for throwing boulders to the surface. For breaking them up when out, place the explosive in a crevice or depression in face of the rock. If there is no crevice and cannot be easily drilled, use a very speedy explosive, sixty percent straight. Place the charge on the surface and cover with a mushy, wet clay. This generally breaks it without any difficulty. If the boulder is large and very hard to break, it has been found very satisfactory to explode a small charge on its face to get a depression and then use this as a seat for the larger charge and carry out the same as above.

The Handling of Dynamite.

Great precaution should be taken in the handling of dynamite when it is in the frozen condition, since then the particles of nitro-glycerine seem to be isolated and it is very sensitive. In thawing it, above all keep it away from the house and the kitchen stove. A good way to thaw it on a farm is to place it in a sack and open the top of the horse manure pile and place it there the evening before using it. In the morning it will be found thawed out. Another method is to place it in a receptacle and this is placed in a larger one containing hot water.

DISCUSSION.

A Member—If you light about twenty stumps at the same time, how long should the fuse be cut?

Mr. Kadonsky—The fuse should never be cut any longer than it is necessary to connect the primer in the charge and extend to the surface to be conveniently lit. They can then be lit very rapidly, especially when a hot rod or a live brand is used.

A Member—Wouldn’t it be best to say a prayer before you go from one to another?

Mr. Kadonsky—Well, I believe it is a good plan to say a prayer at any time if one’s conscience troubles him, but I do not believe it is especially necessary while blasting stumps, because there is not any more danger in blasting than in doing any other piece of work if one knows his business and is careful.

CLEARING NEW LANDS.

L. E. Scott, Stanley, Wis.

On the wall of a corridor of the Wisconsin Agricultural College hangs a sheet of brown paper, a little better than six feet square, placed there by Dean Henry. Upon the lower right hand corner is written, “This represents the amount of land, at sixty dollars per acre, that can be purchased for the price of a five-cent cigar.”

The Wisconsin Advancement Association is calling for settlers to develop 5,000,000 acres in northern Wisconsin. Some of these lands of good quality and desirable location may still be bought for fifteen dollars per acre. It requires but little figuring to show that at this price a plot a little over twelve by twelve feet, or, to be accurate, 145.2 square feet, can be purchased by this same despised nickel that the young man of today so carelessly puffs into smoke.

I have carried this a little farther and find that a young man with red blood in his veins can clear this amount of land of brush and loose rubbish in the fifteen minutes that he
Mr. and Mrs. Christ Otness of Stanley, who cleared ten acres and built these buildings after Mr. Otness was sixty-nine years of age and they are still well and hearty. Mr. Otness is now seventy-eight years old, they are making a good living and are happy.
would devote to smoking the cigar. This would be at the rate of seven and a half days per acre.

I will leave it to the doctor to say which is the greater tax of vitality upon the system; the quarter of an hour spent in clearing land, or in smoking the cigar; but from my experience, I would take chances with the former.

I have used my pencil a little farther, and find that if planted three feet eight inches apart, this plat of land will raise eleven hills of corn and with four ears to the hill, we would have forty-four ears, which, at the current price of sweet corn out of the grocery, would amount to forty-four cents, or the price of nearly nine cigars. At three feet apart each way, one can raise sixteen hills of potatoes, which, with good care, should yield one bushel, the equivalent of which would feed a moderately sized family for a day.

Then again, within his lifetime the young man might expect to see this land increased in value tenfold, and all for that one innocent and thoughtless cigar and the time spent in smoking it.

Cutting Brush.

In clearing this land, I would first cut the brush and carefully pile, laying it straight, with tops one way, picking up what rubbish I could readily handle and pile at same.

The best tool I have found in cutting brush is the weed scythe; a blade of medium weight and length, hung on a strong grass scythe snath.

Autumn is an excellent time to brush land. If cut before the leaves fall, they will burn better, but they cut the best when the ground is frozen, before snow comes.

When I first went north, I asked a friend if he knew of any one to whom I could let a job of cutting brush. His reply was, "If you let a job of brushing, be sure it is to some one who understands his business." I would have you infer from this that cutting brush is not the unskilled and menial service that many consider it. But on the contrary, he who takes an acre of wild and undeveloped land, clears it and starts it well on its Heaven-born mission of providing food for the human race, is just as much of a man as he who tills older and time-honored soil. In fact, he is doing better than to "make two blades of grass grow where but one grew before," he makes three grow where none grew before. All honor to the Pioneers. Their's is a rare privilege. They fill a niche in the world's history that no other men can fill.

"Ay call it Holy ground,
The soil where first they trod."

Cutting the Large Timber.

The amount of marketable timber left by the logger varies; at best it is not a large amount; it may be basswood and elm bolts; it may be pulpwood, or perchance a little saw timber, useful in the construction of buildings on the farm.

After brushing, the next step is to cut the larger timber and pile the limbs and waste pieces on top of the brush piles already started.

This is best done in the winter and the piles may be sufficiently dry to burn well the latter part of April or in May, depending upon the season.

