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Bacteriology in Relation to Agriculture

By Dr. CHARLES E. MARSHALL.

TO relate the benefits to agriculture, or any other industry, derived from any single branch of science, in a large part means a historical survey of its results in their application to agriculture or some other field. Also to assume that any particular branch of science as bacteriology stands out independently in the measure of scientific products, uninfluenced by any other branch of science or practice, would be preposterous and false. An application of scientific effort found in scientific practice is many-sided and is really the offspring of accumulated observations and suggestions, of traditions ever revealing themselves out of a period of chaos in definite, tangible and workable form.

Agriculture has shared freely in the results of scientific study and the branch of agricultural bacteriology has contributed its mite to this great industrial domain. However, only the important and familiarly recognized goods can be mentioned in a limited article.

Fermentations.

Men observed fermentations and utilized them, and also were familiar with putrefaction long before history found it possible to tell their daily experiences. They wondered, weighed, and speculated over many of the mysterious ways of nature. In putrefaction and fermentations they were especially deeply interested for there seemed to be more than the usual inanimate material present—there was seemingly something of life itself in them. Out of them many suspected life to come. These phenomena, however, were processes shrouded in subtle mystery, hidden from the knowledge of man, full of superstitious suggestions and altogether a source of reverential awe.

While conducting the crude fermentation industries, it was soon learned by man that they were subject to undesirable or wayward changes and influences. The thing sought did not always materialize as expected; putrefaction interfered with the keeping of food; and all about was to be seen decay and reduction to earthy material. Where inert or dead substances fell to the direction of man, complete control was exercised, but putrefaction, fermentation and diseases, on the other hand, were still outside of the realm of the absolute domination of man.

Centuries passed with no improvement in the practices utilized in conducting fermentations and in the management of diseases. There appeared to be, during all this period, scarcely much else than speculation, but towards the close of the period, experiments were attempted.

The first vital blow perhaps fell from the hands of an Italian physician, Redi, who was interested in the development of visible life from fermenting or putrefying substances. He took meat and divided it into three portions, placing each in a separate

jar. Over the top of one jar he placed a screen; over another, parchment, and over the third, nothing. The flies lighted on the meat in the open jar and laid their eggs; then maggots soon appeared. The flies were stopped by the cover of the screened jar, and deposited their eggs on the screen. It was possible to see the maggots develop from the eggs, openly before the eyes. But the jar protected by parchment gave no opportunity for the flies to lay their eggs on the cover or to enter, and consequently they could not lay their eggs. Accordingly no maggots developed. The meat in this jar was free from

It was not until 1836, nevertheless, that the yeast cell was first discovered in fermenting fluids and associated with fermentations. The general acceptance of the vitalistic cause, the yeast, of fermentation, and bacteria in connection with putrefaction, did not occur until about 1860. Throughout the centuries prior to 1860 control of fermentations and putrefaction was not possible. When Pasteur gave definite answer to the troubles with beer fermentation, to the nature of vinegar fermentation, to the cause of some milk changes and other fermentations, he opened a field that was extraordinarily fertile for future development

in the manure pile, the soil itself, as well as in those substances which contribute to the fertility of land, as leaves and plants of all kinds, including green manures. On every side in nature man is confronted with change and these changes are mostly caused by micro-organisms. Under the head of fermentation and putrefaction, the nutritional processes of micro-organisms, the recognized forces of microbial life, will be found a singular skeleton key not yet well understood unless we exclude from this category the disease-producing organisms which too doubtless produce their disastrous results by their struggle for food.

To understand what these broad statements have for agriculture, a concise yet general outline as they bear upon some of the most important agricultural subjects will be useful.

Soil.

To obtain a comprehensive notion of soil as it is viewed from the viewpoint of a bacteriologist, it is advisable to consider it in terms of food requirements for plants. In a general way our ideas have grown out of the manures or fertilizers added to soil together with such mineral constituents as may be already there. Through these substances fertility has been promoted. If, on the other hand, we should look upon soil as formed of the rocks which have undergone dissolution, together with an accumulation of organic matter, another picture is presented which in reality is the same as the former, but approached from another angle. It follows from this that soil may be as variable as the original constituents of the rocks and the organic matters which have entered into its composition.

What, then, may be the bacteriological factor in soil making and fertility? This is what we are expected to answer in a few words.

Some micro-organisms live upon the simplest, more or less elementary food. From the air and water, with material to be secured from rocks, such organisms thrive and build their organic or bodily substances. By this simplicity of growth and by their ability to live under very primitive conditions, they have been able to do their share in bringing soil out of rocks to a state for plant growth. Assuming, therefore, that soil is formed and that the maintenance of fertility is the problem which touches the farmer sensitively, it may be asked—do micro-organisms play an important part in it?

Barring the slight changes which would take place through the action of the air, the insoluble mineral constituents would remain insoluble and the organic matter in the form of manure crops as clover, leaves, etc., would continue unaltered without them. There would be no changes, likewise no fertility. The soil would be dead and produce no crops. Back of plant growth are the mineral constituents and organic matter of the soil. These must be made ready for



Pruning, an Essential Orchard Operation. (See page 306).

visible larval life, although it putrefied. This was a simple and direct experiment, originating in a man full of sagacity.

After this, an effort was made to reach an understanding of the putrefaction, still not visible to the naked eye. In this attempt over two or three centuries, there raged discussions which finally stimulated experimentation. Then, as now, arguments were the biggest blows some could use, while others went quietly to work to solve the problem.

as well as concretely contributing millions of dollars to the wealth of his own country, France, in the course of a year or so; and incidentally to the world unestimated wealth.

It is only necessary to recall casually the efforts put forth to direct the common fermentations on the farm as vinegar making, the changes likely to occur in milk, butter and cheese, and milk drinks, the production of ensilage, the keeping of vegetables, fruits, meats, canned goods, the decomposition taking place in the compost heap,

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plants. This preparation and this continuation of soil food are wholly dependent upon micro-organisms. Accordingly, such organisms as are helpful in this process of preparation must be enabled to carry out their work. To hinder them in any manner simply cuts short possible food supplies.

When organic substances are reduced, acids are formed as the acid of vinegar and carbonic acid gas, which react upon the mineral constituents, rendering them soluble. Nitrogenous organic substances are simplified to ammonia as is so easily detected in a manure heap, and this ammonia may be further changed to nitrates for the use of plants. Nitrogen is also abstracted directly from the air and made over by micro-organisms for plant use. Then, again, nitrogen is taken from the air directly by micro-organisms which are associated by means of nodules on the roots of legumes as alfalfa. Thus nitrogen, the most important and expensive element of plant food, is made available in the first place by means of the reduction of nitrogenous organic matter to ammonia and nitrates; in the second place by the direct abstraction of nitrogen from the air by organisms which utilize it and pass it on for plant use; and in the third place by the direct abstraction of nitrogen from the air by organisms which grow in intimate association with legumes and give to them their high nitrogen content.

The oxidations and reductions, the splitting of compounds, the special sulphur and iron micro-organisms and other technical aspects of soil fertility need not be discussed in detail for such knowledge may be found in many books. All of these processes mentioned or hinted at, have for their object so far as man is concerned in transformation of soil substances to be taken up by the plant.

Food.

Still another Italian, Spallanzani, some time after the experiment with flies related above, became interested in the general problems of change by decomposition. He was able to prevent change by means of heat. Different meat and vegetable infusions by this means were actually preserved by him. This was about 1770. It does not follow that food had not been checked in its decomposition or preserved for a time before this, but there existed no principle or practice which proved reliable, since every practice if it rises above haphazard control, must possess a guiding law, whether it is pursued consciously or unconsciously.

Toward the close of the eighteenth century there was a man who not only saw the force of Spallanzani's work with heat, but who proceeded farther and applied it to the preservation of food. Previous to his time there had been some sporadic practices in vogue but no general movement was perceptible. The introduction of the canning industry by Appert, and his exposition of the principles underlying it, gave the impetus which has made it as it exists in our time. A struggle against the organisms instigating putrefaction and fermentations by means of heat has developed an exact technique, which has reached every home and made the lives of our nation not only happier and wealthier, but healthier also. For instance, if each inhabitant of the United States averaged one can each week of either fruits, vegetables, meat or other materials, as condensed milk and babies' food, 5,000,000,000 cans of food would be consumed each year. This is doubtless a very low estimate. When all the commercial canned goods are accounted for, then we have all the domestic canned goods to estimate. While there is still much of detail to master, no one can fail to recognize the essence of this wonderful work in the simple unassuming experiments of Spallanzani when he heated vegetable

and meat infusions, to see whether he could kill the living forms which produced change in them, and prevent their entrance by sealing his flasks hermetically.

Food had been dried in the sun by the ancients. Doubtless this practice was the direct result of observation, but it had made no serious progress till comparatively recent years. When it was ascertained that the elimination of moisture by the sun led to a concentration of the component elements of the food to such an extent that micro-organisms would not grow, a guiding law was at hand which proved directive and reliable. With this was linked the influence of salt and sugar which in reality act in the same way, for drying makes a concentration by the elimination of water, while salt and sugar create concentration by addition of soluble substances, both processes reacting unfavorably upon micro-organisms. Herein lie the beginnings and the foundations for the industries of preserving by salt and sugar, and of evaporating, drying and condensing. A moment's reflection only will impress the mind with their vastness.

Today the cold storage of foodstuffs and refrigeration have occupied the attention of the world because it has become possible for speculators to control the world's food markets through their instrumentality. Little of refrigeration has been apparent till very recent years, although the incipient stages may be noted in the fifties and sixties. Even ice boxes and ice houses have had their origin within the last hundred years. Snow and ice were stored and used, however, as far back as the reign of King Solomon. For purposes of cooling drinks or liquors and later for preparation of ices for noble families, snow and ice were stored in trenches covered over with some loose insulating material. Little if anything is said of using cold for the preservation of food. When it became known what caused putrefaction and fermentations, there was found a basis of procedure. When the carcass of a prehistoric elephant was discovered in the ice of the polar seas, having been there doubtless for centuries, the importance of cold in preservation of food seemed to dawn upon man. Taken together with the economic demands of an increasing civilization, the above facts vented themselves in the establishing of an immense industry.

There have also crept into these food industries practices which cannot be condoned. Lord Lister contributed one of the greatest known blessings to mankind when he introduced his method for preventing micro-organisms entering wounds during operation. His carbolic acid spray over the surface where the surgeon was operating was not only effective but highly suggestive. Out of it there have been many extensions, and one had to do with food preservation; for in the way as carbolic acid can prevent the growth of micro-organisms in wounds, so can certain substances, as salicylic acid, boric acid, benzoic acid, etc., prevent their growth in foods. So far has this practice been carried by some commercial houses that laws have been enacted to control it.

(Continued next week.)

This is the eighteenth of 52 special articles to be published in consecutive issues. Its author, who was for so long at the head of the Bacteriological Department of the Michigan Agricultural College, needs no introduction to Michigan Farmer readers, very many of whom will appreciate this message from him. The article will be concluded in the next issue. The special article for next week will be "The Field Pea in Michigan Agriculture."—Eds.

The Unadilla Silo Co., Unadilla, N. Y., send upon request a handsomely illustrated catalog describing the methods of construction and advantages of Unadilla silos manufactured by this company. The catalog is accompanied by a neat 1915 calendar.

THE ONE-MAN FARM.

Pursuant to the appeal for experiences in managing a one-man farm, the photograph from which the accompanying cut was made was received, together with a statement of the gross receipts from the small farm, the owner of which was at once asked for the more detailed statement which follows.—Eds.

In reply to your inquiry I will give you a brief outline of our operations on 20 acres of pine stump land in Bay county, Michigan, in 1914. Our main money crop is hogs, of which we keep from 20 to 60, big and little. O. I. C.'s are kept; most of them are sold for pork and a few for breeders. Three loads of pork and a few live ones brought over \$850. We keep 150 Barred Rock hens over winter and hatch from 300 to 400 chicks. We sold \$45 worth of chicken meat and a few for breeders. Eggs, 600 dozen, were mostly sold at store prices, but quite a few at breeders' prices.

A patch of strawberries containing 105 square rods, yielded 133 bushels, which sold for \$2 to \$3.50 per bushel, averaging \$2.50. Plants and berries brought around \$235. We also received about \$30 for raspberries. One hundred and fifty bushels of pears at 40 to 75 cents, 50 bushels of potatoes at 50 cents, with cherries, grapes, squash and other vegetables sold, brought our sales up to over \$1,750.

I expect some readers will wonder how we did this, and we were surpris-



Home of F. C. Horn, of Bay Co., who Operates a Successful One-man Farm.

ed when we figured up at the end of 1914. The hogs we raise, except an occasional one for a breeder. We have to buy some feed. This year, 1914, we had six and a half acres of corn on leased ground, and still have 75 bushels of that corn after getting 45 head along this far and fattening over a ton of pork. We have about 400 fruit trees, from one to 19 years old, some of which bear and some do not. We haven't kept an accurate account, only just put down the sales as they came along. We have paid out around \$200 for help, my wife and I doing the rest.

If pears, apples and onions had been their usual price, we would have done considerably better and we still have 90 bushels of apples pitted. We also drew \$31.66 premium money at the Northeastern Fair and got paid off like the rest, at 50 cents on the dollar. This land was brushed 20 years ago, but not finally cleared and stumped until five years ago.

Bay Co. F. C. HORN.

CROP RECORDS.

Experience has taught me that the time to lay out and plan the next year's crops and farm routine is before the time for spring work begins. I have found a systematic but simple system of farm book-keeping of a great deal of value to me in this line.

As a basis for my crop records, I have laid out my farm on a chart, numbering each field. I use an ordinary ledger with columns which I have constructed myself in order to have them most convenient in form.

My columns are headed as follows: Number of field, number of acres, crop planted, date of planting, date of cultivation, (I usually have about three sub-divisions under this heading), date of harvest, amount produced, amount of labor required, approximate cost, estimated profit. In conjunction with the information contained in these columns, I keep a record of the rainfall, showing the dates, also I jot down notations of any extraordinary circumstances such as late frosts, hail storms, etc., that would have some bearing upon the crops.

A record such as this is very simple, and will be found interesting, besides furnishing valuable information. It enables me to arrange my crops in such a way that there will be little danger of conflict with regard to cultivation or harvest dates. Also it serves for a guide for the rotation of crops. By following a scheme of this nature, I have been enabled to tell just where I am making my profits, and eliminate the useless crops.

Nebraska. P. H. EATON.

EVERGREEN WINDBREAKS.

After a careful estimate and investigation of the rapid increase in evergreen tree planting for windbreak purposes, one must come to the conclusion that an evergreen windbreak is not only a paying proposition, but in some cases an absolute necessity where the need for some object to act

as an obstruction to the wind is felt. Evergreen trees are especially desirable for windbreak purposes for several good reasons. When compared with deciduous or leaf dropping trees, they do double duty because of the fact that they retain their foliage throughout the entire year, while the deciduous trees drop their leaves right at a time when they are most needed to give protection against winter storms. Two rows will lodge more snow and check more wind than several rows of deciduous trees, and in addition to their value as windbreaks are a thing of beauty the year around, carrying the freshness and verdure of summer all through the cold winter.

A country home surrounded by evergreens will put the place a hundred miles south in mildness and salubrity of climate, without the mud and chill that is common to those sections on the border line of frost. A belt of evergreen trees afford shelter earlier in life than any of the leaf-shedding trees. That there are not more evergreen hedges than there are can be accounted for only by the fact that the farmer feels that he is too busy to bother with trees that have perhaps no apparent value at first sight. Men who have had no experience in evergreen tree planting are generally of the opinion that it takes a lifetime, perhaps longer, to secure results from evergreens, and all the time they are allowing the destructive winds and storms to eat up their profits by killing off their crops which are not protected as they should be.

Evergreen windbreaks are of inestimable value to the farmer and fruit

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They know how because they have manufactured the vital parts for more than 500,000.

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They know how to make connecting rods, because they have turned out in a year more than 850,000.

They know how to make crank shafts, because they have made as many as 205,000 a year.

They have a factory with a floor space of more than 20 acres, equipped throughout with the most modern machinery known to the industry.

The immense foundry can melt 150,000 pounds of gray iron each day, and 25 tons of brass.

The two big forge plants can shape 300,000 pounds of steel a day.

The fly-wheel department can finish 2,000 fly-wheels each day, punch 40,000 thrust plates, assemble 2,000 differential gear cases and drill 6,000 differentials.

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Handling millions of parts and pieces annually they have learned how to get the utmost out of materials, machinery and men.

Yet despite the scale upon which their business is conducted Dodge Brothers do not have to ask for outside aid.

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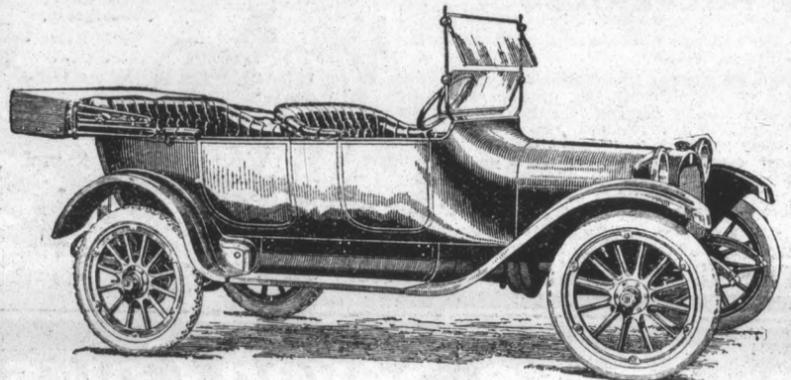
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"Now my silo is up and it's a dandy. Looks fine out there next to the barn. And say, you should see the silage—sweet, clean and palatable, the stock just love it. I can almost see those steers put on fat and that means money in my pocket. And I never knew real profits from dairy cows until I put up this silo. Looks as though my feed bill will be less than half what it was last year. That saving will just about pay for my Saginaw."

Let us put you in touch with the local Saginaw Agent. He will help you solve your feeding problem. He is our direct personal representative, a man you will enjoy doing business with. Whatever your plans may be, write us for Silage Book No. 111.

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grower everywhere, but they perhaps find greater utility in the treeless, wind-swept plains and prairies. In addition to the esthetic benefits and the general "improvement" value to the farm it would, in many instances, be almost impossible to raise crops without protection from the hot dry winds in summer and the cold dry winter winds. When the early settlers in the middle western states planted trees so extensively, they did so with an object in view—to build up a natural barrier against the wind which then swept unimpeded across the plains, doing great damage to their crops, intensifying the effects of both cold and hot weather upon their stock and making their homes almost uninhabitable. They also found that a windbreak was very useful in preventing the drifting of snow. For the protection of such winter crops as wheat and rye, an evergreen windbreak is very efficient as it serves the double purpose of causing an even distribution of the protective snow cover and of sheltering the plants from the wind itself when the snow has melted.

The economic importance of tree planting in the middle west can be realized better when it is known that in only one township of Mary, in Kansas, there are approximately 170 miles of windbreaks, and again in Platte county, Nebraska, my native home county, there are over 22 miles of rows, belts and groves, with an area of about 500 acres and an average height of 45 feet. There are numerous other instances that I could call attention to where farmers, both east and west, have resorted to the only permanent means of protecting their property from conditions which cannot be altered otherwise.

From statistics compiled by some of the most eminent authorities in the country, it has been shown that the windbreak lessens the evaporation of moisture to a considerable extent, and by the interception of air currents over a much wider zone, reduces the mechanical force of the wind and influences the growth of crops, which is a matter worthy of serious thought among farmers whose lands are exposed to all elements such as named above.

Penn. H. W. SWOPE.

TOP-DRESSING FOR ALFALFA.

When young seedings of alfalfa or clover on heavy soils are exposed to the alternate freezing and thawing of springtime, the heaving is often so great that the plants are either killed outright, or they are left with their crowns so exposed above the surface that they are cut off by the mower at the first cutting. After the first season, however, the danger is much less. To entirely prevent heaving on heavy land is almost impossible, but the damage may be greatly reduced by proper management.

Heaving on heavy land is due to the alternate freezing and thawing of the free water in the soil. Good drainage, therefore, is one of the ways of preventing this trouble. Winter-killing by heaving is always noticeably less over and near tile drains through a field.

When fields have not been tiled, the best known way of preventing heaving is top-dressing the land with barnyard manure during the winter, or any time before the spring thaws begin. The surface covering of manure keeps the soil frozen till late in the spring and then allows it to thaw out gradually without heaving. A rather poor stand of alfalfa was top-dressed over part of the field last winter. The untreated portion was nearly all killed out, while the rest did not heave and made a fair showing. The manure not only acts as a blanket to prevent heaving, but it also supplies nitrogen which stimulates early, vigorous growth.

Ingham Co. H. L. BARNUM.

FARM NOTES.

Seeding Alfalfa.

I contemplate sowing alfalfa this spring and would like your opinion as to the best time of sowing, on what kind of soil to sow, the proper way to fit the soil for it, and also if it would be advisable to sow with any grain or any particular seed, such as sweet clover. I have often read in the Michigan Farmer that it would be good policy to inoculate the soil.

Ingham Co. A. W.

Where alfalfa has never been grown before it is best to fit the ground thoroughly and take as much care as possible to have all conditions favorable to its success. Many Michigan soils require an application of lime for the best success of this crop. This is quite generally true of all sandy soils and of some clay soils as well. A good test as to whether lime is needed or not is the success which usually attends clover seeding. Although lime will be found profitable even on soils where there is no difficulty in getting stands of clover or even alfalfa. The object in the application of lime is two-fold, namely, to supply lime as a plant food, alfalfa being a heavy feeder on lime, and as well the sweetening of the soil to make a suitable home for the bacteria peculiar to the alfalfa plant, and which must be present to insure its continued success. Naturally where the soil has not been in a condition to favor the development of this bacteria, particularly where alfalfa has not been grown, the bacteria will not be numerous in the soil, and inoculation is profitable. This can be accomplished by the sowing of soil from a successful alfalfa field or from a sweet clover patch, or by the so-called "glue" method by which some of the soil is glued to the alfalfa seed, or by the use of a pure culture of the bacteria on the seed. As to the best time of sowing, much depends upon the season and soil conditions. It is a good rule to sow at any time when conditions are favorable and a good seed bed has been prepared, although seeding should not be done later than early in August and preferably earlier.

As our fields are gotten into the proper shape for the growing of alfalfa and the harboring of the bacteria peculiar to the plant, it will be, in the writer's opinion, no more difficult to get a seeding than it now is to get a good stand of clover, and this result may be accomplished in the same way that a clover seeding is obtained under the same conditions.

Using Straw as Fertilizer.

Will you please give me information in regard to the disposal of a straw stack? Would it be proper to draw the stack out on the corn ground while it is dry, and plow it under, or would you consider it better to cover the bean ground, which is a clover sod? The soil of the corn ground is clay loam with clover sod.

Ionia Co. O. C. M.

In the writer's opinion, a better place to put the straw to be plowed under for a spring crop would be on the corn ground, for the reason that corn has a longer growing season than beans, and there will be a better opportunity for the straw to become converted into humus and available plant food in time to be of some benefit to the growing crop. It should be evenly distributed so that bunches of straw will not disturb the capillarity of the soil when same is plowed down. A better way to use straw is as a top-dressing on winter wheat, or applied to grass land in midsummer, which will promote a better growth of grass and thus tend to further increase the vegetable matter to be plowed down, while the shading of the ground also permits activity of beneficial soil bacteria.

"The Tower Twentieth Century Corn Culture," is the title of an illustrated booklet sent upon request by the J. D. Tower & Sons Co., Mendota, Ill., manufacturers of Tower cultivators and pulverizers. This is a treatise on modern corn culture, by surface cultivation methods. Mention the Michigan Farmer when writing for this interesting booklet.

