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GETTING RESULTS FROM SPRAYING.

MAN is in an eternal fight with the forces of nature to maintain things as he desires them. This fight is often made more difficult because in disorganizing natural conditions to suit himself he has unbalanced the natural order of things. He has, in changing conditions to suit himself, made them favorable for the development of pests and unfavorable for the well-being of parasites. Through our own efforts, then, we have made it necessary for us to fight for what we deem perfection in our farm crops.

Spraying Essential in Orcharding.

The spray machine charged with the proper spray mixture, is our chief instrument of destruction in the campaign against fruit insects and diseases. Spraying is practically the only undisputed orchard operation, as in our ideas of pruning, cultivation, etc., we may have our differences of opinion and have results to substantiate these various opinions, but there are no two ways about spraying. We have to spray, and spray the right way, to get proper results.

Where differences may come in spraying is in the matter of thoroughness, and due to the different ideas as to what thoroughness is, we mainly get our variations in the results from spraying. Poor results we blame upon the particular brand of commercial spray material, or the kind of spray material we are using, but when the matter is investigated in an unprejudiced way the lack of thoroughness is found the chief cause of the trouble.

Spraying as a Preventive.

Spraying is considered a preventive and not a cure. It should, therefore, be done before the particular condition, which we are fighting, arises. The object of spraying is to thoroughly cover all parts of the tree or bush with mixtures which are fatal to the insects or diseases which attack them. Any place left uncovered is opened to the attacks of these various pests.

A mighty mite, the San Jose scale, an insect the size of a pinhead, has been more responsible for the recent rapid development of spraying than anything else. It made the issue one of spraying or quitting the business, and more than anything else it made fruit growing a specialized business.

But now the scale has ceased to be a fear to fruit growers, as annual thorough spraying will keep it in check. Being a sucking insect, thoroughness is most essential in spraying for it, as it is not killed until it is covered with the spray material. As the scale spreads most rapidly on the new wood because it can get to the sap more readily, special attention must be given to spraying tops of the trees and the smaller limbs.

The Popular Spray Material.

Lime-sulphur is accepted as the most popular scale destroyer. It can now be purchased so cheaply in commercial form that that is the advisable way to get it. According to law, all brands of the commercial mixture

have to be true to their label, specifying the contents. Therefore established brands can be relied upon. Most brands guarantee a test of 32 or 33 degrees Beaume, and at such strength they should be diluted at the rate of 1:8 for scale spraying.

While it is safe to spray for scale any time during the dormant season, better results can be had if the spraying is done in fall or spring. The lime-sulphur does not seem as effective when applied during the freezing weather as at other times. Spring is the ideal time, as then some fungicidal

of aphid the use of commercial tobacco extract will undoubtedly become common. This when used just before and after the blossoming time will keep the aphid in check of the work is done thoroughly. It can be put into the arsenate of lead and lime-sulphur sprays used at that time, thus saving the cost of an extra application. As the strength of the different brands vary they should be used at the strength advised by the manufacturers. The chief factor in the control of the aphid is to kill the few remaining in spring and thus get rid of a source of others.

While Bordeaux mixture was the prevailing fungicide a few years ago, dilute lime-sulphur is now most commonly used. Bordeaux is probably a slightly better fungicide for some purposes, but the handiness of lime-sulphur and the results obtained with it make it popular. Dilute lime-sulphur with arsenate of lead makes an ideal combination for spraying apples, pears, plums and cherries. On apples the lime-sulphur should be used at the strength of one to 40, while on the other fruits one to 50 will give good results without injury to the foliage. The arsenate of lead should be used at the rate of two to two and one-half pounds to 50 gallons.

Good Equipment, Necessary.

As spraying, at its best, is a disagreeable job, one must have proper equipment in order to facilitate thorough work. Poor equipment makes thorough work especially hard and will be the cause of enough loss in poor fruit to pay for several spraying outfits. For small trees the hand pump outfit will do fairly well, but for large trees and where a large number of trees are sprayed the power outfit is necessary. One which is simple in construction and can maintain at least 200 pounds pressure for two leads of hose, should be sought. Good hose, improved couplings, light spray rods and modern nozzles, etc., are things which prove good investments by saving time and improving the quality of the work done.

It may be policy to be economical in some of the orchard operations, but in spraying one should not hesitate to spend money for things which will make for better results. Good equipment and plenty of spray material should be used. An extra investment amounting to a small extra cost, per tree in spraying will often result in a large increase in yield of good quality fruit.

Thoroughness Necessary to Get Results.

To get results from spraying, the right spray materials, thoroughness in application and spraying at the proper time, are necessary. The first is easy. Formulas have been briefly suggested above and advice regarding them can be had from various sources, such as the experiment stations, farm papers, etc. Information regarding the proper time for spraying can also be obtained from these same sources. On account of seasonable changes there will occasionally be slight changes in the time for spraying, so it would be policy to keep in touch with one who is informed along this line.

In the matter of thoroughness one can get little help from others as it all depends upon the one who is handling the spray rod. Under no conditions let anyone but a thorough man handle it. He is worth several careless men because he is the greatest factor in getting good results from spraying. Getting results from spraying consists of knowing how to do a good job and then doing it.

(Our 20th special article.—Eds.)



A Good Spray Equipment is a Great Aid in Doing Thorough Spraying.

effect is derived from the application. If one does not intend to apply a fungicidal spray just before the blossoms, the scale spray should be put on as late in spring as possible. When the leaf buds are beginning to burst is a good time.

As the scale attacks all the fruits, except the sour cherry, they should receive annual spraying. We cannot hope to eradicate the scale but can keep it in check by persistent work. On peaches the scale application should be made early so as to control the leaf curl. It is absolutely necessary to spray for this disease before the buds start swelling and it is generally figured that some time before March 15 will do. There are advanced seasons, though, when it is necessary to spray before the first of March.

While the lime-sulphur is most commonly used, the oil sprays are also effective and are preferred by many because they are more agreeable to handle and spread over the tree more thoroughly, making it more easy to accomplish thorough work.

On account of the increasing amount

With the exception of peaches the spraying of tree fruits is very similar. The formulas used and the times for spraying are all alike. There is the application just before the blossoms which all get. On the apples and pears this application is made mainly for its fungicidal effect while its insecticidal effect is of value on cherries and plums. In many cases the poison is left out of this application on apples and pears, but it is usually advisable to put it in.

The Summer Applications.

The application when about two-thirds of the blossom petals have dropped, and the one ten days to two weeks after, should also be applied on all but peaches. These are usually all the applications necessary on cherries unless the leaf blight is serious, and then another spraying should be made after the fruit has been harvested. On plums another application should be made again in ten days, while on summer apples and pears no more are necessary. On winter apples and pears another spraying about the first of August should be made.

Beans and Soil Fertility

A MECOSTA county subscriber submits the following question: "Do beans take much substance from the soil, and how hard are they on the land as compared with wheat, corn and some other crops?"

It is considered by many if not most farmers in the older bean growing sections of the state, that the bean crop quite rapidly exhausts soil fertility and that more difficulty is ordinarily experienced in getting catches of clover on land which has been devoted to the growing of beans. As a result of this general impression the bean crop has been largely abandoned on many of the lighter soils of the state where several years ago beans constituted an important cash crop, and at the present time this crop is grown more extensively on the heavier soils on what are commonly known as the best wheat lands in the state.

What Chemical Analysis Shows.

By way of answering this question, let us first compare the approximate amounts of plant food constituents contained in a good crop of beans as compared with the grain crops mentioned. Chemical analysis shows that the whole of a crop of beans yielding 25 bushels per acre, which is very much better than the average crop grown in Michigan, contains a total of 88 pounds of nitrogen, 24 pounds of phosphoric acid and 57.5 pounds of potash. Inasmuch as bean straw is ordinarily fed upon the farm where grown and the manure made from this source is returned to the land, it is proper to take into consideration the amount of plant food constituents contained in the bean straw as a separate item. Of the total above mentioned the bean straw from a 25 bushel crop contains 28 pounds of nitrogen, six pounds of phosphoric acid and 33 pounds of potash, leaving in the beans, or the portion of the crop sold, a total of 60 pounds of nitrogen, 18 pounds of phosphoric acid and 19.5 pounds of potash.

In comparison we find that a 25 bushel crop of wheat contains a total of 42.5 pounds of nitrogen, 16.6 pounds of phosphoric acid and 21 pounds of potash, of which the grain contains 30 pounds of nitrogen, 18.8 pounds of phosphoric acid and six pounds of potash.

Similarly a 25 bushel crop of corn, (shelled), contains 39.2 pounds of nitrogen, 13.8 pounds of phosphoric acid and 27.6 pounds of potash, of which the grain contains 32.2 pounds of nitrogen, 9.1 pounds of phosphoric acid and 5.5 pounds of potash.

A Practical Comparison.

First taking into consideration the mineral elements of fertility and reducing the theoretical yields here given to the proportionate average yields of these different crops in Michigan, we find that so far as mineral elements of fertility are concerned that an average bean crop takes from the soil around 50 per cent more of these mineral elements, namely phosphoric acid and potash, than does an average crop of wheat or corn. The bean crop also contains a much larger proportion of nitrogen, but inasmuch as the bean is, like clover, a legume, a very large part of this nitrogen is, under favorable conditions, appropriated from the free nitrogen of the air through the medium of the bacteria which forms nodules on the bean roots and thus does not deplete the fertility of the soil in this respect.

All things considered, then, if the total plant food constituents actually removed from the soil by a crop of corn or wheat were to be replaced in the form of readily available chemical plant food, the cost would be greater than would be the cost of returning to the soil the plant food constituents actually removed from the soil by beans of proportionate yield. This would be true, owing to the fact that in one

case the nitrogen removed by the crop all comes from the soil and that in the other case a considerable portion of it at least does not, and since nitrogen is a relatively expensive plant food constituent when purchased in an available form, the advantage would lie with the beans rather than with the other crops mentioned, so far as cost of supplying needed fertility on this basis is concerned.

The Rotation, Not the Crop, at Fault.

The reason for the general condemnation of beans, so far as their influence upon soil fertility is concerned is, in the writer's opinion, due more largely to the methods pursued by the farmers growing them than to the nature or character of the crop itself. Under the older methods of growing beans, this crop was usually sandwiched in between corn and wheat, making two cultivated crops in the rotation, thus tending to more rapidly exhaust the humus content of the soil and at the same time drawing more heavily upon its store of mineral plant food than warranted without supplementary fertilization by the natural processes which are constantly making the inert plant food of the soil available for the use of the growing plants.

In most cases where a marked depletion of soil fertility or undesirable changes in the physical condition of the soil have resulted from growing beans, it will be found that beans have simply been added to the usual crop rotation without the making of any provision for the addition of more vegetable matter or available plant food to the soil. Where beans have been given the first place in the crop rota-

tion following grass, particularly clover, and where judicious methods of fertilization have been followed, no such results have appeared, and beans have continued to yield well and prove a profitable cash crop.

The problem of the conservation and improvement of soil fertility is one which can be successfully solved only by the observation of certain underlying principles which obtain in every case, although the actual practice which may be followed to this end may be varied widely, and perhaps should be varied to some extent in every individual case. With the facts above outlined, and with a realization of the necessity of first maintaining the humus supply in the soil by the addition of sufficient vegetable matter, keeping the soil sweet and in a fit condition to make a home for the bacteria peculiar to leguminous plants and giving supplementary fertilization so as to keep the plant food constituents in the soil in a well balanced condition for the growing of the crops to which the rotation is devoted, any farmer can not only conserve but increase the fertility of his soil, granting that it has good natural or artificial drainage. One need not refrain from growing any crop because it is "hard on the land," since the amounts of available plant food actually removed from the soil even by such crops are not large, and if they are more profitable than crops which remove a less amount of plant food constituents when the cost of returning that fertility to the soil is considered, there should be no hesitation whatever in growing them. Good farming, like good business of any kind, should be so conducted as to get a maximum of cash return without the impairment of the capital upon which the business must be conducted in the future.

The Care and Use of Auto Tires.

NOW that automobiles have become such a common part of farm equipment, the question of the care and use of automobiles is one of direct interest to a large number of farmers. There is perhaps no single factor in the care and use of an automobile, save perhaps in the item of lubrication, that is of more general interest in this connection than is the question of tires. It is a common experience with all users of automobiles that some one or more tires in a set used on the same car will give far less service than the others of the same set. Often this is ascribed to a difference in the quality of the tires themselves, but far more often if the user searches for the real cause of this difference, it will be found to be due to a difference in actual conditions of use which are very easily and quite generally overlooked by the user.

Of all causes of tire deterioration, experts agree that under-inflation is the most fruitful of bad results. When a tire is imperfectly inflated, its walls are continually bending as the car moves, generating heat in the fibres of the fabric very much the same as heat is generated in a wire when it is bent back and forth in the hand. This constant friction weakens the wall of the tire so that in time it will not support the air pressure plus the weight of the car, and blowouts result. Also when tires are driven in this condition there is a tendency to separate the rubber from the fabric and even the plies of the fabric, thus hastening disintegration of the tire. It is practically an impossibility to determine the sufficiency of inflation by the appearance of the tire alone. Every automobile user should have, and frequently use, a tire gauge to determine whether his tires are sufficiently inflated.

There are many other reasons for tire depreciation. Sharp stones or other material will often be encountered in the roadway, which will make little cuts in the outer covering of the tire.

These may not look at all serious and be, indeed, scarcely noticeable, yet they are like bad habits in people, in that if neglected they may soon get beyond control and eventually destroy the usefulness of the tire. They admit water to the fabric, thus causing its rapid decay. This is a frequent source of small blowouts, which are often regarded as punctures by the inexperienced auto user. Or they may admit grains of sand and dust which form little pockets between the rubber and fabric, separating the two for a considerable area, making "sand blisters" or "mud boils," as they are often termed, and rapidly hastening the disintegration of the tire. These little cuts should be carefully watched, cleaned from sand and dirt with gasoline and then filled with cement and quick repair gum made for the purpose, which will set within a few hours and protect the tire from these deleterious influences.

Other common causes of tire deterioration are rapid driving around corners, setting the brakes too quickly, faulty alignment of the front wheels, exposure to oil and grease on the floor of the garage, unequal adjustment of the brakes on the rear wheels, slow leaks in the air valves of the inner tubes, stone bruises resulting from bad roads, spinning the wheels in attempts to move the car when stuck on a muddy road, overloading of the machine, rapid driving on poor roads, tire chains applied too tightly or left on the tire when standing on concrete floors, rough and rusty rims which tend to cause rim cutting and admit moisture under the tires, etc.

With proper attention to avoid these causes of tire disintegration, with care in purchasing to get good standard, advertised makes of tires, backed up by reputable manufacturers, and tires which are of recent manufacture and have been kept under proper conditions previous to purchase, the tire problem will be a less perplexing one to the auto owner.



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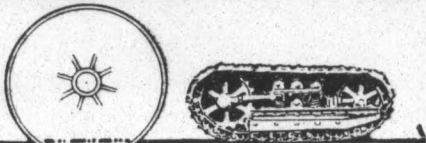
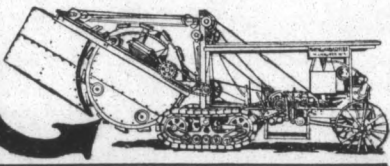


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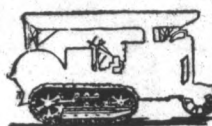


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FARM NOTES.

Treatment for Wireworms.

I have a field of about three acres that is infested with wireworms. What is the best way to get rid of them? Field is in wheat now.

Ottawa Co. J. V.

The best way to handle this land, in the writer's opinion, would be to seed the wheat to clover, as wireworms seldom harm a leguminous crop to any extent. Then devote the land to a short crop rotation, plowing the sod ground in the fall so as to make conditions unfavorable for the larvae over winter.

Plowing vs. Disking Bean Ground.

I have seven acres of bean ground, clean and free from weeds. It is a gravel and sand soil. I want to put on a good coat of manure and drill to corn for the silo. Should I plow it or disk to prepare a seed bed?

Tuscola Co. E. N. S.

Where bean ground is to be planted to corn it would be better, in the writer's opinion, to plow it, especially where manure is to be applied. It would have been a far better plan to have sown this bean ground to a cover crop last fall, using rye and vetch for this purpose and plowing same down this spring, together with the coat of manure for corn. Corn is a comparatively deep rooting plant, for which reason the above plan is advised.

Rape Crop a Failure.

I have a field adjacent to an orchard which I have sowed to rape for the last two years. The first year it did fine but last year it was a half failure. Was it because it had grown rape the year before? If not, I should like to use it again for the same purpose as the orchard contains a living spring and it is a convenient distance from the house for hog pasture. The hogs have been fed on this field more than seven months of each year, so it seems that the land should increase in fertility. Would you advise the use of other fertilizer?

Clinton Co. E. A. C.

It is difficult to ascribe the reason for the partial failure of the rape which is noted in this inquiry. The writer has a small hog lot which has been sown to rape each season for a number of years and produced as luxuriant a growth last year as ever. Some seasons, however, it has not done as well, and we believe that there is a possibility that the strain of seed used some seasons might be better than that used in other years. Then, too, seasonal weather conditions have quite an influence in the growth of this crop. A slight difference in the time of sowing, or a difference in temperature and moisture conditions might easily make a great difference in the yield of forage. Liberal fertilization pays with rape as with other crops, but on land which has grown rape and been used to pasture hogs which were fed a supplementary ration, additional fertilization should not be badly needed.

Salt for Wireworms.

I have a field of somewhat sandy ground, that I would like to sow to oats in the spring, and I think this field is badly infested with wireworms. I have been told that an application of salt would kill them. If so, how much would I apply per acre, and what effect would salt have on the oats? This field was sod plowed under in the spring of 1914 and sowed to beans and plowed again late last fall.

Sanilac Co. M. F. S.

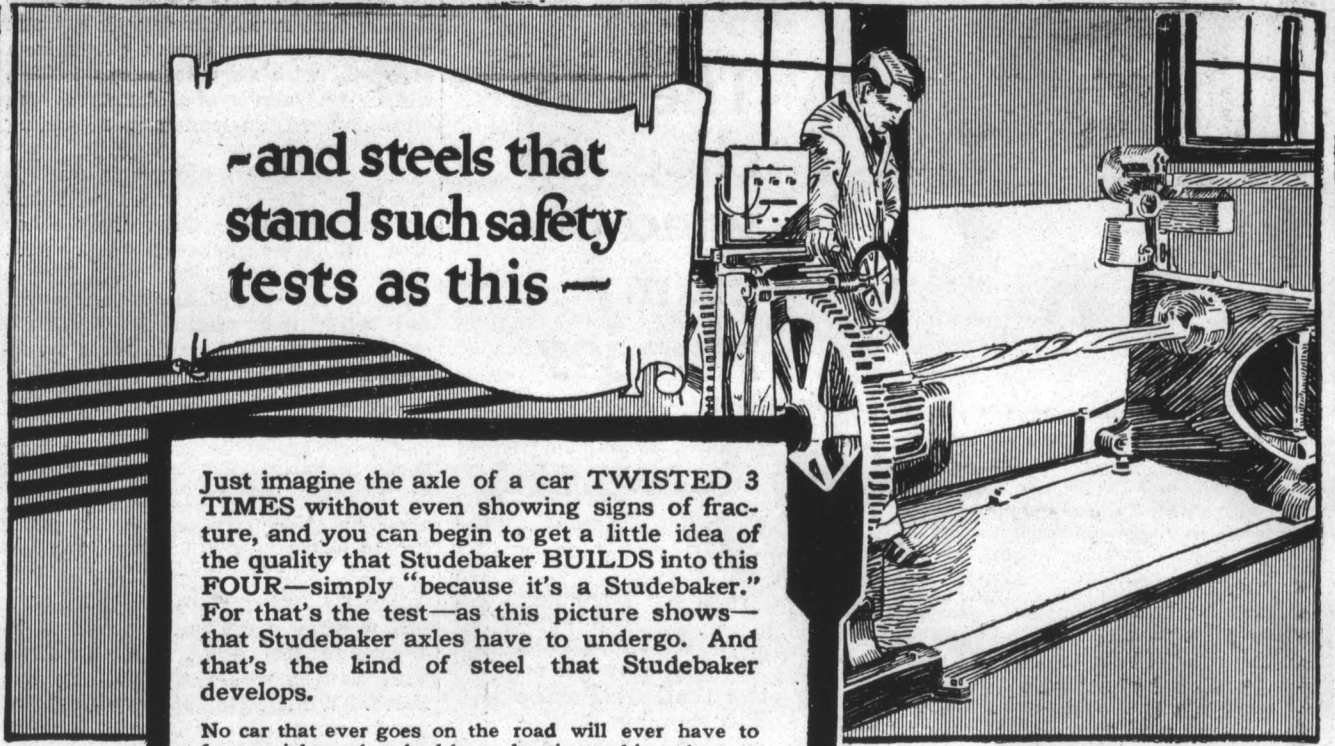
While in some localities good results have been claimed from an application of salt to discourage wireworms, yet the best authorities contend that no such application will kill the worms unless made so strong as to kill plant life. The best remedy for wireworms is fall plowing, and where fields are badly infested it is best to use a leguminous crop following sod, as they do not injure such crops badly. Land infested with wireworms is best used in a short rotation of crops.

Sweet Clover vs. Quack Grass.

I would like to know whether sweet clover would run out quack grass or not? Could you give me any light on the subject? Will sweet clover stand "wet feet" better than alfalfa?

Livingston Co. A. D. G.

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periment tried, it is a fairly safe conclusion that sweet clover will not run out quack grass. Quack grass is a perennial with very tenacious habits, while sweet clover is a biennial which must depend on constant reseeding for its perpetuation.

The best remedy for quack grass is thorough cultivation which will kill even its tenacious roots. Any other plan will, we believe, meet with failure.

Sweet clover will thrive on a wet soil better than alfalfa, but such locations are not favorable for its successful growth.

Clover Seeding Failed.

I seeded clover in a ten-acre field last year, six acres in oats and four acres in barley, but lost the seeding in the oats except in spots. Army worms clipped off many oats which came up after harvest a foot high. I seeded to clover again without results. What is the best thing to do with the field?

Bay Co.

S. W.

It is often a difficult proposition to determine just what is best to do with a field where the seeding has failed. While it might be possible to patch up a partial seeding as suggested on this oat ground, the writer has never found it a satisfactory method. It would be a better plan to plow up the poorer part of the seeding and sow to some substitute crop. If you want forage, soy beans would be a good crop to sow if the soil is light or in poor condition, or perhaps peas and oats if it is in good shape. Following the harvesting of this crop it would be a good plan to sow rye and vetch as a cover crop to be plowed down next year with the balance of the clover, which would add both vegetable matter and nitrogen to the soil, and thus prove quite as efficient as clover, with the exception of the necessary additional investment in labor and seed.

SOIL AND FERTILIZER QUESTIONS.

Fertilizer for Alfalfa.

I have about eight acres of corn-stubble ground of lightish soil, which has been run by putting in too many crops of beans and rye. I have been thinking of plowing it early then working it and sowing it to alfalfa and June clover. Would you advise sowing a little fertilizer, if so, what analysis and how much to the acre? I expected to sow it in June.

Livingston Co.

W. H. D.

I think it quite essential in getting a vigorous stand of alfalfa on run-down land to use a good liberal application of fertilizer at the time of sowing, or some time before sowing the alfalfa. Light sandy soil is also quite apt to be deficient in lime for best results with alfalfa, and 2,000 to 3,000 pounds of ground limestone should be applied some time before sowing. Apply the fertilizer and lime in May if you sow the alfalfa in June. Better still, put the lime on directly after plowing and then a few days before sowing the alfalfa put on the fertilizer.

Any good standard brand of fertilizer will do, say a brand running 2:8:3, and use 200 to 500 pounds per acre. I think this investment in lime and fertilizer would be very profitable.

A Fertilizer Formula for Beans.

What would be the best fertilizer to use on gravelly loam soil for red kidney beans, how should it be applied? Also, how much seed should I use per acre?

Oceana Co.

O. C. D.

Beans are a leguminous crop and hence have the power of obtaining nitrogen from the free air of the soil. Theoretically, they will not require a fertilizer containing a large amount of nitrogen, yet the soil must contain sufficient available nitrogen to give this crop a good start.

Most loamy soils contain potash in quite liberal quantities, though not always in an available form. Most all our soils are deficient in available phosphoric acid, and beans require a good supply of this element to develop the seed.

Beans are planted late in the sea-

son, when the soil is worn and liable to be dry. Fertilizer can produce no results in a dry soil. It must be dissolved in the soil moisture before the plants can use it as food. The bean seed is easily injured by heavy applications of fertilizer in close touch with the seed bean. It is a good plan to distribute the fertilizer on either side of the row of seed, or else apply before the beans are planted and harrow it well into the soil. I would recommend applying about 200 to 300 pounds of 1:8:2 or 1:8:3 fertilizer.

Red kidney beans are quite large and one bushel per acre is about the right quantity of seed, planted in drills 28 inches apart.

Applying Lime on Timothy Meadow.

I have about 200 acres under cultivation and do not make enough barnyard manure to properly fertilize this amount of land. I have two silos and keep from 35 to 40 head of cattle and horses. Can get limestone screenings from quarry at nominal price. Would have to haul it four to eight miles on paved street. Could I profitably apply it as a top-dressing on 75 acres of timothy? Or if lime would not be very beneficial could I afford to apply \$24 fertilizer in the same way?

Wayne Co.

H. S.

Lime should be mixed with the surface soil and it is not considered good practice to apply it as a top-dressing to meadows. If the soil is acid, the only way lime can neutralize this acid is to bring the lime in close touch with the particles of soil, then a chemical reaction takes place and the lime unites with the free acid of the soil, forming some salt of lime. Now, if the lime is scattered on the meadow it does not come in contact with any particles of soil and can do no good: The best use of lime is on freshly plowed land, then by harrowing or cultivating the land the lime is mixed with the surface soil where it can correct the acidity.

Lime is not a plant food and does not take the place of manure or fertilizer. But if the soil is acid this condition must be corrected before you can get the best results with either manure or fertilizer.

