
Hogar, W. J.	Packer	Sept. 1934	Dec. 1934
Holbrook, Edward L.	Compassman	June 1934	Sept. 1934
Holcomb, Carl J.	Estimator - Depletion surveys	Nov. 1934	
Horn, Kenneth H.	Draftsman	April 1939	June 1939
Hougland, Kenneth	Kansas survey	May 1936	June 1936
Hubbard, Edgar R.	Estimator - Depletion surveys	Oct. 1933	Aug. 1934
Hussel, Irwin	Packer	Aug. 1934	Aug. 1934
Ilsley, Irene	Computer	Dec. 1933	April 1934
Isaacson, Wilbur R.	Ownership surveys	Jan. 1938	June 1938
Jackson, Charles	Compassman	Oct. 1933	Jan. 1934
Jackson, Milo O.	Computer	Sept. 1935	June 1936
Jaskoviak, Raymond V.	Compassman	May 1936	Aug. 1936
		March 1937	Aug. 1937
Jensen, Hayden M.	Compassman	June 1937	June 1937
Johnson, Clarence	Computer	Dec. 1933	April 1934
Jones, Jack	Kansas Survey	April 1936	June 1936
Kaufert, Frank	Cull Study	July 1935	Sept. 1935
Kampf, Frances C.	Typist	Jul. 1937	Aug. 1937
Kaye, Robert L.	Draftsman	Feb. 1937	Aug. 1937
Keiper, Arthur F.	Draftsman	June 1937	June 1337
Keller, Dorothy A.	Clerk	Aug. 1936	

Name	Job	Length of Service	
Kimball, James W.	Estimator	Oct. 1934	July 1935
Kissin, Joseph	Compassman	Sept. 1934	July 1935
Knight, D. Manley	Chief of Field Party	Oct. 1934	Sept. 1936
Kobes, Karl	Compassman	April 1936	Sept. 1936
Kron, Edward C.	Estimator	April 1934	July 1935
Kulas, John	Packer	Aug. 1934	Sept. 1934
Kuschke, Merrill H.	Computer	March 1937	March 1937
LaFluer, Dona	Packer	July, 1935	Aug. 1935
LaFluer, Fred	Packer	July, 1935	Aug. 1935
Laine, William	Packer	Aug. 1934	Sept. 1934
Larson, Andrew	Packer	Dec. 1934	Dec. 1934
Lawson, Edward L.	In charge, Field Parties	Oct. 1933	Aug. 1938
Lehmann, Arthur F.	Chief of Field Party	July 1934	Aug. 1936
Leiphart, William	Packer	Sept. 1935	Sept. 1935
Lenox, Opal	Typist	Oct. 1934	Dec. 1934
Lepak, Martin A.	Computer	Nov. 1934	Feb. 1935
Lever, Harold A. ¹	Draftsman	Dec. 1933	Feb. 1934
LeVeque, Eustace	Packer	July 1935	July 1935
Lewis, Clifford A.	Computer	Jan. 1935	Feb. 1935
Lindeberg, Robert	Compassman	Oct. 1934	July 1935
Livens, Warren H.	Compassman	April 1935	Aug. 1936
Lyons, Kenneth ¹	Computer	Dec. 1933	April 1934
Mackey, Bryan	Packer	July 1935	Aug. 1985
MacMasters, Lawrence G.	Compassman	May 1936	June 1936
Maloney, Robert T.	Compassman	June 1937	June 1937
Marazzane, Cyril ¹	Computer	April 1935	July 1935
Margolis, Reuben	Compassman	Sept. 1934	July 1935
Markkanen, Carl	Ownership surveys	March 1934	Aug. 1985
Martin, Dorthy	Statistician	Oct. 1933	
Masternbrook, William	Multilith Operator	April 1936	June 1936
Matthews, Orville S.	Estimator	Aprl. 1934	March 1935
Mattson, Milton M.	Computing Foreman,	Nov. 1933	Jan. 1934
	Compassman	Jul. 1934	
McCullough, John E.L.	Computer	Oct. 1934	April 1935
McDonald, Harry	Computer	Oct. 1934	Feb. 1934
McDougall, Raymond A.	Computer	Oct. 1934	March 1935
McGlade, James C.	Chief of Field Party	Oct. 1933	July 1934
McKey, Edward B. ¹	Computer	Aug. 1936	Dec. 1937
Milius, Hans C.	Estimator	April 1934	Sept. 1934
Miller, John A.	Compassman	Feb. 1937	March 1937
Miller, Lester C. ¹	Computer	Sept. 1935	Jan. 1937
Mohr, Maire L.	Typist	March 1937	June 1937
Morin, Joseph	Packer	May 1934	June 1934
Moser, Harold C.	In charge, Computations	Sept. 1933	
Moxness, Troy	Draftsman	Dec. 1933	April 1937