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Free Book

THAT GERMINATING BOX.

Ten ears of corn of average size will furnish enough seed to plant an acre, allowing four kernels to the hill and the hills to be three and one-half feet apart each way. Seventy-five cents will make a suitable tester and test enough corn to plant ten acres. It is doubtful if there are any of us but who appreciate the value of tested seed corn, but the idea of making the tester and doing the work is the discouraging feature. One might go to the outlay for an expensive tester and apparatus, but that is not at all necessary and many times the simpler ones give the best results. We have come to look upon a stand of from 65 to 95 per cent as being nearly perfect, but this is far from the case. There is scarcely a year when corn is planted that the germination should be less than 95 per cent unless the weather conditions are unfavorable in the extreme. The germinating box will solve the question of why we have such a poor corn stand some years. It has been claimed by some very successful corn men that they could tell weak and strong ears by their outward appearances, but I have tested enough corn to know that this is not possible in all cases. I believe it would be safe to say that not more than one-half of the ears having poor vitality will be detected from an external examination. The germination test is necessary to reveal the other half of poor germinating ears.

One of the simplest testers that I have used is the sawdust tester, and while this is simple, yet it is efficient. Out of some boards around the corn crib or barns make a shallow box, not more than two inches deep and as long and wide as seems necessary. A sardine box from the nearby grocery will serve the purpose just as well. Now take damp sawdust or sand and fill the bottom of the tester to the depth of one inch. Take a piece of white muslin and cut it to the proper size to fit the box; then fasten it securely on a table and rule off, with a square and blue pencil, squares having two-inch sides. A two-inch square is about the right size for testing the kernels from one ear. Number the squares from left to right, beginning in the upper left hand corner. Place this sectioned cloth over the dampened sawdust and set the box in front of the row of ears to be tested.

The next operation is to remove the kernels from the seed ears and place them in their respective squares. It is a disputed point as to how many kernels should be removed for testing but it is safe to say that if less than six kernels are germinated, the results would hardly be reliable. A method followed by many is to take two kernels from the butt of the ear, two from the middle and two from the tip, making a total of six. Each kernel should be taken from a different row. These six kernels are placed in the square whose number corresponds to that of the ear. The germ side is up.

After all the ears have been sampled and the kernels are in their respective squares, place another cloth over the corn and spread over this a layer of moistened sawdust or sand. This is usually all the water that must be supplied. The best results are obtained when the germinating box is kept at temperatures alternating between 65 and 85 degrees and all the sprouts should be well formed in seven days. At the end of this period, the top cloth may be rolled back and each kernel is exposed to view. One of the advantages of this germinator is that the whole root system is exposed for examination. Any ear in which all the kernels have not germinated should be discarded. This germinating box is more convenient and durable than the plate tester and gives just as good results as any of the more complex germinators.

Ingham Co. I. J. MATHEWS.

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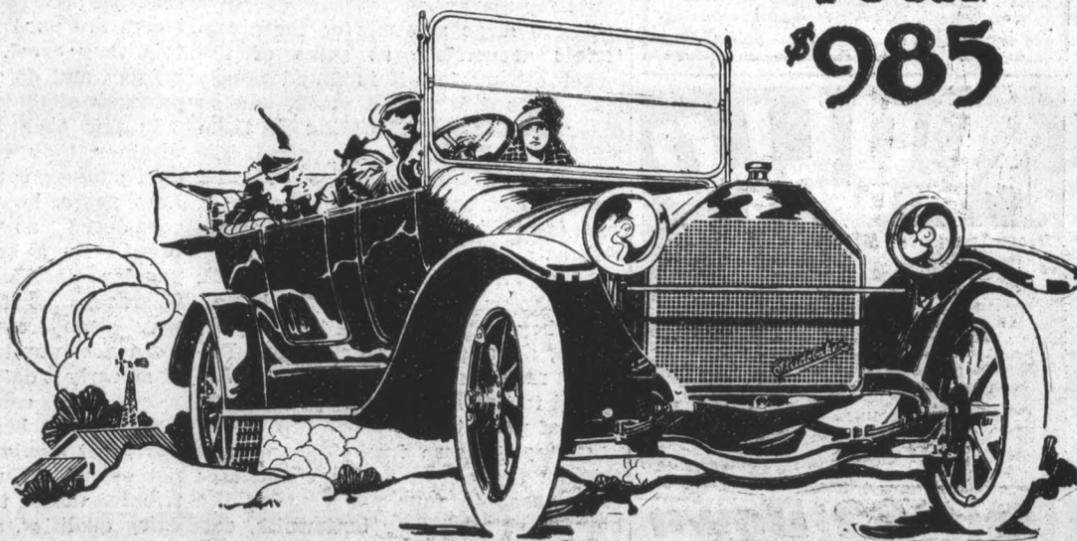
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Utilizing By-Products of the Dairy.

THE utilization of by-products in many of our large industries makes for their success," was the opening statement by Dr. Floyd Robison, in an address before the recent State Dairymen's Association at Flint. A good example of the profits to be made from by-products is seen in the business of the meat packers. In this great industry practically all of the profits are secured from the sale of what would otherwise be thrown away, the regular line of goods being placed upon the market for practically what they cost. The speaker referred to the systematic way in which the German people take care of wastes in their different industries, and it is largely through this practice that they are able to manufacture so economically.

Using the By-products of the Creamery.
One of the great obstacles in the way of successful dairying is the disposition of the waste in the manufacture of butter and cheese and in the sale of cream. Here we have a large bulk of material in the form of buttermilk, whey, or skim-milk, which becomes an absolute loss if not utilized in one form or another. The methods of disposing of these by-products are important.

The first matter taken up by the speaker was that of the over-run in the manufacture of butter. Here he pointed out how it was possible for the creamery man to pay the farmer as much for cream as the manufactured butter would sell for, and yet make a satisfactory margin by reason of the over-run, which amounts to around 20 per cent increase in the weight of the butter over that of the original cream. This method of securing profits from the ordinary wastes in dairying is one that is well understood.

Valuable for Feeding Purposes.
The usual method of disposing of these by-products is to feed them to live stock, including poultry. All of the constituents in the milk are assimilated by the animals and made use of in their growth. Usually hogs and calves are used for this purpose, but good results have been secured by feeding skim-milk and buttermilk to dairy cows. Of late these by-products have been found highly satisfactory as poultry food, as they supply a considerable amount of protein, which constituent is usually lacking in other feeds. Some poultrymen heat these by-products to about 140 degrees F., after which the excess water is siphoned off and the curd mixed with meal, oats, etc., and placed before the birds. It has been found that this feed has a peculiar value in fattening fowls for market.

Where large amounts of these materials accumulate at some of the larger creameries, it is found impossible to feed it to live stock, and so other methods of disposing of them must be provided. Many products are now made from the solids of milk, and we find that the manufacture of such is being looked upon more favorably as a means of disposing of these wastes. Skim-milk and buttermilk equal the whole milk, less the butterfat; they being composed of water, casein, albumen, salts and sugar. Different manufacturing methods are employed to secure these solids for a variety of purposes.

Cottage Cheese from Skim-milk.
From the casein which constitutes from three to four per cent of the bulk of skim-milk or buttermilk, cottage cheese can be produced. This product usually finds a sale in our cities, and with little effort a considerable market can be established. Care is required in its manufacture, and where this is given and customers are accorded good service, substantial profits can be made from the venture. This is attested to by the experiences

of many wide-awake creamerymen. In the manufacture of the cottage cheese only the casein is removed; there still remains the sugar and salts. Recent improvements have made it possible to separate the sugar from the remaining elements and to manufacture what is commercially known as milk sugar. Because of its digestibility this product forms an important ingredient in many of the so-called invalids' and infants' foods. It is usually found in the form of a white crystalline powder. The salts remaining after the manufacture of milk sugar can be utilized as a fertilizer.

Commercial Uses of By-products.
Beside the use of the casein for making cottage cheese, it is also employed in certain manufacturing processes. The method of securing this casein is comparatively simple. A mixture of acetic and sulphuric acids in proportion of one-half to one per cent of the bulk of the milk is used to coagulate the casein. The whey is then drawn off after which the curd is washed several times in warm water. It is then ground in a peg mill, and dried in an oven. This material is used in the preparation of certain paints, in the sizing for paper, and for other purposes.

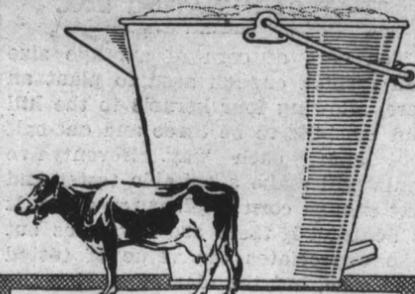
By the employment of these and other methods that are being developed, it will be possible to make use of every part of the milk from our dairy cows. The speaker was of the opinion that careful inquiry should be made along this line, looking toward economical methods of handling these by-products. He believes that a considerable amount is still being dumped into sewers and the sooner a general movement can be started for the proper utilization of such wastes, the better it will be for those concerned in the dairy business.

BROWN SWISS CATTLE.
I would like information concerning the Brown Swiss breed of cattle. There are a few grade cattle of that breed in this locality, but none pure-bred except one bull. A considerable of his get is scattered around the community. We have two half Jersey heifers, one giving milk now. Opinion is very divided locally, concerning the Swiss breed. Some claim they are relatively no good, and others say they are excellent. Personally we are very well suited, as far as we have seen, but wish to investigate thoroughly before specializing on this breed. Can you publish in your paper a story of this breed of cattle, discussing them thoroughly? C. A. W.

The Brown Swiss breed of cattle came from Switzerland, of course, as one would imply from their name. They are a hardy, heavy-boned animal supplying the Swiss people with a general purpose breed. Many of the steers are used for work oxen and in this they excel. They are excellent grazers and do well on the mountain pastures of their native country.

In this country people differ as to whether they should be classed as dual purpose cattle or as dairy cattle. Late years, however, they are being considered as an exclusive dairy breed. As a breed they are not as popular as Holsteins, Jerseys and Guernseys as dairy cattle, but this may come from the fact that they were not introduced into the country at so early a date. These other breeds were well established before the Brown Swiss began to be imported in any great number, therefore we would not expect them to be so widely distributed unless they had very superior dairy qualities.

As a breed they have not made records at the fairs equal to the other three breeds above named. Individual cows have, however, made excellent records. Our experiment station at Lansing has had Brown Swiss cows that made records which would be a credit to any breed of dairy cattle. There is good reason to believe that



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the steers of this breed can hold their own with those of most any dual purpose breed, so far as economical beef production is concerned, and if one is sure that he wants a breed just for butter and not for beef, the Brown Swiss will come as near filling the bill as any breed we have.

The crossing of Brown Swiss and Jersey or any other pure breed should be discouraged. It is practical to use a Brown Swiss bull upon a female of miscellaneous breeding and then breed the resultant heifers back to Brown Swiss bulls, and so on, but the pure-breeds should never be crossed, and with females of miscellaneous breeding, if the blood of one predominates making them grades of that breed, then it is better to use a bull of that breed. It is slow and unsatisfactory work to tear down one breed and build another from it. There are plenty of good breeds, and they should be kept as pure as possible.

SOME POINTS ABOUT THE MODEL COW STALL.

As I am going to remodel my cattle barn and want to install the so-called model cow stall, that I read about in the Michigan Farmer a few years ago, I would like some advice as to how high the manger and feed rack should be built. Can cement floor be put in on a level, with a couple of inches' slope towards the walk, or is it better to have a drop of several inches behind the cows? If so, how long should the platform be when used with these stalls for my large Shorthorn cows?

Lapeer Co. T. N.

The ensilage and grain manger should be on a level with the floor of the stall. The bottom of the hay manger should be 18 inches above this grain manger and should be very narrow (four or six inches) at the bottom. The slats that form the part of the manger toward the cow should slant back at an angle of 45 degrees and extend up as high as the front or feed alley side of the manger. This front side or feed alley side of the manger should be four feet high.

The gutter or drop is an essential part of the model stall. The floor should have a couple of inches slope to furnish drainage. Seven and a half feet is the usual length of stall, that is, from the front part of the manger to the end of the stall partitions. The essential part of the model stall is the 2x4 which is fastened edge-wise across the stall just in front of the cows' hind feet. The grain manger is four inches high and the space between this 2x4 and the grain manger holds the bedding and forms a clean bed for the cow to lie on. This is what keeps the cow clean, or rather this bed is what enables the cow to keep herself clean. There is no filth for her to get into.

ADD CORN MEAL TO THE RATION.

I have two cows, both fresh; I have some alfalfa but not enough to winter them, so I am feeding cornstalks cut fine (half an inch long), at night and alfalfa morning and noon. What grain ration should I feed to get the best results? I am feeding two quarts of bran and same of gluten meal and about five pounds of beets per cow at night with the cornstalks. Can I use corn and cob meal to advantage?

Ionia Co. F. E. A.

Here is a splendid chance to use corn meal to advantage. The two feeds of alfalfa will furnish a sufficient amount of protein in the ration and it is not necessary to have all the concentrates rich in protein. In other words, your ration contains protein in excess. I would recommend that you mix together 200 pounds of corn meal, 200 pounds of wheat bran and 100 pounds of gluten feed. The five pounds of beets furnish a succulency and make an important addition to the ration. You could use corn and cob meal in place of corn meal, but you have sufficient bulk already, and the cob has no particular food value.

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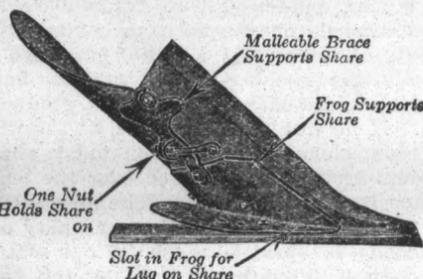
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John Deere Disc Harrow

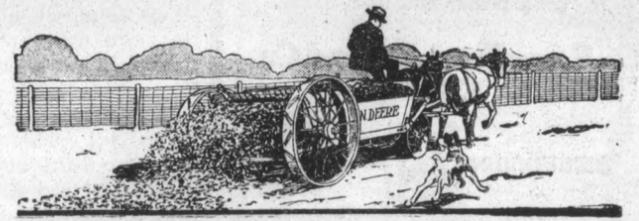
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You can put heavy or light pressure on the inner ends of the gangs and cut out dead furrows or disc ridges without burying the harrow. Cuts even depth entire width of gangs.

The Flexible Harrow. Only that part passing over an obstruction is raised out of the ground.

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John Deere Spreader

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.

The John Deere Only Hip High

The top of the box is only as high as your hips. The John Deere Spreader is easy to load. You see where you place each forkful.

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

Call on nearest John Deere dealer and see the spreader with the beater on the axle. Write for "Farm Manures and Fertilizers", a valuable text book free.

Better Farm Implements and How To Use Them

JOHN DEERE Moline, Ill.

Better Farm Implements and How to Use Them

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; hit-and-miss and volume-governing gasoline engines.

To get this book, free, state what special implements you are interested in and ask for the book as Package No. X-5.

John Deere, Publicity Department, Moline, Illinois

THE TRADE MARK OF QUALITY MADE FAMOUS BY GOOD IMPLEMENTS

Lock 50 Cows Instead Of One

With West Bend Swinging Stanchions and Cow Stops it's as easy to lock or release 50 cows as it is to lock or release one with ordinary equipment. One throw of a single lever does it. And the cattle can't put their heads in any place but the right one—the West Bend Cow Stops attend to that. Aside from these two features West Bend Swinging Stanchions are the last word in sturdiness and handiness.

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We manufacture a complete line of barn equipment—such as Stanchions, Stalls, Pens, Feed and Litter Carriers, etc. We issue a book that tells you the complete story of our line and a copy of it awaits you—write for it.

WEST BEND BARN EQUIPMENT CO.
214 South Water St. West Bend, Wis.

ONE LEVER OPENS 50 STANCHIONS OR ONE

ADJUSTABLE TO EVERY SIZE OF NECK

Make Big Money NOW!

Sell the best cream separator on the market. Get the Exclusive Agency for your territory and be Independent. It's easy to make from \$30 to \$60 a week. We teach you the business and appoint you our SPECIAL AGENT. WRITE TODAY, as we appoint only one man for each territory.

The Cleveland Cream Separator Co.
1017 Power Ave., Cleveland, Ohio

BEET PULP PAYS

It increases production and lowers the cost. Try four parts Beet Pulp by weight to one part Cottonseed Meal or Gluten, with ensilage and hay. Oats and corn are pretty high priced for feeding.

Try Beet Pulp. You cannot lose. You will undoubtedly profit thereby.

Write T. F. MARSTON, Bay City, Mich.

BUY FEED—CAR LOTS Cottonseed—Oil Meal, Hominy, Gluten, etc. Save money. Ask price. J. E. Bartlett Co., Red Mill, Jackson, Mich.

FOR SALE: All tools and machinery in a fully equipped cheese factory. Price reasonable. Address, WILL O. PRICE, Ohio, Michigan.



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Bank the Difference

You want a tractor that will save money—one that can work all the year round, on all kinds of jobs—one that won't tie you up a couple of weeks on the spring plowing because the ground is too soft—one that won't pack the soil. Round-wheel tractors won't do—you've got to have a Caterpillar.

The Caterpillar has a long, wide, endless track, with 8 times the bearing surface of round wheels. Works on soft, rough or hilly land. Over a dozen imitators, but only one Caterpillar. Holt has built it for the last 10 years. Over 2000 in use.



Reg. U.S. Pat. Off.



Don't say Caterpillar unless you mean Holt! Write for Cat. EF 156. It tells why the Caterpillar wears so well.

The Holt Mfg. Co. Peoria, Ill. Stockton, Cal. 50 Church Street, N. Y.

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Many farmers are now buying molasses at a less cost per ton than grain.

A pound of molasses contains more digestible nutriment than a pound of corn.

Besides the saving in cost of feed, animals grow faster and fat quicker, when molasses is used for 10 to 15 per cent of the ration. Cows give more milk when fed molasses.

Farmers who buy Empire Molasses can make no mistake, either in quality or price as it is the kind used exclusively by many State Experiment Stations. Write **Wattles & Company**, Dept. F. Litchfield, Michigan, for price list, freight rates and full information.

GRINDS FEED WITHOUT NOISE

No deafening racket. Grinds ear corn, alfalfa, screenings and all grain, separate or mixed, swiftly, silently and fine at lowest gas cost. Lett Duhre grinds 1000-8000 bushels.

LETT FEED MILL

Self Sharpening Silent Duhre

Try this clog-proof mill 10 days on your farm free. Give H. P. of your engine when you write.

Lett Mfg. Co., 270 East Road, Crown Point, Ind.

Barn Paint 60c a Gal.

Get factory prices on all paints. We guarantee quality. We pay the freight. Franklin Color Works, Franklin, Ind.

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Farm Horse Breeding.

THE improving effects of good blood in draft horse breeding are as sure as day. Colts of superior character in the community mark the location of every stallion of unusual merit. Wherever there are a few high-class stallions and a sprinkling of pure-bred or high-grade draft mares, the number of high-class colts is certain to be correspondingly large. So true is this that one can judge accurately of the progressiveness of any community by noting the quality of the horses that pass along the country road or stand about the markets on a busy day.

Good Blood is Essential.

The fact that good blood is necessary to produce high-class draft colts is not appreciated by the majority of farmers. Location, climate, feeds and accidents and many other influences are blamed by unsuccessful draft horse breeders for the mediocrity of their colts, when in reality the trouble is more often with the ancestry. A few farmers waste good colts by giving them poor care, but far more waste good care on colts of inferior breeding. There are many farmers who have the ability and skill to handle high-class draft horses who have not the courage to try. The man who takes pride in his farm horses and who can keep his farm work teams in a vigorous and thrifty flesh condition should not hesitate to acquire a few well-bred mares and raise a few draft colts every year. What good blood and intelligent care will do for others it will do for him. The very best draft colts are bred and reared by farmers who keep a few well-bred mares to do their farm work and depend upon the sale of young horses for a substantial increase to their bank account each year. A lifetime spent breeding colts from inferior mares will not gain one fraction of the success that attends a few years of intelligent work based upon a foundation of well-bred mares coupled with a high-class draft stallion.

Well Bred Mares Profitable.

The question of buying pure-bred or grade draft mares depends on the man. If one has plenty of money and understands thoroughly the keeping, caring for and mating of such mares he should buy them. If he does not he had better leave them alone. The most successful breeders are men who have made the advance from grade to pure-bred stock gradually. The desire to own improved blood is praiseworthy, but until a man is fitted by experience and inclination to care for it he should not invest too liberally. There is nothing mysterious about the breeding and rearing of pure-bred draft horses, still they require better treatment than most farmers give their horses. Pure-bred horses do not require pampering, but they do require good care and enough good, wholesome food.

If one has been successful with grades the transition to pure-breds is an easy one and he will find no difference between the grade and pure-bred stock. If he knows nothing about draft horses he will do well to grade up his horses for some years before beginning with pure-breds. At least he should gain the necessary experience in some way before he makes the change.

The well-bred farm mare is distinctly a money maker. Even with lower prices for horses her work would still yield a profit for her keep. One of the fundamental principles of successful business is to make every dollar of the capital invested pay the largest possible returns. The idle horse is one of the greatest leaks in the farming of today. For this reason it is fundamental economy to keep brood mares to raise crops and colts. Either the work or the colt will nearly pay for the keep of the mare and by care-

ful management she will perform almost a full season's work in the field while breeding. A little forethought in avoiding too heavy loads, hard backing and slipping or crowding around corners in soft ground and a little extra feed and care after the foal becomes dependent on the mare's milk will enable a mare to go successfully through a season of hard work and produce this double income. It is not necessary to keep her without work more than a few days immediately after foaling. The chances of a good brood mare becoming worthless are very small. If she fails to breed she can pay for her keep in the harness. There is no need to sell her at a sacrifice as is the case with other breeding animals. As a safe business investment mares are safer than any other kind of breeding stock.

Farmers Should Raise their Own Horses.

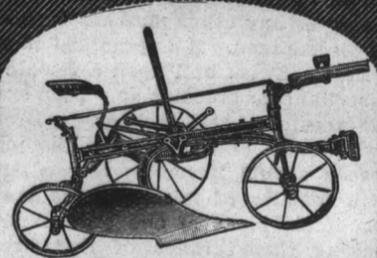
As a general proposition a farmer can raise better horses than he can afford to buy. The colts from his mares, the product of one stallion, will mate more closely in disposition and be better adapted to his work than horses that he can buy one or two in a place. There is something about the working of horses that match in size, strength and disposition that makes the work much easier for both teams and drivers. It is difficult to buy well-matched teams of farm horses and the necessity of making up two, three and four-horse teams makes it very desirable to have uniform horses of the same size and traits of character. This can best be accomplished by breeding a few mares of uniform size and quality to one stallion. The surer way of making up efficient farm teams is to breed them. It requires persistence and adherence to one type until the purpose is accomplished.

A Right Start is Important.

It is important in breeding draft horses to get started right. The class of colts a mare raises depends largely upon her size and general appearance. The grade mare sought by so many farmers cannot produce as good colts as the pure-bred one. Even when mated with the best kind of a stallion she cannot produce a high-class colt; however, at the prices horses are selling for today she can show an advance over the less remunerative system. The downward drag of bad blood in the generality of farm mares is too much for one mating to overcome. It is only by the continued use of the best stallions of a certain breed that one can make a short cut to reach greater average size and quality in his horses. Even this requires years of time. In no line of farm work is there greater need of more thought and attention than in connection with the management of the horses used for work on the farm. On thousands of farms geldings and mules are being used for farm work when the same work might be as well done and the profits greatly increased by the use of good draft mares—either high-grade or pure-bred.