It would not be advisable to apply fertilizer as a top-dressing in the winter. If the ground is frozen much of it might be lost. Apply it early in the spring or late in summer. August is a splendid time to dress meadows with fertilizer. My experience is, when applied in the spring you will get more benefit from it the following season than the same season. The reason for this is, I believe, because much of the nutriment for the season's crop of grain is already stored up in the roots and crowns of the plants; and the fertilizer will make a stronger plant for the next year. I am confident that it pays well to top-dress meadows with fertilizer where one has not sufficient manure, and then it will pay to use a lighter application of manure and balance it with fertilizer, than to use heavy applications of manure alone. I can give no opinion about a \$24 fertilizer because you do not give the formula, but many brands of fertilizers are worth more than \$24 per ton.

The lime screenings certainly should be utilized where they are so near by and so cheap, but you probably can not spread them with a lime distributor because they are not uniformly fine enough. You can well afford to utilize your farm teams in winter in hauling this lime and spreading it with a shovel. You can spread it on any fall plowed land but it is not a good practice to spread on land before plowing, because it is then deposited in the bottom of the furrow and can not neutralize the acid in the furrow slice.

COLON C. LILLIE.

"Try-a-bag" of fertilizer. Our brands are soluble and active, and not only increase yield, but improve quality and hasten maturity. Agents wanted. Address American Agricultural Chemical Co., Cleveland, Cincinnati, Detroit or Baltimore.—Adv.

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Supersedes All Caustery or Firing. Invaluable as a CURE for

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REMOVES

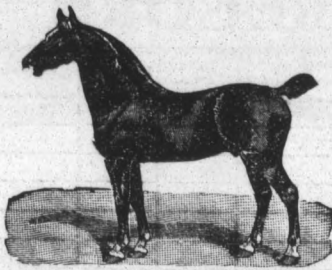
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Your Gombault's Caustic Balsam is the best I know of. I have bought four bottles for my neighbors, and two for myself. I have cured a sweened horse with the Balsam.
—Louis Miller, Sharon, Wis.

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Having read an advertisement in Wisconsin Agriculturist about your Gombault's Caustic Balsam, I have tried some of it and think it excellent.—J. M. Woradowsky, Big Flats, Wis.

Sole Agents for the United States and Canada.
The Lawrence-Williams Co.
TORONTO, ONT. CLEVELAND, OHIO.

Training and Care of Farm Teams.

THE training of the farm horse should commence while he is a weanling colt. At that age a colt may be handled by a man on a basis of strength alone, if need be, and once a colt learns that man is his superior in strength, it is seldom that a second test will be made later in life. A colt may be broken to lead in short order by main strength, but it is vastly better to let him become familiar with the halter before making the attempt to show him man's superior strength. A good way is to carefully halter him and let the halter remain on him a few days with a rather short lead strap or rope, just long enough, in fact, to permit the colt to step on it when he drops his head towards the ground. When his foot is on the lead strap the colt, when he tries to raise his head and walk, will be brought up suddenly and he will soon learn that he cannot go ahead when the halter strap is taut. Of course, the halter should not be put on colts having the run of a pasture which contains a wood-lot or a lot of underbrush, for the strap or rope might get caught in such a way as to prevent him from getting loose. In a clean pasture, however, or in a box stall or paddock, a colt will become wonderfully submissive to a pull on the halter strap in a couple of days.

Handle the Colt Quietly.

When the work of teaching the colt to lead is commenced, do not frighten him, but begin easily and quietly. Have him in a paddock or box stall where he may be convinced that he cannot escape. Once the lesson is begun do not cease until the colt yields to the pull of the halter and follows his teacher. A reward in the shape of something the colt likes, a lump of sugar, a piece of apple, or a nubbin of corn, after he obeys the pressure on the halter will make each successive attempt to lead him an easier task.

Under no conditions, however, should the colt be tied solidly until after he has learned to lead kindly, and then only with a halter strong enough to resist the colt's utmost strength, for, if he breaks away once he is likely to become a confirmed halter puller. If he tries to break away and fails after a couple of attempts, the chances are that he will never try to do so in later years.

If the colt has been broken to lead as a weanling the work of getting him accustomed to harness will have been lightened 50 per cent. Let him become familiar with the harness very gradually. Put it on him while he is in the stable several times before attempting to take him out of doors with it on. Put it on two or three times a day, leaving it on a short time on each occasion. Use a plain, straight bit or an easy single jointed one, and when the harness is on him in the stable hook up the check rein, but be sure to have it very loose. This will get his mouth familiar with the bit. Use an open bridle in order that the colt may see that there is nothing about the harness, its rattling and its contact with him, that will injure him.

Avoid Confusing the Colt.

When finally ready to take the colt out of doors with the harness on to ground-break him, be sure to have the words of command clear in your mind to use when starting, stopping and backing him. Always have a certain word to use when you want the colt to stop. Use some other word if you want him to simply slow down from a trot to a walk. Also, do not cluck the same way you do when you want him to stand over in the stable, when you want him to start up in harness. By always using the same command to secure a certain movement you will have a much more dependable horse and one that will be dependable much quicker than would be the case if words of command were used indiscriminately or carelessly.

Give the colt plenty of ground work before hitching him to a vehicle. A colt that is only bridle-wise has only reached that stage in his education as that of the child who has just learned the letters of the alphabet. Before he is put with another horse or hitched to a vehicle, he should become letter perfect in obeying commands to start, stop and back; should stand quietly when stopped and show no fear of objects met with on the road.

Use Good "Horse Sense."

When this stage is reached the colt is ready to be hitched to a vehicle. If it is desired that he start his next lesson in double harness, decide on which side you wish him to work and put him on that side from the first. He will thus get the habit of coming to the pole on that side and frequently result in a saving of time when time is valuable.

If the colt is an active, sprightly fellow, do not harness him with a slow walking, drone of a horse. Not only will such a course make the colt nervous and then irritable, but it will learn him to become a slow walker, a very serious fault in a farm horse.

Do not forget that the harness affects a colt somewhat in the way that a new pair of shoes affects you. He is unused to the wearing and chafing of the harness and, unless proper precautions are taken to prevent it may result in sores serious enough to have a bad effect on his future usefulness. If his mouth shows signs of becoming sore use the easiest bit possible, and use a healing lotion on the tender places.

Use an open bridle. Blinders are not only unnecessary but oftentimes cause serious injury to a horse's sight. A horse inclined to shy will be worse in that respect with objects partly hidden by the blinders and sudden sounds behind the horse will frighten him when the blinders prevent him from seeing that nothing is approaching that will injure him.

Overchecks are likewise an abomination on the farm horse. A plain side check-rein, never tightened up enough to tire the muscles of the horse's neck, will enable him to do his work with far more comfort than would be the case with his head pulled up into an unnatural position, his mind taken from his work by the aching muscles of his neck.

Remove All Handicaps.

To conserve the horse's energy and power, after he has become thoroughly educated, see that everything connected with his outfit is arranged to make his work as easy as possible. Hook the team as far back toward the whiffletrees as possible, for the farther away they are the harder will the load be to pull. Also distribute the load properly on the wagon, for if the bulk of the load is placed back of the center of the wagon bed the team's task will be made more difficult.

Time spent in keeping the axles of wagons and farm machinery well lubricated and the harness cleaned and well softened with oil, will also be profitably spent as conserving the usefulness of the farm team, for no matter how well trained the horses may be, every detail connected with their treatment ought to be based on a process of reasoning as to the effects produced in order to get from the team the most extended period of service possible with the greatest degree of comfort to the horses.

New York. H. L. ALLEN.

"The New Huber" is the title of the 1915 catalog of the Huber Mfg. Co., Marion, Ohio, in which are fully illustrated and described the Huber line of steam and gas tractors, the latter including several sizes and styles for farm work. The catalog also lists the Huber line of threshing machinery. A smaller catalog is devoted to the gas tractor alone. Mention the Michigan Farmer when writing for these booklets.

When Winter Dies Hard

WHEN the March sun finds the snow still lying in patches on your barn roof, then your stock need plenty of wholesome food to condition them for spring. Your steers and hogs and dairy cattle, your early calves and your poultry crave the flavor and succulence of the contents of your

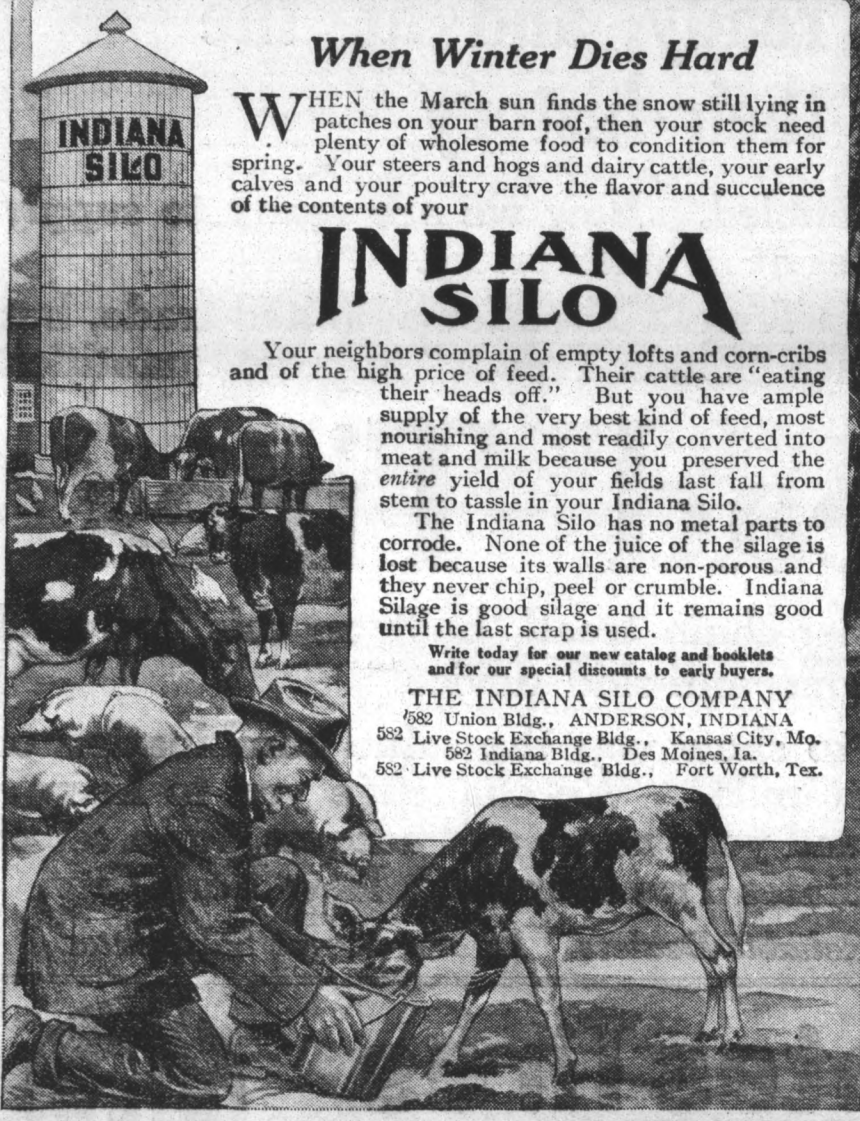
INDIANA SILO

Your neighbors complain of empty lofts and corn-cribs and of the high price of feed. Their cattle are "eating their heads off." But you have ample supply of the very best kind of feed, most nourishing and most readily converted into meat and milk because you preserved the entire yield of your fields last fall from stem to tassel in your Indiana Silo.

The Indiana Silo has no metal parts to corrode. None of the juice of the silage is lost because its walls are non-porous and they never chip, peel or crumble. Indiana Silage is good silage and it remains good until the last scrap is used.

Write today for our new catalog and booklets and for our special discounts to early buyers.

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WE PAY THE FREIGHT.

WESTERN STOCK FEEDING OPERATIONS.

Have just returned from a visit to the Fort Collins district, and it may interest you to know that this section fed about three-quarters of a million old ewes and lambs this winter and about one-quarter of these have already gone to market. There are estimated to be about 50,000 cattle on feed there, and but few of them have yet gone forward. Reports from southern Colorado are that nearly all the lambs on feed there have gone to market, while western Nebraska, which feeds two to three hundred thousand has sent the bulk of their stuff to the butcher. High cost of corn has made feeders anxious to cut loose as fast as they could get out whole or with a small profit. There is every indication that supplies of lambs will not be overly large, especially along late in the season.

Plenty of snow in eastern Wyoming but no stock losses as yet. Other range sections report a fine winter with little snow and all stock in fine condition. No wool contracting in Wyoming, but Idaho and Utah clips are reported contracted at 25 cents, Arizona clips sold at 27 cents, and several good offers have been refused. Most sheepmen will await shearing before selling and try to realize full value for their product. Buyers representing foreign nations are buying horses for the war in this section.

Wyoming. Roscoe Wood.

LIVE STOCK NEWS.

The long predicted boom in prices of fat live muttons has arrived at last, with medium weight lambs leading off, and yearlings, wethers and ewes participating. For several weeks surprisingly numerous shipments of partly fattened lambs have been offered on the markets of the country, and their owners were forced to accept big discounts from prices paid readily for properly finished consignments. Now these misguided owners, who hurried their flocks to market in order to avoid running up feed bills, see their great mistake, with the country facing almost a mutton famine. Lambs and sheep have been selling in the Chicago market at the highest prices recorded since 1912, lambs selling up to \$10.10 per 100 lbs. With such high prices as are now certain, lamb and mutton are bound to become so dear in the retail meat markets of the country as to be beyond the reach of thousands of families, and fresh pork may be expected to be in greater favor than ever, being the cheapest meat on the list.

Prime light-weight veal calves continue to command high prices, and this is a strong temptation to stockmen to market them instead of maturing them. Of course, it is all right to let the dairy calves not wanted for raising go to market for converting into veal, but the shortage of well-bred beef cattle in the country is so great that calves with beef blood should all be kept on the farm to be matured.

Missouri is increasing its herds of pure-bred beef cattle, with Herefords especially popular. The ranking of the states of the Union in regard to the number of Herefords shows Iowa standing first, Missouri second, Kansas third, Illinois fourth and Texas fifth.

The spring wool clip is being held for extremely high prices, and less contracting of wool on the sheep's backs than usual is reported, buyers in many instances holding off. Some contracting has been reported in the western states, however, with desirable medium clips going at 23 to 25c a pound. Shearing began recently in Arizona and New Mexico, and a clip from 600 lambs in the latter state was sold for 22c, such clips having brought 15c a year ago. The British embargo on wool is cutting off much of Australian and New Zealand wool from the United States, and as the combined production of the two countries amounts in round numbers to 800,000,000 lbs., or 32 per cent of the world's entire production, it will be seen what an important curtailment of our supply this is. The embargo was placed for the purpose of conserving the wool for the British army and for preventing exports to Germany and Austria.

Chinese eggs have been selling in the Chicago market for 12½ to 13c a dozen, their quality being ordinary. American hens produce much better eggs, and the home egg production of late has increased enormously, causing a marked decline in prices and much larger consumption everywhere.

John Deere Implements



John Deere Two-Way Plow
The Sulky with the Steel Frame and Patent Auto Foot Frame Shift

Slight foot pressure swings frame and accurately locates plow bottom. Automatic shifting hitch—clevis cannot fail to move to position.

Automatic horse lift. Operator's foot releases latch. Pull of team raises bottom. Hand lever also provided. For hillsides or uneven fields it throws dirt all one way.

Write for John Deere Two-Way Book, handsomely illustrated in colors—and secure full information free.



John Deere Wheel Plows
With Quick Detachable Shares
Unscrew One Nut—That's All

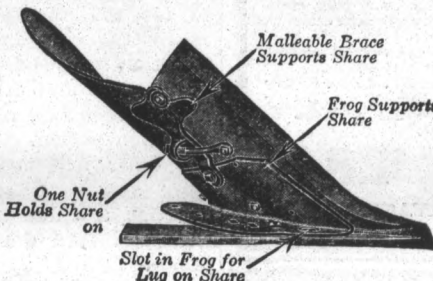
John Deere Wheel Plows, known the country over as "Quality Plows" are now fitted with John Deere Quick Detachable Shares—an exclusive John Deere feature.

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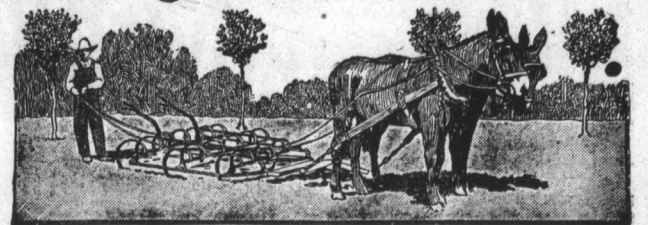
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We have beautifully illustrated booklets on the following plows with John Deere Quick Detachable Shares:

- New Deere Sulky and Gang (High Lift Frame Plows)
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Mention the booklet above that you want and we will send it to you free.

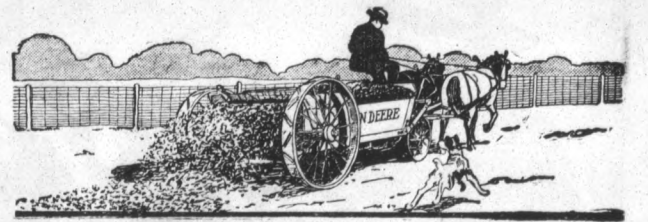


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The Uncloggable Spring Tooth Harrows

The originals of this style. Perfect pulverizers, uncloggable. Forty to fifty-point carbon steel in frame and tooth bars as against ten to twenty in other makes. Special high carbon steel teeth without bolt holes.

Write us for information on these harrows. They are the spring tooth harrows that are giving universal satisfaction.



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The Spreader with the Beater on the Axle

The beater—the business part of a spreader—and all its driving parts, is mounted on the rear axle. This is a patented feature. You cannot get it on any other spreader. Here is what the beater on the axle means to you:

It means: No clutches to give trouble—all taken off.

It means: No chains to break or get out of line—all thrown away.

It means: Less than half the parts heretofore used on the simplest spreader—some two hundred parts are done away with.

It means: Manure is not thrown on the axle—straw and trash cannot wind around it.

It means: You get big drive wheels and a low down spreader, without stub axles—that means traction and strength.

It means: Drive wheels back out of way when loading—you see where you place each forkful.

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To start spreading, you pull back the lever at the driver's right—that's all. A boy can operate it.

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FREE BOOK Illustrates and describes the most complete line of farm implements. Tells how to adjust and use farm tools under varying conditions. It is a practical encyclopedia of farm implements worth dollars to you—a 168 page text book.

It tells about John Deere Implements: Steel plows, cultivators and harrows; corn planters, disc harrows and beet tools; farm and mountain

wagons; manure spreaders; portable and stationary grain elevators and corn shellers; hay loaders, stackers, sweep rakes, mowers and side-delivery rakes, motor hay presses; grain drills and seeders; full line of chilled plows; grain binders and corn binders; bit-and-miss and volume-governing gasoline engines.

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In every part Unadilla Silos are built to endure. Staves accurately milled, tongued, grooved and beveled from selected stock. Bessemer hoops give greatest strength. Other metal parts malleable iron—they won't break. Besides, the Unadilla returns its cost in one season by saving half the hay and expensive mill feeds. You get pasture results in January. Order early and jingle discount dollars in your pocket. Write to-day for catalogue. Agents wanted.

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On Their Feet Again

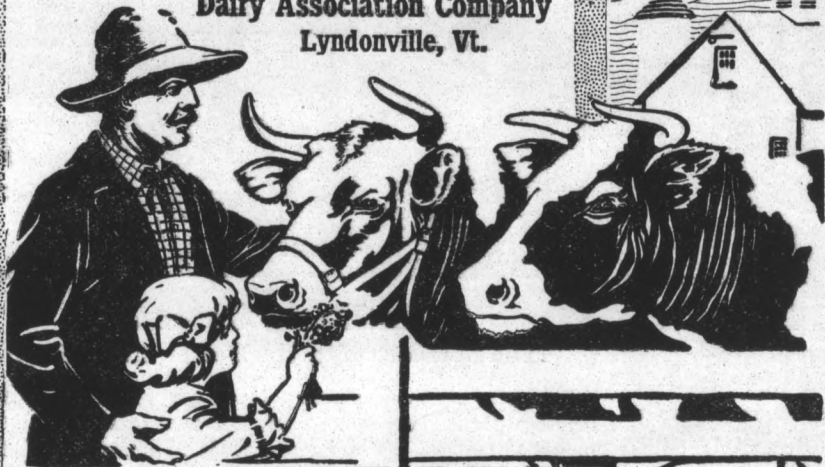
HUNDREDS of farmers and dairymen have felt the joy of seeing sick and ailing cows restored to health and productiveness by the use of KOW-KURE, the great cow medicine. This wonderful remedy has proved its worth for over twenty years in the prevention and treatment of ailments which sap the life and strength of dairy cows—such as Abortion, Retained Afterbirth, Barrenness, Milk Fever, Scouring and Lost Appetite.

Many backward cows are overfed with so-called stock foods when they really need is a medicine that will tone up the system and repair the sluggish digestive and genital organs. HEALTHY cows will thrive on nature's food and produce more and better milk.

If you have a cow that is below par, go to your druggist or feed dealer and try a package of KOW-KURE; the result will surprise you. Sold in 50c and \$1.00 packages.

Write today for free treatise, "The Cow Doctor."

Dairy Association Company
Lyndonville, Vt.



Management at Calving Time.

IN many localities winter dairying has made the dairyman's vocation a continual performance for the majority of the cow-keepers. Individual buttermakers, creamery patrons, and milk shippers have found that the steadily producing cow is the profit winner. In fact, in some localities where dairying is the main business of the farmers, the cows are bred very rarely or not at all after about five years old, but they are fed heavily right along until age renders them unprofitable as milk producers.

The Rest Period of the Cow.

But on the average farm where dairying is not a specialty, the raising of a good calf is usually considered an important item, and the cows, no matter what the breed, are bred about as often as nature will allow. The most serious mistake in connection with this matter is that the cows are dry for too long periods. A majority of the cows kept by diversified farmers are dry nearly half of the year, which certainly is not very profitable on high-priced land, even though the cows be made to rustle their living from the fields and piles of straw. A rest from milk-giving of from 30 to 90 days undoubtedly is beneficial to any cow, and more especially to the development of her calf, but a longer period of idleness cannot profitably be allowed. Except on the western ranges each cow on the farm must return some income besides rearing a good calf, for the calf will cost too much if it is the sole produce of its dam.

Fall calving is in favor with many men who make dairying a specialty, but on the diversified farm spring is usually considered the proper season for calves to come. Within the next two months several millions of cows will freshen, and it behooves their owners to make preparations now to give the cows a little special attention both before and after calving, in order to guard against danger of disease and to insure future usefulness. Many valuable cows are lost every spring from disorders peculiar to the freshening period. The fact should be appreciated, too, that the amount of milk yielded by the cow during her period of lactation is governed to a large extent by the feed and care she receives during the last four or five weeks of the gestation period. Also, cows properly cared for will produce stronger and more active calves. Many cases of abortion are due to a lack of proper care and feed during this important period.

Feed Well During Pregnancy.

It is a mistaken idea to suppose that because a cow is giving little or no milk at the present time that she does not need a fair quantity of good food. As soon as a cow stops giving milk, feeding should begin at once for the following year, for during the brief vacation period food in the proper amount and of the proper character not only puts the cow in a strong, vigorous condition for calving, but also gives her stamina for the coming year's work. There are three specific purposes for which a cow should be fed during her idle period. First, if she is a good, hard-working cow, her last year's work has been wearing on her and her digestive apparatus should have a rest, as far as practicable. Secondly, it is essential to build up the future calf. During the last weeks of pregnancy the unborn calf is making its greatest growth. If, due to a shortage of the proper food for the cow, the calf is born in a stunted condition, it never fully outgrows the effects occasioned by the lack of embryonic nutrition. The third purpose in feeding the dry cow is to store up in her body some fat that may be drawn upon later.

To accomplish the first purpose, foods of a cooling and light, bulky nature, as pasture grass in summer and silage in winter, should be supplied.

There are succulent foods besides silage that may be used in winter, but corn silage is perhaps the cheapest and most convenient to use. As much as the pregnant cows will eat in conjunction with the other ingredients of the dairy ration may be given. As the cows advance in pregnancy a fair quantity of protein food must be supplied each animal for the purpose of developing her unborn calf. Protein is found in large quantities in bran, oil meal, gluten feed, clover hay, alfalfa hay, cowpeas and other legumes, but is lacking in silage, corn, corn fodder and timothy hay. Leguminous hay, therefore, should be fed along with silage. And in order to accomplish the third purpose, that of maintaining the cow in good flesh and vigorous constitution, a grain mixture must be fed. No grain mixture is better than equal parts of corn, oats, and a slightly less quantity of oil meal. This mixture should be fed in amounts according to the condition of the individual cow. If poor in flesh, she should be fed a liberal quantity of the mixture, conjunction with the bulky parts of the ration.

Exercise Important.

Pregnant cows should be well housed in warm, well ventilated barns and not subjected to changeable weather. One day's exposure to a cold, wet storm may be responsible for a heavy loss. Exercise in fine weather is all right, however; in fact, it is essential for the best results. The cow that is kept closely confined is liable to grow inactive and lazy. Her organs become clogged and somewhat dormant, hence it is advisable that the cow be given the opportunity of gentle exercise during the warm portions of the day, but it is best that she be stabled at night. Moderate exercise will loosen all the muscles, open the secretive organs, and cause the animal's whole system to work smoothly.

Pregnant cows should run in separate lots from other stock for at least three weeks previous to freshening. A kick or a bunt from another animal is liable to cause abortion, and is sure to weaken the offspring. Undue exercise, fear or excitement are to be carefully guarded against at all times, as they always prove injurious.

Light-producing cows are seldom much disturbed in health at the time of freshening. On the contrary, heavy producers, with their delicate organizations, must have special attention prior to and after parturition in order to guard against inflammation of the udder or the more serious disorder of milk fever. Although milk fever does not cause the death of nearly so many cows as before the use of oxygen treatment, there are still many good cows lost from this disease. Few farmers own a milk fever outfit, nor do they know how to improvise one; still others do not watch their cows closely enough at freshening time and the disease makes great progress before it is discovered, and by the time a veterinarian can be summoned the cow is dead.

The Milk Fever.

As a rule, it is the best cow in the herd that is liable to this affection. The disease is not very common among the beef breeds but makes its greatest inroads into the heavy milking breeds. In the majority of cases the trouble occurs with the fourth, fifth and sixth parturitions. The disease rarely occurs with the young heifer, and it decreases in frequency after the most active milking period in the cow's life has passed.