Name	Job	Length of Service	
Nelson, Ralph A.	Estimator	May 1934	Sept. 1935
Nicholson, George	Compassman	Dec. 1933	Dec. 1933
Nord, Robert	Compassman	July 1936	July 1936
Nordby, Henry ¹	Computing Foreman	Jan. 1936	
Nugent, William H. ¹	Computer	Sept. 1935	
O'Leary, Joe	Packer	July 1935	July 1935
Olson, Carl M.	Draftsman	May 1936	
Olson, George T.	Estimator - Computer	Oct. 1933	Nov. 1934
Ostrander, Myron D.	Compassman	Feb. 1937	Sept. 1937
	Depletion surveys	Feb. 1938	July 1938
Pager, Henry L.	Draftsman	Feb. 1935	July 1935
Paquin, Henry	Packer	Sept. 1935	Sept. 1935
Parchen, Edw. C.	Computer	July 1934	Feb. 1935
Pasco, Roy E.	Estimator - Computer	Oct. 1933	July 1934
Patterson, Archie E.	Ownership surveys	April 1937	Aug. 1937
Pecharich, M. Jr.	Packer	Aug. 1934	Aug. 1934
Pedo, Otto	Packer	Dec. 1934	Dec. 1934
Pelser, Ray H. ¹	Computer	Aug. 1935	Dec. 1935
Pelsessier, Charles F.	Packer	Oct. 1934	Oct. 1934
Perkins, Glern L	Compassman	Sept. 1937	Oct. 1937
Peterson, Andrew	Packer	Dec. 1933	July 1934
Peterson, Clarence E. ¹	Computer	May 1935	
Peterson, Lynn	Packer	Sept. 1934	Sept. 1934
Peterson, Martin	Packer	Aug. 1934	Sept. 1934
Phillips, Raymond R.	Compassman	June 1937	June 1937
Pierce, Alton ¹	Draftsman	Feb. 1934	April 1934
Pierce, John H.	Computer	July 1934	Feb. 1935
Poor, Chancey	Packer	Sept. 1934	Sept. 1934
Potter, Ivan	Packer	Dec. 1934	Dec. 1934
Priestley, Chas S. ¹	Computer	Dec. 1935	June 1937
Proteau, Ernest	Packer	Oct. 1934	Dec. 1934
Quick, Russell	Computer - Compassman	Nov. 1934	Jan. 1935
		Oct. 1935	Sept. 1936
Rasmussen, Carl	Packer	Aug. 1934	Aug. 1934
Renaud, Jules	Growth studies	June 1935	Sept. 1935
Richman, Hugo W.	Estimator	July 1934	Jan. 1935
Rinne, Felix ¹	Packer	Nov. 1938	Feb. 1934
Rinne, Oivo M.	Compassman	Feb. 1934	Mar. 1934
Rockwell, Frank L.	South Dakota survey	July 1935	Aug. 1935
Roe, Eugene I.	Special projects	Oct. 1933	
Roseau, Marjorie ¹	Computer	Jan. 1934	Jan. 1934
Rosekopf, John K. ¹	Computer	June 1937	July 1937