Every farmer who contemplates breeding draft horses should visit some of the leading fairs, stock yards and sales stables and make a special study of the breeds, types and market classes of horses that bring the most money. They are every-day object lessons. If a man is surrounded by plug and misfit horses all his life he will not be able to recognize, much less produce, better ones. Visit the shows, stock yards and sales stables and study the best horses and produce others of their kind. Select the best mares you can afford and mate them with a stallion that will further your ideas of improvement. With correct ideas and breeding for a definite purpose success will reward your efforts. New York. W. MILTON KELLY.

The New Janesville Plow



Only One Lever Needed

We have done away with the bothersome second lever. This one lever working with the foot lift controls the plows while plowing deep or shallow.

Operate Foot Trip Only

Set the depth lever to plow as deeply as you wish, and you are fixed for the day's plowing, operating the foot lift only at the ends of the field. Simply press the foot trip, and the plow enters the ground point first; touch it again and out it comes. This simplicity in construction takes a whole lot of work and worry out of plowing as you go round after round in any kind of a difficult field.

Floating Bottoms Assured Depth

The depth of the furrow is the same all over the field, up hill or down, as well as in the hard spots. This is regulated automatically by the hang of the plow bottoms in the frame. The plow bottoms have just enough motion at the cutting edge of the shares to take away the "pinch" at the plow points as they turn over the furrow. It is somewhat like the flexible movement that you get in a spade when digging into hard ground, you must work the handle a little before the spade will enter. This easy motion reduces the all-day pull of the team as the plows glide through the soil.

Easier Pulling

Don't forget the sun-baked fields in the late summer when your poor horses will have to sweat and pull to turn over the hard ground, or next spring when the work is rushed and your colts are green. This flexible movement is found only in a plow like the Janesville. The proper suck of the bottoms is self-regulating according to the depth you are plowing, and as the shares become dull more suck is added, another feature found only in the Janesville.

No other wheel plow hugs the furrow wall like this New Janesville. This provides steadiness, allows more tug room, insures even width of furrows, and makes easier work for you and the horses.

These are only a few features found in this New Janesville, but they help take the hard work out of plowing. You save your team, you have an easier day yourself, and you speed up good plowing with less effort.

Write for Booklet

of many actual field scenes showing how the six times World's Champion won with Janesville Plows. It's the secret of all good plowing and how it is done. Write for copy.

THE JANESVILLE MACHINE CO. 49 Center St. Janesville, Wis. Established 1859 Builders of Harrows, Planters, Cultivators and

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Doors Always In Place

Provide convenience in daily use, prevent silage freezing or drying.

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has safe ladder—strong anchoring system—best construction throughout.

Write for 1915 offer. Wood tanks, all kinds. Woods Bros. Silo & Mfg. Co., Dept. 15, Lincoln, Nebr. Branches: Lansing, Mich.; E. St. Louis, Ill.; Topeka, Kan.; Denver, Colo.; Oklahoma City, Okla.; Maryville, Mo.; West Bend, Wis.; Jackson, Miss.; Atlanta, Ga.; Amarillo, Tex.; Minneapolis, Minn.

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FEEDERS' PROBLEMS.

Pasturing Hogs on Rye.

I have a five-acre field of rye sowed last fall. I am planning to put some brood sows and pigs in it as soon as it gets a good start. Would you advise me to sow anything else in with the rye? Also, would you advise turning hogs on rye, especially after it commences to head? I also intend to seed this lot with timothy and clover with a disc drill.

Hillsdale Co.

F. M. S.

Both store hogs and brood sows may be pastured on rye with good results during the early spring. The rye will not make a very productive pasture after it begins to send up seed stalks, and the brood sows should be removed from the field before the heads begin to fill. The store hogs can, however, run in the field until the grain matures, and it can be harvested in this manner if desired, although it is not an economical method of maintaining the hogs. It would be better to move them to some other pasture and give them supplementary grain feed after the rye pasture becomes tough and woody.

Sowing Rape for Hog Pasture.

I want to put in an acre of rape this spring for pigs. When should it be sown and how much seed should I sow per acre?

Iron Co.

X. F. J.

Rape is sown broadcast on a well prepared seed bed at the rate of about five pounds per acre. It may be sown at any time after the season for sowing oats, with good results.

Rye and Vetch as Hog Pasture.

Would like to know if there is any danger in pasturing old or young hogs on rye and vetch in early spring.

Alleghen Co.

H. W. H.

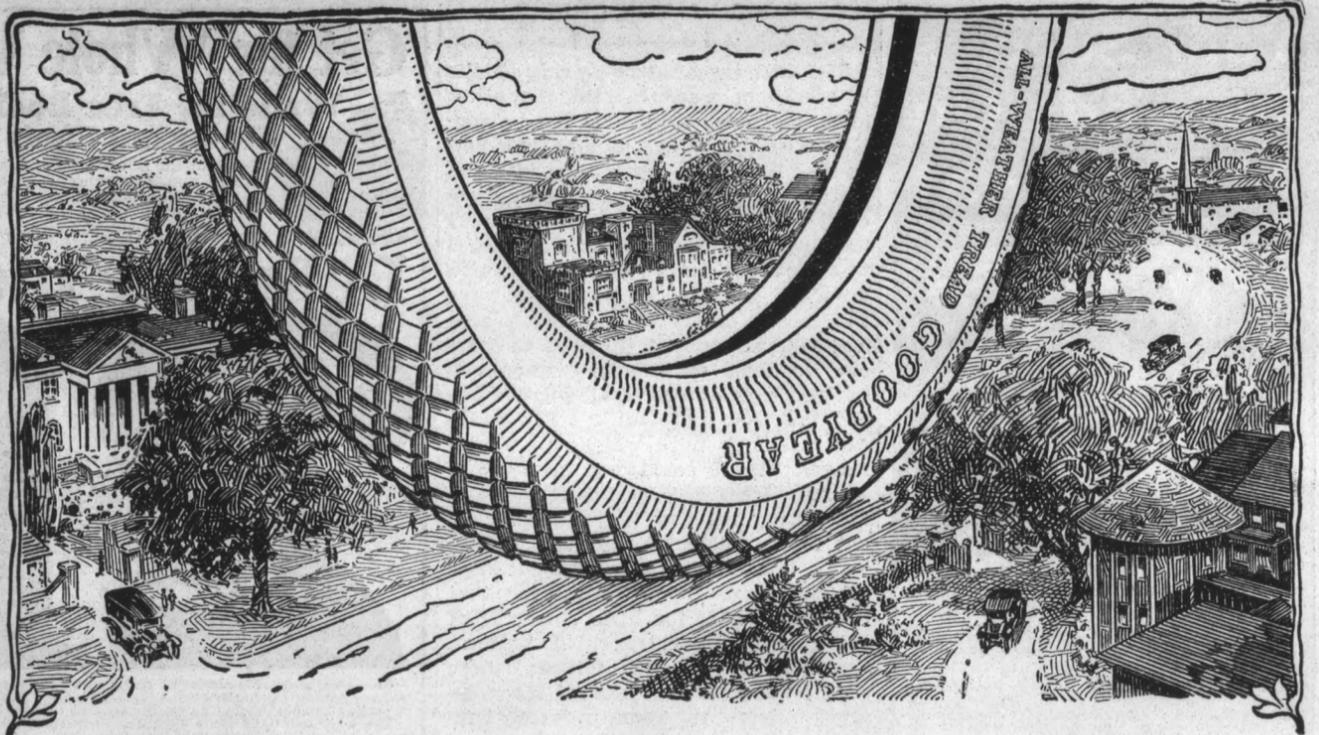
Vetch and rye is recommended by those who have tried it as a hog pasture. We know of no reason why any danger would attend its use for old or young hogs at any season of the year when it is producing succulent forage.

LIVE STOCK NEWS.

Hog packing operations at western points continue on a far larger scale than a year ago, and in a recent week about 882,000 hogs were slaughtered, comparing with 580,000 for the corresponding week of 1914. Everywhere there is an evident eagerness upon the part of stockmen to get their hogs marketed as quickly as possible, as they see weakening prices for hogs much of the time, while corn and other feeds are selling unusually high, even after considerable declines in prices. The average stockman-farmer prefers to let his hogs go to market just as soon as they acquire a fair weight, as he sees prices are much lower than in most recent years, while corn has been selling as much as 15c a bushel higher than at this time last year. Probably, the last crop of hogs was underestimated in many quarters, but it seems certain that the active movement to market means much smaller supplies later on, and after the foot and mouth disease is crushed out, better price for hogs may be expected.

The Chicago cattle trade has been a bitter disappointment to sellers in recent weeks, but under the existing circumstances, this was almost inevitable, as there were so few points open to Chicago shippers, because of quarantines, that the local packers were in a position to dictate terms. Numerous stockmen shipped in fat beeves, only to meet with disappointingly low prices when the stock was sold, and there was frequently no marked difference in values between pretty fair cattle and really choice ones. Such a time is a bad one to market stock in, and many owners preferred either to wait for better times or to ship to other markets, where business was less hampered. Unfortunately, many cattle have reached maturity, being fat and heavy, and owners do not feel like continuing to feed them with high-priced corn.

Sheep and lambs have continued to sell in the Chicago market at extremely variable prices of late, fluctuations in the course of a single week covering a wide range. Irregular receipts furnish a partial explanation, for sheepmen were usually prompt to hold back their flocks after bad breaks in prices, but the restrictions placed upon shipments from Chicago gave local packers too much power to hold values down. As the country's supply is known to be unusually small, everything promises extremely high prices later on.



Goodyears Average Best

That's Why They Dominate Every Road and Street

Some hundred makers now build tires. Yet Goodyear made about one-fourth of all tires used last year.

We sold 1,479,883—about one tire for every car in use. And for years these tires have far outsold any other tire that's made.

Now our prices are about the same as others, due to our matchless output. Our Fortified Tires, with their costly, exclusive features, were once the highest-priced.

Today there isn't a reason why every motorist can not have Goodyear tires. There are these reasons why he should:

These 5 Reasons

Our No-Rim-Cut feature—ours alone—combats rim-cutting in the best way known.

Countless blowouts are avoided by our "On-Air" cure.



This one exclusive process costs us \$450,000 yearly.

We combat loose treads by forming in each tire hundreds of large rubber rivets.

For security against blowing off the rim and tube pinching, each tire base embodies six flat bands of 126 braided piano wires.

Our All-Weather Tread combats puncture by being tough and double-thick. It combats skidding like no other by its sharp-edged bulldog grips.

Those things mean sturdy, trouble-saving tires. Each is found in Goodyear tires alone. In these ways, at least, Goodyear Fortified Tires

excel all other makes. Do you know one way in which others excel Goodyear?

We urge you to prove these tires. Once do so and you'll never give them up. Any dealer will supply you.

THE GOODYEAR TIRE & RUBBER COMPANY, AKRON, OHIO

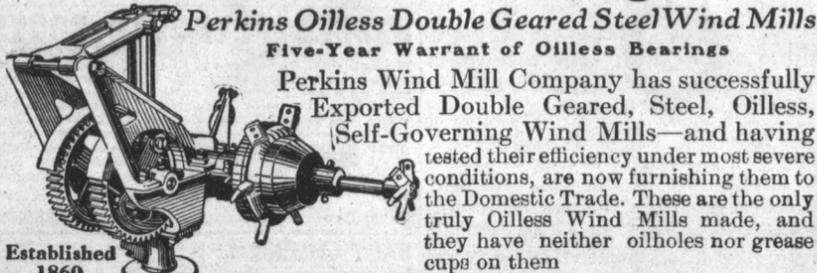
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Use NATCO Drain Tile—Last Forever

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Can't blow down, buckle, twist or collapse. Stands rigid even when empty. Fire-proof. No painting or repairs. Easily erected. No spoiled ensilage near wall. Guaranteed against silage acid. We also make the Ross Wood Silo. Write for free catalog.

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Radiator and Vapor Generator
Perfect Incubator heating. Greatest triumph we ever made in incubator construction.
Only one filling; only one gallon of oil to hatch.
Just Like the Moist Heat of the Mother Hen
Means most chicks and healthiest chicks. Insures you against dead-in-shell chicks. No other machine can get it.
X-Ray Brooders as far ahead as X-Ray Incubators. Direct-to-you factory price. Freight Prepaid. No agents.
ACT NOW!
New X-Ray Book
X-Ray Brooder also has X-Ray Radiator
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BROODING THE CHICKS.

The first essential in rearing chicks is plenty of warmth. On the other hand, too much heat must not be supplied lest the chicks become like hot-house plants. In connection with the matter of supplying heat, a friend recently said: "The first year that I hatched chickens with an incubator I was not fortunate enough to have brooders, so I had to improvise ways and means of my own. That year I had several hundred chickens to come out the first of February when the temperature was several degrees below the freezing point. I had a vacant room upstairs which was so arranged that I could put in a stove. Boxes were fitted up for the chicks, but during the day they were turned out on the floor of the room, a fire being started in the stove. In this room my experience taught me that the proper heat for little chicks is of the greatest importance. A uniform heat should be maintained; there should not be a variation of three degrees. Below the room in which I installed the newly-hatched chicks was the living-room and the floor above was warm. The chicks never were uncomfortable, they never huddled together, they had plenty of fresh air, they were allowed to scratch in litter for a portion of their food, therefore they had plenty of exercise, which is another essential in rearing chicks that must not be neglected under any circumstances."

It is difficult to raise brooder chicks successfully where the brooders must be out in all kinds of weather. The tender things need some other protection. Of course, one can raise a few in this way, but out of doors there is too great a variation in the temperature and unless someone constantly watches the heat it is apt to go too low for the chicks. By all means, early in the season especially, place the brooders in a building or shed where they will be protected from the cold winds and rains. Many persons have told the writer that they have raised a nice brood of chickens in the kitchen in a brooder. Everything is kept perfectly clean, of course, but that is very easily done. A strong, vigorous chick will live if one will let it. We must always consider the weather conditions. Don't heat the little chicks up to a point where they want nothing but water, for bowel trouble then results. One should always use good judgment in brooding chicks and strike a reasonable average that is compatible with conditions. Indiana. W. F. PURDUE.

DRUGGING CHICKENS.

As a general rule it will not pay to drug fowls that are suffering from serious diseases. The cost of the medicine and the value of the time required in administering individual treatment is usually worth much more than the birds cured. And then, it is never safe to keep a bird that has recovered from a serious disease, since the disease will have left it in such a weakened condition that it is thereafter susceptible to disease, and will likely be a carrier of contagion to the well birds. Several years ago I had this point well illustrated in my own case. One morning I found a hen suffering from a bad attack of roup. The hen was at once isolated and given treatment. After treating for two weeks, she recovered and was returned to the henhouse. The following winter this same hen contracted roup again, and before the disease was stamped out, one-half the chickens on the place either died or had the disease in such a bad form that they had to be killed.

The aim of every poultry keeper should be to increase the vitality of his flock. This can only be done by killing all birds suffering from serious

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Winners of 21 World's Championships with Belle City Hatching Outfits tell the story of their success in their own words in my great new Free Book, "Hatching Facts." Send for the book today. A postal brings it. Gives full information, facts, proofs and particulars. Among Belle City Championship Prize Winners are some who never operated any incubator before. Thirteen more Belle City Championships added last season—all with 100 per cent hatches. These, added to eight world's championships formerly won, make

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Write to Mr. A. L. Rice, Manufr., 95 North St. Adams, N. Y., and he will send you a free trial package, also color card and full information showing you how you can save a good many dollars. Write to-day.

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Toms all sold. All pure bred.

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diseases. When eggs from hens that have had serious diseases are incubated, the offspring will be weak, since the low vitality of the parent will be transmitted to her chicks.

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There are three poultry diseases that should not be treated with the idea of curing. These are roup, (in its virulent form), cholera, or cholera-like diseases, and tuberculosis. These diseases are very contagious and the affected birds should be killed as soon as noticed, and the houses and yards thoroughly cleaned and disinfected as soon as possible.

Indiana. T. Z. RICHEY.

SUBSTITUTES FOR WHEAT AND OATS IN POULTRY RATION.

I have about 50 single comb White Leghorn pullets. In November 30 I got the first eggs. In December the Leghorns laid 328 eggs and in January 876. I did not keep a record of the feed for December, but the feed for January cost \$16.30, and the eggs sold for \$36.13. I fed for scratch feed, 100 lbs. of cracked corn, one bushel of wheat and one bushel of oats. For mash I used 100 lbs. of bran, 100 lbs. of corn meal, 50 lbs. of ground oats and a small amount of a commercial egg mash. In January about eight quarts of sour milk each day was also given. Now, here is my trouble. Since all kinds of feed has gone soaring I have cut out the wheat and oats in the scratch feed and the ground oats in the mash, with the result the egg yield has fallen off nearly one dozen per day, and as the price is dropping to a point where it threatens to eat up all the profits, I would like to know if there is any cheaper feed that would take the place of the ones that I have cut out, and still get as good results?

Kent Co. A. L. S.

In taking wheat and oats from the ration as given above, a chief source of protein is taken away and as a result the ration is too fattening for egg laying purposes. As the dairy cow needs a balanced ration to produce milk, the hen needs one to produce eggs, and to make up for the loss of the properly balanced ration through taking out these two grains, one must use some substitute. Wheat bran, middlings, beef scraps and cut bone are all foods which contain a large amount of protein, and may be used in place of the wheat and oats. As neither beef scraps nor cut bone are contained in the ration you are now feeding, it would undoubtedly be of great advantage to you to feed either one of them. Cut bone is a very concentrated food, and one must use care in feeding it. About one-half an ounce per hen per day is sufficient under ordinary circumstances. If the beef scraps are used, they can be put in the mash you are now feeding in place of the ground oats; 50 pounds of the scraps to 100 pounds of bran and 100 pounds of corn meal would be sufficient. A great factor in a large production of eggs is green food, and there is nothing better than sprouted oats, even with oats at their present high price. When oats are sprouted they will increase to about three times in volume and a square inch of sprouted oats is sufficient for a hen per day. It is advisable to have more than one grain for scratch food, as the hens like to pick around for a variety of grains, but there is nothing that could be suggested to take the place of wheat and oats, and therefore corn would be your only scratch food unless you used some buckwheat, which is in character quite similar to corn. It is rather hard to get along satisfactorily with wheat and oats, as both are great egg producing foods, but if you follow the suggestions above, you will undoubtedly get results nearly equal to those obtained in the past.

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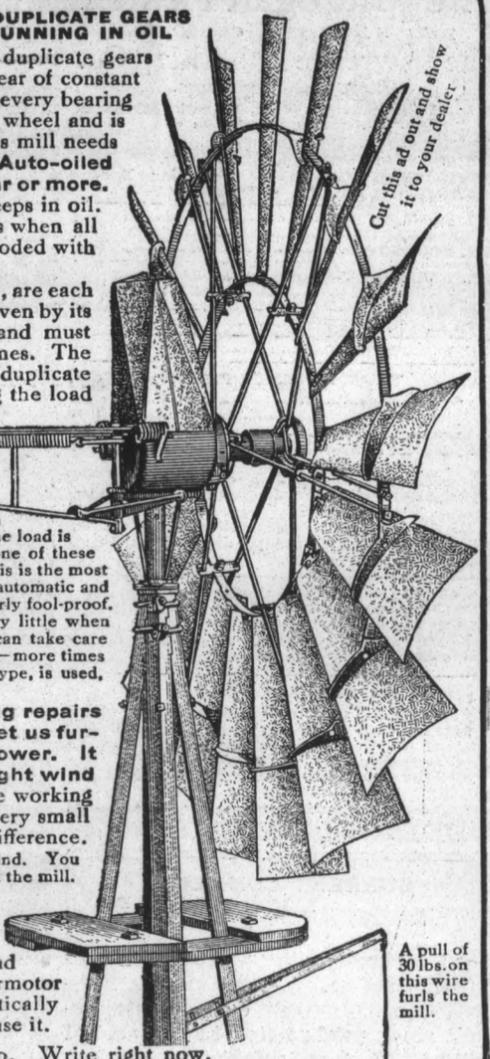
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DETROIT, MARCH 6, 1915.

CURRENT COMMENT.

The Foot-and-Mouth Quarantine.

The local outbreak of foot-and-mouth disease in the Detroit stock yards noted in our second edition of last week's paper has doubtless caused some alarm among Michigan Farmer readers as to the probable effect upon the movement of Michigan live stock to points within or without the state. It is reassuring, however, to note that this outbreak was entirely local, occurring as it did in cattle that had been held in the yards for some time, and that no other portion of the state is involved because of its appearance. The only added inconvenience entailed by this outbreak is the temporary closing of the Detroit yards for disinfection. The general quarantine situation is consequently growing better, each order issued being a modification of the previous quarantine orders.

Information just received from the local office of the Federal Bureau of Animal Industry indicates that stock can now be moved for any purpose to any point within the quarantined area not designated as "closed" or "exposed" areas without inspection or special permission. Such areas now existing in Michigan were designated as being within the limits of Saginaw, Tuscola and Berrien counties and, of course, the Detroit stock yards. As state regulations follow very closely the line of Federal restrictions, the comparative freedom with which stock can be moved within the state will at once be apparent. In cases where restrictions exist, application may be made for permission to move such stock where it is desired to ship breeding stock, to the state or federal authorities as the case may be. The general situation so far as Michigan is concerned is considered very satisfactory by the officials of the local Federal bureau, due to the loyal co-operation of the state official and the farmers within the affected territory. With the greater portion of the state now in what is known as the "restricted area" so-called, and only a small portion in the modified, exposed and closed areas, while other states are struggling to control the disease, there is every reason for congratulation on the situation.

No hesitancy should be felt on the part of farmers in purchasing breeding stock in sections where quarantine regulations permit it to be shipped, comprising the greater portion of the state as above noted. Live

stock breeders have suffered not a little because of the fear of those desiring to purchase breeding stock that there might be a possibility of bringing foot-and-mouth disease onto their farms through such purchases. This was a very natural feeling, but with the progress which has been made in exterminating the disease, it need no longer restrict the movement of breeding animals except in a very small area within the state. Prospective purchasers who are still timid about such purchases may reassure themselves by writing the State Live Stock Sanitary Commission, Lansing, Mich., for information.

Michigan's Third Country Life Conference.

last week is worthy of more than passing attention from the fact that it was essentially what the term implies. As a public gathering it could not be counted a magnificent success for the reason that there was not a large general attendance. As a conference of representatives of different forces interested particularly in the solution of the problems of country life, it loomed large in the history of country life development. On the program were found men who could speak with authority on the various subjects relating to country life development, ranging from problems of sanitation and health to finance and organization. The talks and discussions given at this conference were of exceptional character and interest and will be circulated throughout the state in the form of an extension bulletin to be published later. Various phases of the conference will also be taken up through the columns of the Michigan Farmer to the end that Michigan Farmer readers may be given the latest viewpoint on many factors of country life as discussed at this conference, which was attended not only by Michigan men who are interested in various phases of the rural life problem but as well by leaders in the solution of these problems as presented in other states. These ideas and the progress which has been made in their application will be made the subject of future comment.

Results in Applied Science.

We are becoming so familiar with frequent announcements of new applications of science to industry, including agriculture as well as manufactures, that a new announcement along this line causes little comment. An announcement recently made by Secretary of the Interior Lane, however, well illustrates the fact that new applications of science to industry are keeping pace with the needs of the world and its development. In this announcement mention is made of two important discoveries by Dr. Rittman, a chemical engineer of the U. S. Bureau of Mines, which will contribute not a little to our national progress under present conditions. One of these discoveries, and the more important, is a new process of increasing the supply of gasoline by means of which the output of a given quantity of petroleum can be increased to about three times the amount produced by older methods. This process is to be patented and given to the people, which will make it available for small producers as well as large, thus insuring a more adequate supply of this fuel, the demand for which has increased so rapidly in recent years since the development of the internal combustion engine.