Cows that are well fed during their rest period and thus rendered somewhat plethoric in their condition are more susceptible to milk fever than cows poorly fed and emaciated at calving. However, the advantages gained in feeding the cow well at this period are sufficiently great to offset the danger incurred by milk fever. A de-

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crease in the amount of food given just prior to and immediately after parturition, is a wise precaution. Another excellent precaution against milk fever is to have the cow in a laxative condition at calving time by giving her a pound of epsom salts or a quart of raw linseed oil a day or two prior to freshening.

Best Cows Most Often Affected.

But no system of prevention has yet been learned that is absolutely certain to guard off milk fever at all times and under all conditions. Cows that give a large flow of milk may and often do have milk fever even when every precaution has been taken. Any extra good cow that is predisposed to this trouble should be watched closely both before and for twelve to twenty-four hours after freshening. Every dairyman with good cows should have on hand a milk fever outfit, clean and ready for use, so that if all preventive measures fail the cure may be administered at once. One of these special outfits can be obtained for a comparatively small sum from veterinary supply houses or from any firm carrying stockmen's supplies. It is far cheaper than a trip to a veterinarian.

Milk fever usually comes on within twelve hours to two days after the birth of the calf, and hardly ever occurs after the second week. It both comes and goes quickly. Death or recovery will generally take place in from one to three days after the attack. If a cow recovers from an attack of this kind her future usefulness as a milk producer is not greatly impaired. In the hands of a skilled practitioner the oxygen treatment has proved very effectual, and the layman may have equally successful results if as well prepared for the work as veterinarians. If taken at the start, little treatment is necessary to arrest the trouble. Simply fill all four quarters of the udder with air. Space will not permit of complete directions being given here for using a milk fever outfit; a booklet of instructions usually accompanies each outfit, and by observing the directions closely any intelligent man cannot go wrong.

Care After Freshening.

For several days after freshening the cow should receive special attention, such as being given a reasonable amount of warm water to drink, bran mashes made of two pounds of bran, a pound of oats, a pound of oil meal and a handful of salt, and a little good hay. She should not be given cold water within three days after freshening. After the third day she should be given such balanced rations as will enable her to produce a large flow of milk, and it is very important to keep her milking steadily until her rest period again arrives. Care must be exercised at all times, however, not to overdo her or sicken her by feeding too heavily. It is always best to increase the ration gradually and carefully, as thereby she will be stimulated to produce the greatest amount of milk that lies within her power and she will suffer no injurious effects.

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AMOUNT AND VALUE OF SILAGE.

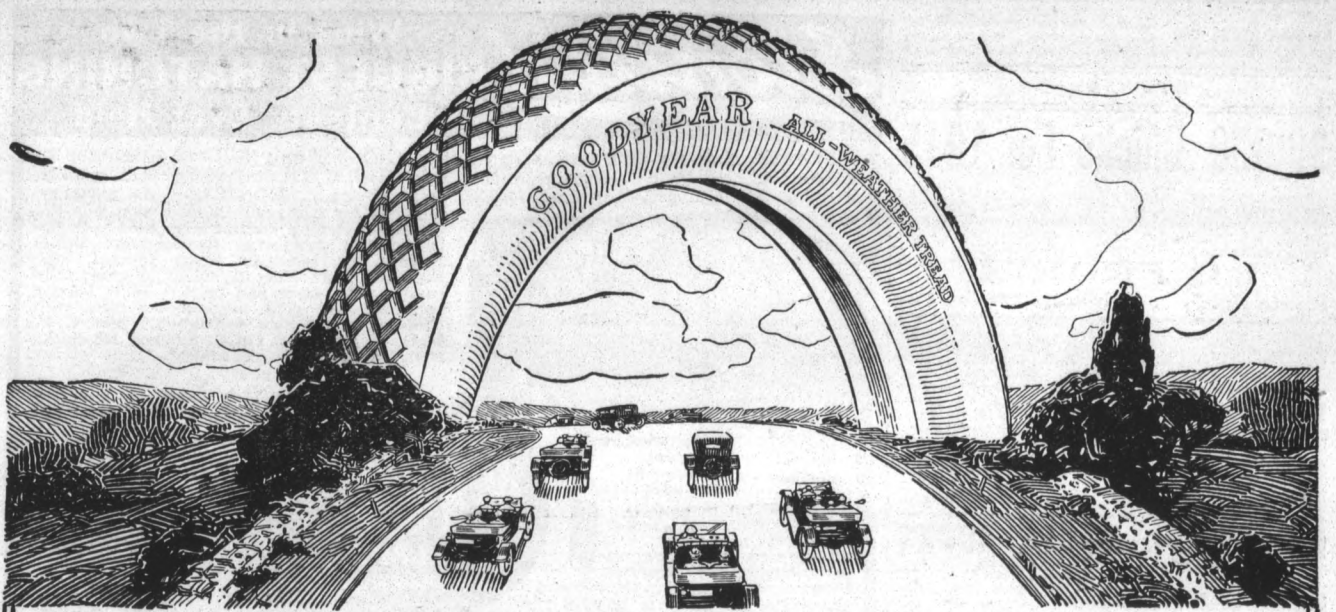
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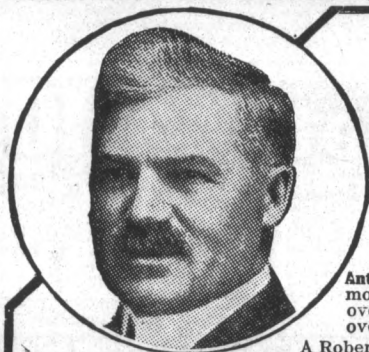
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The Feathering of Young Pigeons.

Some young pigeons will shed their feathers more quickly than others. If the fresh quills are noticed to be coming freely on the head and breast, and if the bird eats well and bathes often, there is nothing the matter. But if the new feathers come slowly and there is a disinclination to feed, that bird should be caught at roosting time and examined. It will probably be found to be thin and light and will require a little extra care. A practice that often helps the bird to shed its feathers is to pull out most of the tail.

If a bird appears very weak it must be put in a pen alone where it can feed without molestation from the other pigeons. A little hemp seed and raw rice will often tempt a pigeon to eat when it is out of sorts. An excellent tonic for a sickly bird is to stir into the drinking water, daily, enough chemical food to make the water pale pink. Some of the older pigeons will commence to shed their feathers in July. They will continue to sit on their eggs or to feed their young ones.

Keep the Loft Clean.

By the end of the month the breeding pairs should be separated before the birds go into heavy moult. It is too late to hatch young ones that are likely to turn out well; so there is nothing to be gained by continuing to let the old birds lay and hatch. They will, instead, benefit by having a long rest. The loft must be kept clean and well ventilated now, or insect vermin will abound. Feathers will accumulate in the corners of the loft and in the nest boxes unless the hoe is kept going.

Towards the end of the breeding season the loft is more crowded than at any time of the year. In addition to the stock birds there are nearly all the young ones. Very few of the latter will have been disposed of as yet. It is risky to get rid of any except the most palpably mismarked or badly-shaped youngsters, unless the owner is a good judge of young stock. Otherwise the best birds may be parted with and the "duffers" retained.

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Many of the various breeds change and alter greatly as the birds get older. Some of the most awkward and ugly-looking youngsters turn into high-class specimens with age. Such pigeons, for instance, as English Owls and Antwerps, thicken and "make up" immensely as they grow older. Any birds that are intended for exhibit must be kept out of the hot sun if they are of delicate color, such as red or yellow. They will become chequery with exposure to the glare, and the beaks of Magpies and other breeds may become discolored and stained.

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If one is short on green food, cut clover or cut alfalfa may be fed instead, and will often give better results. Clover and alfalfa are rich in protein, and the mineral matter that goes into the formation of bone and egg shell. Experiments have shown that 100 pounds of cut clover contains sufficient lime for the shells of 17 dozen eggs.

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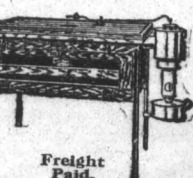
Tells why chicks die

E. J. Reefer, the poultry expert of 643 Main St., Kansas City, Mo., is giving away free a valuable book entitled "White Diarrhoea and How to Cure It." This book contains scientific facts on white diarrhoea and tells how to prepare a simple home solution that cures this terrible disease over night and actually raises 98 per cent of every hatch. All poultry raisers should certainly write Mr. Reefer for one of these valuable FREE books.

\$6.95 For this 150-Egg INCUBATOR

With Brooder \$9.25. Freight paid. Our Direct from Factory Plan makes these exceedingly low prices possible. Machines fully equipped—all set up and ready for use. Write today for circular or order direct from us.

WOLVERINE SALES Co. Dept. 15, 711 Delaware St., Grand Rapids, Mich.



BEE-SUPPLIES. We buy and sell Bees, Beeswax, Honey, and everything used by Bee Men. Our FREE CATALOG tells you the best hive to use. Send your name today for one. It is FREE.

S. J. GRIGGS & CO., Dept. D, Toledo, Ohio.

The Ideal Colony Brooder

With SHAKING and DUMPING GRATE Adjustable Hover Chicks always Visible

COAL-BURNING SELF-REGULATING

Price \$18.00, including Automatic Regulator, \$21.00. Economical and safe. 100 per cent efficient. Large and small farms use the Ideal with success. Vastly superior to oil burners. The Ideal Fresh Air System gives perfect satisfaction. Many testimonials showing the wonderful results obtained during ZERO weather in the cold spring of 1914. Write for free 98 klot. Learn to brood chicks without loss. Make two chicks grow where only one grew before.

LIBERTY STOVE COMPANY, 114 "M" Second Street, Philadelphia, Pa.



21 Times Belle City World's Champion

Get the whole story of the Belle City's World's Championship Hatches in my great Free Book "Hatching Facts." The winners of the 21 World's Championship Hatches tell the story of their money-making, prize-winning success in their own words, with their

World's Champion

besides giving you full information, facts, proofs, about these wonderful hatching machines. 327,000 in use.

Write for "Hatching Facts" Today—A Postal Brings It

It tells everything. Illustrates the Belle City Incubator and Brooder in actual colors—shows what makes the Belle City the 21 Times World's Champion—gives facts about hatching success, bigger and better than you have ever heard of before. Book gives my \$500 Gold Offers. These offers open the way for you to greatly increase your poultry profits this season. Book gives full particulars of my 1-2-3 months' Home Test Plan, my 10 year money back guaranty, and my low prices—freight prepaid—will surprise you. Write today to Jim Rohan, Pres.

BELLE CITY INCUBATOR CO., Box 14, Racine, Wis.



Both for \$10 Freight Paid East of Rockies

Think of it! These two UNSEATABLE Wisconsin Mached Machines—100-egg incubator and 130-chick brooder—winners in 1910-11-12-13 and 1914 National Hatching Contests—for only \$10, delivered, freight paid, (east of Rockies) Guaranteed 10 years and sold on 30 Days' Trial—Money back if not satisfied. Wisconsin are made of genuine California Redwood. Incubators have double walls, double doors, copper tanks, self-regulating. Shipped complete with thermometers, egg tester, lamps, etc. ready to run. Biggest incubator bargain of the year. Send for our new 1915 catalog fully describing this outfit, also larger sizes. A postal brings it by return mail. Write to

Wisconsin Incubator Co. Box 112 RACINE, WIS.



BIG INCOMES FROM POULTRY

assured to those who know how. 10c. in coin gets the latest and most successful poultry methods complete. Many make \$3,000 yearly on small acreage and capital. Possibilities simply amazing. Address

MARK WALTER, Box 108, Kalamazoo, Mich.

CAPONIZING.

Kindly give me information on how to caponize young roosters? Do you think it profitable to do this? At what age would they be ready to sell? Where would a person find a good market for them? About what would they bring per pound when ready to sell?

Tuscola Co. J. H.

Caponizing requires special tools, which can be bought at any poultry supply house. With these tools come instructions which give explicitly the method of operation.

There is no doubt but what caponizing is profitable. The operation costs nothing and the capons gain in flesh much more rapidly from the same amount of food than other fowls and when they are sold they often bring nearly double the market price for hens. A good average price for capons is 20 cents a pound.

With reference to obtaining a market for these birds, it would be advisable to write the high-class poultry dealers of the largest city near you and if you have any great amount, also to the chefs of some of the higher class hotels of that city. Butchers in the better districts of the cities often complain that they cannot get enough capons during the holidays and the winter months.

The best age for caponizing is when the chicks are from six to eight weeks old, and they are in good market condition when they are about nine months old. The best time for marketing is from just before the holidays for the holiday trade and until about the first of March.

COTTONSEED MEAL FOR HENS.

I would like to ask if cottonseed meal is good for hens and how much would it do to feed 100 hens a day? How does it compare with oil meal?

F. P. E.

Cottonseed meal is very rarely used in the rations fed hens. Like linseed meal it is a concentrated protein food and when fed in the ration is liable to give the hens too much vegetable fat and protein for their own good. A hen requires considerable protein in her diet to enable her to lay well, but under natural conditions she obtains this protein in the animal form from the worms and grubs she picks up, therefore it is advisable to make up this lack of protein in the winter ration by the use of beef scraps, green bone or milk.

In many of the rations used by poultry experts, linseed meal is used in small amounts. In nearly all the dry mash formulas used by the Maine experiment station linseed meal constitutes about one-tenth to one-fifteenth of the mash. These mashes are used by experts in poultry feeding, and even they find that the hens suffer from indigestion when linseed forms too large a part of the mash. Cottonseed meal is not found in any of the model rations gotten up by poultry authorities which would lead one to conclude that it is not favored for poultry feeding purposes.

SELECTING THE LAYERS.

Watching trap nests to find out which hens lay, takes too much time. In order to save time I have resorted to the following plan: When a hen has laid out her litter of eggs, she gets broody. When she gets broody, put a leg band on her. Do this to all hens that get broody. Hens that do not get broody by the fifteenth of June are start boarders. So if you find any that do not have a leg band at that time, sell them.

Clinton Co. M. A. DUNNING.

Cedar wood makes excellent perches. Lice and vermin do not like the odor of cedar.

The skim or butter-milk can be fed to the laying hens to better advantage and profit than to the hogs.

Indiana. T. Z. RICHEY.

Firestone

Has Done Better Than Meet Popular Prices



Actual Size
3-inch "Plain Tread"
FIRESTONE

- Fig. 1. 4 plies of fabric in Firestone—3 plies in the ordinary.
- Fig. 2. Extra coating of finest rubber between fabric layers in Firestone—not in the ordinary.
- Fig. 3. 1-16 inch finest rubber cushion layer in Firestone—not in the ordinary.
- Fig. 4. 1-16 inch breaker strip of high-grade fabric and high-grade rubber in Firestone—same quantity in others.
- Fig. 5. 1-4 inch tread, tough, resilient, in Firestone—3-16 inch in the ordinary.
- Fig. 6. 1-16 inch side wall of strongest rubber in Firestone—same quantity in others.
- Fig. 7. Bead of extra cohesive strength in the Firestone—same size bead in others.

Yet you pay only \$9.40 for this 30 x 3 Firestone—less than 5% more than four widely advertised makes.

HERE, is one example: a small size, 30x3, plain tread, shown actual size. The same relative values apply in all sizes. Note the detailed specifications of the section opposite. Then ask any neutral repair man which manufacturer gives the most in quality. He cuts into all makes of tires. He knows.

You want that extra layer of fabric in the Firestones—4 plies instead of 3 in this small size—7 plies in the 5-inch Firestone, for instance, instead of only 6 in the ordinary.

You want that cushion stock in the Firestone. There is none of it in ordinary tires. Yet it is impossible to build a full service tire without a cushion layer under the breaker strip. You must have it to prevent bruising and overstraining the fabric.

Firestone Tires have never been built down to a price. You will find everything in a Firestone that ought to be there. Firestone Tires are vulcanized by the "two-cure" process. This is more expensive than the "one-cure" but it allows rigid inspection in the making and eliminates fabric buckles and other defects.

The Sections Show These Things—the Wear, the Mileage, Prove Them

Take the word of the specialists of the industry—take the record of the Firestone Tires for 15 years—as your authority that these extras of quality are necessary for real service and economy. The Firestone organization, the largest in the world specializing on tires, can make and market tires and tubes at the lowest possible cost to you, the user. The tires and prices prove it beyond argument.

Firestone Tube Prices Give Added Proof of Firestone Savings to You

Firestone is below them all on tubes. WHY? A tube is good or bad to the eye and the touch. Quality can and does vary, weight can be and is skimmed, but not so radically as in tires. The buyer won't have it. Having to come near meeting Firestone quality in tubes others must go above Firestone in price.

Because, as stated, Firestone manufactures and markets at minimum cost to you. But we are no more proud of giving you the best tube below the others than we are of giving you the best tire for so little more. And the proof of appreciation among car-owners lies in the fact that their demand for Firestones last year established 50 per cent more dealers for us and increased our output 78 per cent.

So compare the tires inside. Compare the prices. Compare the service records among your acquaintances—then get Firestones from your dealer and enjoy—

	Case Round Tread	Case Non-Skid	Grey Tube	Red Tube
30 x 3	\$ 9.40	\$10.55	\$2.20	\$2.50
30 x 3½	11.90	13.35	2.60	2.90
32 x 3½	13.75	15.40	2.70	3.05
34 x 4	19.90	22.30	3.90	4.40
34 x 4½	27.30	30.55	4.80	5.40
36 x 4½	28.70	32.15	5.00	5.65
37 x 5	35.55	39.80	5.95	6.70

"Most Miles per Dollar"

FREE—A waterproof bag for Inner Tubes if you tell us the make of tires you use and the dealer you buy from. Also ask for book No. 25.

Firestone Tire & Rubber Company, Akron, Ohio—Branches and Dealers Everywhere

"America's Largest Exclusive Tire and Rim Makers"

THE AUTO-OILED AERMOTOR WITH DUPLICATE GEARS RUNNING IN OIL

Every bearing is constantly flooded with oil. The gear case, in which the duplicate gears run, holds two or three times as much oil as is required by the mill for a year of constant running, days, nights and Sundays. From the gear case the oil flows through every bearing in a continual stream. It goes out through the thrust washers in the hub of the wheel and is automatically returned to be used over and over again. No oil is wasted. This mill needs oiling but once a year. Two quarts of oil in the gear case of the 8-foot Auto-oiled Aermotor will keep the gears and every bearing flooded with oil for a year or more. The galvanized helmet covers the gears, keeps out rain, keeps out dust, keeps in oil. The old Aermotor was known the world over as "the windmill which runs when all others stand still." This new Aermotor with gears and bearings flooded with oil runs in much less wind than the old Aermotor.

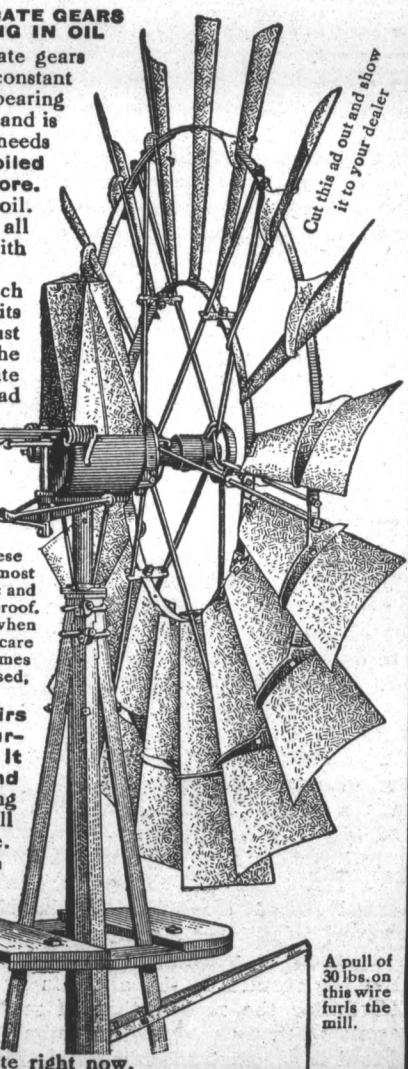
The two large gears, which lift the load straight up, are each independent of the other and each is driven by its own pinion on the main shaft and must take its half of the load at all times. The Auto-oiled Aermotor, with its duplicate gears and two pitmen lifting the load straight up, is unbreakable.

Every 8-foot mill is tested under a pumping load of 3000 pounds on the pump rod. For the larger sizes the load is proportionately greater. We know that every one of these windmills is unbreakable. We venture the assertion that this is the most self-sufficient of any machine of any kind ever made for farm work and the most nearly fool-proof. There is no friction on any part of the furling device when the mill is running and very little when he wheel is furled. A small child can easily furl this windmill or an automatic regulator can take care of it. One of these mills has been furled 10,000 times in one day by a man on our premises—more times than it would ordinarily be furled in 30 years of service. A band brake, of the automobile type, is used, and it always holds.

If you are tired of climbing a windmill tower; if you are tired of buying repairs and having them put on; or, if you are tired of waiting for a big wind, let us furnish you an unbreakable, self-oiling, ever-going mill to go on any old tower. It costs but little and you will get the difference between no water in a light wind and an abundance of water in almost no wind. The flooding of all the working parts with oil, the perfect balance of the wheel and vane on the tower, the very small turntable on which the mill pivots and the outside furling device make this difference. Now there is no objection to a high tower. Have as high a tower as you need to get wind. You don't have to climb it. Your dealer can come once a year and put in oil, if needed, and inspect the mill.

Why not have flowing water, cool in summer and warm in winter, always fresh and pure? It will cost next to nothing. It will give health to your family and stock. Let the water run into a good size reservoir and raise all the fish of the choice kinds your family can eat, and have water to irrigate your garden and make it raise many times as much as it would otherwise. The Auto-oiled Aermotor makes all this possible as it can run from one year's end to another with practically no wear and no cost. Water costs nothing. Use it. To let it stand is to abuse it.

If interested, write Aermotor Co., 1146 So. Campbell Avenue, Chicago. Write right now.



The Michigan Farmer

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The Lawrence Publishing Co.

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Mem Standard Farm Papers Association and Audit Bureau of Circulation.

Entered as second class matter at the Detroit, Michigan, postoffice.

DETROIT, MARCH 20, 1915.

CURRENT COMMENT.

Our Pure Seed Law. A subscriber asks for the publication of Michigan's seed law an early issue of the Michigan Farmer. This law was published in full in these columns at the time of its passage, and its provisions are so well understood by the average reader that a simple review of same will perhaps serve to bring a knowledge of its provisions to those who are not already familiar with it.

Briefly summarized, agricultural seeds are defined by the act including practically all of the seeds used in field culture of Michigan crops. The law provides further that agricultural seeds offered or exposed for sale within the state for seeding purposes shall be accompanied by written or printed statement showing the name of the seed, name and address of the person selling same, approximate percentage by weight of purity or freedom of such seed from foreign matter or from other seeds distinguishable by their appearance, and the approximate percentage by weight of contamination, specifying by name each kind present in greater proportion than one per cent by weight of the whole. Noxious weed seeds are defined by the law as seeds of quack grass, Canada thistles and various kinds of dodder, and it is made unlawful to sell or use for seeding purposes any agricultural seeds containing a greater proportion than one seed of any or all of these weeds to two thousand seeds of the kind sold or sown.

The test for purity may be conducted by the state seed analyst or the seller. The samples of seed may be subjected to the state seed analyst at the Agricultural College, and should be accompanied by the fee of 25 cents for each sample prescribed by the law. Seeds may be sold to seed merchants or shipped to general markets to be cleaned and graded before being sold, or held in storage or sold for shipment, outside the state only, without complying with these regulations. A penalty is provided for the violation of the law.

In operation the law affords protection for the purchases of seeds, in that to comply with its provisions the seed must be labeled showing its percentage of purity and the kind and degree of contamination. Also it provides a means by which samples of seed can be submitted for test of purity to the state seed analyst at a minimum fee. Those who would avail themselves of this service should, however, submit their samples as far in advance as possible, of the date when the results of the analysis are desired, for the reason that in rush seasons so many samples are submitted that it is sometimes impossible for

the state analyst's force to keep up with the demands made upon the seed laboratory.

Live Stock Losses. Live stock losses resulting from the epidemic of foot-and-mouth disease have been brought so prominently to public attention as to overshadow the losses from other sources which are always a very considerable item in this country. The government estimates show that the live stock losses from various causes, mostly diseases, aggregate the tidy sum of \$212,000,000 annually. The largest part of this loss is caused by hog cholera which loss alone is estimated to amount to more than \$75,000,000 per year. Texas fever and the cattle tick which is the carrier of this disease are estimated to cause losses amounting to \$40,000,000 in infected districts of the southern states. Tuberculosis is estimated to come next with an annual toll of \$25,000,000. Other common diseases cause a loss exceeding \$50,000,000, while poultry diseases alone are estimated to cause losses amounting to more than \$8,750,000.

The actual cost of the present epidemic of foot-and-mouth disease is, of course, difficult to estimate. The national government has appropriated more than \$2,000,000 to fight this disease, while the aggregate cost to the state governments has been probably as much more, and the loss to the live stock industry in indirect ways has been a very considerable item. Yet it is doubtful whether so far the total cost has been greater than the annual toll levied upon the live stock industry by parasites, which is estimated to be at least \$5,000,000. The necessity of stamping out foot-and-mouth disease because of the possible cost to the live stock industry in the future has operated to direct public interest to that item of loss, yet there are many live stock diseases to the presence of which the public have become accustomed which cause far greater annual losses than will be the total of this year's loss from the epidemic of foot-and-mouth disease, and against which no systematic campaign of control or extermination is being directed by the stock owners who suffer the loss. There is little excuse, for instance, for so large a loss from animal parasites, although some of the internal parasites are somewhat difficult to control. Public necessity has made the foot-and-mouth disease campaign a public issue, but the elimination of most other live stock losses might be materially aided through systematic effort and reasonable precaution on the part of stock owners of the country.

Agriculture and the War. The rise in market values of wheat and other grains due to the influence of the European war was scarcely more spectacular than was the sharp decline in values caused by the operations of the Allied fleets in the Dardanelles in the campaign aimed at the Turkish capital and the opening up of the Black Sea route for Russian grain. Regardless of any temporary fluctuations of values due to this cause, American farmers need have no fear that their products will not find a ready market in European countries following the close of the war, as well as during its progress. This will be true, not only of grain, but of certain live stock products as well. Without question the scarcity of grain in Europe will be instrumental in causing the sacrifice of the larger proportion of the live stock normally maintained upon farms in the affected area. Likewise the war's toll upon the horses of these countries will be enormous, and horses will be needed quite as badly for agricultural purposes after the war is over as they will be for military operations during the war. In fact, the demand for American horses of fair quality will undoubtedly be greater for use in peace-

ful pursuits than has been the case for military operations.