Burning Brush.

In burning brush, I have tried many plans. When a boy, I was obliged to carry live coals from one pile to another. My bald head is not the result of "early piety," as many suppose, but rather from heading in on the seething mass to "snatch a brand from the burning" and then cool off by blowing it to a flame under the next pile. I have carried these brands
Potatoes and other products grown on newly leared land, exhibited at Fair at Stanley, Wls., 1911.
with shovel, with fork and with tongs: I have used torches soaked in coal tar and with kerosene; I have even used the gasoline blow-torch, but now when I go out to burn brush I fill my pockets with matches and take a can of kerosene in my hand. I pick up a dry piece of wood and if it is a little rotten and punky, so much the better. I turn on about a half a tea cup of kerosene (just what will soak in nicely), and light it with a match. I then lay it on top of the center of the pile and pick up a little fine, dry rubbish and put on top of that and soon have fire kindled that will burn down through the pile. A gallon of kerosene costs eight cents and will double the day's work. A fire in the roof will burn a house just as completely as one in the basement.

A bright day with a light breeze is the best time to do this work. A gale will drive the flame out of the pile, burning out the fine material and leaving the coarse limbs. A light breeze is preferable. The fire will burn out the entire center and leave but a light fringe on the outside, if any. With an old fork, this should be thrown in while the center is still alive with coals, and the burning is complete.

You are then ready for the crop; for sowed crops or for seeding down to grass. There is probably no better tool with which to stir up the vegetable mold than a spring-tooth harrow. Where a meadow is desired, I would use this tool vigorously and pick up all rubbish. If only a pasture, I have seen a good catch on clay ground by just scattering the seed without harrowing if the weather is favorable, but even then a light harrowing gives better results.

One can get on very well mowing a good stand of grass between stumps, but the settler works to better advantage if he has a little improved land upon which to grow his winter feed and can pasture his stump lands till the stumps can be well removed.

**Stumping.**

The stumps can best be extracted after a few years of rotting, especially the hard-woods, and then always with explosives.

Plans are now on foot to clear lands on a large scale with powerful machines. The Soo road is now building a stump puller in Eau Claire at a cost of eight thousand dollars, which they will put in operation in the spring, but so far as this plan has been tried it has been found expensive and one serious objection is that much clay adheres to the roots and is dragged over the surface soil to its serious injury. Then much valuable top soil is taken to fill the deep holes from which the stump was removed.

Upon sandy soils where dynamite is not so effective, the moderately sized cable grubbers may be serviceable, but on clay soils I will take dynamite whenever more power than a team with a single block is needed. It is cheaper and more serviceable than any other power and the only objection to it is the headache which often accompanies its use. This does not come from the concussion and probably not so much from the smoke and fumes following the explosion as many suppose, although it is well to avoid the gases as much as possible; but it is more frequently caused by absorbing the nitro-glycerine through the skin in handling the dynamite. This causes an over-stimulation of the heart. I have experienced a severe attack of headache, nausea and vomiting from merely opening a box and picking up a couple of cartridges with the bare hands. Dynamite should be handled with gloves.

Dynamite should be used at 50° F. or above, or when it is soft enough to yield to the pressure between thumb
Corn, Dairy Products and Canned Fruits, products of the New Norbl. exhibited at Fair at Stanley, Wis., 1911.
and finger. If hard, it should be placed in a warm room a day or so, and if the weather is cold, a few cartridges at a time taken to the field and kept covered with a cloth. If necessary to thaw it at once, this is best done by putting it in an earthen jar and setting the jar in a pail of warm water, keeping the dynamite dry. Never place it near a fire.

Just after the frost has gone out in the spring is the best time to use it. The ground then offers the least resistance to the roots and the holes can be the most easily made. We use a sharp crowbar for this purpose, making a hole large enough to admit the cartridge. We put in a half cartridge at a time, first splitting the jacket with a sharp knife, then with an old broom handle we firmly crowd this to the bottom of the hole; then another and another, if necessary. Of course the last piece put in, containing the cap and fuse, cannot be so firmly crowded home. We do not split the jacket of this, but gently tamp some soft clay over it. If water is convenient, I would pour in some of that, which excludes the air and nothing more on top is needed.

Much more force is obtained if the charge is compact in the bottom of the hole. Boring a large hole and placing cartridges side by side gives poor results and is a great waste of material.

The hole should be punched between the roots at an angle that will bring the charge under the center of the stump just as close up to the stump as possible. It is a mistake to set the charge deeply in clay ground.

In case of a hollow stump, or if the crown has been burned off, a small charge must be placed under each outlying large root, one at a time.

One advantage in the use of dynamite is that the stump is split up and clean from dirt, making it much easier to pile and burn.

The expense of stumping varies from six dollars per acre on hard-wood land cut ten years to sixty dollars for removal of green hard-wood, or a thick setting of large pine. I have always been in favor of pasturing till stumps are fairly well rotted, say about seven or eight years.