Another chemical process, the discovery of which is simultaneously announced, relates to the production of toluol and benzol from petroleum. Both of these products were formerly produced from coal tar, the principal supply coming from Germany where scientific men have specialized more largely on coal tar products than has been the case in this country. These

products are used largely in the manufacture of dye stuffs, also as an ingredient in high power explosives, and the process will be particularly useful at this time when the supply of such materials from Germany has been cut off.

Mention is made of these announcements simply to illustrate the extent to which applied science is affecting and modifying our industries at the present time. This is true of agriculture not less than of manufactures, and incidents of this kind offer conclusive proof that the research work which is being done in the laboratories of our agricultural colleges and experiment stations will have a larger effect in shaping the agriculture of the future than even the most optimistic of the present generation realize, and emphasizes the fact that this kind of work, although perhaps not productive of immediately visible results, is well worthy of the support of the farmers of the country. Dr. Marshall, in the special article appearing in part in this issue tells us something about the relation of one of the newer sciences to agriculture, and incidentally pays fitting tribute to science as a whole in this connection.

HAPPENINGS OF THE WEEK.

Foreign.

European War.—The positions of the armies of the west have been little affected by the events of the past week. In the Vosges Mountains both French and Germans report successes; it would appear, however, that the latter have made greater advances. In northern France and Belgium accounts of only minor engagements are noticed. The Belgian army is said to have been reorganized and is expected to begin offensive operations soon. The eastern campaign is characterized by severe fighting. The Russians are said to be driving the Germans to the north and west of Warsaw and have retaken Przasnysz, an important base for offensive work in Prussia. The Austrians have been checked in Western Galicia and heavy fighting is in progress in the Carpathian mountains. Perhaps the most important movement of the week is the bombardment of the forts along the Dardanelles by French and English war ships. The latest cables indicate the gradual reduction of the forts as they come within range of the guns of the ships. The Turkish capitol has been removed from Constantinople to Asia Minor. The forcing of this passage will probably mark an important stage in the history of the great war.

The American steamer Dacia recently purchased from German owners by an American, and loaded with cotton for export to Germany, has been taken into custody by a French cruiser and sent to Brest, France. A prize court will undoubtedly be called upon to decide whether the purchase of this vessel was a valid one or not.

A conference is being held at Peking, China, between representatives of that country and Japan looking toward the settlement of questions growing out of the recent infringement of Chinese rights in connection with the operations against the Germans at Tsing-Tau and also regarding Japanese privileges in Southern Manchuria and Mongolia. The latest reports are that no agreement has yet been reached. China stubbornly refuses to concede the demands being made by Japan.

To date a total of 150,000 tons of food have been sent from this country to relieve the Belgians. Of this amount 116,857 consisted of wheat and flour.

It is reported that Canada has received orders aggregating \$70,000,000 for munitions of war, accoutrements, clothing, food and various supplies incident to military activities.

Bread and flour have been practically eliminated from restaurants and other eating places in Berlin, except upon the presentation of tickets, the distribution of which has been discontinued. Some of the bakeries are putting bread on the market supposed to be made of rice flour and potatoes.

Secretary Bryan has protested to Gen. Carranza of Mexico, in behalf of 180 priests who have been arrested by Gen. Obregon and are being held for ransom.

National.

The Michigan Railroad Commission has granted to the railroads of the southern peninsula of Michigan the five per cent increase in freight rates for which the transportation lines have been petitioning for nearly two years back. It is estimated that the increase will net the roads \$1,200,000 annually.

An effort is being made to secure legislation by Congress to provide for some form of rural credits. The provision has been attached to the agricultural bill and was being fought out by the House committee on agriculture early this week.

Chinese organizations in western United States have instituted a boycott against Japanese goods on the Pacific coast. The differences have grown out of the political demands now being made on China by Japan.

A trade balance of the United States as shown by the excess of exports over imports, touched a new high mark last month with a total of \$145,536,103. As compared with a year ago exports increased nearly \$64,000,000 while imports decreased about \$32,500,000.

Railroads of the eastern territory have begun a campaign for the reduction of employes' wages. The move will affect 750,000 men if successful.

The state public service commission has valued the telephone service of New York city at \$82,000,000. A new schedule of rates is to be ordered by the state authorities, using the above valuation as a basis. The company will be allowed to earn eight per cent on its investment.

State officials believe that fully 100,000 automobile licenses will be issued in Michigan during the present year.

The Detroit Tigers have arrived at Gulfport, Miss., for their spring training season.

A refrigerator company of Greenville, Mich., had its buildings destroyed by fire Sunday, entailing a loss of \$150,000 and throwing 160 men out of employment.

The Board of Commerce of Detroit declares from its investigation of the labor situation of this city, that at the present time skilled mechanics are scarce, notwithstanding the fact that the city is full of unemployed.

A good roads rally is to be held at Grand Rapids, March 9-12, inclusive. On Wednesday the Michigan State Highway Department will furnish speakers for the different sessions, while on Thursday the program will be supplied by the Michigan Good Roads Association. Governor Ferris and United States Senator Townsend will also address the visitors.

MORE ABOUT CO-OPERATIVE TELEPHONE SERVICE.

Since writing the article on co-operative telephone companies, published in your issue of February 6, several inquiries have come to hand. Some intimated that the figures quoted were too low, that a high class of service could not be given for \$8 per head, and some, like Mr. Stafford, asked for more information. It would thus appear that considerable interest as well as misunderstanding seems to exist. To clear up this matter I beg to offer the following, given from a viewpoint of a farmer:

I think all will agree with me that modern farming demands telephone service quite as much as modern implements and methods. Also, that while the art of telephony has made rapid strides in the past few years, the service delivered to rural districts has not kept pace with other improvements given the farmer, for it is a deplorable fact that while service and equipment in the larger cities may be good, the rural lines have frequently been the dumping ground of antiquated and partly wornout equipment, the companies apparently working on the theory that anything was good enough for the farmer.

I take the view that the farmer, on account of his isolation and distance from medical help, etc., should have the very best of service, and owing to cheaper cost of construction of rural lines the service should cost less than in the cities, with its costly underground work and private lines.

There are in Michigan nearly 1,200 telephone companies, about 700 of which are small companies. While some of these were organized for the purpose of profit, the larger per cent had for their object better service. The value of service depends to a great extent on the percentage of families in a given area that have telephones. If, through cheap and satisfactory service every family in a township could have a telephone the value would be vastly greater than if, through high rental or poor service only a very small per cent could enjoy service. This is why small non-profit companies operating at a low rate are able to serve a larger percentage of the families in their territory.

It is also true that upward of 95 per cent of the farmer's telephone business is done with his own switchboard or, in the case of one living between two or more towns, the business would be divided between these; that while dealers and so-called business men must and do use long distance toll service, the farmers are interested main-

(Continued on page 301).

Magazine Section

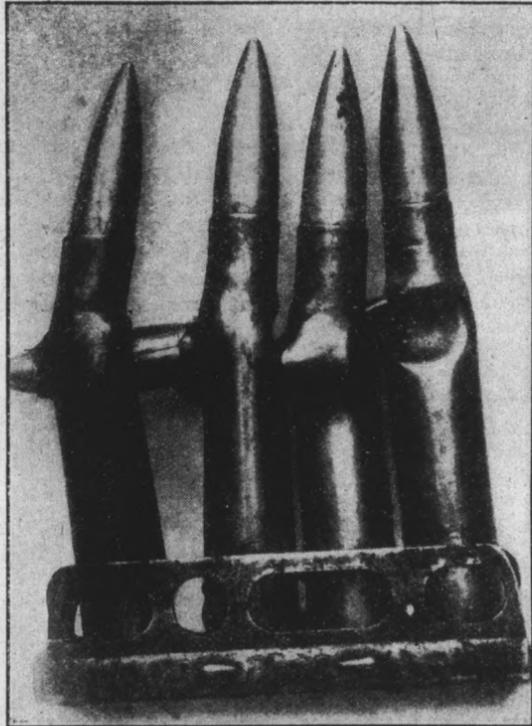
LITERATURE
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MECHANICAL

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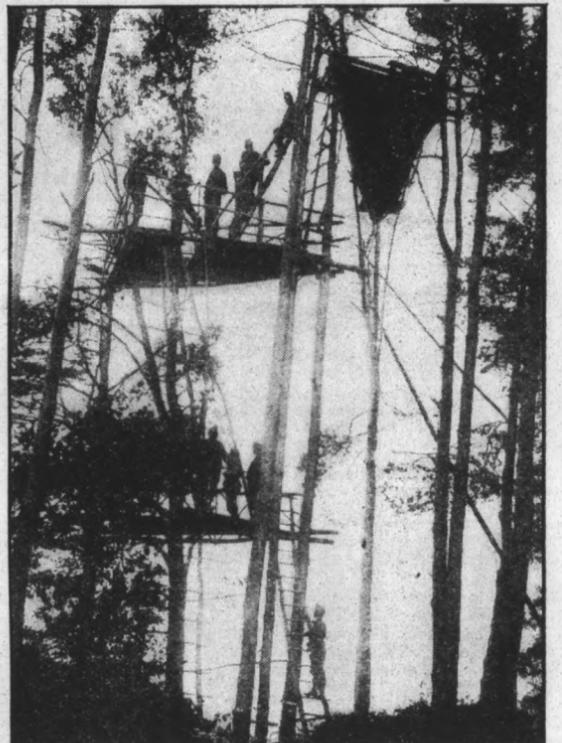
WORLD EVENTS IN PICTURES.



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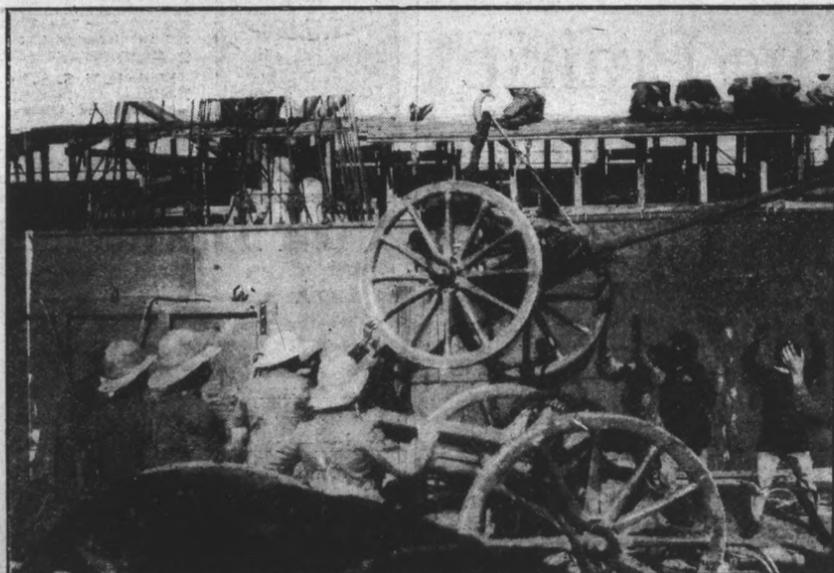
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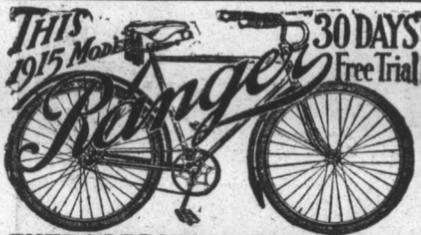
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American Commission Visits Russia.

By Wm. B. Hatch, Michigan Member of Commission.

I WAS personally gratified at being assigned to the Russian section. I wanted to know more about Russia by seeing it. I think perhaps the average American, in some respects at least, is prejudiced against Russia. We measure it in Siberian scales, so to speak. We have heard so much about the cruelties connected with exiles to Siberia that we have judged Russia in this atmosphere, and this atmosphere, prejudiced probably, helped materially in accomplishing the summary abrogation of the long-standing commercial treaty of 1832, through the ineffectual attempt to aid the Jewish people.

Americans have always been friendly to Russia and the friendship is generally conceded to have been mutual. The "mysterious black fleet" lying off the New England coast during the Civil war was regarded as a symbol of friendship, or guarantee, so to speak, of a square deal. We have understood that the sealed orders of the commander of that fleet read, "At the first authentic information of aid to the south by Great Britain place this fleet at the disposal of President Lincoln at once." As evidence of friendship we purchased Alaska, and now, of course, this makes Russia a comparatively near neighbor approximately seventy miles by the map.

The abrogation of this commercial treaty lost us, and is still losing us, a large volume of business, especially in agricultural implements and it leaves us official representation in Russia by courtesy only, and we did not help the Jews in Russia by abrogating that treaty. At the time we abrogated it we were discriminating against Russian citizens at least as arbitrarily as Russia was charged with discriminating against Jewish citizens. We denied, and still deny, citizenship to certain of the population of Russia today and did when that treaty was abrogated. We have to patch up, then, a friendship, in one sense, which had not needed patching, so far as we know, in all our history before.

But Russia did not permit this action on the part of our Congress and the President to in any way interfere with the cordial consideration which they extended to the American Commission in its study in their big country.

We in America do not appreciate the bigness of Russia. We have so long accustomed ourselves to referring to this country of ours as the dominion of "magnificent distances," and the other European countries are so comparatively small, that we forget the dimensions of the Russian Empire, which contains one-sixth of the earth's surface. It takes thirty-six hours from Vienna to St. Petersburg, and it takes, on a fast limited transcontinental train, eight days from St.

Petersburg to Vladivostock, and St. Petersburg is still up in the northern part of Russia by the Baltic Sea and it is a long stretch from there southward to the Black Sea.

This great domain lies in the main farther north than ours. We are between 25 degrees and 44 degrees, while Russia is mainly between 40 degrees and 75 degrees. St. Petersburg, now Petrograd, the capital, is practically at 60 degrees and this, though in the neighborhood of 1500 miles north of the southern boundary of Russia is still almost as far, if not quite, south of the northern boundary, yet this latitude of St. Petersburg is that of southern Greenland and runs through the center almost of Hudson's Bay.

Here in this imperial capitol are two million people. They do not raise corn, as might be expected in this climate, but wheat, oats, rye, barley, flax and vegetables were thriving on the twenty-fourth of May, apparently about a month behind the same crops in southern Michigan. Many of our common trees are equally common here. The oak, of a different variety, however, the elm, ash, poplar, maple, birch and basswood are as often seen as at home. One of the best and most extensive botanical gardens we have seen is here. Plants brought from Brazil are so improved on that these gardens supply seed to Shaw's gardens in St. Louis, and other noted American and foreign gardens. Seventeen below zero is usually as low as it goes here, though in Moscow further south and inland, it drops to 50 below. A close proximity to the Baltic Sea probably accounts to some extent for this more moderate weather. The day we arrived seemed warmer than the day we left Venice, Italy. The long days in summer undoubtedly makes possible a growth of vegetation in this northern latitude which would not otherwise be possible. When we were there, the so-called "white nights" had arrived, by which they mean it does not get dark. The sun sets at 10:00 p. m. and rises at 3:00 a. m. and it is twilight meanwhile, during which time you can read a newspaper, provided it is not a Russian newspaper and you an American.

Among the other evidences of municipal enterprise which we noticed here were one or more municipal theaters built and maintained from their earnings. First-class entertainment at low prices, as well as meals, are provided. The theater which I visited was as good as the best in Detroit, seating 4,000 people; the best seats are fifty cents, good seats for ten cents. The best talent appearing on any stage or in any music hall appears here. The electric light and gas plants are also owned and operated by the municipality.

Winston of the Prairie

BY HAROLD BINDLOSS.

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CHAPTER XXII.

Winston smiled somewhat dryly. "Then all its virtues will be tested tonight, and I had better make a commencement while I have the courage. Colonel Barrington is in?"

Maud Barrington went with him to the door, and then laid her hand a moment on his arm. "Lance," she said, with a little tremor in her voice, "if there was a time when our distrust hurt you, it has recoiled upon our heads. You have returned it with a splendid generosity."

Winston could not trust himself to answer, but walked straight to Barrington's room, and finding the door open went quietly in. The head of the

Silverdale settlement was sitting at a littered table in front of a shaded lamp, and the light that fell upon it showed the care in his face. It grew a trifle grimmer when he saw the younger man.

"Will you sit down?" he said "I have been looking for a visit from you for some little time. It would have been more fitting had you made it earlier."

Winston nodded as he took a chair. "I fancy I understand you, but I have nothing that you could expect to hear to tell you, sir."

"That," said Barrington, "is unfortunate. Now, it is not my business to (Continued on page 296).



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Land O' Nod Stories.

By HOWARD T. KNAPP.

Briar Bush is a Friend of the Defenseless.

BILLY BE BY BO BUM was just about the maddest little boy you ever saw. Yes, sir, he was as mad as a hornet, and he had good reason to be. For he had got all tangled up in a briar patch, and anyone who has ever had anything to do with a briar bush knows how their thorns scratch.

You see, Billy had been following the tracks of Mr. Rabbit through the White Forest, and when the trail led into a briar patch, Billy tried to follow. But the sharp little thorns grabbed his clothes and wouldn't let go until they had torn big holes in his coat and pants. Then when he did pull himself loose, the branch would spring back and scratch his face and hands. Before long Billy decided he didn't want to follow Mr. Rabbit any further, so he turned around and tried to get out of the briar patch. But it was as hard work getting out as it had been getting in, and by the time he was back in the open, he had been scratched in forty-one different places. He had just about made up his mind to cry when he heard someone laughing, and there, on the top of a stump, sat Tinker Teedle Tee.

"I don't see anything to laugh at," said Billy, "and you wouldn't think it was any fun either if you were as badly scratched up as I am."

"I know I wouldn't, Billy Boy," replied the merry little elf, "but seeing you reminded me of that old rhyme:

There was a man in our town
Who was so wondrous wise,
He jumped into a briar bush
And scratched out both his eyes.
And when he saw his eyes were out,
With all his might and main,
He jumped into another bush
And scratched them in again.

You didn't scratch your eyes out, but I'll bet you won't try to follow Mr. Rabbit into a briar patch again." "Not if I know it," replied Billy.

"But I don't see why blackberry bushes have thorns anyway. They aren't any good that I can see."

"Oh, aren't they? Well, maybe Mr. Rabbit thinks differently," said Tinker. "If you were to ask Bunny, he would tell you that the briar bush, with its thousands of sharp little thorns, is his best friend. Why, Billy Boy, if it wasn't for the briar bush, Mr. Rabbit couldn't life in the White Forest a day.

"You see, Mr. Rabbit has more enemies than any of the Little People, and he is in constant danger of being caught and eaten. If he isn't dodging Slinker the Weasel, or his cousin, Sharpnose the Mink, he is running away from Fleetfoot the Fox or old Long Ears the Hound. Then he must always keep his eye peeled for Hook-beak the Hawk and Too Whoo the Owl, and last of all there are the hunters and their terrible guns. But every one of these animals is afraid of the briar bush, for they know how the sharp little thorns scratch and tear. So, when Busybody the Bluejay shouts his warning that an enemy is afoot Mr. Rabbit runs for a briar patch as fast as his legs will carry him. He knows that if he can reach the briar's friendly shelter, he will be safe. But did I ever tell you how the briars came to get their thorns?"

"Why, I supposed they were always just as prickly as they are now," said Billy in surprise.

"No, indeed," Tinker replied. "Once upon a time when geese were swine houses were made of buckwheat cakes and bricks were made of batter, the berry bushes had no thorns. But the hawks pulled the berries off with their claws; the squirrels and mice climbed over them; the cattle knocked them off with their horns; the possum twitched them off with his long tail, (Continued on next page).

Babies Content With a Foster Mother.



Perhaps the mother didn't mean to be rough, but she was so fat and awkward, that she lay down rather suddenly, and took the little ones by surprise, so much so that out of thirteen young hopefuls, only four remained. This the farmer was unwilling to endure, so he interfered by adopting the pigs for his own.

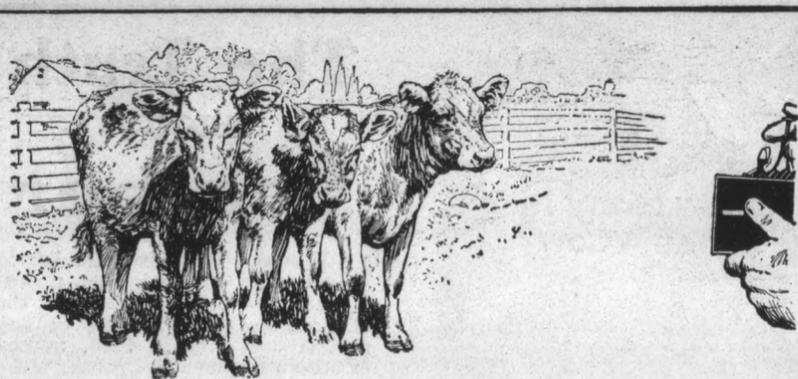
How to take care of them was the next question. Apparently the first thing to look out for was their milk supply, for the mother sow was unreliable, and apparently quite willing to get rid of her family, whereas the little sucking pigs were eternally hungry.

A unique plan was no sooner thought of than put into execution. Four beer bottles, four nipples, and a board rack with four holes bored to

admit the necks of the bottles, and behold, a foster mother was before our eyes! Everybody laughed when they saw it, except the pigs. They were kept cuddled up in a box, under quilts, and taken out periodically and allowed to suckle.

The milk was nice and warm, made so by immersing the bottles in hot water, and really the pigs seemed to enjoy life as farm pets and orphans more than they did as belonging to the old sow. The farmer, Herman Ehmman, of Benzie county, has four children, the hired men, and his wife, as well as himself, interested in the welfare of the pigs, and it will be the fault of the pigs now if they go hungry or get rolled into pancakes under some lazy old sow.

Benzie Co. E. H. BROWN.



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The Truth ABOUT Leather

How Many Hides Has A Cow?

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In a recent defensive circular to the auto trade, leather manufacturers define leather as "the skin or hide of an animal, or any part of such skin or hide, tanned or otherwise prepared for use."

But since whole hides are too thick for upholstery and the under fleshy portion must be split away from the grain side to make it thin enough, why should the two or three sheets into which the wastage is split, be called leather? Although artificially coated and embossed to look like real grain leather, they are weak, spongy, and soft, crack, peel and rot.

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and the deer, with his sharp hoofs, would break them down. So the briar bush armed itself with sharp spikes to protect its berries and declared war on all creatures that climbed trees, had horns or hoofs or long tails. This left the briar bush at peace with none except Mr. Rabbit, who could not climb, was hornless, hoofless and had scarcely any tail at all. As Mr. Rabbit had so many enemies always on the lookout to make a meal of him, the briar bush took Bunny under its protection. So, when danger threatens, Mr. Rabbit flees to the nearest briar bush, certain that its thousands of sharp little daggers will defend him against every foe.

"Well, I'm glad those thorns are of some use," said Billy. "And now that I know they help protect Mr. Rabbit, I don't mind getting scratched up nearly so much. But tell me, Tinker, if the briar bush is such a good friend to Bunny, why is it that so many rabbits get killed?"

"Don't you remember I told you Mr. Rabbit was the biggest coward alive," replied Tinker. "When he knows Slinker the Weasel or Sharpnose the Mink is after him, he loses all his courage and even the friendly briar bush can't save him, for he gets too frightened to run to its shelter but just sits down to wait until he is caught."