For these reasons every American farmer will do well to increase his production during the coming year as a means of increasing his income. Europe will undoubtedly produce less of the foodstuffs needed for her people than under normal conditions, and the opportunity is good for American farmers to supply this deficiency in foodstuffs and other products to their own profit. This can be accomplished by better farming quite as well as by more extensive farming, and although the time may not have arrived for the general practice of what is designated as intensive farming in Europe where the population is much more dense than in America, yet the time has arrived when we can undoubtedly apply more intensive methods than we have done in the past, especially in the essentials of better tillage and more liberal fertilization of the soil.

MICHIGAN STANDS FOR GOOD ROADS.

Enthusiasm for improved highways marked the proceedings through the seventh annual convention of the Michigan Good Roads Association and the exposition of road building machinery, material and equipment held at Grand Rapids, March 9-12. It was really four days of uplift and inspiration. The gathering of township, county and state road officials was the largest and most representative ever taking place in Michigan. In co-operation with the state association were the three leading development bureaus, the Western Michigan, the Northeastern Michigan, and the Upper Peninsula, also the West Michigan Pike Association and the Grand Highway Association. In addition State Highway Commissioner Rogers and other officials of the Michigan Highway Department were on hand and active throughout the four days.

The exposition, which was put on for the first time this year, proved a success, with something like 50 different displays. Special interest was taken in the educational exhibits made by the state highway department, the University of Michigan and the United States government, the latter including road models, starting with the Applan Way. This celebrated Roman road was started in 312 B. C. and remained in perfect condition for more than 800 years after its construction. French roads were shown as well as all leading modern types, with examples of drainage methods, rock crushers and other machinery.

The convention was held at the Coliseum and the main floor and annex were filled with exhibits, while the street in front of the building for a block was closed to traffic and was occupied with engines and other large pieces of machinery in operation. Local arrangements were under direction of Alvah Brown and J. Hackley Skinner, of Grand Rapids, with able assistants, and the success of the convention and show is due very largely to their efforts.

John N. Lent, of Monroe, succeeds Arthur P. Loomis on the board of trustees, and with this exception officers were re-elected. They are as follows: President, P. T. Colgrove, Hastings; vice-president, N. P. Hull, Dimondale; secretary, A. A. Anderson, Hastings; treasurer, J. Edward Roe, Lansing; trustees, Roy D. Chapin, Detroit; Alvah Brown, Grand Rapids; W. K. Prudden, Lansing; John N. Lent, Monroe; Dr. Geo. F. Young, South Haven; A. H. Dudley, Jonesville; Frank Hamilton, Traverse City; W. M. Bryant, Kalamazoo; Chas. Farrin, Mt. Clemens; C. E. Palmerlee, Lapeer.

President Colgrove in his annual message did not spend much time telling what has been done, taking for his text rather, the trumpet call, "To the Dogs with Yesterday; what's Doing Today?" He devoted much time to legislative matters now pending and gave vigorous support to the so-called trunk line bill. He declared that these trunk lines as laid out are in reality main market roads and should be so named. It part he said: "These roads start somewhere and go somewhere, and they mean the industrial upbuilding of the small towns and rural communities. They are calculated to open up every section of the state and to turn back the stream of wealth and population to the rural districts. They will develop our state, raise land values, improve the commercial and religious life of the country and keep boys and girls on the farms."

President Colgrove strongly opposed the Culver bill which provides that all moneys raised in the state for highway purposes shall be apportioned among the several counties accord-

ing to the value of their real and personal property subject to taxation. This bill he declared was a selfish measure framed very largely in the interests of Wayne county, which after completing a splendid system of cement roads, aided by every taxpayer throughout the state, now turns round to the rest of Michigan and says: "I don't want to play with you any more; build your own roads." Prison labor on roads was strongly recommended and it was suggested that since Jackson is on the main market road midway between Detroit and Kalamazoo that here is a fine opportunity to make a beginning.

The recommendation of the president that membership in the association be divided into four classes, life membership at \$25, sustaining memberships at \$5 per annum, active memberships at \$1 per annum and honorary memberships, was adopted.

Some of the more important features of the convention will be told in a future letter.

Kent Co. ALMOND GRIFFEN.

HAPPENINGS OF THE WEEK.

National.

The Post Office Department and the Department of Agriculture are co-operating with the Department of Labor in aid of the plan for the employment and distribution of laborers in the United States; the former through its postmasters, officers in charge of branch post offices, and rural mail carriers; and the latter through its field and other services throughout the United States. The purpose of this plan is to supply labor where required in every section of the republic. An effort will be made to furnish farmers and other employers of labor with help at all seasons of the year. To employers and employes desiring to avail themselves of the opportunities presented by said plan, the following explanation of the methods adopted may be of service: Blanks for use of employers desiring help and for persons seeking employment may be had on request from the postmaster, or officer in charge of any branch post office, or rural mail carrier. All application blanks when filled out and signed should be folded and returned to the postmaster or other officers mentioned, whereupon they will be forwarded to the proper officer of the Department of Labor, where they will receive special and prompt attention. When thus returned no postage will be required; otherwise the usual postage will be necessary.

Mrs. John D. Rockefeller, wife of the head of the Standard Oil concern, died March 12 at Pocantico Hills, N. J. She was nearly 76 years old, and had been in ill-health for several months. Lincoln Beachey, the well-known aviator, was killed March 14 at San Francisco when his aeroplane collapsed and plunged into the bay from a height of 3,000 feet. The accident occurred in full view of thousands of exposition spectators.

Foreign.

The European War.—With the coming of spring war military campaigns appear to be assuming larger proportions. In northern Poland both Russians and Germans anticipate a battle, and are moving large numbers of troops to that region. The Russians are also active in Galicia, and appear to be pressing the Austrians hard in the Carpathian passes. In the west the Allied armies are organizing for an extensive campaign, and last week English forces were successful in capturing Neuve Chapelle in northern France and held the position against repeated attacks by the Germans. The submarine attacks on British shipping in the English Channel are being prosecuted with vigor. In three days the submarine U-29 sank four British and one French merchantman and damaged three other British ships. In the attack on the forts of the Dardanelles by the Allied fleets of England and France, slow progress is being made.

Last week the German sea raider, Prince Eitel Frederick, sailed into Hampton Roads, Va., for repairs. This cruiser left the harbor of Tsing Tao, China, last fall, crossed the Pacific, passed around the Horn and up the eastern coast of South America, finally reaching the Virginia harbor. Eleven ships were sunk during the voyage, one of which was the American schooner, William P. Frye, into which an investigation is now being made by the United States.

China has protested to the German legation at Peking that Capt. Rabe von Peppenheim, a German military attaché, has been active in an endeavor to incite the natives of Manchuria to cut the trans-Siberian railroad.

FORD CAR OWNERS

Can learn of an easy way to make money by writing Dadco, Detroit, Mich. Mention the Michigan Farmer. —Adv.

Magazine Section

LITERATURE
POETRY
HISTORY and
INFORMATION

MICHIGAN FARMER
AND *LIVE STOCK*
PUBLISHED WEEKLY. *JOURNAL*
ESTABLISHED 1843.

The FARM BOY
and GIRL
SCIENTIFIC and
MECHANICAL

This Magazine Section forms a part of our paper every week. Every article is written especially for it, and does not appear elsewhere.

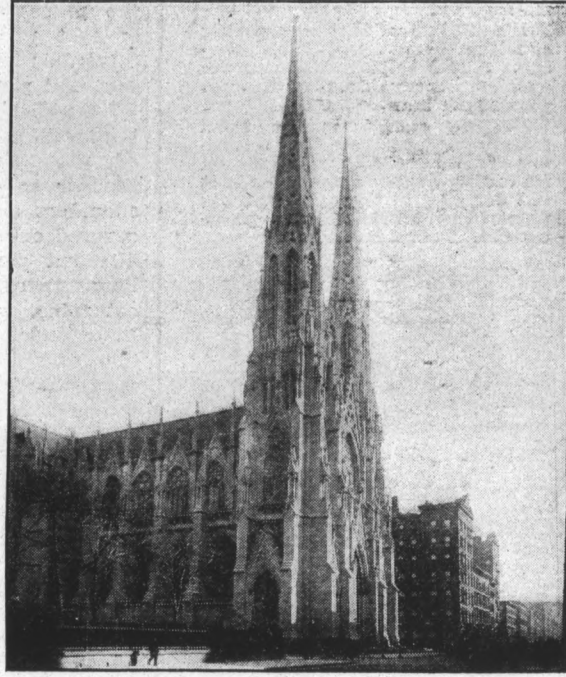
WORLD EVENTS IN PICTURES.



Prisoner at Sing Sing Knitting for Belgians.



Residence District of the Turkish Capital.



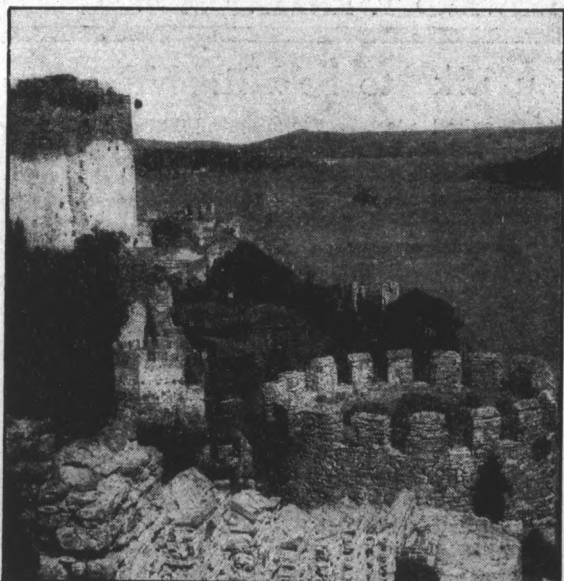
New York Cathedral Threatened by Anarchists.



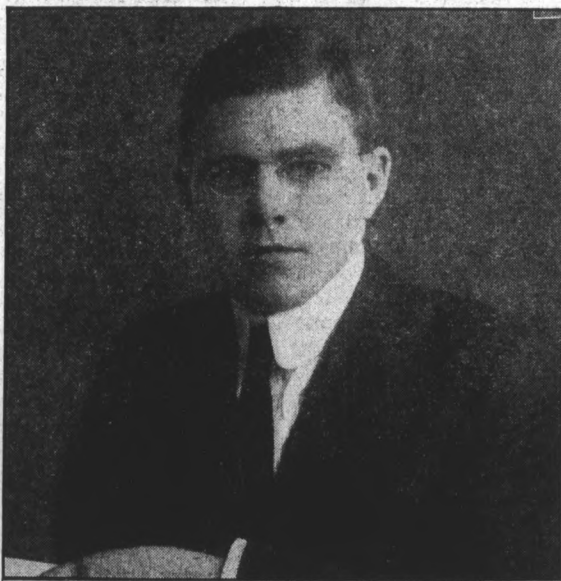
Anxious to Aid their Country, Parisian Working Girls Become Nurses.



Narrowest Part of Bosphorus (810 yards). Asia at Right, Europe at Left.



"Seven Towers" Guard Passage at Constantinople.



Dr. Rittman Finds New Way to Make Gasoline.



Scene on Golden Horn, Constantinople.

TRACTOR FEATURES

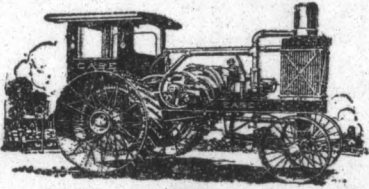
Win CASE Supremacy

Since the very invention of the traction engine, the name of CASE has stood for unchallenged supremacy. In power plowing, as in every other field, CASE Steam, Gas and Oil Tractors have won through actual performance.

Cost per acre plowed is one common method of comparing tractors. Countless working tests and public contests have proven CASE superiority here.

Working speed is the second big consideration in a tractor for plowing. CASE holds records for the greatest average number of acres plowed per hour.

Lasting quality is the third and greatest consideration in choosing a tractor. CASE would win on its lasting quality alone, even if it did not lead in the other two big points. Durability is the one greatest CASE consideration.



CASE 40 H. P. Gas and Oil Tractor

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Winston of the Prairie

BY HAROLD BINDLOSS.

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It was a still, cool evening when every man of the community, and most of the women, gathered in the big dining-room of the Grange. The windows were shut now, for the chill of the early frost was on the prairie, and the great lamps burned steadily above the long tables. Cut glass, dainty china and silver gleamed beneath them amidst the ears of wheat that stood in clusters for sole and appropriate ornamentation. They merited the place of honor, for wheat had brought prosperity to every man at Silverdale who had had the faith to sow that year.

On either hand were rows of smiling faces, the men's burned and bronzed, the women's kissed into faintly warmer color by the sun, and white shoulders shone amidst the somberly covered ones, while here and there a diamond gleamed on a snowy neck. Barrington sat at the head of the longest table, with his niece and sister, Dane and his oldest followers about him, and Winston at its foot, dressed very simply after the usual fashion of the prairie farmers. There were few in the company who had not noticed this, though they did not as yet understand its purport.

Nothing happened during dinner, but Maud Barrington noticed that, although some of his younger neighbors rallied him, Winston was grimly quiet. When it was over, Barrington rose, and the men who knew the care he had borne that year never paid him more willing homage than they did when he stood smiling down on them. As usual he was immaculate in dress, erect, and quietly commanding, but in spite of its smile his face seemed worn and there were thickening wrinkles, which told of anxiety, about his eyes.

"Another year has gone, and we have met again to celebrate with gratefulness the fulfillment of the promise made when the world was young," he said. "We do well to be thankful, but I think humility becomes us too. While we doubted the sun and the rain have been with us for a sign that, though men grow faint-hearted and spare their toil, seed-time and harvest shall not fail."

It was the first time Colonel Barrington had spoken in quite that strain and when he paused a moment there was a curious stillness, for those who heard him noticed an unusual tremor in his voice. There was also a gravity that was not far removed from sadness in his face when he went on again, but the intentness of his retainers would have been greater had they known that two separate detachments of police troopers were than riding toward Silverdale.

"The year has brought its changes, and set its mark deeply on some of us," he said. "We cannot recall it, or retrieve our blunders, but we can hope they will be forgiven us and endeavor to avoid them again. This is not the fashion in which I had meant to speak to you tonight, but after the bounty showered upon us I feel my responsibility. The law is unchangeable. The man who would have bread to eat or sell must toil for it, and I, in disregard of it, bade you hold your hand. Well, we have had our lesson, and we will be wiser another time, but I have felt that my usefulness as your leader is slipping away from me. This year has shown me that I am getting an old man."

Dane kicked the foot of a lad beside him, and glanced at the piano as he stood up.

"Sir," he said simply, "although we have differed about trifles and may do so again, we don't want a better one

—and if we did we couldn't find him." A chord from the piano rang through the approving murmurs, and the company rose to their feet before the lad had beaten out the first bar of the jingling rhythm. Then the voices took it up, and the great hall shook to the rafters with the last "Nobody can deny."

Trite as it was, Barrington saw the darker flush in the bronzed faces, and there was a shade of warmer color in his own as he went on again.

"The things one feels the most are those one can least express, and I will not try to tell you how I value your confidence," he said. "Still, the fact remains that sooner or later I must let the reins fall into younger hands, and there is a man here who will, I fancy, lead you farther than you would ever go with me. Times change, and he can teach you how those who would do the most for the Dominion need live today. He is also, and I am glad of it, one of us, for traditions do not wholly lose their force and we know that blood will tell. That this year has not ended in disaster irretrievable is due to our latest comrade, Lance Courthorne."

This time there were no musical honors or need of them, for a shout went up that called forth an answering rattle from the cedar paneling. It was flung back from table to table up and down the great room, and when the men sat down, flushed and breathless, their eyes still shining, the one they admitted had saved Silverdale rose up quietly at the foot of the table. The hand he laid on the snowy cloth shook a little, and the bronze that generally suffused it was less noticeable in his face. All who saw it felt that something unusual was coming, and Maud Barrington leaned forward a trifle, with a curious throbbing of her heart.

"Comrades! It is, I think, the last time you will hear the term from me," he said. "I am glad that we have made and won a good fight at Silverdale, because it may soften your warranted resentment when you think of me."

Every eye was turned upon him, and an expression of bewilderment crept into the faces, while a lad who sat next to him touched his arm reassuringly.

"You'll feel your feet in a moment, but that's a curious fashion of putting it," he said.

Winston turned to Barrington, and

stood silent a moment. He saw Maud Barrington face showing strained and intent, but less bewildered than the others, and that of her aunt, which seemed curiously impassive, and a little thrill ran through him. It passed, and once more he saw only the leader of Silverdale.

"Sir," he said, "I did you a wrong when I came here, and with your convictions you would never tolerate me as your successor."

There was a rustle of fabrics as some of the women moved, and a murmur of uncontrollable astonishment, while those who noticed it remembered Barrington's gasp. It expressed absolute bewilderment, but in another moment he smiled.

"Sit down, Lance," he said. "You need make no speeches. We expect better things from you."

Winston stood very still. "It was the simple truth I told you, sir," he said. "Don't make it too hard for me."

Just then there was a disturbance at the rear of the room, and a man, who shook off the grasp of one that followed him, came in. He moved forward with uneven steps, and then, resting his hand on a chair back faced about and looked at Winston. The dust was thick upon his clothes, but it was his face that seized and held attention. It was horribly pallid, save for the flush that showed in either cheek, and his half-closed eyes were dazed.

"I heard them cheering," he said. "Couldn't find you at your homestead. You should have sent the five hundred dollars. They would have saved you this."

The defective utterance would alone have attracted attention, and, with the man's attitude, was very significant, but it was equally evident to most of those who watched him that he was also struggling with some infirmity. Western hospitality has, however, no limit, and one of the younger men drew out a chair.

"Hadn't you better sit down, and if you want anything to eat we'll get it for you," he said. "Then you can tell us what your errand is."

The man made a gesture of negation, and pointed to Winston.

"I came to find a friend of mine. They told me at his homestead that he was here," he said.

There was an impressive silence, until Colonel Barrington glanced at Winston, who still stood quietly impassive at the foot of the table.

"You know our visitor?" he said. "The Grange is large enough to give a stranger shelter."

The man laughed. "Of course he does; it's my place he's living in."

Barrington turned again to Winston (Continued on page 360).

Land O' Nod Stories.

By HOWARD T. KNAPP.

Would You Like to be a Rabbit?

WHY are you so late?" asked Tinker Teedle Tee as Billy Be By Bo Bum climbed over the stump that separated the cow pasture from the White Forest. "You promised to meet me right after school and here it is nearly time for the sun to go to bed behind the western hills."

"I would have been here sooner but I was kept in after school," answered Billy. "I think our teacher is just too horrid for anything," and he stamped his foot and pouted like the little boys who live on Grumble Corner of Cross-patch Town.

"What were you doing that she made you stay in after school?" asked Tinker, trying to look very grave but smiling in spite of himself.

"I wasn't doing a thin, honest I

wasn't," protested Billy. But there was such a knowing twinkle in Tinker's eyes, a twinkle that said, just as plain as could be, "You can't fool me, Billy Be By Bo Bum," that Billy hastened to add:

"Well, I was only talking to the boy in the seat back of me and I didn't stop when she told me to. But I don't see anything wrong in that, do you Tinker?"

"It wasn't the talking that was wrong," replied the merry little elf. "It was the fact that you didn't mind teacher, and little boys who don't mind always get in some kind of trouble."

"Oh, dear, I wish I was a rabbit," grumbled Billy. "Then I could do just as I pleased."

"Yes, and get caught by Slinker the

Weasel or Fleetfoot the Fox before you were a week old," retorted Tinker, beginning to get just a little bit out of patience. "A baby Bunny learns to mind his mother before he can walk, and until he is old enough to have baby bunnies of his own, he never thinks of disobeying.

"Just as soon as he is able to stand up on his wobbly little legs, Mrs. Rabbit starts to teach him the ways of the woods and the many tricks a rabbit must know to fool his enemies. First, Bunny learns to lay low and say nothing, and that is called freezing. Then he is taught the briar patch is his best friend, ever ready to protect him with its thousands of sharp little thorns, and after that he learns about the barbed wire fence."

"I know all about barbed wire fences," interrupted Billy. "I tore my coat last week crawling through the one that separates the lower orchard from the meadow, but I shouldn't think they would bother Bunny."

"They don't," replied Tinker. "Not a bit of it. In fact, the barbed wire fence is one of Mr. Rabbit's best friends. And that's rather funny, for man is Bunny's worst enemy. Even the briar bush can't save him from guns and ferrets, and whenever Farmer Meadows comes into the White Forest, it means trouble for the Little People. For if he leaves his gun at home, he is sure to bring his axe, and that means trees are to be cut down, making the woods smaller, or briar patches and hollow logs are to be cleared away. But although Farmer Meadows spoils lots of snug little hiding places, it wasn't long before Bunny discovered he had planted a new kind of briar bush—the barbed wire fence."

"But I don't see how the barbed wire fence help Mr. Rabbit," said Billy.

Just as Tinker was about to answer, they heard old Long Ears the Hound baying off at the other side of the woods, and the next minute Mr. Rabbit darted by lickety split, going so fast he looked like a streak of brown fur bounding over the snow. Long Ears wasn't far behind, but he wasn't running nearly as fast as Bunny, for he kept his nose close to the ground, except when he raised his head to sound a long wow-wow-wow.

"Come on Billy Boy," shouted Tinker, spreading his wings and darting off through the woods, and Billy followed as fast as his chubby little legs would carry him, jumping over logs and tearing through clumps of bushes until he came to the barbed wire fence separating the lower meadow from the White Forest and here Tinker stopped. Off in the field they could see Mr. Rabbit bounding along with Long Ears close behind; so close, in fact, that it seemed as though the hound would catch bunny at the very next jump. But Mr. Rabbit managed to keep just a little bit ahead, and after circling the field, he made straight for the fence.

"Now we will see some fun," shouted Tinker, jumping up and down in his excitement, and the next minute Mr. Rabbit bounded through the barbed wire fence and vanished into a briar patch.

Long Ears was right behind, but he was running so fast and keeping his nose so close to the ground that he did not see the fence. So he ran smack into it, hitting the wires so hard he turned a complete somersault, landing on his head in a snow drift some distance away. When he scrambled to his feet, howling with pain, Billy saw the sharp little barbs had torn his ears and pricked his sides. He never waited to see what had become of Mr. Rabbit, but putting his tail between his legs, started for home yelping all the way.

"Now you see how the barbed wire fence helps Mr. Rabbit, don't you?" asked Tinker Teedle Tee. "It saved Bunny's life that time, as it has many times before."

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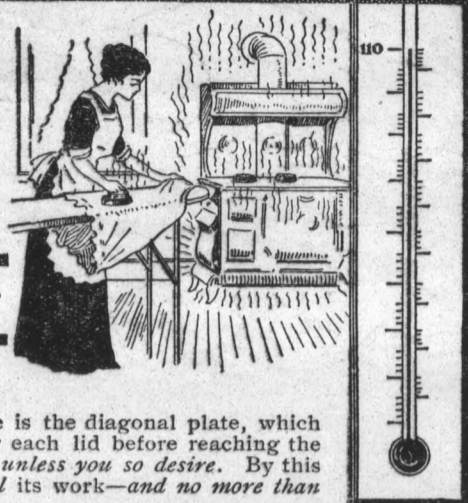
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WINSTON OF THE PRAIRIE.

(Continued from page 358).

and his face seemed to have grown a trifle stern.

"Who is this man?" he said.

Winston looked steadily in front of him, vacantly noticing the rows of faces turned towards him under the big lamps. "If he had waited a few minutes longer you would have known," he said. "He is Lance Courthorne."

This time the murmurs implied incredulity, but the man who stood swaying a little with his hand on the chair, and a smile in his half-closed eyes, made an ironical inclination.

"It's evident you don't believe it or wish to. Still, it's true," he said.

One of the men nearest him rose and quietly thrust him into the chair. "Sit down in the meanwhile," he said dryly. "By and by, Colonel Barrington will talk to you."

Barrington thanked him with a gesture, and glanced at the rest. "One would have preferred to carry out this inquiry more privately," he said, very slowly, but with hoarse distinctness. "Still, you have already heard so much."

Dane nodded. "I fancy you are right, sir. Because we have known and respected the man who has, at least, done a good deal for us, it would be better that we should hear the rest."

Barrington made a little gesture of agreement, and once more fixed his eyes on Winston. "Then will you tell us who you are?"

"A struggling prairie farmer," said Winston quietly. "The son of an English country doctor who died in penury, and one who from your point of view could never have been entitled to more than courteous toleration from any of you."

He stopped, but, for the astonishment was passing, there was negation in the murmurs which followed, while somebody said, "Go on."

Dane stood up. "I fancy our comrade is mistaken," he said. "Whatever he may have been, we recognize our debt to him. Still, I think he owes us a more complete explanation."

Then Maud Barrington, sitting where all could see her, signed imperiously to Alfreton, who was on his feet next moment, with Macdonald and more of the men following him.

"I," he said, with a little ring in his voice, and a flush in his young face, "owe him everything, and I'm not the only one. This, it seems to me, is the time to acknowledge it."

Barrington checked him with a gesture. "Sit down all of you. Painful and embarrassing as it is, now we have gone so far, this affair must be elucidated. It would be better if you told us more."

Winston drew back a chair, and when Courthorne moved, the man who sat next to him laid a grasp on his arm. "You will oblige me by not making any remarks just now," he said. "When Colonel Barrington wants to hear anything from you he will ask you."

"There is little more," said Winston. "I could see no hope in the old country, and came out to this one with one hundred pounds a distant connection lent me. That sum will not go very far anywhere, as I found when, after working for other men, I bought stock and took up government land. To hear how I tried to do three men's work for six weary years, and at times went for months together half-fed, might not interest you, although it has its bearing on what came after. The seasons were against me, and I had not the dollars to tide me over the time of drought and blizzard until a good one came. Still, though my stock died, and I could scarcely haul in the little wheat the frost and hail left me, with my worn-out team, I held on, feeling that I

could achieve prosperity if I once had the chances of other men."