There is another plan which begins to appeal to me where one is in greater haste. It is to blast green stumps with light charges but not remove them. This hastens the decay so they can be easily removed in two or three years thereafter. In the meantime, many of these may be burned, and the cavities under the stumps will have become so filled and firm as not to interfere with plowing. A freshly blown stump hole, in a wet season, is sometimes pretty soft for a horse.

It is economy of labor to make small piles of stumps and logs at nearby points, rather than haul farther and pile higher. After burning, the few fragments left may be readily assembled and fired again.

Always blow the large pine stumps first and if not entirely out, pile rubbish around them and when the wind is dry, burn and the labor will be greatly reduced.

So many seem to object to going into the timbered country on the grounds that the clearing is so laborious and requires so much time. They say they prefer going on to the prairies of the west, or to Canada, where they can get results so much quicker and easier.

As an inspiration and example to young men, I would like to show you what one of my neighbors has done. He started in at the age of sixty-nine years on ten acres of absolutely wild land. Being near town, this cost him five hundred dollars (fifty dollars per acre). Being handy with tools he put up his buildings with little help other than his own hands. In nine
years he has done this and has himself cleared the land and made a good living for himself and wife. He has been offered three thousand dollars for this little home, upon which he has placed a higher value. He keeps no horses, but hires a man and team now and then as needed. He keeps cows, a few hogs and poultry and has a good garden. He is now seventy-eight years of age, hale, hearty and happy.

DISCUSSION.

A Member—How do you fill holes?
Mr. Scott—If they need filling at all, we fill them with the grub hoe or mattock. Many of them do not need filling.

Mr. Torkelson—I have had some experience with dynamite and we want to remember that dynamite is most dangerous when frozen, most of the accidents occur with dynamite which has once been frozen; that is, after it has been frozen and is being thawed out. The only theory I can invent to account for that is that the freezing tends to isolate the drops of nitro-glycerine.

Mr. Kadonsky—I believe you are right on that point, because when dynamite is in a frozen condition I have known of instances when during the process of breaking a cartridge it exploded with serious results.

Mr. Torkelson—I have known of instances where it would catch fire when it has been frozen.

Mr. Kadonsky—if dynamite is frozen and receives only a very slight jar, that is the time it will go off. It will burn just like a candle if you do not jar it.

Mr. Aderhold—Did you hold it in your hand like a candle while it was burning?

Mr. Kadonsky—No, I would not recommend that, although I have done it as an experiment.

Mr. Torkelson—It will be an im-
DISCUSSION.

willing to wait for part of it, this cost can be much reduced. I have known lots to be cleared of brush and stumps as low as ten dollars an acre.

Mr. Hirst—What would it cost an acre to prepare it for a road machine; taking it right out of the green?

Mr. Scott—I should say fifty dollars would be a fair average.

Mr. Kadonsky—It is awfully hard to take the figures as they stand today, because a great many men are simply experimenting. You spoke about a stump machine that the Soo Line were using. They have got it down as low as ten dollars an acre on cut-over lands. This includes stumps and down logs, but not green timber.

Mr. Scott—Do not infer if you take more time to do this work that the time is really wasted. Just as soon as the brush is removed and this land is into grass, it is bringing in a revenue. The cattle will probably get just as much value out of that land as pasture as if the land were entirely clear from stumps. The old cow is bringing in a good many dollars feeding between these stumps.

A Member—How do you handle brush which is too large to be cut with a scythe?

Mr. Scott—We cut that with a good sharp axe, close to the surface of the ground; but with that weed scythe, when one gets used to cutting brush with it, he can cut brush nearly an inch in diameter.

Mr. Kadonsky—When we get into northern Wisconsin, where some of the land has been burned over in places, we will find a growth of poplar. I have had some experience with that. In the spring of the year, when everything is dry, we set fire to it and it burns up the loose material, dead grass, and so forth around the small trees, which causes them to die the following summer. During the summer and early fall, the grass, which grows so abundantly in Northern Wisconsin, grows up among these openings and furnishes some more combustible material. Then during early fall, when everything is frozen up and before the snow falls, or perhaps when there is little snow on the ground, we take a heavy roller or a big log with a team hitched to it, and this breaks down all material, including the trees. Then the snow in the winter will break them down still farther with all that grass grown up and the following spring, when it is pretty dry, we put a fire in there again and it cleans it up pretty thoroughly.

Mr. Hirst—What is the difference in cost between twenty-seven per cent dynamite and forty per cent?

Mr. Scott—I haven't the exact figures, but there is quite a difference. I think the forty per cent averages about seventeen cents.

Mr. McLeran—I think about fourteen.

Mr. Kadonsky—And the twenty-seven per cent I think is about two and a half cents or so less than the forty per cent. The twenty-seven per cent dynamite does not contain so much nitro-glycerine. It works slower, propelling rather than shattering. We use about the same amount as we do the forty per cent. The more speedy dynamite will cut our roots and leave them behind, it shoots out too fast. You want the slow, propelling force for clay conditions, or wherever you can use it.

Recess to 1:30 p. m.