"You know, Billy Boy, if a person won't help themselves, all the friends in the world can't keep them out of trouble."

WINSTON OF THE PRAIRIE.

(Continued from page 294).

pose as a censor of the conduct of any man here, except when it affects the community, but their friends have sent out a good many young English lads, some of whom have not been to discreet in the old country, to me. They did not do so solely that I might teach them farming. A charge of that kind is no light responsibility, and I look for assistance from the men who have almost as large a stake as I have in the prosperity of Silverdale.

"Have you ever seen me do anything you could consider prejudicial to it?" asked Winston.

"I have not," said Colonel Barrington.

"And it was by her own wish Miss Barrington, who, I fancy, is seldom mistaken, asked me to the Grange?"

"It is a good plea," said Barrington. "I cannot question anything my sister does."

"Then we will let it pass, though I am afraid you will consider what I am going to ask a further presumption. You have forward wheat to deliver, and find it difficult to obtain it?"

Barrington's smile was somewhat grim. "In both cases you have surmised correctly."

Winston nodded. "Still, it is not mere inquisitiveness, sir. I fancy I am the only man at Silverdale who can understand your difficulties, and what is more to the point, suggest a means of obviating them. You still expect to buy at lower prices before the time to make delivery comes?"

Again the care crept into Barrington's face, and he sat silent for almost a minute. Then he said, very slowly, "I feel that I should resent the question, but I will answer it. It is what I hope to do."

"Well," said Winston, "I am afraid you will find prices higher still. There is very little wheat in Minnesota this year, and what there was in Dakota was cut down by hail. Millers in St. Paul and Minneapolis are anxious already, and there is talk of a big corner in Chicago. Nobody is offering grain, while you know what land lies fallow in Manitoba, and the activity of their brokers shows the fears of Winnipeg millers with contracts on hand. This is not my opinion alone. I can convince you, from the papers and market reports I see before you"

Barrington could not controvert the unpleasant truth he was still endeavoring to shut his eyes to. "The demand from the east may slacken," he said.

Winston shook his head. "Russia can give them nothing. There was a failure in the Indian monsoon, and South American crops were small. Now, I am going to take a further liberty. How much are you short?"

Barrington was never sure why he told him, but he was hard pressed then, and there was a quiet forcefulness about the younger man that had its effect on him.

"That," he said, holding out a document, "is the one contract I have not covered."

Winston glanced at it. "The quantity is small. Still, money is very scarce and bank interest almost extortionate just now."

Barrington flushed a trifle, and there was anger in his face. He knew the fact that his loss on this sale should cause him anxiety and was significant, and that Winston had surmised the condition of his finances tolerably correctly.

"Have you not gone quite far enough?" he said.

Winston nodded. "I fancy I need ask no more, sir. You can scarcely buy the wheat, and the banks will advance nothing further on what you have to offer at Silverdale. It would be perilous to put yourself in the hands of a mortgage broker."

Barrington stood up very grim and straight, and there were not many men at Silverdale who would have met his gaze.

"Your content is a little too apparent, but I can still resent an impertinence," he said. "Are my affairs your business?"

"Sit down, sir," said Winston. "I fancy they are, and had it not been necessary, I would not have ventured so far. You have done much for Silverdale, and it has cost you a good deal, while it seems to me that every man here has a duty to the head of the settlement. I am, however, not going to urge that point, but have, as you know, a propensity for taking risks. I can't help it. It was probably born in me. Now, I will take that contract up for you."

Barrington gazed at him in bewildered astonishment. "But you would lose on it heavily. How could you overcome a difficulty that is too great for me?"

"Well," said Winston, with a little smile, "it seems I have some ability in dealing with these affairs."

Barrington did not answer for a while, and when he spoke it was slowly. "You have a wonderful capacity for anyone to believe in you."

"That is not the point," said Winston. "If you will let me have the contract, or, and it comes to the same thing, buy the wheat it calls for, and if advisable sell as much again, exactly as I tell you, at my risk and expense, I shall get what I want out of it. My affairs are a trifle complicated and it would take some little time to make you understand how this would suit me. In the meanwhile you can give me a mere I O U for the difference between what you sold at, and the price today, to be paid without interest and whenever it suits you. It isn't very formal but you will have to trust me."

Barrington moved twice up and down the room before he turned to the younger man. "Lance," he said, "when you first came here, any deal of this kind between us would have been out of the question. Now, it is only due to tell you that I have been wrong from the beginning, and you have a good deal to forgive."

"I think we need not go into that," said Winston, with a little smile. "This is a business deal, and if it hadn't suited me I would not have made it." He went out in another few minutes with a little strip of paper, and just

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before he left the Grange placed it in Maud Barrington's hands.

"You will not ask any questions, but if ever Colonel Barrington is not kind to you, you can show him that," he said.

He had gone in another moment, but the girl, comprehending dimly what he had done, stood still, staring at the paper with a warmth in her cheeks and a mistiness in her eyes.

CHAPTER XXIII.

Sergeant Stimson Confirms His Suspicions.

IT was late in the afternoon when Colonel Barrington drove up to Winston's homestead. He had his niece and sister with him, and when he pulled up his team, all three were glad of the little breeze that came down from the blueness of the north and rippled the whitened grass. It had blown over leagues of sun-bleached prairie, and the great desolation beyond the pines of the Saskatchewan but had not wholly lost the faint, wholesome chill it brought from the Pole.

There was no cloud in the vault of ether, and slanting sun-rays beat fiercely down upon the prairie, until the fibrous dust grew fiery and the eyes ached from the glare of the vast stretch of silver gray. The latter was, however, relieved by stronger color in front of the party for blazing gold on the dazzling stubble, the oat sheaves rolled away in long rows that diminished and melted into each other, until they cut the blue of the sky in a delicate filigree. Oats had moved up in value in sympathy with wheat, and the good soil had most abundantly redeemed its promise that year. Colonel Barrington, however, sighed a little as he looked at them, and remembered that such a harvest might have been his.

"We will get down and walk towards the wheat," he said. "It is a good crop and Lance is to be envied." "Still," said Miss Barrington, "he deserved it, and those sheaves stand for more than the toil that brought them there."

"Of course!" said the Colonel, with a curious little smile. "For rashness, I fancied, when they showed the first blade above the clod, but I am less sure of it now. Well, the wheat is even finer."

A man who came up took charge of the horses, and the party walked in silence towards the wheat. It stretched before them in a vast parallelogram, and while the oats were the pale gold of the austral, there was the tint of the ruddier metal of their own Northwest in this. It stood tall and stately, murmuring as the sea does, until it rolled before a stronger puff of breeze in waves of ochre, through which the warm bronze gleamed when its rhythmic patter swelled into deeper-toned harmonies. There was that in the elfin music and blaze of color which appealed to the sensual ear and eye, and something which struck deeper still, as it did in the days men poured libations on the fruitful soil, and white-robed priests blessed it, when the world was young.

Maud Barrington felt it vaguely, but she recognized more clearly, as her aunt had done, the fair and daring of the sower. The earth was very bountiful, but that wheat had not come there of itself; and she knew the man who had called it up and had done more than bear his share of the primeval curse which, however, was apparently more or less evaded at Silverdale. Even when the issue appeared hopeless, the courage that held him resolute in the face of others' fears, and the greatness of his projects, had appealed to her, and it almost counted for less that he had achieved success. Then glancing further across the billowing grain she saw him—still as it seemed it had always been with him, amid the stress and dust of strenuous endeavor.

Once more, as she had seen them when the furrows were bare at seed time, and there was apparently only ruin in store for those who raised the eastern people's bread, lines of dusty teams came plodding down the rise. They advanced in echelon, keeping their time and distance with a military precision, but in place of the harrows, the tossing arms of the binders flashed and swung. The wheat went down before them, their wake was strewn with gleaming sheaves, and one man came foremost swaying in the driving-seat of a rattling machine. His face was the color of a Blackfoot's and she could see the darkness of his neck above the loose-fronted shirt, and a bare blackened arm that was raised to hold the tired beasts to their task. Their tramping, and the crash and rattle that swelled in slow crescendo, drowned the murmur of the wheat, until one of the machines stood still, and the leader, turning a moment in his saddle, held up a hand. Then those that came behind swung into changed formations, passed, and fell into indented line again, while Colonel Barrington nodded with grim approval.

"It is very well done," he said. "The best of harvesters! No newcomers yonder. They're capable Manitoba men. I don't know where he got them, and, in any other year, one would have wondered where he would find the means of paying them. We have never seen farming of this kind at Silverdale."

He seemed to sigh a little while his hand closed on the bridle, and Maud Barrington fancied she understood his thoughts just then.

"Nobody can be always right, and the good years do not come alone," she said. "You will plow every acre next one."

Barrington smiled dryly. "I'm afraid that will be a little late, my dear. Anyone can follow, but since, when everybody's crop is good, the price comes down, the man who gets the prize is the one who shows the way."

"He was content to face the risk," said Miss Barrington.

"Of course," said the Colonel, quietly. "I should be the last to make light of his foresight and courage. Indeed, I am glad I can acknowledge it, in more ways than one, for I have felt lately that I am getting an old man. Still, there is one with greater capacities ready to step into my shoes, and though it was long before I could overcome my prejudice against him, I think I should now be content to let him have them. Whatever Lance may have been, he was born a gentleman, and blood is bound to tell."

Maud Barrington, who was of patrician parentage, and would not at one time have questioned this assertion, wondered why she felt less sure of it just then.

"But if he had not been, would not what he has done be sufficient to vouch for him?" she said.

Barrington smiled a little, and the girl felt that her question was useless as she glanced at him. He sat very straight in his saddle, immaculate in dress, with a gloved hand on his hip, and a stamp which he had inherited, with the thinly-covered pride that usually accompanies it from generations of a similar type, on his clean-cut face. It was evidently needless to look for any sympathy with that view from him.

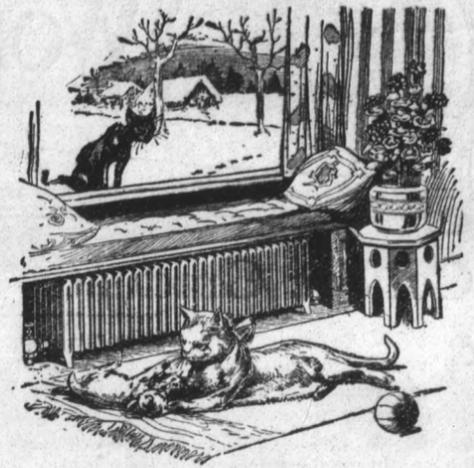
"My dear," he said, "there are things at which the others can beat us; but, after all, I do not think they are worth the most, and while Lance has occasionally exhibited a few undesirable characteristics, no doubt acquired in this country, and has not been always blameless, the fact that he is a Courthorne at once covers and accounts for a good deal."

(Continued next week.)

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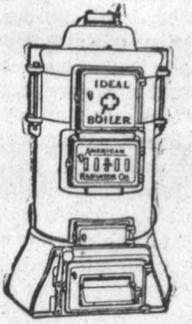
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Woman and Her Needs

At Home and Elsewhere



College Graduates as Domestics.

A FEW weeks ago an article appeared in this department laying stress on the necessity for girls learning to cook. It cited the case of a woman who advertised for a companion nurse that could cook and offering \$15 a week as wages. The position went begging because none of the applicants could cook. The article was read by a Michigan Agricultural College graduate who wrote at once to ask if there were more of such positions lying around loose. For her benefit, and the benefit of other domestic science graduates, the editor of the department inquired into the situation in Detroit. The answers were as diverse as the persons interviewed, but the consensus of opinion seemed to point to one conclusion—that the girl who is efficient can always secure work at a good salary, provided always she is willing to take things as she finds them and live above the unpleasantnesses of her situation.

Mrs. R. H. Ashbaugh, president of the State Federation of Women's Clubs, is of the opinion that there are plenty of situations in Detroit for high-class girls, but that the girls would not accept them.

"The position of the girl is the crux of the situation," said Mrs. Ashbaugh. "She is not a guest, and if she is a college graduate she naturally feels that she wants to associate with people of a higher type than the average servants who will be her companions.

"Her employer's library and living room are not open to her, and she can not meet her employer on terms of equality. She does not want to do manual work, she wants a position as housekeeper. There are many of the wealthier homes where she could get a position as housekeeper or cook, with a scullery maid to do the rough work, but her position in that home would be such that she would not stay. She wants social life and it is her right. If the thing could be put on a business basis, if she could meet her employer at any time as an equal, the situation would be cleared and girls of education and refinement would be willing to hold domestic positions."

Miss Hattie Carstens, president of the Twentieth Century Club of Detroit, ignored the social situation, and held to the idea that it would be a good thing for domestic science graduates to seek positions in city homes.

"There are a number of cooks in homes where they employ scullery maids to do the rough work, and where the cooks are paid high salaries. If the girl likes to cook, if she knows how to do fine work, she could get a position with no difficulty, and should be glad to secure it," said Miss Carstens. "I know any number of families who would be glad to pay well for a girl who could give them a balanced ration on a moderate sum. Many of these families are now paying a high-priced French chef, but would be glad to give the money to a bright American girl if they could secure her. Girls who desire such positions should communicate with the various intelligence offices in the large cities. Many of the families I know are securing their help from New York offices, as they claim they can get better help for less money in the

east than they can secure here. Of course, they pay the railroad fare. The Y. W. C. A. also has calls from the best families, and could place competent girls.

"Then there is another line of work the girls could take up. If they knew anything of nursing they might get positions as diet nurses in hospitals. Lacking a knowledge of nursing they might become invalid cooks."

Mrs. H. T. Watt, who has a high-class employment office in Detroit, was sanguine as to the chances for girls to secure positions, but not until after Easter.

"Things are very quiet just now," said she, "and there are many girls out of work. After Easter the work will open up again and there will be many chances for high-class positions. There are several families paying from \$10 to \$15 a week for first-class cooks, but these are in families where from seven to 14 other servants are employed and necessitate six meals a day. The help has a private dining-room, and different cooking from that of the family, thus making six meals necessary. But there is a scullery maid who prepares vegetables, washes dishes, makes the toast and coffee and keeps the helps' dining-room in order. The servants have dinner at noon and supper at night, when the family are served dinner.

"Besides the families who live on this scale there are many who pay their cook from \$7.00 to \$10.00 per week, and who employ two or three other girls. Girls for general housework are always in great demand and get from \$6.00 to \$8.00 a week. High-class girls can always secure employment, though I would advise them now to wait until after Easter, when there will be many more openings."

At the Y. W. C. A. the idea seemed to be that a competent girl could get work even now, with a wait of only a day or two.

"It is the incompetent girl who has to wait," said Miss Jane Spence, domestic secretary of the Y. W. C. A. "The girl who is sure of herself, even if she is not a domestic science expert, can always secure a position, while the untrained girl who is not

self-confident is passed by. Just now specialized workers, governesses and ladies' maids, are not in much demand but the girl for general housework and the first-class cook can always secure work. At Grosse Pointe there are many families paying from \$10 to \$12 a week. These positions might well be taken by girls thoroughly versed in domestic science."

At the nurses' registry office conducted by Mrs. Nellie B. Christin it was learned that there are frequent calls for a woman who understands cooking, to look after convalescents or chronic invalids. In these places a knowledge of nursing is not indispensable, but would help.

"I have frequent calls for girls with a thorough knowledge of invalid cooking," said Mrs. Christin, "but none just now. Everything is very quiet. These places pay not less than \$15 a week, some of them more."

There are many chances, then, for the domestic science graduate to secure work aside from teaching cooking. Of these chances hospital cooking and invalid cooking would suit her better, as her social position would be on a much higher plane than in domestic service. Her associates would be her mental equals and there would be no question of her inferior standing.

Lamentable as it is, her social position as cook would be intolerable to a college-bred girl of the type turned out by our state agricultural college. We hear a great deal of talk about the dignity of labor and the beauty of working with one's hands. But the fact remains that the girl who accepts a position as a domestic is treated as

a menial. She is in no sense regarded as the equal of her employer, even though in many cases she is her equal mentally, and her superior in morals and culture. Even the clerks and factory girls consider themselves a step higher than the cook and housemaid, and their freedom is certainly greater.

The cook is expected to use the side door or the back door, to have freedom to leave the house only at stated intervals and to entertain her callers either in the dining-room or kitchen, and this consent even is grudgingly given in some homes.

This is the dark side of the picture. There are many women who recognize the divine right to happiness of the girls in their employ, and who make their homes a home for their servants. The domestic, too, can save more money, and in most cases receives as much, or more, as the girls in factory and store. Her wages, too, are clear profit as she need not pay for board, room, light, heat or laundry. What she earns is net. She is sheltered, well-fed, and warm, when the girls who scorn her employment for the sake of greater freedom, are worried as to suitable rooms and often only half-fed. Furthermore, she can make her life what she wants it to be. If her work does throw her among girls and men who are not her intellectual equals, she need not descend to their level. The Y. W. C. A. and women's clubs offer her a place to meet congenial friends, and she can secure companionship if she goes after it.

In housework, as in everything else, the work does not determine the character. It is up to the girl to raise the position to her standard. DEBORAH.

City Helps in the Farm Home.

By IDA L. CHITTENDEN.

IT was a beautiful morning in early October. The maples were beginning to show their autumn coloring, and all nature seemed marked by ripening shades. The cattle had just been turned out of their stable and were leisurely making their way to the stream winding in and out among the willows that almost touched their branches over its waters. Every foot of land in sight showed marks of

thrifty farming. The cattle were splendid specimens of their kind; the horses already hitched to the plow seemed powerful enough for any task that might be given them; the barns were well cared for and the yards showed no rubbish or litter; tools were not to be seen except those in use, and one could imagine them all stored away safely under cover, where the weather could not reach them and make them unfit for use.

Two years before this Mrs. Vaughn had come here a bride. She had been a school-teacher in a distant city, but spending her vacation with friends in this vicinity, she had met handsome, black-haired, athletic Dan Vaughn. Myrtle Allen was not lacking in personal charm as young Dan soon realized. It was almost love at first sight on both sides, and was pronounced by their friends an ideal match.

So persistent was young Vaughn in his courtship that instead of going back to teaching in the fall, Myrtle Allen Vaughn went into this farm home to take up the duties of a farmer's wife. She loved her big, handsome husband, and felt perfectly secure of his love in return. Nevertheless the conditions which surrounded her, the duties which were expected of her, the lack of conveniences for accomplishing her tasks, were almost appalling. She could not understand why their beautiful home life of which she had dreamed, must be marred by this constant drudgery.

Dan's father had given him a fine



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farm with very comfortable buildings, when they were married. This had apparently put them on their feet financially from the start. Still the first two years had been something of a struggle owing to the buying of stock and the necessary equipment for the farm work. This had now been accomplished, and not only the farm but stock and tools were free of debt.

This particular morning young Vaughn had said to his wife just before he had gone to the field,

"That forty joining us on the north is for sale. What do you think, Myrtle, of our buying it? It is splendid land and the ten-acre wood lot has some fine timber."

"We would have to go in debt for it," said Mrs. Vaughn.

"Yes, but we would soon pay for it," was the reply.

Myrtle Vaughn looked at her husband with that puzzled look which he occasionally met, and which he could not at all comprehend, but only said, "Dan, dear, please wait just a little. I want to think."

This remark was equally incomprehensible to the young man, and he left the house, wondering just what his wife was thinking.

Left alone, Myrtle Vaughn went to her room, locked the door and stood before her mirror studying the face that looked back at her. She could readily see that she had changed decidedly during the last two years. The six months' old baby in the cradle at her side might partly account for this change, but there were young mothers of her acquaintance who did not show these marks of fading beauty as she did. There was an almost imperceptible stoop to her shoulders, and her face presented a drawn expression, caused doubtless, by a back that rebelled against the heavy strain put upon it. Too, she had lost some ten or fifteen pounds of flesh. There was no mistake, she was certainly losing her physical charms while Dan was handsomer than ever. She could not afford to become a mere drudge, but what should she do?

It had seemed all right to get along almost any way till the farm was equipped with stock and tools; but now to buy more land—

Her home was sufficiently large, and the house was well built. In its construction, however, no study had been made for convenience in labor. The cistern had been built outside with the pump directly over, necessitating carrying the water up several steps into the kitchen. The drinking water was also outside, though the well was near the kitchen door. Big kitchen made many steps, while the large floor of white maple must be kept scrupulously clean if her reputation for good housekeeping in that particular neighborhood be retained.

Farm neighborhoods have fads. In some it is white kitchen floors; others lay great stress on brightly polished stoves and tinware; again, a strife will lie in possessing parlors of different degrees of uselessness, which are though in darkness most of the time, a great source of pride to their owners, and still again the fad consists in reputations as cooks. In the neighborhood where the Vaughns lived the fad was shining kitchen floors.

The week before an experiment worker from the state agricultural college had spent a few days in the vicinity and one day, when Dan was away from home, she had called with a neighbor who was taking her to the train. Mrs. Vaughn was very popular and the call was purely a social one. Seemingly, quite by accident, the conversation fell on conveniences in the farm home. The stranger immediately found herself plied with questions by the most eager listener she had had for months.

"How could I have hot and cold water in my home? What manner of heating is the cheapest to install, and what would be its cost? What kind

of a power washer would be practical?" were some of the questions which Mrs. Vaughn eagerly asked. Together they made a hasty survey, and the experiment worker took notes of the existing conditions. Then, promising to write Mrs. Vaughn fully as soon as she could look the matter over carefully, she hastened to make her train that she might meet her appointments.

Of all this Myrtle Vaughn had said nothing to her husband, but in her mind had grown a mighty hope that she would be able to make things easier for herself now that everything was in such splendid shape outside. But if they bought that forty acres what would she be and how would she look when that was paid for?

She turned these thoughts over and over in her mind as she studied her face in the glass. Baby turned on her pillow, threatening to wake, but a gentle jar of the cradle coaxed her back into slumber.

Every moment meant lost time in the kitchen but of this she seemed oblivious, so absorbed was she in the problems before her. At last, with an air of decision, she turned, just as the baby opened wide her eyes with cooing mischief in their depths, and almost snatching the child into her eager arms, she said,

"I must, and I will, baby dear, for your sake and mine."

Myrtle Allen Vaughn was no weakling mentally, and she had taken hold of the problems that confronted her with a determination born of necessity. Life might mean so much, she had decided, or she might become just a working machine. She wanted to do her part in every way and meant to do so. She had made up her mind, though, that it was far from good economy to do with her own strength those things which could be done by machinery and mechanical contrivances.

After leaving her room she took the baby to the kitchen, gave her her breakfast and bath, doing this with leisure and enjoyment. No matter what else demanded attention this hour with baby was sacred. Little Doris was extra good on this particular morning, helping her mother with the morning work by demanding hardly any attention herself. The washing of the morning dishes and the other work was accomplished as if by magic. No woman ever could make her "head help her heels" more than could Mrs. Vaughn, and a big purpose gave quickness to her deft fingers.

The dinner was planned and all ready to be put over when the rural delivery man went by. How she hoped that the letter from the experiment worker would come this morning! Running out to the letter box, she found, to her satisfaction, not only the letter she was wishing for, but a large bundle of literature besides. She also found another letter, addressed to her in a strange hand. On opening the latter communication, she read:

"Dear Mrs. Vaughn:—I would like to know if your property on —St., in N— is for sale. My daughter is about to be married and we would like to have her live near us. Your property adjoins my own, and though it is in pretty bad repair at the present time, it could be made into an attractive little place. I would offer you \$1,500 cash for it as it now stands, if you care to sell. I believe that this price covers its full value. Kindly let me hear from you at your earliest convenience.

Yours very truly,
N. M. JONES."