He stopped a moment, and Macdonald poured out a glass of wine and passed it across to him in a fashion that made the significance of what he did evident.

"We know what kind of a struggle you made by what we have seen at Silverdale," he said.

Winston put the glass aside, and turned once more to Colonel Barrington.

"Still," he said, "until Courthorne crossed my path, I had done no wrong, and I was in dire need of the money that tempted me to take his offer. He made a bargain with me that I should ride his horse and personate him, that the police troopers might leave him unsuspected to lead his comrade running whisky, while they followed me. I kept my part of the bargain, and it cost me what I fancy I can never recover, unless the trial I shall shortly face will take the stain from me. While I passed for him your lawyer found me, and I had no choice between being condemned as a criminal for what Courthorne had in the meanwhile done, or continuing the deception. He had, as soon as I had left him, taken my horse and garments, so that if seen by the police they would charge me. I could not take your money, but, though Courthorne was apparently drowned, I did wrong when I came to Silverdale. For a time the opportunities dazzled me; ambition drew me on, and I knew what I could do."

He stopped again, and once more there was a soft rustle of dresses, and a murmur, as those who listened gave inarticulate expression to their feelings. Moving a little, he looked steadily at Maud Barrington and her aunt, who sat close together.

"Then," he said, very slowly, "it was borne in upon me that I could not persist in deceiving you. Courthorne, I fancied, could not return to trouble me, but the confidence that little by little you place in me rendered it out of the question. Still, I saw that I could save some at least at Silverdale from drifting to disaster and there was work for me here which would go a little way in reparation, and now that it is done I was about to bid you good-by, and ask you not to think too hardily of me."

There was a moment's intense silence until once more Dane rose up, and pointed to Courthorne sitting with half closed eyes, dusty, partly dazed by indulgence, and with the stamp of dissolute living on him, in his chair. Then he glanced at Winston's bronzed face, which showed quietly resolute at the bottom of the table.

"Whatever we would spare you and ourselves, sir, we must face the truth," he said. "Which of these men was needed at Silverdale?"

Again the murmurs rose, but Winston sat silent, his pulses throbbing with a curious exultation. He had seen the color creep into Maud Barrington's face, and her aunt's eyes, when he told her what had prompted him to leave Silverdale, and knew they understood him. Then, in the stillness that followed, the drumming of hoofs rose from the prairie. It grew louder, and when another sound, audible too, more than one of those who listened recognized the jingle of accoutrements. Courthorne rose unsteadily, and made for the door.

"I think," he said, with a curious laugh, "I must be going. I don't know whether the troopers want me or your comrade."

A lad sprang to his feet, and as he ran to the door called "Stop him!"

In another moment Dane had caught his arm, and his voice rang through the confusion as everybody turned or rose.

"Keep back, all of you," he said. "Let him go." Courthorne was outside by this time

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and only those who reached the door before Dane closed it heard a faint beat of hoofs as somebody rode quietly away beneath the bluff, while as the rest clustered together, wondering, a minute or two later, Corporal Payne, flecked with spume and covered with dust, came in. He raised his hand in salutation to Colonel Barrington, who sat very grim in face in his chair at the head of the table.

"I'm sorry, sir, but it's my duty to apprehend Lance Courthorne," he said.

"You have a warrant?" asked Barrington.

"Yes, sir," said the corporal. There was intense silence for a moment. Then the Colonel's voice broke through it very quietly.

"He is not here," he said. Payne made a little deprecatory gesture. "We know he came here. It is my duty to warn you that proceedings will be taken against anyone concealing or harboring him."

Barrington rose very stiffly, with a little gray tinge in his face, but words seemed to fail him, and Dane laid a hand on the corporal's shoulder.

"Then," he said grimly, "don't exceed it. If you believe he's here, we will give you every opportunity of finding him."

Payne called to a comrade outside, who was, as it happened, new to the force, and they spent at least ten minutes questioning the servants and going up and down the house. Then as they glanced into the general's room again, the trooper looked deprecatingly at his officer.

"I fancied I heard somebody riding by the bluff just before we reached the house," he said.

Payne wheeled around with a flash in his eyes. "Then you have lost us our man. Out with you, and tell Jackson to try the bluff for a trail."

They had gone in another moment, and Winston still sat at the foot of the table and Barrington at the head, while the rest of the company were then scattered, some wonderingly silent, though others talked in whispers, about the room. As yet they felt only consternation and astonishment.

CHAPTER XXV.

Courthorne Makes Reparation.

THE silence in the big room had grown oppressive, when Barrington raised his head and sat stiffly upright.

"What has happened has been a blow to me, and I am afraid I am scarcely equal to entertaining you tonight," he said. "I should, however, like Dane and Macdonald, and one or two of the older men to stay a while. There is still, I fancy, a good deal for us to do."

The others turned towards the door, but as they passed Winston, Miss Barrington turned and touched his shoulder. The man, looking up suddenly, saw her and her niece standing close beside her.

"Madam," he said hoarsely, though it was Maud Barrington he glanced at, "the comedy is over. Well, I promised you an explanation, and now you have it you will try not to think too bitterly of me. I cannot ask you to forgive me."

The little white-haired lady pointed to the ears of wheat which stood gleaming ruddy bronze in front of him.

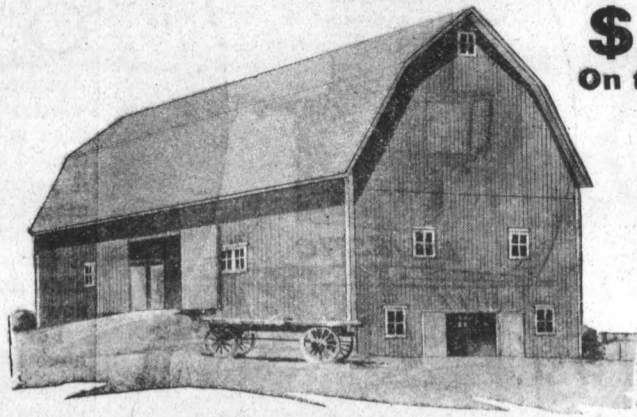
"That," she said, very quietly, "will make it easier."

Maud Barrington said nothing, but everyone in the room saw her standing a moment beside the man, with a little flush on her face and no blame in her eyes. Then she passed on, but as it was, the pause had been very significant, for it seemed that whatever the elders of the community might decide, the women, whose influence was supreme at Silverdale, had given the impostor absolution.

(To be continued).

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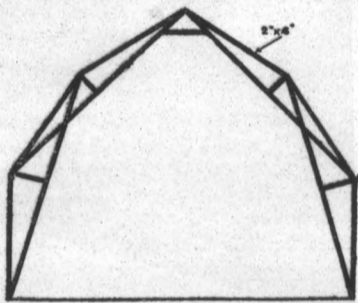
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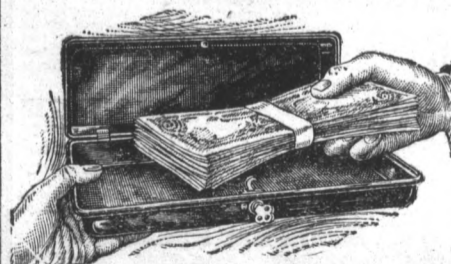
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A Progressive School in Upper Michigan

By L. A. CHASE.

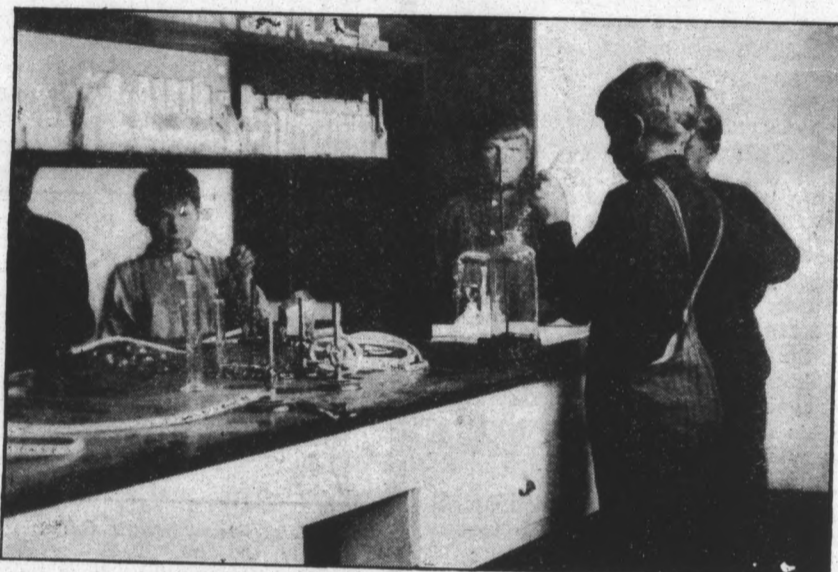
ONE does not look for a modern school, with a city equipment, located in the primeval woods, surrounded with a sparse and backward rural population that does not even speak the language of the country. This you will find nevertheless, if you take the Otter Lake road running south from Houghton, Michigan, and follow it for some sixteen miles. It takes you into a settlement of Finnish farmers—men once miners but now following their natural vocation.

For twenty-five years these people have lived off the highway of civilization, far from markets, without telephone or rural free delivery, living and dying unto themselves alone. They are in the copper district of Michigan but are miles off the copper ranges in a region wholly neglected except by the lumberman and such agriculture as these Finnish farmers can practice. But they happen to be within the limits of Portage township, which is about three times the size of the usual

may be expected to have; but this is not all.

The equipment includes a dairy department with cream separator, Babcock tester, and large rotary churn. In a chicken house adjacent is a flock of pure-bred fowls and nearby is a pen of thoroughbred pigs. Other live stock is to be added—including high-grade breeding animals; for the school seeks to be the agency whereby better grades of live stock are to be introduced into this community. So it is also with the crops. Four acres of the forty belonging to the school have been cleared, and most of this has been devoted to the raising of varieties of cereals and vegetables superior to those found in the neighborhood.

The school stands ready to do anything that promises the regeneration of the community economically, socially, and intellectually, and will not allow precedent nor convention to interfere with the attainment of this object. It is to work not only for the



Boys Working in Chemical Laboratory at Otter Lake Agricultural School.

Michigan township, and which possesses an up-to-date school system based upon the township unit system popular in the northern peninsula of Michigan.

Life and industry in Portage township are varied. At the northern end is Houghton, an important shipping point by lake and railroad, with a population of intelligent and well-to-do people, many of them connected with the management of the copper mines and smelters, or the railways, and with a considerable college personnel connected with the Michigan College of Mines. Back of Houghton are the mining locations, among the oldest in the state. Beyond these is the farming district we have described. The township school system has thirteen schools, including a well-equipped city high school at one end of the scale and Otter Lake Agricultural School at the other.

The latter school is now in its second year of operation. It was built to solve not one problem but several. How to get an immigrant population on to the land; how to keep it there from generation to generation; how to make progressive farmers of these people; how to add agriculture to the industries of the district. These were the problems attacked by the school management of Portage township.

The Otter Lake Agricultural School stands at the corner of a wooded school ground forty acres in extent. It is an eight-room, two-story structure, not counting small rooms and basement. It is equipped with electric lights, gas, water under pressure, plumbing, and hot water heating; in fact, every modern convenience of a city school is provided. It is also equipped with apparatus for teaching agriculture and domestic science by laboratory methods, and manual training. So far the equipment represents what other schools of similar purpose

children but for all residents within its reach. It is therefore a community center, and once a month the parents assemble there to discuss among themselves problems in which they are interested and to listen to talks by Finnish-speaking or English-speaking persons capable of instructing them.

One hundred and fifteen children are, this winter, in attendance at the school. In addition to the regular course prescribed for primary schools by the State Department of Public Instruction, embracing the usual literary subjects, each pupil spends one hour a day studying either agriculture or domestic science by the laboratory method, and the boys get manual training in addition. The work does not extend beyond the eighth grade, and the course for this reason is perhaps unique. But it is practical. When a chicken house was wanted, the boys from the classes in manual training built it. The boys and girls raised vegetables that were awarded prizes at the Copper County Fair last fall.

To help make life interesting for them in their isolated circumstances, the school conducts parties for the young people and a farmers' club especially for the young men has been promoted where those above school age may discuss farm problems and seek to better their methods. The Otter Lake Agricultural School is so near its inception that large results cannot yet be looked for; but an expenditure in the enterprise for plant and equipment of some eighteen thousand dollars manifests the faith of Superintendent J. A. Doelle and the Board of Education of Portage township in it. In addition to this outlay, forty-two thousand dollars have been spent in constructing a new and direct highway from the district to Houghton with obvious advantage to both communities. This road is a result of this school enterprise.

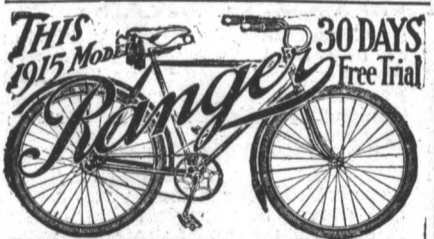


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Woman and Her Needs

At Home and Elsewhere

The Domestic Crucible 10. The Failure of the Outing.

FOR Heaven's sake stop stuffing fried chicken into that basket and come on and dress," John Ludlow called from the bedroom. "We aren't going to camp out for a week. All you want is enough for dinner and supper and you had that much packed a half hour ago."

"In a minute," Grace answered. "You never know who is going to come up and expect a sandwich or a piece of cake." She crowded the olive bottle over to make room for another cup cake, found she couldn't get it in without crushing, and reluctantly concluded the basket was full.

"I'll be ready in just ten minutes," said John from the depths of the closet, "and if you aren't I'll take Aunt Ann. I tell you I'm not going to be late. They're going to read the Declaration at exactly 11 a. m., and I'm going to be on the front seat. We've got just one hour and 15 minutes, and eight miles to drive."

"Oh, I can dress while you're hitching up," scoffed Grace, giving the paper napkins over her basket a few extra pats. "This lunch is of more importance than the Declaration of Independence. That's ancient history and my very present reputation depends upon this."

"You'll do better than you've ever done before if you can," replied John, ignoring the last half of her remark. "I'm starting for the barn this minute," and he hustled through the kitchen, wildly trying to knot his tie as he spoke.

Grace hurried into the bedroom then, determined to make good her boast. Her one-piece work-dress was off in a twinkling, pins flew out of her wavy hair, and with lightning fingers she combed and smoothed and patted it into a becoming knot. She didn't dare put on the new dress she had intended to wear, that had to be hooked up the back, and she couldn't ask John to do that after taking so much time over the lunch basket.

She slipped into a white muslin left over from last year, with the consciousness that every woman would take instant note of it, for she would be on parade today as the neighborhood bride.

True to his word John drove up and whistled in exactly ten minutes, but it was another ten minutes before a flushed and perspiring Grace emerged, her hat awry and a dab of powder adorning one ear.

A lively procession greeted them as they turned off their own little cross-road onto the state reward road which stretched away to the lake where the Fourth of July celebration was to be held. The entire neighborhood had turned out, and smart carriages gay with hunting, small American flags fluttering from the horses' heads, were interspersed with shining new autos, the wheels a maze of red, white and blue. A shower the night before had laid the dust, there was a fresh breeze, snow-white clouds sailed peacefully above, and altogether the morning was perfect. They were quickly in the heart of the parade, calling greetings to the friends nearest, waving handkerchiefs to those farther away. Grace's heart thrilled. Her holiday with John would be perfect.

"There's Dora Stuart," said Grace,

after a prolonged stare to the rear. "She's got a blue hat with a red plume and a pink dress. Can you beat that?" John had been rather attentive to Dora in the days that Grace was away at school. "But who is that she is with? I never saw that turnout before."

John turned to inspect the new conveyance, taking occasion to greet Dora with a sweeping raise of his hat. "That's Billy Perkins," he announced. "You ought to know that trap, you've ridden in it often enough. He's just had it overhauled and repainted."

Grace bent suddenly to inspect the lunch basket. John was not supposed to know about the rides she had taken with Billy.

The front seat was filled when they reached the ground, in fact, every seat around the speakers' stand was taken. John and Grace joined the crowds on the bank of the lake who had decided to swim, fish or try the toboggan rather than listen to speeches. Dora and Billy greeted them as they came up.

"How sweet you look," said Dora. "I loved you in that dress last summer. Excuse me," and with a quick pat of her handkerchief she brushed the powder from Grace's ear. Grace flushed hotly and could have killed Dora with pleasure.

"It's nice of you to like it," she said. "John adores it." Why hadn't he told her to wipe that powder off?

"Let's get a boat and go out rowing, broke in John, who had been eyeing the small row-boats and canoes lined up for rent.

"O, yes, let's do. I just love the water," agreed Dora. "And you can teach me to row."

Grace, who had been anticipating the suggestion with dread turned white. She hated and feared the water, especially when she was as near to it as one of those horrid, tippy, dirty little boats brought her.

"You all go, and I'll look for mother and father," she said. "I want to see them, and I don't care much for rowing."

"Oh, come on," urged Dora. "You can find them afterwards."

John was already bargaining with a boatman for the boat. Was that all he cared about her? He knew perfectly well how afraid she was. She drew back from Dora. "No, you go on and I'll stay here. That boat isn't large enough for four anyway."

"Oh, come on Grace," called John. "You couldn't drown in this lake if the boat did upset. It isn't deep enough."

But Grace stubbornly refused. It was bad enough to stay on dry land with Dora around, but to get into a small boat with her, never! "No, I'd rather not," she said. "Take Dora."

Dora was already clambering into the boat, shrieking excitedly as it tipped to her weight.

"All right," said John. "Come on, Billy. We'll meet you by the buggy when we come back."

But Billy gallantly remained by Grace's side. "I'll stay and take care of Grace," he said, "you go and enjoy your ride and we'll all lunch together."

Grace turned away, boiling with rage. It was bad enough to have John walk off with that blue hat and pink dress, but to have this simpering idiot stick by her when she wanted to get

away alone for a few minutes was insufferable. She'd get rid of him. But no, she wouldn't. If John could go gaily off with Dora, she'd have a good time with Billy.

It was one o'clock before John and Dora returned triumphant. Dora acted as if she owned John, Grace thought. But John, big and hearty, thought only of the lunch basket.

"Bring on your fried chicken and deviled eggs, Grace," he begged, "I'm hollow to my toes. Rowing Dora around is harder work than thrashing."

"And I've got sandwiches and the most delicious fruit salad," broke in Dora, bustling about importantly. "We'll all eat together."

Lunch over, Dora clamored for a ride down the toboggan, and John, ever ready for action, seconded the motion. Grace, who would not wear a rented bathing suit, watched them splashing about in the water, while Billy hovered about. Her father and mother drifted up and other friends joined them. The toboggan ceased to charm, and Dora and John came up, flushing and laughing. Now Grace was sure John would come to her and introduce her to the many friends he had there whom she had never met. But, no. Dora wanted to teach him the one-step and everyone must go to the pavilion.

It was quite seven o'clock before they were finally alone together, and then only because they had to go home, Grace told herself bitterly. The beautiful day she had planned, the day when John was to hunt up all his old friends and proudly present his wife, when she was to be the center of attraction because she was a bride, lay in ruins about her. John didn't care for her, that was certain. He never had loved her or he could not have spent the day chasing about with a red-faced girl in a pink dress.

"Well, we had a bully time, didn't we, kiddo?" John cracked the whip over the horse's back and smiled down at Grace cheerfully, as he spoke.

Stony silence greeted him, and the whistle stopped abruptly. "Why, what's the matter? Are you sick?" he asked anxiously. "Why didn't you say so and we would have started home before?"

"No, I'm not sick," Grace replied icily, "only tired." Her voice would waver a little in spite of herself.

"I believe you are too sick," John persisted, taking her hand. "Why didn't you tell me and we'd have started home sooner."

"I'm perfectly well," insisted Grace, drawing her hand away. "And anyway, if I hadn't been, you and Dora were having such a perfectly lovely time I couldn't have spoiled it."

John sat up suddenly and looked straight ahead. So that was it? And she had told him to go boating with Dora, urged him to try the toboggan and insisted that he learn the one-step. Women were the darnedest. You never knew whether they meant yes or no.

"You told me to take her boating," he defended himself.

"Yes, but I didn't tell you to spend the whole day with her," Grace replied. "She acted just as if she owned you, and I heard two people say she must be your wife, and she doesn't know how to dress, and now everyone will think I'm a frump." Her pent-up tears escaped and she sniffed quite audibly. Whether because she had been neglected or because her taste in (Continued on page 365).



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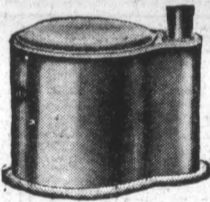
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MICHIGAN'S HAPPY BABIES. No. 12.

When at the age of six months or seven months you may begin to feed the baby, care must be taken to choose the food best suited to your own infant.

Eggs and a simple starch, either hard dry toast, crackers or a well-cooked cereal, are safe as a beginning. Do not make the mistake of soaking the toast and crackers in hot water or warm milk and feeding with a spoon. Instead give the child the dry food in his hand and let him nibble it. The starch is digested in this way as he must keep the food in his mouth until it is thoroughly moistened or he can not swallow it, while if it is soaked for him he swallows it before it is acted upon by the saliva which changes the starch into sugar. Besides, chewing the hard substance helps him in teething.

If your baby is troubled with constipation, graham crackers would be better for him than the common butter crackers. There are also crackers manufactured especially to help overcome constipation, which you may buy.

In choosing the cereal to feed him be governed, also, by the action of the bowels. If he is constipated, give oat meal, well-cooked, which does not mean stirred up in a saucepan for two or three minutes, but cooked not less than a half hour. If he is troubled with looseness, rice is a good cereal to choose, while for the normal child any one of the wheat preparations are good. Oat meal has so long been recommended for babies that many mothers think it is the best thing. On the contrary, there are fewer children who can digest it than there are those whom it suits. A wheat cereal is better for the average baby.

Feed the cereal with a little warm milk and no sugar. The starch in the cereal will be changed into sugar during digestion, and no more sugar is necessary. In fact, it will often upset the digestion and the mother who thinks her baby can not digest certain cereals will find by leaving off the sugar that the child can take the cereal perfectly. It was the sugar which worked the harm.

Potatoes should never be fed before the beginning of the second year, and in many cases they can not be digested under two years. Potato starch is the hardest form of starch to digest.

These few things, with a little orange juice and scraped apple, are about all you can safely feed under one year of age. You may give other things and because the baby is not made positively ill at once, think he is digesting them all right. But the stomach is harmed by them nevertheless.

Under no circumstances give a taste of tea, coffee or alcoholic liquors. These things are stimulants pure and simple, and have a very bad effect on the child's nervous system. **DEBORAH.**

RECIPES.

Rose Apples.

Dissolve a small wine glass full of little red cinnamon candies in two cupfuls of water and in this cook a half-dozen cored and pared apples. If large cut them in halves. When the apples are tender but not broken, remove them from the fire and cook down the liquid until of the consistency of syrup. Pour over the apples and serve when cold.—L. M.

Sweet Potato Biscuit.

Bake four medium-sized sweet potatoes, scoop out the pulp, add one spoonful of butter and press through a colander, with a pinch of salt. Mix the potatoes into one quart of sifted flour, and moisten to a dough with one and a half cupfuls of thick sour milk in which half a teaspoonful of baking soda has been dissolved. Roll out, cut into biscuits, and lay them in a greased pan until morning. Then set them to rise in a warm place for a

few minutes and bake in a hot oven to a rich brown. Whese are good either warm or cold.—M. A. P.

Rice with Apples.

Mash two cupfuls of steamed rice, add two beaten eggs, one-half cupful of sugar and one-half cupful of milk. Stir thoroughly, beat in three apples well cooked and mashed, and bake 20 minutes in a buttered tin. Serve with milk or whipped cream.—L. M.

Anise Cake.

Beat four eggs, add one and one-half cupfuls of sugar. Stir together and beat in one pint of flour to which a teaspoonful of baking powder has been added. Stir into this batter five drops of anise oil, beating thoroughly all the while. Set away in a cool cupboard for six hours before baking on a well-buttered tin.—L. M.

Nut Bread.

Mix together one-half teaspoonful of salt, four cups of flour, one-half cup of sugar, one scant cupful of chopped walnuts, four teaspoonfuls of baking powder. Add two cups of sweet milk, one beaten egg. Let raise 20 minutes and bake in moderate oven one hour.—Mrs. J. J. O'C.

Home-made Cheese.

Put your sour milk on the stove until it curds. Press out the whey thoroughly, then put in a crock, cover with a thin cloth and set in a warm place for three or four days, or until it ferments, stirring it once a day. Now put in a kettle two heaping table-spoons of butter to one quart cheese, let melt, then stir in your cheese, season with salt, cook until it becomes a creamy substance, stirring while cooking. Pour into a deep dish. When cold cut like any other cheese.—M. B. O.

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Our latest Fashion Book, containing illustrations of over 700 of the season's latest styles, and devoting several pages to embroidery designs, will be sent to any address on receipt of fifteen cents.



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No. 8344a—Basque with Tunic. Cut in sizes 34 to 42 bust measure. Size 38 requires 4 3/4 yds. of 36-inch material and 3/8 yd. 27-inch for collar and cuffs.

No. 8174—Seven-gored Skirt. Cut in sizes 26 to 36 waist measure. Size 32 requires 3 1/4 yds. of 36-inch plain material.

No. 8382—Three-piece Skirt with Long Tunic. Cut in sizes 24 to 32 waist measure. Size 28 requires 2 1/2 yds. of 36 or 44-inch material for skirt and 2 1/4 yds. for tunic.

The above patterns will be mailed to any address by the fashion department of the Michigan Farmer on receipt of ten cents for each.

THE DOMESTIC CRUCIBLE.

(Continued from page 363).

dressing would be questioned, neither she nor John knew.

John slipped his arm about her, and this time she did not draw away. "You see, I am so sure of your love that I don't need to tie you up tight to keep you," he said soberly. "Can't you feel the same way? Are we to drop all our old friends and never look at other men and women just because we are married? I admired lots of girls before I chose you, and I'm sure they are just as attractive now as they ever were. Even you used to have a sneaking fondness for Billy. Why not be sensible and enjoy our old friendships?"

"Perhaps that's the way men look at it," said Grace. "But I don't want any man but you."

"Maybe you will in another six months," John replied hopefully, "and if you do, remember you have my consent. We'll go to the Grange picnic two weeks from today," he promised, "and I'll introduce you to those folks who thought Dora was my wife. I'd hate to have anyone think I'd pick out such a color combination as she was today. Weren't her stockings green?"