Name	Job	Length of Service	
Salo, Walter ¹	Packer	Dec. 1933	April 1934
Samuel, W. N.	Kansas survey	May 1936	June 1936
Sauer, John E.	Compassman	Oct. 1934	July 1935
Schatz, Louis W.	Ownership surveys	Dec. 1934	Sept. 1937
Schives, Hubert F.	Computer	Dce. 1933	Feb. 1935
Schmidt, Theodore J. ¹	Computer	Feb. 1937	April 1937
Schroeger, H. S.	Packer	Oct. 1934	Oct. 1934
Schul. Leonard J.	Packer	Sept. 1936	Oct. 1936
Schuler, James	Packer	Sept. 1935	Sept. 1935
Schwartz. Roman A.	Compassman	June 1937	June 1937
Scott, Howard	Packer	Sept. 1934	Sept. 1934
Sharp. Robert W.	Estimator	June 1934	Sept. 1935
		April 1936	Oct. 1936
		June 1937	Aug. 1937
Shoop, Carl P. ¹	Computer	Aug. 1935	Dec. 1935
Simonds, C. H.	Compassman, Farmwoods Study	Dec. 1935	Jan. 1936
		June 1936	June 1936
		Feb. 1937	Dec. 1938
Sleizer, Irene	Tabulating machine operator	June 1934	Aug. 1936
Smith, John B.	Compassman	Oct. 1934	Dec. 1936
Smith, Richard C.	Estimator	April 1934	Oct. 1935
Solheim, Albert ¹	Draftsman	Feb. 1934	April 1934
Stoddard, Chas H. Jr.	Estimator	Oct. 1934	Dec. 1934
		June 1935	Sept. 1936
Spike, Allen B.	Compassman	Sept. 1937	Dec. 1937
Stevens, Raymond E.	Estimator - Growth study	June 1938	June 1938
		Oct. 1938	Nov. 1938
Sullivan, Harold ¹	Computer	April 1935	July 1935
Swanson, Harold E.	Draftsman	Feb. 1936	Aug. 1936
Szaroletta, Ignace	Packer	Nov. 1934	Nov. 1934
Taplin, James	Compassman	April 1936	Aug. 1936
		March 1937	
Teasaker, Arvid	Compassman	Nov. 1934	April 1935
Thomas, Helen ¹	Typist	Oct. 1937	
Thornbrough, Wayne	Kansas survey	June 1936	June 1936
Tulloch, Allister	Packer	Nov. 1934	Nov. 1934
Turzak, Sam	Packer	Oct. 1934	Nov. 1934
Tye. James M.	Computer	July 1934	Feb. 1935
Tyson, Carroll ¹	Computer	March 1934	April 1934
Wagner, Jack A.	Estimator	May 1934	Sept. 1936
Wales, Ricahard W.	Draftsman	April 1939	June 1939
Walters, Howard	Packer	Dec. 1933	April 1934
Wanschure, John	Computer	Aug. 1935	Dec. 1937
Ware, E. R.	In charge, Kansas and South Dakota Surveys	March 1935	March 1938
Wells, Theresa M.	Draftsman	March 1937	June 1938
Werner, Justin V.	Compassman	Oct. 1933	Sept. 1935
Westfall, Frank ¹	Computer	March 1934	April 1934

Name	Job	Length of Service	
Westlund, Frank E.	Kansas and South Dakota Surveys	Dec. 1935	Aug. 1937
Wheaton, Charles	Typist	June 1937	June 1937
Whitacre, George ¹	Computer	June 1935	July 1935
White, Henry G.	In charge, Depletion surveys	Sept. 1934	
Wilder, Fred	Estimator	Jan. 1935	July 1935
Wick, Peter S.	Depletion surveys	Dec. 1933	April 1935
Wilson, John R.	Compassman	June 1938	Sept. 1938
Woodwarth, Richard I.	Compassman	Jan. 1935	March 1936
Woolery, Ronald J.	Chief of Field Party	April 1934	Sept. 1937
Wright, Charles B.	Computing Foreman	March 1934	Oct. 1935
Yerkes, William R.	Kansas Survey	May 1934	Nov. 1934
Yonkosky, John	Packer	Oct. 1934	Nov. 1934
Young, C. B. J. ¹	Computer	March 1934	April 1934
Yourgdahl, Olga	Computer	Dec. 1933	March 1935
Zoglin, Emanuel	Kansas survey	May 1936	June 1936

¹ Emergency personnel, employed under CWA, FERA, WPA (ERA).

Maurice Day, Jack Wagner, Ed Lawson, Dick Smith

FOREST SURVEY - Iron River MI, 1934



Dick Smith

FOREST SURVEY - Iron Mountain MI, 1934