This place was all Myrtle Allen possessed in the world—when she married Dan Vaughn. The house had usually been rented for a small sum but the repairs and taxes took about all the rent. It seemed unsalable in the small town of N—, and so Mr. Vaughn had thought it did not amount to much



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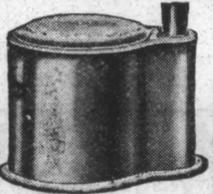
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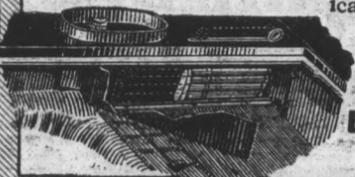
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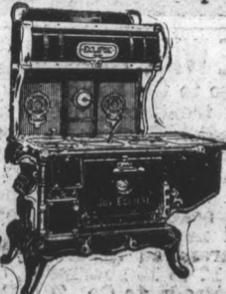
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and had not been interested in it.

This letter put a different outlook on Myrtle Vaughn's problems and simplified them an hundred fold. Her plan had been to state her case fully to Dan that noon and ask for the needed improvements in the house, corresponding to those he had in the barns and on the farm. Now she would have to think it all over under this new condition, so she said no word to her husband regarding the matter during the noon hour.

After dinner Mrs. Vaughn lay down with baby, to coax her into her usual afternoon nap. In the meantime plan after plan evolved itself, only to be cast aside. Once she said aloud,

"That is all I have in the world that is all my own. If I should put it in here would it still be mine, or would it be Dan's only? I read the other day about a joint deed for man and wife. I wonder if ours is a joint deed." (To be continued).

A BIT OF EMBROIDERY.

BY ARTHUR W. PEACH.

It's not a thing of beauty; artist eyes Would look upon it as a cause for mirth; But in that faded bit of cloth there lies For me a tender beauty and great worth.

With dainty strands of many brilliant threads, (That is, they were so, years ago) she wove Such gorgeous bloom as ne'er in wild-wood glades Or cherished gardens richness lived and throve.

It's faded now, but in my heart it's bright As on the day when, with an open pride, She spread it out before my wondering sight With hopeful glance to see me satisfied.

Each thread is not a thread but touch Of love, and countless touches here I see: Though as a thing of beauty, it's not much, As treasured gift of hers, it's love to me!

RECIPES.

Sour Cream Layer Cake.

One cup of white sugar, one well-beaten egg. Place two tablespoonsful of sour cream in a cup and fill cup with buttermilk. One level teaspoonful of soda and salt, two cups of flour with two teaspoonfuls of baking powder. Flavor with vanilla.—Mrs. F. S.

Sour Cream Cookies.

One cup of white sugar, one cup of very thick sour cream, one egg, one teaspoonful of soda and salt each. Flavor with nutmeg. Mix soft and bake in a quick oven.

Sour Cream Molasses Cake.

One cup of brown sugar, one cup of sour cream, not too thick, one-half cup of molasses, one egg, one-half teaspoonful of soda, one of salt, ginger, cloves, cinnamon and nutmeg, one cup of chopped raisins, two cups of flour. Bake in a slow oven about one hour.—Mrs. F. S.

To a reader who would like to know how to make cider sauce or apple butter, I will send my recipe. I put sweet cider in a granite basin or stew kettle on the stove, when it begins to steam. Then put apples in so the cider just covers them and boil down until thick. I made some with snow apples this fall. It was a little tart. That made with any good sweet apples is the best. I do not use any sugar or spices.—Mrs. E. W. S.

To Can Beef.

Cut the pieces of raw beef small enough to go inside the can, leaving out all bones, pack in can as tightly as possible until full, then put in a teaspoonful of salt and on top of all place a piece of suet; this hardens when cold and helps to preserve the meat. Then put on rubber and cover and screw down tight. Place cans in boiler with hay in the bottom and around cans to prevent their touching.

If one has a rack made to fit the boiler, so much the better. Fill the boiler about one-half full, or until just below the rubbers on cans, with cold water, bring to a boil and boil steadily for three and one-half hours. Let the cans remain in the water until cold. Should any of the rubbers loosen during the process it will do no harm to remove cover and put on new ones, providing you do it while the contents are steaming hot. When wanted for use place meat in a dish in the oven or on top of the stove, and brown. Meat canned in this way will keep indefinitely, and being cooked in its own juice has such a delicious flavor. Pork can also be canned in the same manner.—Mrs. F. S., Mason.

THIMBLE CLUB CONTEST.

BY MAE Y. MAHAFFY.

A needlework club recently held the following contest at one of their gatherings, the queries creating considerable amusement and wonder. A doll pin cushion was utilized for the first prize. For the booby prize a tiny emery, with the phrase, "A good sharpener needed," sketched on a short length of attached ribbon, was used.

The questions, with answers, follow: 1, what the farmer does to his sheep—; 2, to pick one's way—; 3, what is thrown away—; 4, a sign of servitude—; 5, a berry—; 6, a blow—; 7, a company of musicians—; 8, an exclamation—; 9, necessary to hang a picture, and part of the body—; 10, a grassy sward—; 11, what the cook does to the turkey—; 12, part of a door—; 13, a negative—; 14, a king's followers—; 15, a portion of armor—.

Answers: 1, shears; 2, thread; 3, waist; 4, yoke; 5, thimble; 6, cuff; 7, band; 8, a-hem; 9, hook and eye; 10, lawn; 11, baste; 12, panels; 13, knot; 14, train; 15, shield.

FASHIONS BY MAY MANTON.

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.



No. 8352—Girl's Yoke Dress. Cut in sizes 8, 10 and 12 years. Size 10 requires 3 yds. of 36-inch material with 1/2 yd. of 27-inch for collar, cuffs and belt.

No. 8488—Apron Dress. Cut in sizes 6, 8 and 10 years. Size 8 requires 2 3/4 yds. of 36-inch material.

No. 7652—Child's Bishop Dress. Cut sizes 6 mos., 1, 2 and 4 years. Size 2 requires 1 3/4 yds. of 36-inch material.

No. 7906—Child's Empire Dress. Cut in sizes 1, 2 and 4 years. Size 2 requires 1 3/4 yds. of 36-inch material.

No. 7235—Girl's Yoke Apron. Cut in sizes 6, 8 and 10 years. Size 8 requires 2 3/4 yds. of 36-inch material.

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

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This \$12.50 Grocery Order and Rocker EXTRA All for only \$12.50

40 Pounds Gran. Sugar.....\$1.00	2 ½-lb. Pkgs. Shred. Coconut.....\$.40
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8 ½-lb. Pkgs. Breakfast Oats..... .45	2 1-lb. Pkgs. Corn Stch. .30
8 ½-lb. Pkgs. Breakfast Wheat Food... .45	2 ½-lb. Packages Bk. Pepper (ground)..... .30
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2 2-oz. Bots. Van. Ex... .50	6 1-lb. Cans Lustré Bright Scouring Pwd. .60
2 ½-lb. Pkgs. Unsweet. Chocolate..... .70	2 Pkgs. Wash. Pwd..... .30
1 ½-lb. Can Phosphate Baking Powder..... .25	1 3-lb. Pkg. Gl. Starch .35
7 Cans Pork and Beans (large size)..... 1.05	2 5-Bar Boxes Asstd Toilet Soap..... .50
2 1-lb. Pkgs. Noodles... .40	5 Bars Floating Bath Soap..... .25
2 Cans Hominy..... .30	
2 1-lb. Pkgs. Spaghetti .30	
Total \$12.50	

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We will send you this \$12.50 List of Groceries including 40 lbs. of Granulated Sugar for \$1.00 and this fine upholstered Rocker, all for only \$12.50. We want to prove to you and the thousands of other families who accept this offer that our Factory-to-Home plan of dealing gives nearly double the value you can secure elsewhere. We manufacture our own goods and sell the entire output of our large factories direct to the home without the added cost of middlemen.

MONEY BACK IF NOT PLEASD

This Rocker would cost \$10.00 or more in any retail store—the frame is of solid Oak, Golden finish; front posts and arms are 4 inches wide; spring construction seat measures 21x30 inches; back is 27 inches high from seat; deep comfortable upholstering of best grade of black imitation leather. The Groceries too, would cost from \$10.00 to \$13.00 at retail. If when you receive order, you are not satisfied that we have given you at least a \$20.00 value for \$12.50, just write us and we will take entire shipment back at our expense and refund your money. We have been in business over 25 years—have more than one million satisfied users of our goods. Ask any Banker or Postmaster as to our reliability.

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ASK FOR



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(In writing mention this Paper.)

(Continued from page 292).

ly in local service; that any company that has for its aim universal service and rates cannot serve the farmers to the best advantage.

Just as it would be folly to erect a costly set of farm buildings on land with a faulty title, so it would be folly to attempt to organize and construct a telephone system until laws can be enacted giving such companies a right to live. So I again urge every farmer who is interested in better telephone service to ask their hired men at Lansing to work and vote for the Lewis bill, now before the House. Even if no new company was needed, this law would act as a guarantee of good and reasonable service, would work no hardships to the large toll lines or city service and would still leave plenty of work for the railroad commission.

If any who doubt that a high class of service can be given at from \$6 to \$10 per year, could come to northern Van Buren or southern Allegan counties, he will find that it can and is being done.

To those like Mr. Stafford who wish to do something, I can see no help, for as the law now stands, he cannot build a line to his tenant house across the road, "should anyone object," without the consent of the railroad commission. This shows how the farmer's hands are tied, and until the law is changed they must accept what is offered at the price charged, and pretend they like it.

Should this bill become a law I will be pleased to take up the subject of incorporation, financing, construction and operation of these small non-profit companies in some future issue. Until then, I beg of the farmers to get busy with their representatives and senators.

Van Buren Co. C. E. DENTON.

WILL THEY STICK?

For the past few years there has been a strong "Back to the Farm" sentiment abroad in the land. The agricultural press have given space to all ideas, old and new, which would tend to lead some down trodden factory worker from the city into a better and more stable way of living. The daily press of our state have touched on the matter editorially from time to time and there has actually been a back to the farm movement. But just now it seems to be growing faster and assuming larger proportions than at any past time. The factories are closed or running short hours and the working class in cities, both skilled and unskilled, have been and still are, out of work and they are thinking seriously and also planning to get out on a farm this coming summer and the question arises, will they stick? The farms for sale at a bargain are not always the best or, I might say, better class and some of the newcomers are inexperienced in the actual present day farm problems. They go from the thickly settled cities. The women are accustomed to near neighbors and everyday companionship. The men are accustomed to working with many other men; they have, as they say, something doing. How will they be received? Will they stick?

The average farm community is not much of a social center. From April 1 until snow flies there is not much doing but work, and with old friends and neighbors around us are we not inclined to neglect new ones?

The children from the city are not accustomed to the district school and the country children are not accustomed to the ways of those from the city and sometimes they do not mix. The newcomer may not have as good clothes and shoes as the old settler and is looked down upon on that account. The newcomer may not have all tools necessary to carry on the work as he would like. Will you loan or rent him at a reasonable price from your stock, that he may be the better able to buy for the next season? If he is inclined to make bad mistakes will the old ones get together and have a good laugh at his expense, or will you show him where he is wrong and how to go to work to correct it?

I think that the sticking question depends upon the sticking qualities of the newcomer first, and second, upon how they are received in the community, for a lonesome, homesick man or woman cannot do their best. Hundreds of communities in Michigan will have new neighbors this summer. I say, treat them well until they prove themselves unworthy.

Oakland Co. W. H. MARION.

A Correction.

In the awards of Michigan Farm Crops Exhibit, published in our issue of February 13, our correspondent made an error in his report in naming the first prize winner on exhibit of white beans. The first prize in this class was won by W. W. Terry & Sons, of Remus, instead of Mr. Cowdrey, as stated. Mr. Cowdrey won the second prize in the same class.

Will You Help Save the Pere Marquette?

The Pere Marquette is being operated at a loss for one reason—because the state law has fixed its passenger rates at an amount less than the cost of operation.

The road is now in our hands as Receivers appointed by the United States Court. We have cut down expenses to the limit of safety, but economies, helpful as they are, will not save the situation. It has been necessary to borrow money to operate the road, even without paying interest on bonds. The Court, without assuming to make a recommendation, but following the suggestion of the Interstate Commerce Commission, has directed us to lay the matter before the Legislature for such relief as it may find to be merited, and we have done so.

Why You Should Help Save This Railroad—

- You need its freight service in your business.
- You require its passenger service when you travel.
- You know that this railroad is necessary to the prosperity of this community.
- You know that this railroad is one of the greatest assets of the state.
- You know that the Pere Marquette is an important factor in your life, directly or indirectly, every day in the year.
- It serves this county, this town—it serves you.
- It cannot longer continue to do business at a loss and furnish the service you need and require.
- It has reached a crisis in its affairs. Foreclosure and dismemberment are staring the road in the face.

On The Average We Lose

- A quarter of a cent every mile we carry a passenger.
- Ten cents on every passenger we carry.
- Twenty-two cents every mile a passenger train runs.
- This does not mean that we do not want your patronage. We do, we appreciate it. Our loss is greater if you do not give it to us, because we have to run the trains anyway.

The Interstate Commerce Commission decided after an investigation of these conditions that 2½c is a fair rate, and therefore fixed it on interstate business. This does not help us greatly because we have but little passenger service outside Michigan. The Pere Marquette is a local railroad. The most of its passenger business is local. Isn't it worth as much to carry you inside the state as it is to points outside, or from points outside to points within? Yes, and in some cases more, when you consider the sparsely settled sections served by the Pere Marquette.

How You Can Help

Take this matter up right away with your Legislator. See him personally, if possible; if not, write him at once. He is entitled to your views and it is necessary to get action at this session. The matter has been presented to the Legislature and we are now laying the conditions before you with a view of getting your assistance. The railroad is as much entitled to living rates as an individual is to living wages. Urge your Legislator to act favorably at this session, and

Help Us Preserve the System intact to Michigan

PAUL H. KING,
DUDLEY E. WATERS,
Receivers.

Insure Against DROUTH

Prepare your soil to retain moisture and produce bigger crop yields, by making a perfect seed bed with the **IMPERIAL PULVERIZER**

Packs the subsoil, and crushes, rolls, levels and pulverizes the topsoil. Does the work of 3 implements—all in one trip.

Saves buying more implements—saves two extra trips over the plowed ground.

Send at once for our Booklet

Peterson Mfg. Co.,
146 River St.,
Kent, Ohio.

We Custom Tan Horse Hides or Cattle Hides for Robes at \$3.50 each

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Reading, Mich.

FREE "Linene" COLLAR

State size on postal and whether you want collar like cut or low turnover style

REVERSIBLE COLLAR CO.,
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Rubber is a sap product that any maker can buy

CRUDE rubber comes from Brazil and the Malay States. Any manufacturer with the price can buy. The only attempt to secure a "corner" in rubber failed. Hence no one has a monopoly of crude rubber.

The finest grades of crude rubber are used in making Ajax Tires. It is the higher in-built quality of Ajax Tires that makes possible the written guarantee of 5000 miles, and it is the written

**AJAX
TIRES**
Guaranteed
in writing

**5000
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"While others are claiming Quality we are guaranteeing it."

guarantee which inspires your confidence in Ajax Tires. The anticipated life of other tires is but 3500 miles.

You can save, by using Ajax Tires, from \$4 to \$20 a tire, according to the wheel size you use. Why not make and keep for yourself this important saving? Why not reduce the cost of your motoring, while adding to your own comfort and security? See the Ajax dealer who is close at hand, or write us for "The Story of Ajax Tires."

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BRANCHES: Atlanta, Boston, Brooklyn, Chicago, Cleveland, Dallas, Denver, Des Moines, Detroit, Indianapolis, Kansas City, Mo., Minneapolis, Philadelphia, Seattle, Portland, Ore., Los Angeles, San Francisco.
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SOWIN' wild oats is the easiest work on the farm o' life. Reapin' the crop is the hardest

Velvet Joe



But it's no harder than trying to enjoy a pipe when the tobacco isn't "right." "Sow" your pipe with VELVET, The Smoothest Smoking Tobacco, and you'll "reap" hours of happy, peaceful comfort. 10c tins and 5c metal-lined bags.

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Send for free book anyhow.

Try-a-bag of

fertilizer. Our brands increase yield, improve quality and hasten maturity. \$2 to \$4 an acre will show you. Also ask for carload inducement and terms to agents.

The Am. Agr. Chem. Co.
Cincinnati, Cleveland, Detroit.

Let Your Boy Plow Like a Man

But Plow Faster. Easier and Better
No matter what kind of a walking plow you have, turn it into a sulky with a **Winner Plow Truck**
Saves one man. Plows any ground. Easier on your horses. More even furrows. Instantly adjustable. 3 days work in 2. With or without seat.
Free Trial—then return the Winner—if you will part with it. We'll return your money and pay ALL freight. Special Introductory Offer to first buyer in any neighborhood. Write today for free book.
Lewis Mfg. Co., 63-79 Owego Street, Cortland, N. Y.

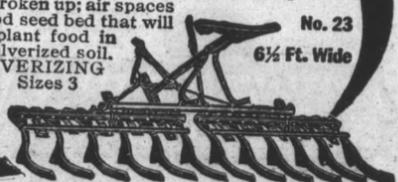


Better Crops on Perfect Seed Beds

Prepared with the **ACME Pulverizing Harrow.**

AFTER plowing sod or stubble, it must be worked down thoroughly and pulverized. Sods, clods and lumps must be broken up; air spaces and voids worked out and filled to insure a good seed bed that will give **BETTER CROPS**. Make available the plant food in plowed manure by thoroughly mixing with pulverized soil. **BETTER CROPS** will result. The "ACME" PULVERIZING HARROW makes possible the perfect seed bed. Sizes 3 to 17½ ft. wide, for one to four horses.

Light Draft—All Steel—Low Price
Write for catalog and name of nearest dealer.
DUANE H. NASH, Inc., 404 Division Ave., Millington, N. J.



Farm Commerce.

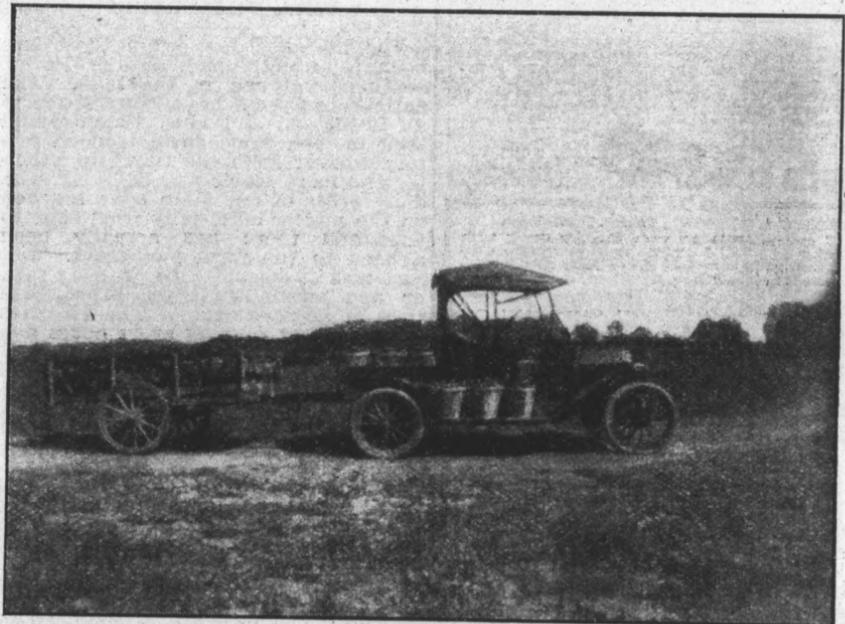
Reducing Costs with Auto-Trailer.

IDLE machinery or capital means money wasted. One of the farmer's mottoes should be to use, if possible, every tool to its fullest capacity. This is the reason for many of the advantages the large farmer has over the small farmer, and why it is often unprofitable for the man with few acres to purchase certain kinds of labor-saving implements—there not being enough work to save the cost of depreciation and interest on investment.

Now, recent investigations have led thinking farmers to declare that the auto-trailer is a vehicle that can be used in a variety of ways. And because of its many uses, some of which we shall suggest, these simple rigs are proving very valuable.

In the first place, a trailer increases the usefulness of the automobile. Farmers are rapidly finding that the auto is a great labor and time saver. This observation is now leading many to buy these modern horseless wagons for the economical advantages offered. But the carrying capacity of every au-

tomobile? Quite a little work has been done along this line to determine the possibilities of the trailer and it has been found, as would be expected, that the condition of the roads has much to do with the size of the load that can be hauled with safety. Generally speaking, on ordinary good dirt roads one can put on the trailer about four times the weight he would load on the rear of the automobile. In the accompanying illustration the owner found that he could load nine baskets of tomatoes upon his auto and 32 on the trailer. Had he space he could have added the other four baskets to bring the proportion up to that stated above and moved it without danger of overburdening his car. One live stock breeder and dealer has three of these trailers fitted out with high sides for the purpose of carrying cattle or other stock. Upon one of these he will load two full-sized cows and takes them wherever he desires. For a very large majority of the loads hauled upon, away from and to the average farm, it will be found



Small Car and Trailer Carrying 41 Hampers of Tomatoes.

tomobile is limited and the horse power is far in excess of the ordinary demands made upon it. Now, the auto-trailer makes use of this extra power and at the same time does not overload the automobile. It enables the owner to save power that is ordinarily wasted and to give the machine much additional work. In other words, the farmer can use the automobile to more nearly its full capacity.

A Few of the Uses.

A little reflection will suggest some of the uses to which the farmer would put an equipment of this kind. Instead of harnessing the horse to take a few cans of milk to the station a mile or two miles away he would deliver it in one-quarter the time with the auto and trailer. The 100 trips that the average farmer annually makes to town would be made with the new equipment. He could bring home a barrel of salt, a harrow, a plow, building material, cement, fencing, flour, feed, fertilizer; could load in a critter, a few hogs, sheep or calves; would find it convenient to go to his neighbor's, or into the next county for seed potatoes, beans, wheat or corn; would carry posts and wire to where the men were to erect the fence. In all, the farmer would find a multitude of uses where he could save much money because he would be able to save much time.

How Much they Carry.

Now, how much can one expect to carry on one of these trailers attached

that the capacity of the trailer, even for the small cars, will be sufficient.

With the Auto-Truck.

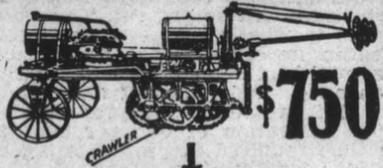
Another advantage of the trailer is its use with the auto truck. So promising is it in this connection that there is reason to believe that the size of the truck that the farmers are going to buy will be considerably influenced by it. Here is the situation: If, for instance, the farmer is marketing strawberries or peaches, or wishes to carry a crate of eggs, he will find that with a large truck he must have to load it to full capacity in order to get the greatest benefit from the resiliency of the springs and move his load of produce with the least damage. If he is only half loaded the strawberries or peaches are going to be terribly shaken down and the eggs perhaps broken.

Now we realize that one should go to town with a full load, but it too frequently happens that by reason of a storm or accident that the farmer finds a part of a load harvested and if it is not immediately marketed it will be a full loss. Should he be equipped with a small truck he can carry this load with safety and then when he desires to take a larger load he will attach the trailer. Other advantages are that the trip can be made much quicker with the lighter car and the upkeep is generally believed to be less.

Some Suggestions.