"Orange, green and purple stripes," said Grace venomously. "With a pink dress, old rose petticoat, blue hat and a red plume."

CO-OPERATIVE TELEPHONE SERVICE.

In a recent issue of the Michigan Farmer, Mr. J. C. Stafford, of Van Buren county, asked for information in regard to farmers' telephone lines and their cost for construction, maintenance, etc. In answer, I will say that it is possible to furnish local telephone service at \$8 per year.

The Railroad Commission is not opposed to rural neighborhoods securing cheap telephone service, provided they serve all alike in their companies. In fact, the commissions of this and other states have done more for the small companies than any other one agency.

Not being acquainted with all of the conditions in Van Buren county, I cannot answer all of Mr. Stafford's questions. As to the third question, I would join the nearest company and then I would ask the Railroad Commission to compel the other companies to exchange messages on a toll basis. If one of these companies are incorporated, by all means take the one that has a legal right to the highway.

Perhaps a short history of the Hillsdale County Telephone Co., would answer many of the problems presented by Mr. Stafford. The Hillsdale County Telephone Company was organized in 1901 and 1902, incorporated in 1903. It started with less than 50 'phones, and one switchboard. They sold one share of stock and a 'phone for \$25. Lines were built whenever we could get two patrons to the mile. Each one of those patrons being allowed to set a certain number of poles, according to specifications, for which he received 30 cents each. The balance was paid in money and was used to buy switchboards, wire, material, and pay for construction. A switch fee was charged which has been raised to \$10 a year.

At the present time we have 1,000 'phones, 225 miles of poles, 900 miles of wire, three centrals and over 40 miles of toll lines. We have ceased to use native poles. We buy our poles in carload lots, and our wire in large quantities. In fact, our material and construction compare well with any of the large companies of the state.

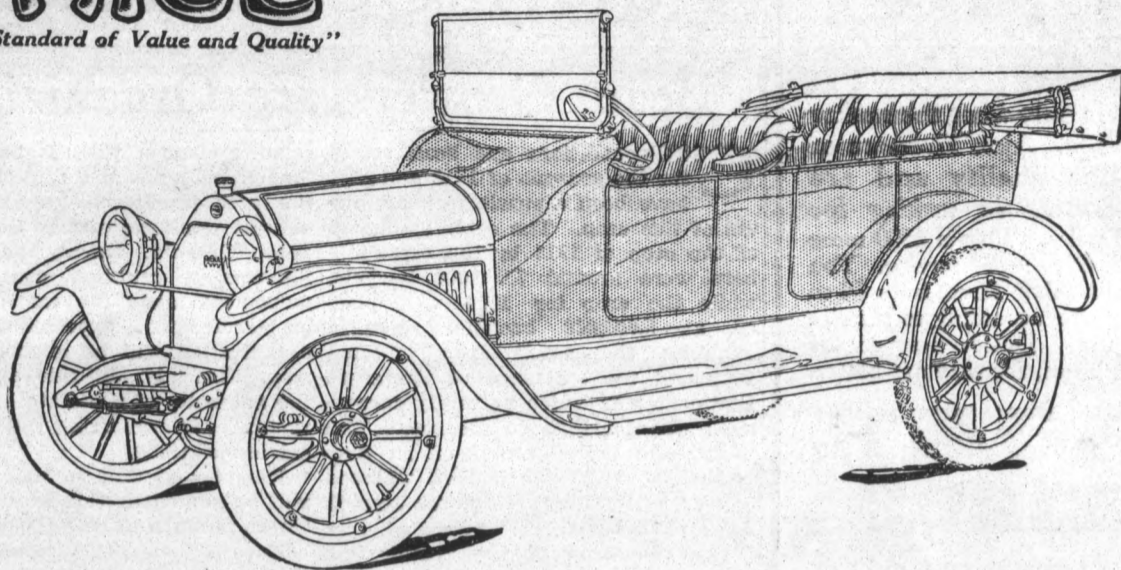
We are in connection with nearly all of the farmers' lines in the southern part of the state, many of them by free exchange, and also with all long distance toll lines. Our service is continuous, day and night, seven days in the week. All are pleased with the service and realize that our service is better than it would have been with some of the large stock companies.

In conclusion let me say, profit by the experience of other companies. First, incorporate; second, use good material and build well; third, build metallic; fourth, bear in mind that the Railroad Commissions have in all states, invariably stood with the small companies and kept the big companies all over the United States in line and checked them from swallowing the small fish.

Hillsdale Co. O. S.

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THE NATIONAL VERDICT

To the best of our knowledge and belief, the Paige in actual bona fide sales led every other American-made motor car in each and every Automobile Show held in this country this winter.

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Below you will find the specifications of the Paige Glenwood "Four 36". COMPARE the Glenwood feature for feature, part for part, dollar for dollar with any other four-cylinder car in the world. And then remember the new Paige Price is \$1075.

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Equipment—Rain vision ventilating windshield; silk mohair top with envelope; speedometer; one extra demountable rim; robe rail; license bracket; horn; pump; jack; tools and tire repair outfit. Trimmings black and nickel.

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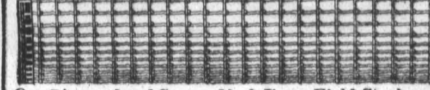
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Farm Commerce.

Bean Growers are Organizing.

CROP conditions and bean prices for the seasons of 1913 and 1914 have been a puzzle to the growers of this crop. The early estimates of the crop of 1913 by the bean jobbers were around 7,000,000 bushels, while the crop for 1914 was placed at 5,000,000 bushels. Notwithstanding the small crop of last year and the existence of the great European war which naturally encouraged the demand for foodstuffs like beans, the price started off in September at \$1.75 per bushel, whereas a year earlier marketing was started on a \$1.85 basis.
But the mind of the grower has been perplexed, not alone over this peculiar situation. During the marketing season of 1913 prices suddenly dropped and when the cause was discovered the blame for the decline was traced to one man. This person is alleged to have offered beans to the large factors on a basis of \$1.60 to the farmers. When the jobbers endeavored to sell their accumulations and were confronted with the offer made by the broker they became almost panic stricken and immediately put values down to where they could meet the competition without loss. The price of beans was soon at a point where the broker could buy and fill his orders. The farmers lost hundreds of thousands of dollars. Conditions which enable one man, single-handed, to fix the price of a commodity in which so many are concerned, either as producers or consumers, was rather astonishing.

But a refreshing thought gains possession of one after a careful survey of the sections where the white bean is grown commercially. Although a large number of states produce a few beans the bulk of the crop is taken from about 25 counties in Michigan. New York state also supplies a liberal share of the white legumes, but Michigan is the heavy producer. With the production limited to a comparatively small area the organization of the growers is not so formidable a proposition as would be the organization of the growers of other products. And if an effective organization can be gotten in motion the business end of the bean industry can be placed upon a more reliable basis.

This very thing is coming to pass right here in Michigan. Last fall growers of Saginaw county launched a local association. On March 8 a similar organization was effected in

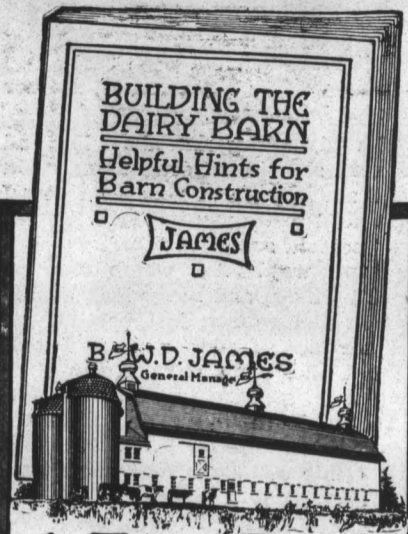
Gratiot county, with Isabella, Clare, Montcalm, Ionia and Clinton to be in the race by March 13. During the current week growers in Genesee, Lapeer, Tuscola, Huron, Sanilac and Shiawassee counties contemplate a movement along the same lines and on March 23 it is expected that a state organization will be effected at Saginaw. James N. McBride, acting under the authority of the state board of agriculture, is organizing the various local associations.

It is hoped that a variety of ends will be served by this new institution. There is much to be learned about the culture of beans, the use of fertilizers, the selection of seed, the best methods of harvesting, curing, etc. These problems will receive due attention. A crop reporting system is greatly needed. By extending the organization to the various townships of the bean growing counties it will be possible to gather accurate information of the crop each year, which knowledge can be collected and then sent out again to the members of the local associations. But perhaps the chief purpose of the organizations is to improve marketing methods—among other things to make impossible the inconsistency in price mentioned above. With accurate crop data representatives of the local organizations can meet with representatives of the jobbers and after carefully weighing the facts affecting the market, a reasonable price for the crop can be established. Besides this a systematic campaign looking toward the advertising of the bean as a food product is among the possibilities of the movement.

In the efforts made to secure improved marketing conditions through the establishing of local elevators, growers have been trained to do team work for this new, but larger business. The local co-operative elevator saves in the cost of handling the beans. What net profits would ordinarily go to the local middleman goes to the farmers. In other words, a more economical middleman has been substituted. Working together to do this makes united effort easier in the work ahead. The newer movement contemplates a program of more vital import: It seeks to secure for the grower a reasonable price for beans, a price that will cover every legitimate expense incurred in the growing and handling of the crop and a moderate profit. If the movement succeeds



What Shall it be, Veal, Beef, or Dairy Cows?



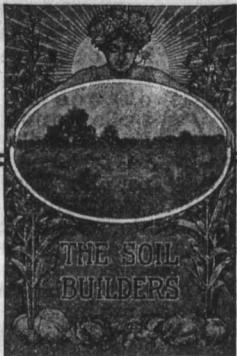
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BUILDING a barn is big, important work. Should be done correctly right from the start. Hard to undo building mistakes. Expensive, too. James Plan Service starts you right. Keeps you going right all through building operations, whether remodeling or actually building. Saves you money. Prepared by W. D. James, assisted by his corps of barn experts. Contains latest ideas of men of brains who have concentrated on barn building—originators of sanitary barn equipment ideas. Whether you do the work yourself, or hire a builder, you need this book.
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How many cows have you? When will you remodel or build? Are you interested in Stalls, Stanchions, Pens or other barn equipment?
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More important than ever. The U.S. will export potatoes this year. Every bushel raised will be needed. Potash is scarce. Seed will be high. This planter puts one piece only in every space, saves at least one bushel of seed every acre—no injury to seed, no disease carried, best distribution of fertilizer. Ask your dealer to
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show you planter and write us for free illustrated booklet.
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RUN THIS ENGINE for 30 DAYS FREE
Detroit Kerosene and Gasoline engines sent YOU on 30 days FREE TRIAL; guaranteed 10 years. Economical horse power, lowest prices; farmer agents wanted everywhere. Engine operates on gasoline, kerosene, alcohol, distillate or naphtha. Saws wood, grinds feed, churns, pumps, separates, makes light any job around the farm. Only 3 moving parts, no cams, gears, sprockets, etc. Send for "Common Sense Power Book." Detroit Engine Works, 149 Bellevue Ave., Detroit, Mich. 503
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Bucks This Hertzler & Zook Portable Wood SAW
This is the cheapest saw made. Only \$7.90 saw frame to which a ripping table can be added. Guaranteed 1 year, money refunded and all charges paid if not satisfactory. Write for catalog.
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DARLING'S ANIMAL MATTER FERTILIZERS

You don't know what this form of Fertilizer will do until you try it. Don't put it off any longer—

Try a Ton This Spring

Darling's Fertilizers contain the available Plant Food necessary to increase yields. They also hasten maturity and improve the quality. This means bigger profits for you.

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Jackson Owners Never Wish for Power

Power is bred into every Jackson. It's part and parcel of each big, silent Jackson motor, and backed up by big, strong gears and axles.

The Jackson is built in the midst of sand and hills, and it is built to go through the sand and over the hills, with power to spare.

Jackson "44"—\$1250

This newest Jackson has all the old-time sturdiness, with the most up-to-date design and equipment.

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Doors always in place—safe, convenient ladder—saves work in feeding, keeps silage perfectly, doors lock airtight.

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are the most effective as well as the most economical. They give your land just what it needs. Recommended by all authorities. Used by progressive farmers because they

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We promptly ship from convenient points Nitrate of Soda, Potash, Acid Phosphate, genuine Peruvian Guano, Tankage, Bone, etc.

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in doing this, and is not abused, it will prove of great assurance to the farmer who grows this crop.

NATIONAL CROP REPORT.

The Crop Reporting Board of the Bureau of Crop Estimates, from reports of correspondents and agents, estimates that the amount of wheat on farms March 1, 1915, was about 152,903,000 bushels, or 17.2 per cent of the 1914 crop, against 151,809,000 bushels, or 19.9 per cent of the 1913 crop on farms March 1, 1914, and 156,483,000 bushels, or 21.4 per cent of the 1912 crop on farms March 1, 1913. About 60.7 per cent of the crop will be shipped out of the counties where grown, against 53.9 per cent of the 1913 crop and 61.6 per cent of the 1912 crop so shipped.

The amount of corn on farms March 1, 1915, was about 910,894,000 bushels or 34.1 per cent of the 1914 crop, against 866,392,000 bushels, or 35.4 per cent of the 1913 crop on farms March 1, 1914, and 1,289,655,000 bushels, or 41.3 per cent of the 1912 crop on farms March 1, 1913. About 18.6 per cent of the crop will be shipped out of the counties where grown, against 17.2 per cent of the 1913 crop and 21.8 per cent of the 1912 crop so shipped. The proportion of the 1914 crop which is merchantable is about 84.5 per cent, against 80.1 per cent of the 1913 crop and 85.0 per cent of the 1912 crop.

The amount of oats on farms March 1, 1915, was about 379,369,000 bushels, or 33.2 per cent of the 1914 crop, against 419,476,000 bushels, or 37.4 per cent of the 1913 crop on farms March 1, 1914, and 604,216,000 bushels, or 42.6 per cent of the 1912 crop on farms March 1, 1913. About 29.4 per cent of the crop will be shipped out of the counties where grown, against 26.5 per cent of the 1913 crop and 30.9 per cent of the 1912 crop so shipped.

The amount of barley on farms on March 1, 1915, was about 42,889,000 bushels, or 22.0 per cent of the 1914 crop, against 44,126,000 bushels, or 24.8 per cent of the 1913 crop on farms March 1, 1914, and 62,283,000 bushels, or 27.8 per cent of the 1912 crop on farms March 1, 1913. About 45.1 per cent will be shipped out of the counties where grown, against 48.4 per cent of the 1913 crop and 53.7 per cent of the 1912 crop so shipped.

MICHIGAN CROP REPORT.

Wheat.—In answer to the question, "Has wheat during February suffered injury from any cause?" 172 correspondents in the state answer "yes" and 260 "no," in the southern counties 80 answer "yes" and 116 "no," in the central counties 46 answer "yes" and 47 "no," in the northern counties 45 answer "yes" and 71 "no," and in the upper peninsula one answers "yes" and 26 "no."

Snow protected wheat in the state 15 days; in the southern counties 11; in the central counties 14; in the northern counties 19 and in the upper peninsula 28 days.

The average depth of snow on February 15 in the state was 3.59 inches, in the southern counties 1.23, in the central counties 2.38, in the northern counties 5.79 and in the upper peninsula 12.00 inches. On the 28th the average depth of snow in the state was 2.11, in the southern counties 0.33, in the central counties 1.23, in the northern counties 2.55 and in the upper peninsula 12.75 inches.

The total number of bushels of wheat marketed by farmers in February at 71 flouring mills is 112,765 and at 85 elevators and to grain dealers 174,535, or a total of 287,300 bushels. Of this amount 202,120 bushels were marketed in the southern four tiers of counties, 72,805 in the central counties and 13,075 in the northern counties and upper peninsula. The estimated total number of bushels of wheat marketed in the seven months, August-February, is 8,500,000.

Forty-eight mills, elevators and grain dealers report no wheat purchased in February.

The average condition of live stock in the state is reported as follows, comparison being made with stock in good, healthy and thrifty condition: Horses, sheep and swine 96; cattle 95.

CROP AND MARKET NOTES.

Michigan.

Shiawassee Co., March 6.—Heavy northeast snow storm sweeping over the country. About five inches of snow on the level. Roads in splendid condition. Rye and meadows withstanding the winter in good condition. Not a great deal of salable live stock in the country. Farmers are well supplied with feed for home use. Lambs are coming in for second feed. A few lots of fattening cattle about ready for market. Wheat \$1.33; oats 52c; beans \$2.65; potatoes 30c; eggs 18c; barley \$1.25 per cwt.

(Continued on page 368).

You Pay for this Spreader Anyhow—Why Not Have It?

THE saving effected by a Nisco spreader can be figured in actual dollars and cents. If you do not have the spreader you are losing the money just as surely as though it dropped out of your pocket.

If you go without a Nisco spreader you lose enough money to pay for it. If you use it you not only save this money but have the added convenience. Here's the way the Nisco saves you:

It saves valuable manure because the variable spread enables you to lessen or stop the spread where little or no manure is needed. It saves repairs because it's strongly made and has few parts. Saves time and labor because it can be loaded high and the wide spread means fewer trips to the acre.

THE FORTY FEATURE SPREADER

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THREE WHACKS AT THE MANURE

The "New Idea"

Backed by 15 years' experience. A practical machine for farmers who want results. Loads high, hauls easily, spreads wide. Double cylinder and revolving distributor take three whacks at the manure. Endless apron conveyor prevents clogging. Seventeen-inch clearance insures against conveyor striking ground.

A Successful Gearless Spreader

Demonstrated by years of actual service. No gears to strip, break or freeze. The Nisco is a simply made machine—has only about half as many parts as others. Two levers afford easy control from driver's seat.

We guarantee the Nisco for one year against breakage from any cause, even carelessness. We guarantee it to be of best material and workmanship and to do everything we claim for it.

ASK YOUR DEALER

If he does not handle the Nisco write us for catalog. Take no substitute.



New Idea Spreader Co.

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AUSTIN FARM TILE TRENCHER

The earning power of this machine is equal to that of a good sized farm and costs less.

Digs a ditch up to 4½ feet deep by 11½ inches wide at the possible rate of 10 lineal feet per minute.

AUSTIN FARM TILE TRENCHER

works in any soil—has multipedal traction, Self Cleaning Buckets, Ditch Cleaning Shoe, grading device—and Engine specially designed to resist shocks incident to "ditching" work.

Made by the oldest and largest manufacturers of ditching machinery in the world. Send for catalog. Don't buy until you have investigated.

F. C. Austin Drainage Excavator Co.
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Try It For 10 Days—Free



Change your walking plow into a sulky plow. Use it 10 days. Then if you don't think the best investment you can make is a Winner Plow Truck return it at our expense. We will return your money and pay all freight. Saves one man. Plows any ground. Easier on your horses. All weight on wheels. More even furrows. Instantly adjustable. Does 3 days' work in 2. Furnished with or without seat. Special Introductory Offer to first buyer in any neighborhood. Write today for free booklet.

Lewis Mfg. Co., 63-79 Owego Street, Cortland, N. Y.

SEALED JOINT SEMENT STAVE SILO

New and Positive method of sealing the joints. We build complete silos.

Agents Wanted. Catalog free.

Sealed Joint Silo Co., 205 Long Bldg., PORTLAND, IND.

ZENOLEUM

A Remedy for All Live Stock

A Standardized coal-tar disinfectant, insecticide, animal dip; always the same.

Use Zenoleum; get more milk from your cows; more pork from your hogs; more wool from your sheep; more eggs from your hens; more work from your horses. In short, make more money in the Live Stock business by using this great preventative.

Used and Endorsed by 50 Agricultural Colleges

Our guarantee: If Zenoleum is not all that YOU think it ought to be, you can have your money back; no letters, no talk, just money back.

Prices: postpaid—3 oz. 25c; qt. 50c; gal. \$1.50. Ask for our free 1915 Live Stock Life Insurance Policy.

The Zenner Disinfectant Company
316 Lafayette Ave., Detroit, Mich.

Use Zenoleum Lice Powder for Poultry.



Markets.

GRAINS AND SEEDS.

March 16, 1915.

Wheat.—Although prices have fluctuated, the general trend of the wheat market the past week has been upward...

Table with columns: No. 2 Red, No. 1 White, May. Rows: Wednesday, Thursday, Friday, Saturday, Monday, Tuesday.

Table with columns: No. 3 Mixed, No. 3 Yellow. Rows: Wednesday, Thursday, Friday, Saturday, Monday, Tuesday.

Oats.—This cereal has gone up due to general buying. There exists a brisk export demand for the grain.

Table with columns: Standard, White, No. 3. Rows: Wednesday, Thursday, Friday, Saturday, Monday, Tuesday.

Rye.—This grain is again in demand, and on Monday the market was bid up 3c with no sales resulting.

Beans.—A lifeless situation appears and prices marked up 5c effected no sales. Detroit quotations are: Immediate, prompt and February shipment \$3; May \$3.20.

FLOUR AND FEEDS.

Flour.—Jobbing lots in one-eighth paper sacks are selling on the Detroit market per 196 lbs., as follows: Best patent \$7.50; seconds \$7.20; straight \$7.00; spring patent \$7.80; rye flour \$7.10 per barrel.

Hay.—Quotations are steady. Carlots on track at Detroit are: New, No. 1 timothy \$16@16.50; standard \$15@15.50; No. 2, \$14.50@15; No. 1 clover and mixed \$13@13.50.

Butter.—Market is easy with ample supply and moderate demand. Prices 1c lower. Extra creamery 27½c; firsts 25½c; dairy 21c; packing stock 16c per lb.

are lower. Extra creamery 28c; extra firsts 27½c; firsts 23½@25½c; seconds 20@22½c; packing stock 17½c. Elgin.—No improvement in the unsettled conditions prevailing. Price based on majority of sales is 28c.

FRUITS AND VEGETABLES.

Apples.—Market is active and easy. Quotations: Baldwins \$2.25@2.75 per bbl; Greenings \$2.75@3; Spy \$3.25@3.50; Steele Red \$3.50; No. 2, 40@50c per bushel.

DETROIT EASTERN MARKET.

There was a fair amount of produce on the eastern market Tuesday morning. Apples were moving freely with prices generally between 50@90c per bushel.

WOOL.

Although sales have been small, the market maintains a very strong position. Stocks are reduced and prices show a tendency upward.

LIVE STOCK MARKETS.

Chicago. March 15, 1915. Receipts today. Cattle, Hogs, Sheep. Same day 1914. 18,322 50,334 23,382. Last week. 43,470 149,175 61,080.

Chicago. March 15, 1915. Receipts today. Cattle, Hogs, Sheep. Same day 1914. 18,322 50,334 23,382. Last week. 43,470 149,175 61,080.

Cattle sellers were in hard luck last week, the Pennsylvania state quarantine preventing live stock shipments through the state, so that the Chicago packing brotherhood were in a position to fix prices.

DETROIT EASTERN MARKET.

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LIVE STOCK MARKETS.

Chicago. March 15, 1915. Receipts today. Cattle, Hogs, Sheep. Same day 1914. 18,322 50,334 23,382. Last week. 43,470 149,175 61,080.

SAFETY FIRST



Buy the Silo that keeps ensilage perfectly. Take no chance of feeding spoiled ensilage. Perfect ensilage can be produced for \$1 per ton.

The Independent Silo

Built Right—Costs Less. Constructed of full length stave, best grade Washington Fir, any length up to 40 feet. Satisfaction Guaranteed. Shipped to your station on approval.

Safe, Bright Light for Barn, Dairy,

EVEREADY Electric Hand Lights and Lanterns. Made in every size, shape and price from a dandy little vest pocket light to a big hand searchlight and house lamp.

NOTICE.

TO THE MEMBERS AND POLICY HOLDERS OF THE MICHIGAN MUTUAL, TORNADO, CYCLONE & WINDSTORM INSURANCE COMPANY, OF HASTINGS, MICHIGAN.

BAGS FOR SALE

2000 grain bags, 100 each. Also 5000, 1, 2, and 2½ bu. onion and potato bags.

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110 Acre Farm For Sale. Good buildings, soil, and water. A bargain if sold at once.

GOOD FARMS

around Lansing, East Lansing properties. California lands. J. D. TOWAR, East Lansing, Michigan.

IMPROVED FARM LANDS

in Manitoba and Saskatchewan, close to R. R., Schools and Churches. Prices and terms reasonable.

MICHIGAN FARMING LANDS

Near Saginaw and Bay City, in Gladwin and Midland Counties. Low prices. Easy terms. Clear title.

WANTED

To hear from owner of good farm or unimproved land for sale. C. C. BUCKINGHAM, Houston, Texas.

Central and Western Michigan Farms.

Fertile, dark loam and clay, hardwood, clover, grain and dairy farms. Only the best. Send for literature.

I WANT A HOME.

five to ten acres. Livable buildings cheap. S. M. GRAVES, 822 Second Ave., Detroit, Michigan.

Virginia Farms and Homes.

FREE CATALOGUE OF SPLENDID BARGAINS. R. B. CHAFFIN & CO., Inc., Richmond, Va.

Farms Wanted

We have direct buyers. Don't pay commissions. Write describing property, naming lowest price.

FARMS, GOOD, CHEAP, PROFITABLE

UNUSUAL OPPORTUNITIES NOW State Board of Agriculture, Dover, Del.

LIGHTNING RODS 9c PER FOOT. Best Quality Copper—Extra Heavy Cable. A better conductor than required by Insurance Companies.

300,000 Apple Trees 3 1/2c each. "Good Fruit and How to Grow It" FREE. This is an 80-page book of valuable information about soils.

BEET PULP PAYS. It increases production and lowers the cost. Try four parts Beet Pulp by weight to one part Cottonseed Meal or Gluten.

Pump, Grind, Saw. Double Geared Steel, bronze bearings OILLESS WIND MILLS. No oil, no climbing towers.

BERRY PLANTS. ALL KINDS. Millions of them. Catalog Free. W. H. Scarff, New Carlisle, O.

My 1915 Book Free Here It Is Read! Act!

My better than ever, bigger than ever, book of bargains for 1915 and price-reducing, sliding-scale schedules on gasoline engines and cream separators printed in four colors with special gasoline engine, manure spreader, cream separator, auto truck, elevator, carpet and rug and vehicle color work, hundreds of illustrations of farm and household necessities.