Experience with trailers has taught that it is not possible to use a pair of

HITCH IT TO YOUR PRESENT IMPLEMENTS



\$750

The BATES STEEL MULE

ONE MAN

DOES ALL THE WORK
Problem for Tractor Buyers

OR

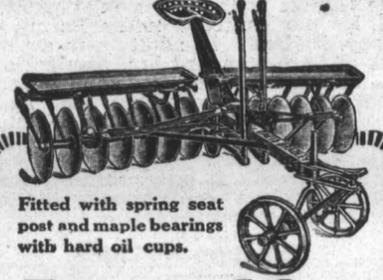


IT'S CRAWLER WORKS ON ANY SOIL ALL THE YEAR AROUND

DOES THE WORK OF 10 HORSES
AND COSTS LESS TO KEEP THAN TWO.

IT HAS
A HEAVY DUTY 4 CYLINDER MOTOR
A TWO SPEED TRANSMISSION
8 ALL WORKING PARTS RUN IN OIL
HUNDREDS IN OPERATION

MANUFACTURED BY
JOLIET OIL TRACTOR Co.
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Fitted with spring seat post and maple bearings with hard oil cups.

Easy on Man and Team

THE David Bradley Disc Harrow possesses every good point a reliable harrow should have, many of them exclusive Bradley features. Built to last and save wear and tear on man and team. 27 styles and sizes. Prices \$15.95 and up. Get acquainted with this excellent implement today. Send for our special Disc Harrow Offer. It will interest you.

Sears, Roebuck and Co.
Chicago

Hastings, Mich., Feb. 23rd, 1915.

NOTICE.

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

Notice is hereby given that there will be a special meeting of the members of said company held at City Hall, in the City of Hastings, Michigan, on the 30th day of March, A. D. 1915, at 1 o'clock, P. M., for the purpose of voting upon a resolution to extend the corporate existence of said company for a period of thirty years from the 7th day of April, A. D. 1915, and if said corporate existence is extended, then also for the purpose of passing upon proposed amendments to the Articles of Association of said company. By order of Board of Directors. D. W. ROGERS, Sec.

Just Say "Saw your ad. in the Michigan Farmer" when writing advertisers.

ordinary buggy wheels for this purpose, with the expectation of securing the greatest satisfaction. These wheels were not built for the rapid travel of the automobile. The boxings are apt to become loosened and it is very difficult to keep the bearings properly lubricated. Then, too, if there is to be travel upon pavement or hard roads the iron tires are pretty sure to break by reason of the speed. A good serviceable trailer should be equipped with the same kind of roller bearings that are found in the automobile, regular auto tires and good springs. The trailer should be fastened to the frame of the automobile, or truck, and not to the rear axle.

After seeing what can be done with these trailers, one is convinced of their practicability on the farm, and it would seem the part of wisdom for the owner of a truck or automobile who is looking toward the more efficient use of these vehicles, to carefully investigate this inexpensive accessory.

Crop and Market Notes.

Michigan.
Emmet Co., Feb. 25.—The weather is such as would indicate an early break-up. Recent thaws have left the fields bare; not much damage to winter grain as yet. There is no great quantity of wheat grown in this section. There are thousands of bushels of potatoes in storage on farms, and some are being marketed at 20c, but the outlook for this crop is not very bright, and some are feeding the tubers to stock. Hens are laying more freely. Pork \$7@8; beef \$7@9; wheat \$1.40; beans \$2.25@2.50; hay \$14; eggs 28c; chickens 15@16c.

Isabella Co., Feb. 24.—Roads have been icy, but the recent rains and thaws have brought some of the frost out of the ground. Considerable beans were marketed while the price was high, but there is still some unsold. There is quite a lot of feed on hand. Farmers are busy hauling out manure, so as to help with their spring work. Red wheat \$1.45; oats 50c; beans \$2.80; cream 27c; eggs 20c; butter 23c per pound.

Iowa.
Osceola Co., Feb. 15.—Plenty of rain and snow the past two weeks; the roads are blockaded in many places. There is an excellent covering of snow on meadows and fall seeding. Live stock is in good condition, but farmers are turning off quite a few cattle as stockers that are only in fair condition compared with former years. There is plenty of roughage at present, but the cold weather requires liberal feeding. Corn 65c; oats 52c; barley 75c; hay \$11.50; butter-fat 28c.

Missouri.
Vernon Co., Feb. 15.—We have had considerable winter for this part of Missouri, but the weather is growing warmer and the farmers will soon be sowing oats. The snowfall was not as great as a year ago, but have had more rain. The roads have been bad most of the winter but are improving now. Wheat is looking very good. There is plenty of feed in the country for home use. Most stock are coming through the winter in good shape. Wheat \$1.40; oats 50c; corn 70c; butter 22c; eggs 20c; chickens 12½c.

Barton Co., Feb. 16.—Wheat looks fine. Some of the earliest sowing is badly infested with the Hessian fly. Roads are in fine shape where dragged, but when not dragged have been pretty bad a good part of the winter. Farmers have plenty of roughness for stock but grain is scarce and high. Dairying has not been very profitable on account of high prices of feed and poor prices for dairy products. Wheat \$1.50; corn 80c; oats 50c; hay \$8; cream 26c; eggs 18c; hogs \$6.25; beef cattle \$5@6.

Kansas.
Lincoln Co., Feb. 15.—The snow is all melted, but so far the wheat had good protection from the severe cold weather. There will be a lot of feterita planted this year and also some of the new Sedan grass will be tried. Cattle are all in good condition, and there are no cattle diseases in this section. Hogs are scarce. Wheat reached \$1.50 per bushel; country butter sells at 20c; eggs 22c.

Colorado.
Kit Carson Co., Feb. 15.—Weather continues fine, only one light snow fall this month, but it was gone in a few days. Roads are splendid. Wheat and rye are in good condition. All live stock looking good. Plenty of feed and some to spare. Not much surplus products for sale as the high prices have caused everyone to sell. Wheat \$1.30; corn 65c; potatoes 80c.

President Wants War on Stumps Now

"There is a shortage of food in the world now and that shortage will be more serious a few months from now than it is now."

"It is necessary that we should plant a great deal more; it is necessary that our land should yield more per acre than it does now; it is necessary that there should not be a plow or a spade idle in the country if the world is to be fed."

PRESIDENT WILSON

Before Chamber of Commerce of the United States February 3rd.

Every day's progress of the war in Europe and Asia emphasizes the dominating position of America as the world's food producer.

There is going to be a tremendous decline in food production in Europe in 1915, because of the millions of men and thousands of square miles of territory engaged in military operations.

It is not only our duty to push our farms to their highest producing possibilities, but it will be greatly to our profit.

We must not only get the maximum production out of every acre of cultivated land, but we must as far as possible put under cultivation thousands and thousands of acres of cut-over timber and swamp land.

The ground occupied by one good sized stump or boulder can produce enough food to feed one person one week.

Don't wait until next spring or summer To Get Rid of the Stumps. By using low freezing explosives you can clear that land before the snow leaves the ground. You can blast ditches before the ground is dry enough to cultivate.



Stumping Powder
IS
Low Freezing

Order through any hardware dealer. Ask him to telegraph. Full instructions free in our Farmer's Handbook No. 100-F.

DU PONT POWDER CO., Wilmington, Del.

ESTABLISHED 1802.

Duluth Office: Fidelity Building.

Markets.

GRAINS AND SEEDS.

March 2, 1915.

Wheat.—This has been a poor week for the holders of wheat. Values show a drop of 12c on the Detroit market. The reasons generally ascribed for the rapid decline is the probability of an early opening of the Dardanelles by the combined English and French fleets of warships, and the general blockade of foodstuffs from Germany and Austria. With this water course opened to commerce it will be possible to send Russian wheat into southern and western Europe to meet the demands of Italy, France, England and Holland. It must be remembered, however, that Russia's crop for 1914 was not a normal one and that the unusual waste due to the exigencies of war and the care with which belligerent nations must maintain adequate stocks of grain, make it probable that with the free movement of wheat through the Dardanelles the market will not go to pieces, except of course, the present abnormal values cannot be paid. One year ago No. 2 red wheat was quoted at 98½c per bu. Prices for the past week are:

	No. 2	No. 1	Red.	White.	May.
Wednesday	1.54½	1.49½	1.58		
Thursday	1.52½	1.47½	1.56		
Friday	1.48	1.43	1.51		
Saturday	1.51½	1.46½	1.54½		
Monday	1.46½	1.41½	1.49½		
Tuesday	1.42½	1.37½	1.45		

Chicago, (March 2).—May wheat \$1.42½; July \$1.16.

Corn.—This grain has suffered with wheat. The supply in this country is much larger than a year ago. There was some surprise Monday, however, when the amount of corn in sight showed an actual decrease for the past week and on Tuesday prices recovered a half cent of the recent decline. Primary receipts are lighter. Argentine promises a corn crop of 335,945,000 bushels of which over 200,000,000 bushels will be available for export. A year ago No. 3 corn was selling at 63c per bushel. Quotations are as follows:

	No. 3	No. 3
	Mixed.	Yellow.
Wednesday	73	74
Thursday	72	73
Friday	70½	71½
Saturday	72½	72½
Monday	70½	71½
Tuesday	71	72

Chicago, (March 2).—May corn 72.6c; July 74.6c per bushel.

Oats.—The bearish feeling in the grain trade has extended to this grain; although traders feel that oats have more native resistance than either wheat or corn. Farmers are holding fewer oats than a year ago when the local price was 44½c for standard. Quotations are as follows:

	Standard.	White.
Wednesday	58½	58
Thursday	58	57½
Friday	56½	56
Saturday	57½	57
Monday	56½	56
Tuesday	56½	55

Chicago, (March 2).—May oats 55.3c per bushel; July 51.3c.

Rye.—Values have declined with wheat. Supplies are small. No. 2 spot is quoted at \$1.19 per bushel, which is 6c below last week's price.

Beans.—Transactions are limited and prices steady. Detroit quotations are: Immediate, prompt and February shipment \$3.05; May \$3.25. Chicago trade firm and unchanged. Stocks are small. Pea beans, hand-picked, choice, quoted at \$3.40@3.50; common at \$3.15@3.25; red kidneys, choice at \$3.25@3.50; at Greenville and other primary points beans are quoted at \$2.80.

Clover Seed.—Market is easy and lower. Prime spot \$8.90 per bushel; March \$8.90; prime alsike \$8.75.

FLOUR AND FEEDS.

Flour.—Jobbing lots in one-eighth paper sacks are selling on the Detroit market per 196 lbs., as follows: Best patent \$7.30; seconds \$7.20; straight \$7.40; spring patent \$7.80; rye flour \$7.10 per barrel.

Feed.—In 100-lb. sacks, jobbing lots are: Bran \$28; standard middlings \$28; fine middlings \$32; coarse corn meal \$30; corn and oat chop \$29 per ton.

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.

Chicago.—Offerings light and demand good. Choice timothy \$17@18; No. 1, \$15@16; No. 2, \$13.50@14.

New York.—Quiet. Prime \$22; No. 1, \$21; No. 2, \$18@19.

Straw.—Steady. Detroit prices are:

Rye straw \$8.50@9; wheat and oat straw \$7.50@8 per ton.
Chicago.—Rye straw \$8@8.50; oat straw \$7@7.50; wheat straw \$7@7.50.

DAIRY AND POULTRY PRODUCTS.

Butter.—Market is dull but prices remain unchanged. Extra creamery 29c; firsts 27c; dairy 21c; packing stock 19c per lb.

Chicago.—Business continues light and prices are slightly lower. Extra creamery 29c; extra firsts 28@28½c; firsts 25@26½c; seconds 23@24c; packing stock 18½c.

Elgin.—The price for the week, based on the majority of the sales, is 29c per pound.

Poultry.—Market is firm with demand good. Prices are higher. Live, Springers 15@15½c; hens 16@17c; ducks 16@17c; geese 14@15c; turkeys 20c.

Chicago.—A fair demand and light receipts keep trading firm. Prices on fowls and springs ½c higher. Turkeys not wanted. Turkeys 13c; fowls 11@15c; springs 13@16½c; ducks 16c; geese 8@10c.

Eggs.—Market is active and easy at prices 5c lower than last week. Fresh stock sells at 19½c per dozen.

Chicago.—Supply is heavy and demand good. Prices are about 3c lower than last week. Miscellaneous lots cases included 18@19c; ordinary firsts 18½@19c; firsts 19½c.

Veal.—Quoted steady at 12½@13c for fancy, and 10@11c for common.

Pork.—Market is steady for dressed hogs, light weights selling at \$8 per cwt; heavy \$7@7.50.

FRUITS AND VEGETABLES.

Apples.—Market is active and well supplied. Baldwins \$2.25@2.50 per bbl; Greenings \$2.75@3; Spy \$3.25@3.50; Steele Red \$3.50; No. 2, 40@50c per bushel.

Chicago.—The demand for apples is fairly good and a much firmer feeling is noted. Prices unchanged. The prices as here quoted are for refrigerator stock. Baldwins \$2.25@2.50; Kings \$2.75@3; Wageners \$2.25@2.50; Jonathans \$3.25@3.75; Greenings \$2.50@2.75; Northern Spy \$2.50@3.50; Western box apples are selling for 90c@92.25 per box.

Potatoes.—Offerings are liberal and demand good. Carlots 35@37c per bu; At Chicago the market is dull and steady with prices unchanged. Michigan white, in bulk, are quoted at 38@42c per bushel. At Greenville potatoes are quoted at 25@27c.

WOOL.

While trading last week was slower the market has lost none of its strength and prices all over the world are tending upward. There seems to be a greater demand for woolen goods than there is wool to be manufactured. Supplies in this country are limited. Americans are in Australia endeavoring to replenish stocks. Michigan fleeces are quoted in Boston at 25@26c for fine unwashed; delaine unwashed 27@28c; ½-blood do. 32@33c; ¾-blood do. 35c per lb.

GRAND RAPIDS.

Both eggs and dairy butter open at 22c this week, with eggs in good supply and in good demand also. The potato market continues dull and it is estimated that one-half the Michigan crop is still in the hands of growers. The bean market is easier, with \$3 the top figure now for the white pea, while red kidneys are quoted at \$2.90. Wheat barely touches \$1.40 this week, while oats are 55c; corn 75c; rye \$1. Timothy hay brings \$11@13. Live poultry is reported scarce, with chickens at 13@13½c.

DETROIT EASTERN MARKET.

Buying was active Tuesday morning and most of the farmers were sold out early. Apples continue to come freely with prices ranging from 40c@51; potatoes 45c; cabbage 30@50c; according to quality; rhubarb 15@35c per bunch; eggs 30c; pork 9c; hay has a good demand with prices from \$17@22 per ton.

THE LIVE STOCK MARKETS.

Chicago, March 1, 1915.
Receipts today. 17,000 42,000 13,000
Same day 1914—19,819 41,743 40,824
Last week30,877 158,539 57,780
Same wk 1914.49,985 151,576 135,131
Only 5,920 cattle, 28,730 hogs and 9,441 sheep were shipped from here last week, comparing with 19,538 cattle, 49,030 hogs and 39,145 sheep for the same week last year.

The week opens with a fairly active demand for cattle, and early sales were at steady prices, but buyers neglected the less attractive offerings, and tried to force them lower, not many having been sold up to noon. Hogs averaged 5c higher, with sales at \$6.20@6.75, and rumors of a \$6.80

top. Pigs went mostly at \$6.10@6.75. Hogs marketed last week averaged 221 lbs., comparing with 226 lbs. a year ago and 232 lbs. two years ago. Sheep and lambs are scarce today, with a good share of the receipts consigned to packers direct from Missouri river markets. Prices are 10@20c higher, with prime lambs selling for \$9.85.

Cattle surprised owners last week by advancing to prices that were quite unexpected at such a time of quarantined markets and consequently restricted demand, but the upward movement shows what may be accomplished by simply shipping in stock conservatively. Pretty much everything in the cattle line shot up in price, even the poorer lots of thin steers on the feeder order sharing in the rise, and by the middle of the week steers were going mainly at a range of \$7@8.75, with the choicer lots of heavy cattle taken at \$8.50@9.10 and good steers going at \$8.25 and upward. On Monday inferior steers went as low as \$5.25, but later in the week common lots sold at \$5.50@6.75, with not much trading in steers below \$6.50, while warmed-up steers brought \$7@7.70 and medium grade steers \$7.75@8.20. Ordinary to prime yearling steers sold at \$7.40@9.15, while butchering cows and heifers found buyers at \$5.10@8.25, few heifers selling above \$8, however, while the best cows sold at \$6.75@7. Cutters advanced to \$4.50@5, canners to \$3.25@4.45 and bulls to \$4.75@6.75. Calves had a good outlet, selling at \$4.75@8 for heavy weights and at \$9@10.50 for light vealers. A re-action set in on Thursday, with cattle buyers holding back, and prices were generally lower, but the decline was not very marked. General conditions have not changed any as yet, and country shippers should continue to follow a cautious course and avoid glutting the market with cattle, especially with immature stock. While fat beefs are in demand, excessive weight is discriminated against by packers, and last Wednesday steers weighing around 1800 lbs. sold at \$8.75, whereas the same day 1592-lb. steers sold at \$9.05 and 1214-lb. yearlings at \$9.10. Some 1542-lb. steers that brought \$9 were not any better than some that sold at \$8.15 during the early part of the previous week. Despite a small decline in prices late in the week, values still averaged 75c@1 higher than early in the previous week.

Hogs were marked up sharply in price last week, several upturns taking place because of the great falling off in the receipts day after day. On some days shippers operated more freely than they have been in the habit of doing of late, and this was quite a help in advancing prices. Prime light weights topped the market, with the heavier pigs at times selling a nickel above the best light hogs, and heavy hogs sold slowly at a discount of 20c or even more. The offerings have been showing up well in their average grading, with no large percentage of pigs. Provisions of late have developed increased weakness, selling much lower, but the rise in hog values has exercised a strengthening influence at times. After prime hogs had sold at \$6.85 as a top, the market declined Saturday to \$6.20@6.75 as an extreme range, with pigs at \$6@6.75 for the greater part. A week earlier hogs sold at \$6.10@6.65. Ten cars of Canadian pigs that averaged from 75 to 97 lbs. brought \$6.25.

Sheep and lambs underwent several sharp advances in prices last week as a result of the continued meager receipts, with fancy western fed wethers going at \$7.75, the best price paid since 1913. Prime ewes sold for \$7.65, prime yearling wethers for \$8.50 and prime lambs for \$9.65, the high point of the year. Colorado fed lambs comprised a big share of the receipts, with goodly numbers of fed western lambs and small offerings of yearlings and sheep. At the close lambs were salable at \$6.75@9.65, heavy ones weighing from 90 to 100 lbs. going at \$8.50@9.15, while yearlings sold at \$7.50@8.50, wethers at \$6.75@7.75, ewes at \$4.50@7.65 and bucks at \$4.50@6. Sheep were mostly 50c higher than a week earlier, while lambs were 75@90c higher, going at the highest February prices on record.

Horses were marketed freely last week, and buying for the armies of Great Britain and France was lively at unchanged prices, but otherwise the demand was hardly up to the average, causing weakness except for good animals. Farm chunks were salable at \$100@160 per head mostly, while inferior horses sold as low as \$60, with limited numbers of horses taken at \$200@250.

A FARMERS' MARKET CONFERENCE.

A marketing conference will be held at the Court House, or other hall, at the times and places indicated in the respective counties as printed below. These conferences have especially to do with improved marketing condi-

tions for the bean crop to be grown in 1915. Jas. N. McBride, acting under the authority of the State Board of Agriculture will be present. The question as to whether farmers are interested in improving marketing conditions will best be answered by a large attendance. Ask yourself and neighbors if it would not be profitable to spend a fraction of one per cent of the time required in crop growing to consider marketing problems.

- Gratiot Co., Ithaca, Monday, March 8, 1:00 p. m.
- Isabella Co., Mt. Pleasant, Tuesday, March 9, 1:00 p. m.
- Clare Co., Clare, Wednesday, March 10, 1:00 p. m.
- Montcalm Co., Stanton, Thursday, March 11, 1:00 p. m.
- Ionia Co., Ionia, Friday, March 12, 1:00 p. m.
- Clinton Co., St. Johns, Sat., March 13, 1:00 p. m.
- Genesee Co., Flint, Monday, March 15, 1:00 p. m.
- Lapeer Co., Lapeer, Tuesday, March 16, 1:00 p. m.
- Sanilac, Sandusky, Wed., March 17, 1:00 p. m.
- Huron Co., Bad Axe, Thurs., March 18, 1:00 p. m.
- Tuscola Co., Caro, Friday, March 19, 1:00 p. m.
- Shiawassee Co., Corunna, Saturday, March 20, 1:00 p. m.
- State meeting at Saginaw, Tuesday, March 23, to complete state organization.

BOOK NOTICE.

"Rural Credits, Land and Co-operative," is the title of a new book by Hon. Myron T. Herrick, ex-American Ambassador to France, and R. Ingalls. The purpose of this book as set forth by the writer is to throw light upon the subject of rural credits and to lay before the American people the customs and laws in operation in other countries so as to prepare the way for more enlightened plans for improving the land and agricultural credit facilities in the United States. Ambassador Herrick has made a long and close study of this subject, both at first hand and through public documents which has enabled him to give the most comprehensive description of the rural credit societies of other countries which has been placed before the public. Mr. Herrick's long connection with one of America's greatest financial institutions as well as intimate connection with public affairs in this country and abroad have enabled him to present the essential facts developed by his inquiry in a manner which will be readily appreciated and understood by the average American reader. The book contains 519 pages, 5x7½ inches in size, published by D. Appleton & Co., New York. Price \$2.00.

"Poultry, How to Make it Pay," is the title of a 60-page booklet published by the United Poultry Farms, of Hope, Indiana. In addition to a price list of pure standard bred poultry and manufactured poultry supplies, this booklet contains chapters on many phases of profitable poultry farming, including, how to raise chickens, diseases of poultry, poultry house construction, etc. It is a profusely illustrated booklet conveniently indexed for reference purposes.

CATALOG NOTICES.

Myers spray pumps for spraying, painting and disinfecting, manufactured by F. E. Myers & Bro., Ashland, Ohio, are fully illustrated and described in a 60-page catalog send upon request by the above company. The types include bucket, barrel, hydraulic and power spray pumps, spray rigs, hose, nozzles, fittings and fixtures, repairs, etc.

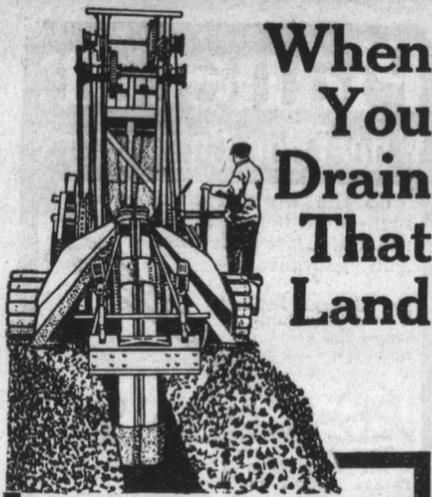
Ross Bros. Co., Worcester, Mass., send a large 1915 catalog of vegetable, grass and flower seeds. In addition to a full line of seeds, this catalog lists many implements and farm accessories in its 120 pages.

Moline Pressed Steel Co., East Moline, Ill., send literature describing the Presteel incubator, Presteel brooder coops, etc., which claims some of the important incubator developments of the year.

Conkey's Poultry Doctor, a handy book of reference on poultry raising, published by the G. E. Conkey Co., manufacturing chemists, of Cleveland, Ohio, is the twenty-fifth edition of this booklet, which will be sent upon request, to Michigan Farmer readers.

The "K" hand power stump puller, manufactured by Walter J. Fitzpatrick, 1926 Second Ave., Seattle, Wash., is fully illustrated and described in a 50-page art catalog sent upon request to Michigan Farmer readers.