This great book will save you money. You are sure to buy something within the next few weeks on which we can save you money. Get my prices and learn all about my 1915 price-reducing, sliding-scale schedule before you spend another dollar for anything for the farm or household. A postal addressed to me now will bring this big book to you by the next mail, postpaid.

Galloway's Sanitary Separator

This new Galloway Sanitary perfect skimming cream separator is made so good in our own factories that I will send it anywhere in the United States without an expert to set it up, to any inexperienced user for 90-day free trial to test against any make or kind that even sells for twice as much and will let the user be the judge. It's the most modern—the most sanitary—the most scientific—the cleanest skimmer—the most beautiful in design of any cream separator made today and I have seen them all. I want you to know all about this wonderful separator that is sweeping the field before it. Investigate this before you buy.

More Power 6H 9875 Less Money 6P 9875

The New Galloway Masterpiece Big Six Horse Power Gasoline Engine at our new low price is positively the power sensation of 1915. The most engine ever offered for the money. My 1915 sliding-scale, price-reducing schedule still further reduces the above price according to the number sold.



Galloway Spreaders From \$64.75 Up

Let me tell you about its special patented features about its light draft, its all steel gear and how it is built of heavy channel steel, trussed like a steel bridge, superior in every way to the new-fangled ironies of heavy draft that are going up for repairs.

The above money-saving catalog fully describes the complete line of Galloway Specialties and will be mailed to you the day we receive your request. W. W. GALLOWAY, Pres. W. W. GALLOWAY CO. 177 Galloway Station, Waterloo, Iowa

A Wonderful Feed

NO MIXING NO BOTHER

At last the dairyman can get the feed he has long wanted—a Ready Ration—to be used right out of the sack without any mixing or bother—made of honest ingredients that are just right, without any adulterants, fillers or other rubbish.

Larroe-feed

is compounded to produce results—it is made of choice cottonseed meal, dried beet pulp, gluten feed, corn distillers' grains, wheat bran, wheat middlings and a little salt—that's all. Properly blended, thoroughly mixed to produce lots of milk—good milk and keep your cows healthy. Sold on a plan of money back if you are not satisfied. LARROE agents almost everywhere. Write us if none near you.

The Larroe Milling Co., 1043 E. 12th St., Detroit, Mich.

Best Feed for Calves

Calves cost less to raise, grow faster and are sturdier when fed on **Ryde's Cream Galf Meal**

Sell all your milk. The milk for one calf will buy Ryde's Cream Galf Meal for three calves. It contains all elements necessary for rapid symmetrical growth. Cooked by special process to insure easy digestion. Insist on Ryde's to get the best results. Free booklet. Ask your dealer.

RYDE & CO., 2556 Fillmore Street, Chicago.

BUY FEED—CAR LOTS AND LESS—Cottonseed Meal, Hominy Feed, Douglas Gluten, Bran and Middlings. J. E. Bartlett Co., Jackson, Michigan.

KOMONO APRONS 59

Made of the best quality heavy percale, checks, stripes and figured goods, in either light or dark shades, in all sizes up to 44" full length. Guaranteed satisfactory or money refunded. State color and size desired. Mailed Parcel Post prepaid.

ECONOMY SALES CO., Box 839, Detroit, Michigan.

DETROIT MARKET CONDITIONS.

March 11, 1915.

The work of cleaning and disinfecting the local stock yards is going on slowly, with about 100 men on the job, and it does not look now as though the yards would open before April 1. Wednesday there was about 100 cars at the various packing houses being unloaded, most of them containing hogs which, for Wednesday's and Thursday's shipments bring \$7, weighed off the cars without feed or water. This is the only way anything can be handled at Detroit at present; the price paid for hogs is a dime higher than Chicago. Extreme top on Wednesday and about a quarter above the bulk of sales, and is considered good. When the yards open here in April it is thought that the embargo will be lifted everywhere and business will resume its normal condition, and that we will be able to handle interstate business once again. Just now the state of Pennsylvania has placed an embargo on all shipments east originating in any federal, closed, exposed or modified quarantined area of any state and a large number of counties in Michigan are shut off from Buffalo and New York. As the only way at present open at all to the east is via Toledo and the Lake Shore Railroad and this road passes through Pennsylvania at Erie, closing the east completely from points west, including Chicago.

The cattle trade here is extremely dull and will be until after Easter. One load of extra good steers was purchased by Hammond, Standish & Co. for \$8 per cwt., but this is the first to bring over \$7.50 in several weeks. The milk cow dealers who have been completely out of business since last November are getting uneasy and if the quarantine is not lifted soon will have to go into other business.

The veal calf trade continues slow and while a few choice bring \$10.50 the bulk of the good ones sell at from \$9@10, with medium and common at \$7@8.75.

Sheep and lambs are not coming in very freely and are selling at \$9.25@9.50 for the best grades at the packing houses. A load of good yearlings sold at \$7.75 and sheep all the way from \$4.50@6.

BROOKWATER FARM DUROC SALE.

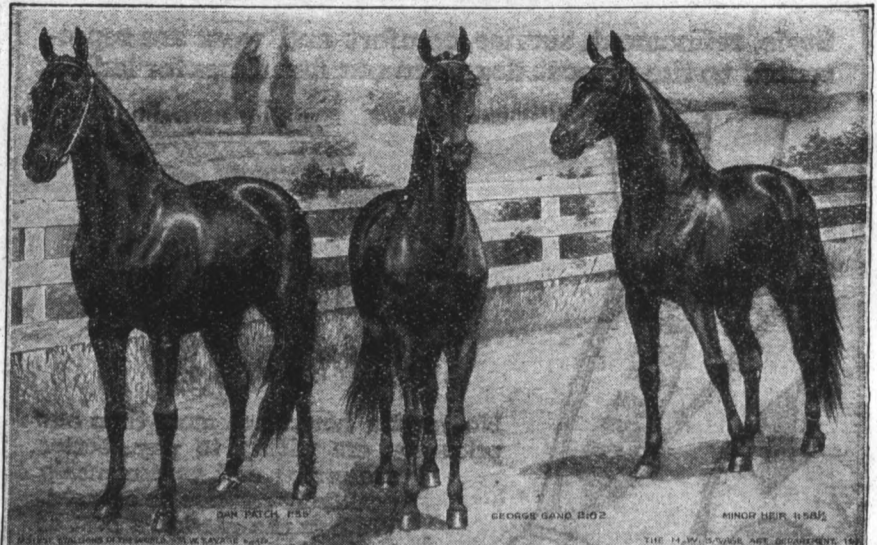
Brookwater Farm held a highly successful bred sow sale on the farm at Ann Arbor on March 4. The adverse foot-and-mouth restrictions in some states prevented as wide a distribution of stock as in their last August sale. The high animals sold were two Orion Chief sows bred to Brookwater Cherry King which sold for \$100 and \$90 to J. R. Sweeney, Rockfield, Ky., and O. C. Stevens, West Unity, Ohio, respectively. While stock was sold to South Carolina, Virginia, Kentucky, Ohio, Indiana, Illinois, Wisconsin, Missouri, and California, the firm is gratified to know that a lot of the good stock was sold to Michigan farmers, which speaks well for the growing popularity of the breed, even as it spreads out beyond the corn belt. Field men, who have attended sales throughout the winter, give the farm credit of presenting as well bred and as well fitted an offering as had been driven into a sale ring this winter. Brookwater Cherry King, the first prize Senior Yearling boar at the Michigan State Fair in 1914, when seen at the farm with his produce, was accredited as one of the best Duroc sires of the day and the demand for stock sired by him or bred to him was noticeable throughout the sale. The sows bred to him sold for an average of \$53. This animal is already adding popularity to the herd. The good stock seen in the breeding herd of over 200 animals convinced visitors that there would be good hogs at Brookwater for some time to come. The average price received for the offering was \$44, which would foretell sales in normal years and the farm already announces its intention of holding another sale in the summer.

CROP AND MARKET NOTES.

(Continued from page 367).

Livingston Co., March 8.—Weather ideal, and roads in splendid condition. Wheat and meadows in good condition. Surplus live stock has been nearly all disposed of owing to the scarcity and high price of grain. There is still quite a large amount of wheat and beans in farmers' hands, farmers not being willing to sell at present quotations.

Wexford Co., March 8.—Wheat and rye being uncovered and are not looking good. Roads are not very good. Live stock looks good, as there is plenty of feed. Wheat \$1.30; oats 60c; shelled corn 80c per bu; hay \$12@16; cows \$45@90. There is considerable land, both wild and unimproved, for sale; quite a few farms for rent.



Beautiful Picture of 3 World Champion Stallions, in Eight Colors.

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FREE

ENAMELED STOCK LARGE SIZE 16 by 22

Here is My New, Large and Beautiful Horse Picture, in 8 Colors that will Strongly Appeal to Every Horse Lover in the World. The Original Picture was made from Life and is as True as if My World Famous, Champion Stallions Dan Patch 1:55, Minor Heir 1:58 1/2, and George Gano 2:02, stood Right before You in Actual Life.

Pictures in Colors and Extra Fine Stock, usually Retail at \$2.00 to \$3.00 at Art Stores but You can have One Absolutely Free.

You will Enjoy this Horse Picture all Your Life and it is Entirely Free of Advertising, so that it is Really an Art Picture of Great Merit and a Picture of Three Great World Champion Stallions.

Dan Patch 1:55 is the Fastest Harness Horse of all Champions. Minor Heir and George Gano are the Fastest Team, in the World. Wagon Record 2:02.

WRITE ME TODAY and BE SURE of one of These Beautiful Horse Pictures, in EIGHT COLORS, Absolutely Free, Postage Prepaid.

This Splendid, COLOR PICTURE is on Extra Heavy, Superfine, Enamel Stock and is Worthy to Hang in Any Home or Office. It is one of the Finest, and Most Attractive Horse Pictures in the World. I Mail Them in Extra Heavy, Double X Mailing Tubes to insure Safe Delivery. Such Splendid.

IF YOU ANSWER 3 QUESTIONS. All you have to do to receive this Beautiful Horse Picture is to Answer the following THREE QUESTIONS. PROVIDING You Are a Farmer or Stock Owner or Horseman—Over 21 Years of Age. **FIRST**—In what Paper did you read this offer? **SECOND**—How Many Horses, Cattle, Sheep, or Aogs do you own? **THIRD**—Have You EVER used International Stock Food Tonic for Horses, Cattle, Sheep or Hogs? **M. W. SAVAGE, Minneapolis, Minn.**

Did International Stock Food Tonic, Help Make Dan Patch 1:55,—World Famous OR, Did Dan Patch 1:55, Help Make International Stock Food Tonic,—World Famous?

M. W. Savage has sent a Large CAR LOAD of Dan Patch Colts to the PANAMA EXPOSITION to Race the Pick of the World. Watch results of Dazzle Patch in TWO,—2:06 Pacing Races, for \$48,000, and Electric Patch in TWO,—2:10 Trotting Races for \$40,000. The Panama Exposition offers \$227,000, for Harness Horse Races. THESE COLTS RACE FOR \$135,000.

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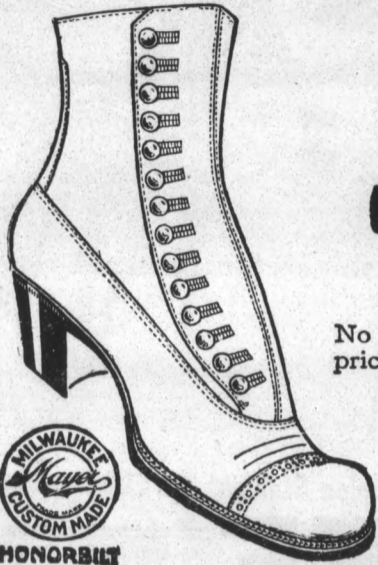
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Fillers in Apple Orchards.

THE first question presenting itself to the orchardist when he considers returns from the orchard during its early non-productive years, is what to grow between the permanent trees. The crop must be such that it will permit the proper treatment to be given the regular orchard and such that it will not ruinously deplete the land to the detriment of the trees. Two avenues of procedure are open, either companion crops such as truck or feed crops, or so-called "fillers" or interplanted fruit trees. But when we come to fillers we encounter one difficulty which determines either the success or failure of this practice. This is the old problem of removing the interplanted trees when their size begins to seriously interfere with the development of the permanent trees. The human failing is to always leave them for just one more season in order to get just one more crop from them.

Are Fillers Advisable?

The question of fillers or no fillers comes back to the deciding factor in the success or failure of the majority of orchards—the man. If he is farsighted enough and broad-minded enough to keep in view his ultimate goal and not be influenced by the allurements of present gain which will only work ultimate harm, then he will probably find fillers a paying investment. But the best advice to the or-

undoubtedly be a good fruit to use for fillers

Apples as Fillers.

However, if the land is unsuited to this fruit, the second best choice will probably be early bearing varieties of apples. While different varieties of apples have their likes and dislikes as to soil, yet their needs in this direction are not so vital as between peaches and apples and this question of adaptability of varieties to soil is one which has not been fully answered by station experiments. Michigan orchardists favor these varieties of apples as fillers, in the order given: Wagener, Wealthy, Oldenburg and Yellow Transparent. Although the general opinion seems to favor the Wagener as the leader among varieties which are suited as fillers, yet there is some doubt as to the advisability of planting this variety in preference to the others named. Numbers of the best posted growers expressed their opinions to the effect that the Wagener is not all that could be desired in this respect and that it was not a good market variety when compared with other possibilities. Their opinion was sustained by the answers of the market men consulted in the survey of market preferences. The primary advantage of apples is that they require the same treatment as the permanent trees, saving both time and money, and not working any in-



A Well-Cared for Pear Orchard which Has Been Profitable for More than Fifty Years.

chardist who has not the strength of mind to resist the temptation to allow the trees to remain but one more year is to not meddle with temptation, but to resort to either early bearing varieties for his permanent orchard or to plant annuals as companion crops, which will yield an income but not a temptation.

The survey of Michigan orcharding shows that the growers in the state are most in favor of the peach as a filler for apple orchard with early bearing varieties of the apple running a close second. Peaches pay better than almost any tree fruit if planted in favorable locations. They are short lived and come into bearing early. Thus by the time that they are becoming dangerous to the apple trees they have already passed the zenith of productivity and the grower can more easily get his courage up to the sticking point necessary to cut them down. The determining point in the success of peaches as fillers for apples, is the suitability of the land for peaches. And this would seem to be a vital difficulty, for much of the land that is suited to apples is entirely out of the question for peaches. Apples require a heavier soil which in many cases would throw the more tender trees into a serious wood growth, and secondly, apples will grow and thrive in locations where the frosts and winters would be sure death to peach trees. If the land and elevation is suited to the production of peaches they will

jury to the permanent trees through conflicting treatments. The great objection to apples as fillers has been already mentioned—they will be at their height of production when the time comes for their removal, and the men are few and far between who have the courage of their convictions at this time.

Other Kinds for Fillers.

The man who does not care to take either of these suggested fruits can take his choice of cherries, pears, bush fruits or plums, which is the order in which these fruits stand in the estimation of the men included in the survey. An advantage of these fruits is that with a proper combination it may be possible to greatly simplify the labor proposition and allow the manager of the orchard to keep his help steadily employed through the season. This is a marked advantage for then a certain number of men can be retained through the year, giving a nucleus of trained men who know the orchard and the methods employed, and these men will be found exceptionally valuable when it is necessary to bring in transient labor to help with the unavoidable rush of work during the harvest season. This argument is often raised against the use of apples as fillers, claiming that apples will simply intensify the labor problem at harvest time. However, much can be done to avoid this difficulty by the planting of early and late varieties of apples.

J. W. FISHER, JR.

TROUBLE DEPARTMENT.

Spraying and Pruning Queries.

We have on hand several gallons of concentrated lime-sulphur which has been allowed to freeze. We have no means of testing same as to strength. What do you suggest as a way of determining it?

I also wish to know if you would advise pruning a four-year-old peach orchard that was heavily pruned last spring and has made a fine head, having made a remarkable growth also.

When only one dormant spray is given would you apply before any sign of growth appears, or would it be as well to wait until just before the buds open, for curl leaf control?

What do you think of the Babcock-Lasher formula for the destruction of all orchard pests? Also the dust spray which would be much easier to apply than other sprays?

Manistee Co.

J. J. S.

Concentrated lime and sulphur which has been allowed to freeze does not deteriorate very much, as it takes a very low temperature to thoroughly freeze it. The usual plan in using such material is to dilute it about 1-6 instead of 1-8 as the commercial lime-sulphur is usually diluted. It would hardly be necessary for you to have the mixture tested, as there has undoubtedly been some evaporation taken place so that it would influence the hydrometer reading in such a manner that one would think it stronger than usual.

A four-year-old peach orchard which has been heavily pruned last spring has undoubtedly made considerable vigorous growth, and therefore the tops of the trees are probably quite brushy. It is not advisable to give the young peach trees severe pruning, as it tends to produce succulent and weak growth. This year it would be advisable to cut out all of the weak growth and cut back slightly the remainder. To leave the trees unpruned this year would make the heads too thick and make pruning a more serious problem next year. For the good of the orchard, peach trees should receive moderate annual prunings instead of heavy prunings occasionally.

For the control of the curl leaf on the peach it is absolutely necessary to spray before the buds start swelling. In normal seasons any time before March 15 will do, but we occasionally have advanced seasons when the first of March should be the time limit. Lime-sulphur as used for scale is the best and most practical material to use for the control of this disease.

The dust method of spraying has been in use for several years, but thus far it has not been successful. According to reports from New York this method is now being used with some success. We cannot advise the use of this method of spraying until we have evidence that it is more generally successful than it now is.

The Babcock-Lasher formula is a combination of fish-oil soap and carbolic acid. It has been used with great success in the control of rose bugs by two men who are capable of judging the value of anything of this sort. While it is a spray material which appears to be very promising, we do not feel that we would care to advise its use until it has been more generally experimented with by fruit experts.

An article in our horticultural columns of the issue of March 13 describes both the recent developments in the dusting method, and the results from the Babcock-Lasher formula.

Grafting Fruit Trees.

I have a little grafting to do. I have seen it done but have never done it. I would like to know the wax formula, the best time to cut the cions, and how large around the limb should be, and any other details connected with the work.

Oakland Co.

D. W.

The best time for grafting fruit trees is just as the leaf buds are bursting. At this time the sap is circulating freely, and wounds are healed very quickly, and therefore graft unions are more easily accomplished

than at other times of the year. The most satisfactory limbs to be grafted from which the best results can be obtained, are those from a half-inch to two inches in diameter. The above sizes are the best for cleft grafting, which is most commonly used for top-working trees. If smaller limbs are to be grafted the whip graft or the tongue graft should be used. The limbs four to six inches in diameter are sometimes grafted by the cleft graft method, but the results of grafting limbs of that size by any method are not as satisfactory as the grafting of smaller limbs.

The cions should be cut while the tree is dormant, the best time being late fall. They should be packed in moist sand to prevent their drying out until grafting time. Occasionally the cions are cut at the time grafting is done, but the results are not generally satisfactory. If they have not been cut yet, it would be advisable to do so immediately, packing them in sand as suggested above.

The best formula for grafting wax for outdoor use is as follows: Resin, four parts; beeswax, two parts; tallow, one part. These should be melted together and upon cooling pulled in a manner similar to pulling molasses candy. Before using the grafting wax the hands should be well greased with tallow and the wax worked until it is pliable.

The principle object in grafting is to have the cambium layer, the green part just under the bark, of the cion touch the cambium layer of the stock. To facilitate this a double wedge should be cut on the cion, one downward and the other inward. To make a good smooth wedge a sharp knife should be used. The stock should be carefully split and pruned apart slightly and then the cions inserted, one at each end of the split.

When set properly the cions will be held firmly by the stock. Care should be taken that the cambium layers touch as suggested. The top of the stub, the sides when split, and the top of the cions should thoroughly be covered by the grafting wax.

Of course, the grafting should be done on limbs well placed to form a well-balanced top of the grafted tree. In grafting, too much of the tree should not be cut away as it is detrimental to the vitality of the tree. The time to take to graft over a tree should be from one to three years, depending upon the age of the tree.

Peach Borers.

I have heard that painting peach and apple trees with white lead and oil will prevent the borers from both-ering the trees, especially peach trees. I have 150 trees from three to ten years old in fine condition, and each year set from 50 to 100 trees. I spray two or three times a year with lime sulphur spray, and keep the borers out with a knife, which takes a lot of time.

Macomb Co.

S. L. J.

White lead and oil, if mixed to a consistency of thick paste and applied to the base of the trees will tend to prevent the borers in the peach tree.

Mounding trees with earth, to a height of about one and a half feet will also prevent trouble from this source to a great extent. These two methods are the best known in the way of preventive measures, but only control the greater peach borer.

The lesser borer works in the crotches of the top, and the only method of controlling them is by digging for them, in fact, digging is by far the best method of controlling both kinds of borers, and if one makes a practice of doing it once or twice a year, he need not fear any injury from these insects.

Trees which are making a rapid sappy growth are more often affected by them. If your trees are making rapid growth, it would be advisable that you use some method of checking the growth if possible.

The Flansburgh & Potter Co., Leslie, Mich., send a catalog and price list of strawberry plants and other small fruits for the spring of 1915.



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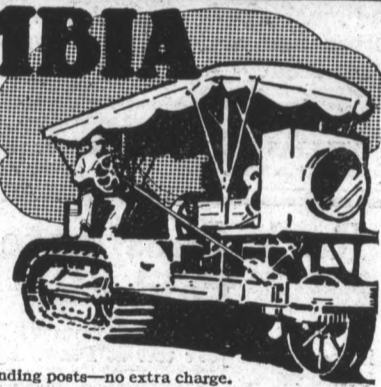


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Greatly increase the yield of corn, beans, cotton, potatoes, and are the leaders in surface cultivation. They spare all the crop roots, but destroy all weeds. They furnish the best dust mulch which holds moisture. A larger yield of corn and root crops results because of earlier maturity.

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Use NATCO Drain Tile—Last Forever

Farm drainage needs durable tile. Our drain tile are made of best Ohio clay, thoroughly hard burned. Don't have to dig 'em up to be replaced every few years. Write for prices. Sold in carload lots. Also manufacturers of the famous NATCO IMPERISH-ABLE SILO, Natco Building Tile and Natco Sewer Pipe.

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Practical Science.

FOOD LAW ENFORCEMENT IN AND FOR MICHIGAN.

BY FLOYD W. ROBISON.

(Continued from last week).

Meat Products.

In 1907 the Dairy and Food Commissioner began the enforcement of the food law with reference to the sale of sausage and comminuted meat products. Meat dealers throughout the state were using large quantities of so-called cereal products mixed up with chopped meats, with varying quantities of water, sometimes as high as 40 pounds of water with 100 pounds of meat. To curb this evil the Dairy and Food Commissioner, through his inspectors, took a great many samples from different sections of the state. Within a few months the enforcement of the act was enjoined by an application for an injunction filed by Armour & Co., of Chicago. These injunction proceedings came up for a hearing on the merits of the case before Judge Wiest, in the Ingham County Circuit Court, who decided that sausage with cereal and water was an adulterated product within the meaning of the law. Upon appeal to the Supreme Court of the state this decision was somewhat modified by the higher court. The substance of the decision of the supreme court was that cereal used with sausage was not an illegal product, provided that the fact of its employment be stated on the label. Thus the supreme court in reality coincided with the opinion of Judge Wiest, although prescribing a slightly different method of procedure. The only unfortunate conclusion, to our mind, of the supreme court, was that no disposition whatever was made of the fact of the employment of water, which was the most serious feature of the whole phase of the problem. To meet this also, the Legislature of 1913, under act No. 151, passed a law definitely defining the status of sausage within the state. In this act sausage is declared to be adulterated, first, if it contains added water in excess of the quantity required to bring the amount up to that which the meats from which it is prepared contained immediately after slaughter. In addition it prescribes that sausage should not contain cereals in excess of two per cent. Sausages of the kind which are cooked, or smoked, such as frankfurt style, vienna style, or bologna style, may contain water in excess of three per cent, under which case the product must be labeled "sausage, water and cereal."

Weights and Measures Law.

Under act No. 168, of the public acts of 1913, a state standard for weights and measures is prescribed, providing the following standards:

	Lbs. Per Bu.
Wheat	60
Rye	56
Shelled corn	56
Corn on cob	70
Corn meal	50
Oats	32
Buckwheat	48
Beans	60
Clover seed	60
Timothy seed	45
Flax seed	56
Hemp seed	44
Millet, or Hungarian grass seed	50
Bluegrass seed	14
Red-top seed	14
Barley	48
Dried apples	22
Dried peaches	28
Potatoes	60
Sweet potatoes	56
Onions	54
Turnips	58
Cranberries	40
Peas	60
Michigan salt	56
Coal	80

Potatoes are being sold more and more by weight and it is well to bear in mind that when a farmer sells 60 pounds of potatoes for a bushel, or 15

pounds for the peck, it is the consumer's privilege under the law to receive from the grocer or dealer the same weight.

Law Regulating Sale of Veal.

Another very desirable act was passed by the Legislature of 1913, which defines veal and prevents the killing of calves for veal when they are less than four weeks old, a practice which has been very obnoxious in previous years.

The Advertising Law.

One of the most annoying obstacles in the enforcement of pure food laws within the state has been the lack of any power to curb vicious advertising. A dealer advertises much in this way:

"Why pay 35c for butter? Visit our butter department and secure a 2-lb. roll of our freshly churned for 50c."

The product really referred to is oleomargarine or renovated butter; but the intent of the advertiser is to make the consumer feel that she is getting a good grade of butter at about ten cents per pound cheaper than the market price. Until the convening of the Legislature of 1913 there seemed no remedy for this, but this Legislature enacted a law to regulate and prohibit fraud, deception, and fraudulent markings and advertisements in newspapers, periodicals and other publications, or by circulars or hand bills. This is of great importance and is a step decidedly in the advance in the protection both of the producer of pure products and the consumer.

We are printing this short act in full:

Act No. 276, Public Acts 1913.

"Any person, firm, corporation or association, or the agent or manager of any such firm, corporation or association who, with intent to sell or in anywise dispose of merchandise, securities, service or anything offered by such person, firm, corporation or association, directly or indirectly, to the public for sale or distribution, or with the intent to increase the consumption thereof, or to induce the public in any manner to enter into any obligation relating thereto, or an interest therein, knowingly makes, publishes, disseminates, circulates, or places before the public, or knowingly causes directly or indirectly to be made, published, disseminated, circulated, or placed before the public in this state, in a newspaper or other publication, or in the form of a book, notice, hand bill, poster, bill, circular, pamphlet, or letter, or in any other way, an advertisement of any sort regarding merchandise, securities, service or anything so offered to the public, which advertisement, contains any assertion, representation, or statement of fact which is untrue, deceptive or misleading, shall be guilty of misdemeanor, and shall be punished by a fine of not less than twenty-five dollars nor more than two hundred dollars, or by imprisonment in the county jail for a period of not more than ninety days or by both such fine and imprisonment in the discretion of the court: Provided, That the publisher or printer of any newspaper or other periodical shall not be liable under this act for publishing deceptive advertising received from any other person: Provided further, That said printer or publisher is not aware of the deceptive character of the advertising so received."

CATALOG NOTICES.

"Soil Sense" is the title of a booklet published by the Dunham Company, Berea, Ohio. This is a profusely illustrated book, dealing with the science of soil culture and conservation of soil moisture, with chapters relating especially to farm crops. Write the Dunham Company for a copy, mentioning the Michigan Farmer.

The Alfred J. Brown Seed Co., of Grand Rapids, Mich., send a handsomely printed Thirtieth Anniversary edition of their 1915 catalog of farm seeds. This is a large size catalog profusely illustrated with half-tone engravings, showing the product of Brown seeds. It also lists a full line of poultry supplies.

Grange.

NOTES FROM STATE EXECUTIVE COMMITTEE MEETINGS.

Since the session of State Grange at Battle Creek, the executive committee has held three meetings. Concerning matters discussed or acted upon, the following notes may be of general interest or helpfulness to patrons of Michigan:

At the organization meeting December 21, George B. Horton was elected chairman for the year; the sub-committee upon legislation is, Thos. A. McNaughton, J. W. Hutchins, B. B. Lincoln, W. F. Taylor and J. C. Ketcham; sub-committee upon co-operation, George B. Horton, W. F. Taylor, C. S. Bartlett and J. C. Ketcham; sub-committee upon finance, C. S. Bartlett, N. P. Hull and J. C. Ketcham.

Upon the method of receiving demitted members into a subordinate Grange during the life of the demit, it was decided that "the demit shall be presented at a regular meeting of the Grange and lie over until the next regular meeting, at which time it shall be voted upon by paper ballot, a majority being necessary to elect."

Regarding pay for organizing a Grange, it was voted "That State Grange pay \$25 for organizing a Grange; then, if the organizer gets 30 members, pay \$5 extra."

Master Ketcham recommended that State Grange allow \$15 for re-organizing and instruct the deputy to collect \$10 from the Grange re-organized. The Grange re-organized shall have been dormant one and one-half years on the secretary's books.

J. W. Hutchins was authorized to draft a night letter and send to Michigan senators and congressmen, stating the Grange's attitude upon nationwide prohibition and asking their votes in favor of the measure.

Master Ketcham presented a proposition regarding a Michigan edition of the National Grange Monthly; no action was taken.

The committee formulated the position taken at the annual session upon legislative matters and gave the statement to the daily press, namely, upon:

1. Torrens system of land transfers, and tonnage tax.
2. Bank deposit guarantee.
3. Primary law.
4. Good roads.
5. Maximum rate on state taxation.
6. Market commission.
7. Michigan Agricultural College.
8. Smith-Lever bill.
9. Live stock shipments.
10. State censorship of moving picture films.
11. Temperance.

(Continued next week).

AMONG THE LIVE GRANGES.

Millington Grange, No. 755, met in Odd Fellows Hall, March 3, with a good attendance. After dinner was served the Grange was called to order and the ordinary Grange work transacted, after which the lecturer, Mrs. Lincoln Milliman, presented a program of recitations, singing and music that was enjoyed by all.

An Oyster Dinner, which might more properly be called a banquet, was enjoyed by members of Sparta Grange, March 6, preceding annual installation of officers. At 2:00 o'clock the meeting was called to order for the regular session when the newly elected officers, with the exception of Mrs. Ruben Carlson, who was elected lecturer and withdrew in favor of E. G. Beckwith, were installed. H. C. Darling and wife, district delegates to the state convention, were the installing officers. At the time of the death of Thomas Whittall, J. W. Spangenberg was appointed to fill out the balance of his term as director of the Grange Fire Insurance Co., and at the meeting recently he was unanimously elected to the office. A time of good fellowship and sociability was enjoyed after the meeting.

Wayne Pomona Grange No. 8 will meet with Huron Valley Grange in New Boston, Saturday, March 27.

Farmers' Clubs

CO-OPERATION THROUGH THE FARMERS' CLUB.

One of the striking things about the development of manufacturing, merchandising and commerce is the large scale on which they are carried on. This means that a great many people work together. It will be found that the work is divided up in such a way that certain groups of people work at one thing and so develop special skill and speed in doing this particular work. Other groups do other lines of work. This means that everyone employed in the industry develops special skill for doing his or her particular line of work and each line of work is under the direction of an expert. This results in making the factory, railroad or whatever it is, more efficient.

In farming it is not so easy to bring this about, as each one must necessarily do practically all the different kinds of work that needs to be done on a farm. However, one farmer will develop particular skill in feeding hogs, another has great success in raising horses. Another had a special knack for making roads, still another farmer can make trees and fruit to do exceptionally well. Such farmers are experts in these lines of work. They ought to be made the experts for the community so their skill can be brought onto all the farms in the community. If this could be carried out the production of the farms in any community would be greatly increased.

One way for bringing this about is the Farmers' Club. The farmer who has had success in growing hogs can tell his neighbors how he did it. As his farm is located right in the locality, anyone who is interested can visit the farm and get more information in this way. Other lines can be treated in the same way. This would result in bringing the best methods worked out on each individual farm onto many of the other farms in the locality.

This would not only spread the skill of the individual farmer onto many farms, but it would have a great stimulus on the most successful farmers. They would have the eyes of their neighbors watching their methods. They would want to do even better, which would lead them to study their particular line more than ever.

A great deal could be done to encourage the breeding of pure-bred stock, and to confine it to one breed. It is a misfortune for a community to have several breeds of cattle. It is best to have just one. Then the community will develop that breed better and that much quicker become noted for that one breed.

The subject of marketing and buying can be taken up in the Club. If the Club members will buy together they can often secure better prices from the grocer, the hardware dealer and the machine dealer, etc.

The Farmers' Club can be made the starting point for these co-operative enterprises. It can be used to secure the farmers the benefits that big business secures from doing things on a big scale. Many have the idea that nothing can be done unless there is a big organization. This is a mistake. The successful co-operative enterprises have come from small beginnings.—N. Dak. Exp. Station.

CLUB DISCUSSIONS.

A Successful Institute.—The Salem Farmers' Institute was held at the town hall, Friday, February 12. The hall was filled to its capacity. As several of the schools were closed in order to allow the attendance of teachers and scholars. State Speaker Scully spoke in the morning on "Weeds and their Eradication," making those present feel the need of great patience and vigilance in this important work. Good music by Mr. and Mrs. William Stanbro opened and closed the morning session. An excellent hot dinner was served by the ladies of the Baptist Church. After dinner the subject of the corn contest was again announced by President Thompson. Music was furnished by Miss Hazel Sprague on the piano, and Mr. Wm. Groth on the violin, which was greatly enjoyed. State Speaker Scully spoke on "Soil Fertility." Discussion led by DeForest Thompson. Several took part in the discussion. Prof. Harvey, of Ypsilanti, then addressed the children. Fine recitations were given by the young people in the evening. Speaker Scully and Prof. Henry again addressed the meeting. Instrumental and vocal music graced the occasion and all departed feeling it had been an enjoyable meeting.—H. C. T., Reporter.

Studebaker

WAGONS BUGGIES HARNESS



HERE'S WHAT MR. MCINTYRE HAS TO SAY

I purchased my Studebaker in 1874 from Henry Brown of LeRoy, N. Y., and paid for it in wood, cut by myself.

The wagon drew all the stone that was placed in my house and barn. It has never been idle.

All the heavy work that is done on the farm today is done by the old wagon.

It is just as good as it was the day I bought it.

Peter R. McIntyre,
Caledonia, N. Y.

As good as the day it was bought — 39 years ago

"All the heavy work that is done on the farm today is done by my old Studebaker I bought thirty-nine years ago."

Is it possible to say more in praise of a wagon?

Doesn't it prove conclusively that the best material and workmanship went into it?

—and doesn't it also prove that it pays to buy the best?

The best investment lasts the longest

Suppose you buy a Studebaker Wagon today — and it costs you a little more — but lasts a lifetime — isn't it, after all, the cheapest wagon you can buy?

Studebaker wagons are honestly built of the very best material. Not with the idea of building a cheap wagon but the best wagon.

— and, owing to improved methods of manufacture, Studebaker Wagons are really better built today than they were when

Mr. McIntyre bought his wagon — and they cost less.

Durability — long service — have been always the watchwords of Studebaker.

That is why, within the last sixty-three years, Studebaker has grown to be the largest wagon builder in the world.

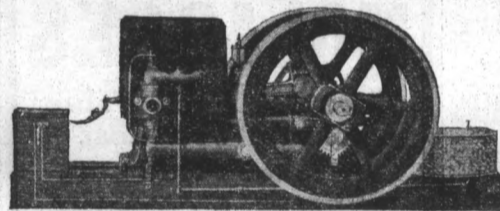
Studebaker Harness and Studebaker Buggies are built with the same integrity as are Studebaker Farm Wagons.

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Studebakers last a lifetime

GASOLINE ENGINES



2 H. P.—\$ 45.00
4 H. P.— 75.00
6 H. P.— 100.00
8 H. P.— 140.00

Other sizes at proportionate prices.

Machinery of all kinds for wood, iron and tin working, Belting, Pulleys, Shafting, Hangers, etc. Contractors Supplies, Builders Material, Rails, Beams, Angles, etc.

RIVERSIDE MACHINERY DEPOT,
24-26 St. Aubin, Detroit, Mich.

STURGES Milk Cans

Are Guaranteed Correct Capacity!

Every 5, 8 and 10 gallon can holds 5, 8 or 10 gallons to the crease at the bottom of the neck.

You buy accurate measures as well as strong, sanitary containers when you buy Sturges Milk Cans.

Built to give long service. Sturges Cans are so well made and so strong that they stand hard service for a remarkably long time.

Smooth soldering of inside seams leaves no crevices where milk or cream can lodge. Sturges Cans may be easily and thoroughly cleaned.

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Write for catalog No. 46 You'll find it well worth while.

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for silos, tanks, stable floors and all concrete work on the farm. The best is the cheapest. Sold by the best dealers.

PENINSULAR PORTLAND CEMENT COMPANY,
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will pay for itself in a few days work. Furnished with three screens of different size meshes. It folds up and can easily be carried in a top buggy. Every farmer and dealer should have one. Guaranteed to give perfect satisfaction or money refunded. Write for particulars. W. B. HODGES, New Hudson, Mich

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THE NEW FIRST NATIONAL BANK, COLUMBUS, O.

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are today as for the past forty, eight years the breed's best



As a matter of fact you can also get more here for your money than elsewhere. If you are interested in Percherons and want to get in touch with the oldest concern in the business—the one that handles the best class of horses, and whose reliability is proven by the experience of thousands of satisfied customers. Come and see us.

New illustrated catalog on application
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Sale of Pure Bred Horses

Thirty head of pure bred registered Percheron, Belgian and Clydesdale,

From weanlings to aged Horses, Mares and Stallions: Also fifty head good grade stock will be sold at auction

Friday, March 26,

at one o'clock sharp at Caro Racing Park, Caro, Mich. One year's time on good bankable paper at seven per cent, or special terms may be arranged on day of sale. For further information write

ERNEST E. JONES

Sect. Tuscola County Horse Breeders Association, Caro, Mich.

LOESER BROS.

We have sixty head of imported Belgian and Percheron stallions and mares, from weanlings up. We are also offering a car lot of big drafty grade brood mares all in foal, weighing 1600 to 1800 pounds.

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PERCHERON SALE.

Farmers and Breeders Attention.

In order to insure quick sales we have decided to cut our prices. Your choice for \$1000. A lot of good ones at \$400-\$500-\$600.

A. A. PALMER & SONS,
R. R. Orleans. P. O. Belding, Mich.

FOR SALE—One Pair of Ch. Belgian Geld's 5 yrs. old, wt. 2800 lbs.; One Pair of 5 yr. old Percherons, wt. 2800 lbs.; One Pair of Brown Belgian Geldings wt. 2850 lbs.; One Blue Roan Gelding, 5 yrs. old, wt. 1540 lbs.; One Brown Gelding, 5 yrs. old, wt. 1500 lbs.; one Bay Blocky Mare, 6 yrs. old, wt. 1500 lbs.; One Red Roan Gelding, wt. 1300 lbs., 7 yrs. old; One Black Mare, 8 yrs. old, wt. 1350 in foal to 2200 lb. Belgian Stallion. No. of other single Mares and Geldings suitable for Farm or Draft Purposes, also one Bay Road Horse 4 yrs., sired by Online. Horses for all purposes at the right price. Quality considered.
STARK WEATHER STOCK FARM,
Northville, Mich.

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We have a fine selection of stallions and mares ranging from 1 to 6 years old. Prices reasonable, terms to suit purchaser. **METZ BROS., Niles, Mich.**

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Pigeon Pony Farm—Reg. Shetland Ponies, mostly spotted spots, 1 spotted stallion and young stock for sale. **Dr. W. T. Morrison, Pigeon, Mich.**

SOUTH ST. PAUL HORSE & MULE COMPANY.

Union Stock Yards, South St. Paul, Minn. A large assortment of Good Horses and Mules always on hand. **PRIVATE SALES DAILY.**
HORSE AUCTION SALES EVERY MONDAY.
GET IN TOUCH WITH US.

PERCHERONS—Impassant, one of the heaviest horses in state, at head of stud. Brood Mares as good, young stock for sale. **CHAS. OSGOOD & SONS, Mendon, Michigan**

FOR SALE—Registered Percheron Stallion Mares and Fillies at reasonable prices. Inspection invited. **F. L. KING & SON, Charlotte, Mich.**

FIVE REGISTERED PERCHERON STALLIONS, blacks from weanlings to 12 years old, and sound. **WM. McORODAN, Dutton, Kent Co., Mich.**


Registered Clydesdale Stallions for Sale.
F. A. PETZ, CAPAC, MICHIGAN.

FOR SALE—Registered Percheron Stallion five years old, price \$500. Would exchange for registered mare or pair of good work mares. **R. B. NOLL, Vickeryville, Michigan.**

FOR SALE: Pair Registered Grey Percheron Mares 5 and 8 years old, weight 1900 lbs., 1 ready to foal \$800. **R. S. HUDSON, care M. A. C., East Lansing, Michigan.**

Michigan Livestock Insurance Co.
Capital Stock—\$100,000. Surplus—\$100,000
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Give Your Horses a Spring Hair Cut



Clip Your Horses and Mules Before the Spring Work Begins

They are healthier and render better service. When the heavy coat that holds the wet sweat and dirt is removed, they are more easily kept clean, look better—get more good from their feed and are better in every way. Insist on having

The Stewart Ball Bearing Clipping Machine

It turns easier, clips faster and closer and stays sharp longer than any other. Gears are cut from solid steel bar, enclosed, protected and run in oil; little friction, little wear. Has six feet of new style easy running flexible shaft and the celebrated Stewart single tension clipping head. **Get one from your dealer, or send to us \$2.00 and we will ship C. O. D. for balance. Money and shipping charges back if you are not more than satisfied.**

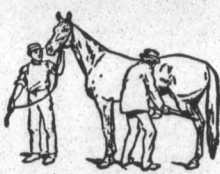
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Write for complete new catalog showing world's largest and most modern line of horse clipping and sheep shearing machines, mailed free.



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Greatest Food Value Lowest Ton Cost
Write for Price List.
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SAVE-THE-HORSE
(Trade Mark Registered)



Results Are Permanent

Mr. Glenn Owen, Wellington, Kans., writes: "In spring of 1913, as you will remember, my mare got caught in the railroad, nearly pulled off her foot. Her leg swelled to nearly three times its natural size. It was awful. I am enclosing her picture to see if you can tell which leg it was. It is now two years, and she has never taken a lame step since Save-The-Horse got in its work."

Our Advice Helps Him

J. H. Peters, Nos. 26-35 East Congress St., Detroit, Mich., writes: "I did as you advised, and I wish to state that the ringbone is cured. I give her severe drives ever since, without any trace of lameness. This was a severe case and the horse a valuable one. I want to thank you for helping me."

Every bottle of Save-The-Horse is sold with signed Contract Bond to Return MONEY if Remedy fails on Ringbone—Thoroughpin—SPAVIN or ANY—Shoulder, Knee, Ankle, Hoof or Tendon disease. 19 Years a Success.

WRITE and we will send our "SAVE-THE-HORSE BOOK." Sample contract and ADVICE—ALL FREE to Horse Owners and Managers. Address

Troy Chemical Co., 20 Commerce Ave., Binghamton, N.Y.
Druggists Everywhere sell Save-The-Horse with CONTRACT, or we send by Parcel Post or Express paid.

MINERAL HEAVE COMPOUND in use over 50 years
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Booklet Free
\$3 Package guaranteed to give satisfaction or money back. \$1 Package sufficient for ordinary cases.
MINERAL HEAVE REMEDY CO. 463 Fourth Ave., Pittsburgh, Pa.



Veterinary.

CONDUCTED BY W. C. FAIR, V. S.

Advice through this department is free to our subscribers. Each communication should state history and symptoms of the case in full; also name and address of writer. Initials only will be published. Many queries are answered that apply to the same ailments. If this column is watched carefully you will probably find the desired information in a reply that has been made to someone else. When reply by mail is requested, it becomes private practice, and a fee of \$1.00 must accompany letter.

Speck on Eye Ball—Film.—My seven-year-old mare was hit in eye with end of whip lash, injuring eye ball, leaving a speck which I would like to have removed. **R. A. C., Imlay City, Mich.**—Blow a small quantity of calomel into eye daily and it will perhaps clear eye ball.

Petlock Lameness.—Three weeks ago my mare slipped on the ice and sprained ankle joint, causing her to go lame. **W. E. V., Coopersville, Mich.**—Give her rest, clip off hair and apply one part powdered cantharides and four parts lard every ten days. Keep up this treatment until she recovers.

Elbow Tumor.—My nine-year-old mare has a boil on elbow which our local Vet. opened but failed to cure. What had I better apply to take it off? **E. W. R., Lowell, Mich.**—Call a competent Vet. and have him cut off the tumor, removing some loose skin with bunch or he will not have a smooth elbow when wound heals.

C. C., Merrill, Mich.—As your two-year-old heifer has never been seen in heat, give her a forced service, and it may have the desired effect of bringing her in heat.

Gastritis.—I have a heifer two and a half years old that is off feed, inclined to eat rotten wood and rubbish. **F. D., Nashville, Mich.**—Give her ½ oz. hypo-sulphite soda at a dose in feed three times a day. If her bowels are costive give epsom salts to open them.

Sidebones—Eczema.—I have been a reader of the Michigan Farmer for many years and obtained valuable information by reading the veterinary column. I have a mule six years old which, when worked, shows considerable lameness and soreness in both front feet and I have been told that side-bones caused this lameness. I also have calves that lose hair around eyes and face and I am unable to cure it. **B. J. H., Suttons Bay, Mich.**—Apply one part red iodine mercury and four parts lard to bunches on coronet every ten days and your mule will perhaps get well. Apply one part sulphur, one-half a part carbonate potash and four parts lard to sore parts of skin of calves three times a week.

Nasal Gleet.—I have a gelding that has a nasal discharge which appears to be incurable. Sixteen months ago a swelling came on face, veterinary pulled fourth molar; some time later trephined bone of face and for eight months his head has been dressed, but wound has now healed and Vet. tells me he has done his best. **J. A. McC., Amadore, Mich.**—Chronic nasal gleet where the bones of head are diseased, it is frequently impossible to effect a cure. Wash out nostrils with tepid salt water, a teaspoonful of salt to each pint of water. Give 1 dr. tincture chloride of iron and ½ oz. of Fowler's solution at a dose three times a day.

Rheumatism.—A year ago I bought a mare; led her 75 miles, she stiffened in both hind legs, had to leave her; she caught cold and since then has gradually improved, but one of her stifles is affected and stiff. **F. M., Smith's Creek, Mich.**—Apply one part red iodine mercury, one part powdered cantharides and eight parts fresh lard to swollen stifle every ten days. Also give mare 2 drs. sodium salicylate at a dose in feed two or three times a day.

Tongue Loller—Perspires too Freely.—I have a mare ten years old that hangs tongue out when bit is in her mouth; besides, she perspires altogether too freely. **J. B., Peacock, Mich.**—Tongue lolling is often corrected by using a bit with spoon on it, or a crooked bar, affording a place for tongue—the object of the spoon is to prevent the animal placing tongue over bit. This mare should be clipped and admit more fresh air in stable.

Vaginal Polypus.—I have a mare that has never been bred which occasionally leaks some blood from vagina, but every other way she seems healthy. **E. P., Fruitport, Mich.**—Dissolve ¼ lb. of alum in a gallon of water and inject a few ounces into the vagina once a day.

Septic Infection—Loss of Appetite—Stunting Growth of Young Stock.—

I have a cow that came fresh last March; did not clean properly and has not done well since. I have another cow that will be fresh next month which seems to have lost her appetite and her bowels are costive. I have had no luck raising young stock and have been at it for three years. My calves grow and do well until fall, then stop growing and what they eat fails to do them much good. When spring comes those that are alive do not seem to thrive and grow. I have given them everything that I know of, but it fails to fatten them. **H. V., Jr., Empire, Mich.**—Give your cow ½ oz. hypo-sulphite of soda and 1 dr. of ground nux vomica at a dose three times a day. Give your other cow 1 dr. fluid extract nux vomica, one-third of an ounce of fluid extract of gentian and ½ oz. fluid extract cinchona at a dose two or three times a day, and enough epsom salts to open bowels. I am inclined to believe that you fail to feed your young stock enough nutritious food to keep them growing, or perhaps they do not have sufficient shelter. Mix together one part powdered sulphate iron, one part ground nux vomica, one part sulphate of soda one part salt and four parts ground gentian and give each calf a teaspoonful or two at a dose in feed two or three times a day.

Barren Heifer.—Heifer 15 months old comes in heat every 16 or 17 days, has been bred regularly for some time but fails to get with calf. Do you believe that I should introduce my hand and open neck of womb or not? **V. A. K., Fennville, Mich.**—Introducing the hand and forcing neck of uterus open will cause this young heifer to suffer considerable pain and accomplish nothing. When she comes in heat, inject her with the following soda solution, made by dissolving 2 ozs of bicarbonate soda in three pints of clean tepid water. Don't breed her for six hours.

Spasm of Muscles of Neck.—Last summer while my eight-year-old cow was running on pasture she would frequently return in the evening with head drawn to one side, but after standing in stable a while the head went back to place. Her head is always twisted to the right and she was worse when pasture was short. **J. C. G., Whittemore, Mich.**—The muscles of neck should have been rubbed with spirits of camphor twice a day.

Indigestion—Acute Indigestion.—I have a cow that had a calf ten days ago; she cleaned all right as far as I can see, and gave 12 quarts of milk at each milking. Was fed four quarts of corn and cob meal, one pint of old process oil meal and three quarts of bran at a feed. She is now giving much less milk, but is dull and dumpish part of the time. I also have two pigs three months old that bloat after eating and one of them vomits. We gave them ashes, salt and charcoal, also some epsom salts. **C. M., Sears, Mich.**—Give her ½ lb. of epsom salt at a dose night and morning until her bowels move freely; then give her ½ oz. hypo-sulphite of soda at a dose three times a day. Now, regarding your pigs, give them a teaspoonful or two of aromatic spirits of ammonia every hour or two until bloat goes down. If the pigs are costive, give castor oil to open them.

Navel Infection.—At birth our calf appeared to be perfectly normal, but when seven days old it seemed to refuse to suck. Next day it was down and unable to get up, so we carried it to the mother and held it up to nurse. In this condition it remained for some ten days, and I might add that both locks are swollen and tender. **W. S., Highland Park, Mich.**—Paint swollen joints with tincture iodine three times a week. Give calf 10 grs. of sodium salicylate four times a day.

Pneumonia.—About eight weeks ago my hogs were taken sick, coughed and wheezed; one large hog died and our local Vet. called it pneumonia; others took sick and two died, but showed no symptoms of cholera. We have had no hog cholera in this section of the country for some time. My hogs are not thriving, but some days they appear to be all right and at other times dumpish. **J. E., St. Johns, Mich.**—Your hogs either take cold and suffer from a congestive chill or else suffer from the bad effects of infected food. Mix together one part powdered sulphate iron, two parts bicarbonate of soda and three parts ground gentian and give each full grown hog a teaspoonful at a dose two or three times a day.

Worms—Sitfast.—I have a five-year-old mare troubled with worms, she also has small hard lumps on shoulder which enlarge whenever she is worked, but reduce in size when idle. **D. McC., Yale, Mich.**—Mix together one part powdered sulphate iron, one part salt, one part powdered fenugreek and three parts ground gentian and give her a tablespoonful at a dose in feed three times a day. Cut out bunches, removing skin that covers them, then apply one part iodoform and nine parts boracic acid to sores twice a day.

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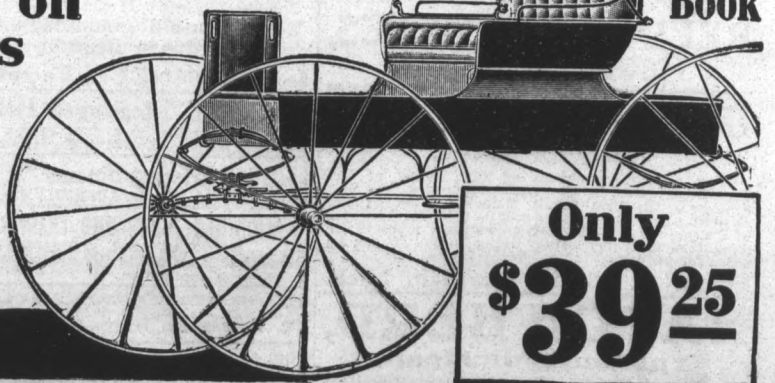
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