Brookwater Farm in a single day of a recent week sold three lots of Durocs for shipment to Texas, Colorado and Oklahoma, besides receiving orders for two shipments in Michigan. This is a good illustration of how the trade for Michigan stock of quality is extending at the present time.



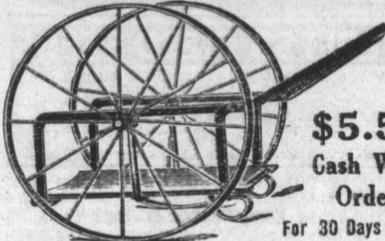
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SAVE \$4 to \$8 PER TON

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Buy the soil elements you need, mix them in the proportions you should use, and save freight charges on useless filler and charges for mixing. This method is not only cheaper, but better. Export Station, colleges, and agricultural lecturers all endorse home mixing for economy and effectiveness. We can ship promptly from principal points. Nitrate of Soda, Muriate of Potash, Sulphate of Potash, Acid Phosphate, genuine Peruvian Guano, Tankage Bone, etc. Get our free booklet on Home Mixing and Formula Table.

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WANTED—Single man on stock farm near Romeo. Must be good milker. Best of references. \$30 per month and board.
M. H. CHAMBERLAIN JR., Romeo, Michigan.

A small quantity of white unhulled **SWEET CLOVER SEED** at \$4 per bu. Sample on request.
T. C. McCULLAGH, Meauwataka, Michigan.

Young Man—Would you accept a tailor-made suit just for showing it to your friends? Then write, Banner Tailoring Co., Dept. 13, Chicago, and get beautiful samples, styles and a wonderful offer.

NO DETROIT LIVE STOCK MARKET THIS WEEK.

Owing to the appearance of foot-and-mouth disease in the Detroit stock yards as announced in the last edition of last week's paper, the yards have been closed for disinfection and there will be no market until the clean-up is completed. In the meantime all shipments of live stock to Detroit will be made direct to local packing plants.

LIVE STOCK NEWS.

Recent sharp advances in prices for cattle in the Chicago market go to show what may be accomplished when stockmen hold back supplies for a short time. Cattlemen should remember that at the present time even fair supplies cannot be sold on the market without weakening prices, as has been shown repeatedly. Nor should it be forgotten that for several months the country east of the Missouri river has not been receiving any feeding cattle, and all this time owners of cattle have lost no opportunity to hurry them to market whenever any relaxing of quarantines permitted. Even the inferior thin steers of light weight, as well as the half-fat cattle, have been headed marketward most of the time, and after the foot-and-mouth disease is exterminated it will be found that the country faces the greatest scarcity of beef cattle known in many years. Unfortunately for owners, there are many cattle that have matured and must be marketed to prevent further losses to owners, and many cattle are sold every week that bring below their first cost as feeders. This is unavoidable, but owners who market thin cattle at the present time are making a serious mistake, notwithstanding the dearth of corn and other feed. Such cattle go at extremely low prices, local packers being in a position to dictate terms.

Hogs have been marketed with great liberality at western packing centers for months, the result being that the manufacture of cured meats and lard has attained enormous proportions, and stocks of provisions in the leading western packing cities have been increasing much more rapidly than in former years. Stocks are now much larger than in recent years, and, unfortunately, the failure of retail meat market to lower prices in accordance with reductions made by packers stands in the way of their normal consumption. Fresh pork is having a very large consumption everywhere, being the lowest priced meat to be had, but hams, bacon and other cured hog meats retail extremely high.

Recent substantial advances have taken place in prices for fat lambs, yearlings, wethers and ewes in the Chicago market, due to the extremely small receipts. Conditions are greatly in favor of sellers, notwithstanding abnormal markets just now as a result of strict quarantines maintained on account of the foot-and-mouth disease, but great caution is required in the holding down of daily supplies to square with the limited trade requirements. Fresh pork is competing with mutton in the meat markets of the country to a much greater extent than ordinarily, but when sheep and lambs sell as high as they have been lately, prices cannot fail to have its influence on the markets of the country later on. Recent prices for sheep and lambs have ruled far higher than a year ago.

A Danish ship has arrived in San Francisco with a cargo of 90,000 dozen eggs from China, the largest cargo of that kind ever received in that port. The ship took the Panama Canal route instead of passing through the Suez Canal in order to lay in a supply of fuel oil, which is just now very cheap in California.

Efforts are being made in Chicago to bring about five market days in every week for cattle, hogs and sheep, instead of having big supplies on Monday and Wednesday and slim supplies on other days. With demand mostly from local slaughterers, this plan is commendable, as it would work favorably for both sellers and buyers. It should be remembered that under present quarantine orders, all live stock arriving in the stock yards must be slaughtered within 48 hours.

Breeding cattle are in good demand and stockmen are investing in a higher grade of bulls as a rule than in past years. Unfortunately, the quarantines and foot and mouth disease are injuring this trade in parts of the country.

Beef-eaters are complaining that while prices for cattle in the Chicago market have fallen recently to the lowest level reached in three years, prices for beef roasts, steaks, etc., are as high as ever, the retail meat markets failing generally to reduce their prices in accordance with reductions made within a short time by the packing concerns. The packers have, it

is true, not lowered their prices as much as they should to equalize the great decline in cattle values, but they have at least made fair reductions, late quotations showing that No. 1 loins were wholesaling for 18 cents per pound, comparing with 23 cents at the middle of last December. They have lowered No. 1 ribs from 17 cents to 15 cents, No. 1 rounds from 12½ cents to 11 cents and chucks from 12½ cents to 10½ cents.

The first direct shipment of wool from Argentine in a quarter of a century has arrived in New York. The amount is given as 200,000 pounds, and it is said to be of first-class quality. This importation relieves the wool situation temporarily.

A quarantine order issued at Washington permits shipments of cattle between the quarantined states from those areas in each state which are not under quarantine. For instance, the free counties of Indiana, Ohio, Pennsylvania, or any other state under quarantine. Shipments of cattle for immediate slaughter can be received in the quarantined states from states not under the ban.

"Building the Dairy Barn"
By W. D. JAMES
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THIS valuable book will help every man who expects to build a new barn or remodel his old one. It is given to interested dairymen. Whether you intend to do the work yourself or hire a builder, you should have this free service from W. D. JAMES and his corps of barn experts.

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170 Acres of sandy loam with eleven room house, basement, barn (new) 78 x 32, tool shed, corncrib, shop, hen house, stock shed 14 x 40, windmill and cistern. Fruit—apple and plum trees, grapes and 3 acres of huckleberry marsh and timber. This farm is located on the shores of beautiful Duck Lake with about one half mile of water front which would make a fine summer resort. About 2/3 of it is hard land. Teams will meet forenoon trains at Clyde on the P. M. Oakland Co., Township of Highland, Bell Phone Highland.

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For Trade, for good Southern Michigan farm land, 42 acres in southern New Mexico under Irrigation, and government dam, mostly alfalfa. J. C. Francis, Argos, Ind.

76 ACRES—Near Lansing, Mich. Buildings, wire fences, tile drains, clay soil, 2a. orchard; all of the best; close to market. E. Belden, Dimondale, Mich.

Wanted to hear from owner of good farm for sale. Send cash price and description. D. F. BUSH, Minneapolis, Minn.

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

MICHIGAN FARMING LANDS
Near Saginaw and Bay City, in Gladwin and Midland Counties. Low prices. Easy terms. Clear title. Write for maps and particulars **STAFFELD BROTHERS, 15 Merrill Building, Saginaw, (W. S.), Michigan.**

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Good buildings, good soil. Price \$12,000. Also 125 acres at \$50 per acre. Estate of Jus. in Wentworth, 507 Phoenix Bldg., Bay City, Michigan.

Farms Wanted—We have direct buyers. Don't pay commissions. Write describing property, naming lowest price. We help buyers locate desirable property free. American Investment Association, 10 Palace Bldg., Minneapolis, Minn.

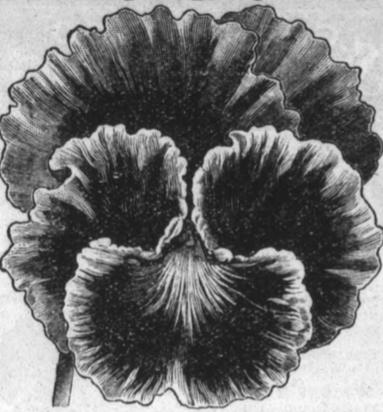
PROFIT-MAKING Farm Lands in best districts of South, growing greatest variety of crops, giving best home locations. Shall we give you information? **M. V. RICHARDS, Ind. & Agri. Commissioner, Room 78, Southern Railway, Washington, D. C.**

FOR SALE—80 Acre farm with house, barn, corn cribs, orchard, fenced with woven wire fence, team of horses, cattle, hogs, and all the farm tools needed, 70 acres cleared, soil good sandy loam. Price \$2800, payment down and easy terms. If interested write or call on **J. M. McFARREN, Rapid City, Michigan.**

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Only 4 miles from Gladwin, 6 miles from Beaverton. Fine clay loam, fine locality, 2 telephones and R. F. D. 60 acres well improved, balance fine unimproved land. This 80 acres is a part of my 280-acre farm. It has only a new 4-room cottage house, no other buildings, but you can build barn to suit, as I shall make the price on that basis. Write at once for particulars.
U. G. REYNOLDS, GLADWIN, MICHIGAN.



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PURE FIELD SEEDS Clover, Timothy, Alsike, Alfalfa and all kinds of Pure Field Seeds direct from producer to consumer. Free from noxious weeds. ASK FOR SAMPLES.

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SWEET CLOVER SEED—White and large biennial yellow. Prices and circular on request. **EVERETT BARTON,** Box 129, Falmouth, Kentucky.

SWEET CLOVER SEED We buy or sell. **YOUNG-RANDOLPH SEED CO., Owosso, Michigan,**

Garden Seeds—Wholesale price to you 50 per oz. for vegetable seeds, etc. Write for Catalog today. **ALLEN'S SEED HOUSE, Dsk. M, Geneva, Ohio**

Choice SEED POTATOES Northern Grown. CATALOGUE SENT ON REQUEST

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STRAWBERRY PLANTS—35 Varieties, \$1.65 per 1000, valuable catalog free. **MAYERS PLANT NURSERY, Merrill, Mich.**

The Essentials of Pruning Fruit Trees.

WHEN our practices in agriculture are based upon suggestions we get from nature, they are very likely to be right because the practices are carrying out the natural work to a much more effectual degree than nature can. Often we err in overdoing or underdoing the work but we learn by experience and are therefore constantly and gradually making changes in our methods.

Pruning is one of our orchard methods based upon a natural process. Nature is constantly changing the old for the new and discarding those not fit to survive. In trees, to start with, all sorts and conditions of limbs and branches grow. Later, those which have gotten the best of the struggle remain and the others die. The natural process of elimination, however, is a long and crude one. Therefore the pruning shears and the saw in the hands of a man with the proper knowledge of pruning will accomplish in a few hours what nature takes years to do.

The Young Tree's Critical Time.

When a young tree is transferred from the nursery to the orchard it goes through a critical period. Its equilibrium has been disturbed. It is dormant under artificial conditions for a while, and when planted again it will have to adapt itself to entirely new conditions. We should, therefore, make it as easy as possible for the

ravage of this insect will not destroy them all.

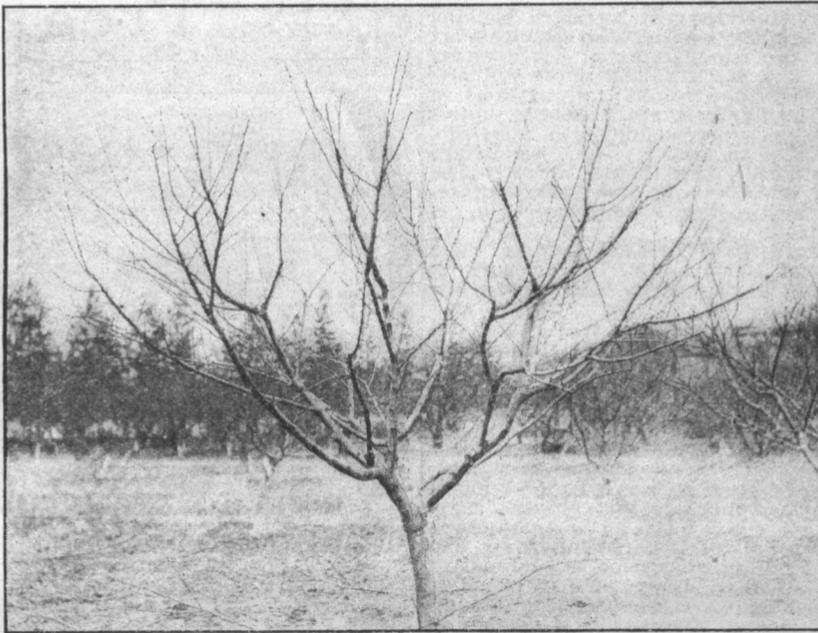
Trimming the Young Tree.

The ideal way to start a young tree is to leave from three to five scaffold limbs so placed as to form a well-balanced head. These should not start from the trunk so as to form crotches and should be about two inches from each other. Often the ideal head can not be formed at the start and that work will have to be done during the second or third years.

The pruning of the young tree up to bearing time should be nothing but correcting evil tendencies of growth. The reason for this is that there is a distinct relation between the wood growth and fruit production and in pruning the young tree we encourage sappy wood growth and discourage fruiting. By pruning when young the fruiting of a tree is often delayed for several years. Varieties which tend to bear early such as the Wagener apple, it might be advisable to prune before they come in bearing, but on such as the Spy it would be folly to do so.

Trimming Ill-shaped Trees.

Cross limbs and lob-sided tops might be called evil tendencies of growth. Cross limbs should be cut out every year. In the case of lob-sided tops we usually find one or two limbs which are much stronger and larger than the rest. They often ex-



A Peach Tree After Pruning.

tree to start. Therefore, in pruning the young tree we should cut away all of the bruised roots and cut back all others to about six inches in length. The roots left are of little value to the tree in gathering their food, but the new roots that start from them are. To encourage the growth of young roots the cuts on the old ones should be made parallel to the ground and not at right angles to the root itself. The roots are left six inches long for anchorage purposes mainly.

Leave Plenty of Live Buds.

Because the roots are cut back considerably and are at disadvantage in supplying the tree with the food it needs, the tops should be cut back so that there will be less of the tree to support. We might cut all trees to a whipstalk if it were not for the fact that we would cut too many of the live buds off and thus make it necessary for the tree to force dormant ones to start growth. Unless growing conditions are very satisfactory the tree has a hard pull of it to grow. On year-old trees the whipstalk is often satisfactory because there are quite a few live buds along the trunk of the tree. Therefore peach trees are often pruned that way. On account of the prevalence of the climbing cutworm it should be considered when pruning and extra buds left so that a night's

tend a foot above the rest of the top. The common practice is to cut these back to the height of the rest of the tree. This does not rectify the trouble, as those limbs will still be the strongest and will therefore make the most rapid growth. The proper method is to cut them out altogether, even if it makes an ill-shaped tree for a while. By doing this the remaining limbs have an equal chance for growth and the result, with proper training, if necessary, is a well balanced top. The vase form of tree is the best for all kinds of fruit. This is obtained by cutting out the center limb and leaving scaffold limbs as suggested before.

Pruning Peach Trees.

Peach trees have a different character of growth than other fruit trees and therefore need somewhat different treatment. Each year the young tree should be pruned to properly direct the shape of the top and to cut out useless weak limbs. The peach produces much more annual growth than other kinds and if left unpruned would soon have a brushy and tangled top, and in a few years the lower limbs would die on account of the crowding. The principal objects in pruning a peach tree is to control its production and to keep the bearing wood on low tops. All of the weak growths should be cut out and the others cut back some, and in many cases the leader

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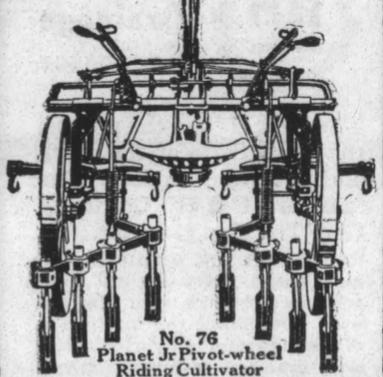


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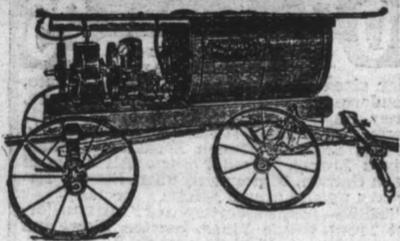
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growth of each limb cut out altogether.

The present tendency is toward less pruning on all kinds of tree fruits. After the tree comes into bearing, all that is necessary is to do slight annual pruning, cutting out branches where they are too thick, and those which cross. Cherries need practically no pruning, while the other kinds, excepting peaches, need the slight amount mentioned.

The main thing in pruning is to have a definite idea as to what the ideal shape of the tree should be and then prune to get that shape. The most practical ideal is the vase form with limbs far enough apart to let the sunshine in. The bearing wood should be kept as low on the top as possible so as to facilitate picking and spraying. Therefore, the tendency of pruning should be downward instead of upward. Do not cut the lower limbs off unless they are so low as to interfere with cultivation. The palm tree type of fruit tree indicates that the pruner works where most convenient and is too lazy to get a ladder and prune from the top down, or he is very ignorant regarding what the shape of a fruit tree ought to be.

Best Pruning Tools.

The best pruning tools are the California hand pruning shears and the pruning saw. Long-handled pruning tools of all kinds are conducive to careless work because the work is done at long range. With the two tools mentioned, a ladder, and a pair of rubbers on the feet one is equipped to get to most any part of the tree to prune. The rubbers are to protect the large limbs when one is climbing about in the tree.

March is the ideal time for pruning because the cold weather is over by that time and as the sap starts flowing soon after, the wounds start healing quickly. It is rarely possible to prune during that month on account of other work, so one must prune earlier. Any time during the winter will do as no injury will result from winter-pruning. Summer-pruning, early in July, is thought to check wood growth and encourage the formation of fruit buds and winter pruning to encourage wood growth. If the trees are making excessive growth, summer-pruning had better be practiced. Care must be taken, however, to not prune much after the middle of July, as new growth will start which will not mature before the winter sets in.

An important factor in pruning is to make the cut properly. No stub should be left, but the cut made close to and parallel to the remaining limb. The cut should always be made with sufficient slant to allow water to drain off readily.

The practice of pruning is simple but it should be carefully done. Careless pruning, or pruning done by one who does not know the objects of pruning, will cause injury which often cannot be overcome in years.

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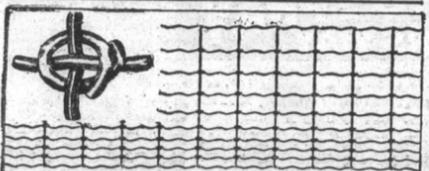
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Practical Science.

FOOD LAW ENFORCEMENT IN AND FOR MICHIGAN.

BY FLOYD W. ROBISON.
(Continued from last week).

Under the first clause, as will be seen, an article is adulterated if any substance or substances have been mixed with it, so as to lower or depreciate or injuriously affect its quality, strength, or purity. Under this clause would fall cases of adulteration such as the addition of water to milk, or the addition of chicory extract to coffee extract, or the addition to a genuine article of any inferior or cheaper substance whether harmful or not.

Under the second clause would come the addition of cottonseed oil to lard, for example, or the substitution of renovated butter in part or in whole for creamery or dairy butter, or the substitution of an artificial extract in part or in whole for the genuine extract.

Under the third section: "If any valuable or necessary ingredient has been wholly or in part abstracted from it" would fall the removal of butter-fat from milk or cream below the minimum limit, or the exhausting of tea leaves before selling the dried tea, or the exhausting of coffee beans to make a coffee extract and then subsequently curing and selling the residual coffee bean.

The fourth clause is self-explanatory, referring to diseased and decomposed animal or vegetable foods.

The Crucial Test.

The fifth clause is one of the most important, if not the most important, clause in the act. It reads: "If it is colored, coated, polished, bleached or powdered whereby damage or inferiority is concealed or if by any means it is made to appear better or of greater value than it really is." Many times the manufacturer asks the question if his product, handled in his particular way, falls within the scope of the food law, and usually if the question is asked, if by any means it has been made to appear to be, or to be, of greater value than it really is, the question is very simple in its answer.

Butter Coloring Exempted.

The sixth clause is an important one, and it is the clause of the food law which has brought the greatest embarrassment to an executive department in securing its enforcement. This clause reads: "If it contains any added substance or ingredient which is poisonous or injurious to health; Provided, that nothing in this act shall prevent the coloring of pure butter." It will thus be seen that the provisions of the food law specifically exempt the coloring of butter from its provisions.

The express permission given in the statute to the coloring of butter has been a source of very great annoyance at times to executive officials charged with the enforcement of the law. We do not wish to be understood at this point as urging the abolition of this clause of the law for we realize that there is good ground for the use of coloring matter in butter and was at that time considered ample by the Legislature, but it has been nearly the only point that the enemies of a food law could bring to bear against the integrity of the law itself, claiming by this that there was a specific exemption in favor of one class of producers. We personally think that the use of butter color may be avoided but the discussion concerning its use we will reserve for some future time.

I will be a man among men; and no longer a dreamer among shadows. Henceforth be mine a life of action and reality! I will work in my own sphere, nor wish it other than it is. This alone is health and happiness.—Henry W. Longfellow.

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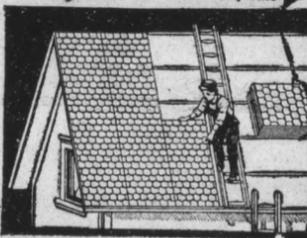
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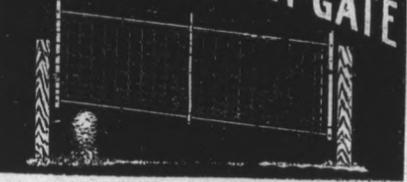


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Offers best trees, plants, shrubs, also seed oats, potatoes and greatest catalogue ever grown.
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Michigan's best, hardy, well rooted stock from old established growers. All varieties of Strawberries, Raspberries, Blackberries, Currants, etc. Also the great Everbearing Strawberry. Moderate prices.
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Michigan White Cedar Fence Posts, 7 ft., 8 ft., and 10 ft., lengths. Special attention given to farmer club orders. Write for prices and terms. F. G. COWLEY, Oscoda, Mich.

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Grange.

Our Motto:—"The farmer is of more consequence than the farm, and should be first improved."

STATE GRANGE OFFICERS.

Master—John C. Ketcham, Hastings.
 Overseer—C. H. Bramble, Tecumseh.
 Lecturer—Dora H. Stockman, Lansing.
 Secretary—Jennie Buell, Ann Arbor.
 Treasurer—Frank Coward, Bronson.
 Executive Committee—C. S. Bartlett, Pontiac; Geo. B. Horton, Fruit Ridge; J. W. Hutchins, Hanover; W. F. Taylor, Shelby.

PROGRAM FOR MARCH.

"We invite you to work with us as we propose to work with you for the good of all of us."—Chas. M. Gardner.

State Lecturer's Suggestions for First Meeting.

Music, a temperance song.
 Roll call by ten people giving ten reasons why they want a "Dry" county.

How can the Grange co-operate with other forces to help in the "Dry Campaign?"

Reading, "Uncle Sam's Soliloquy." Resolved, that we favor "business roads," and a "pay-as-you-go" policy, by two men.

Refreshments, candy and peanuts.
 Music, an Irish song in costume.

WAYNE AND WASHTENAW.

A joint session of the neighboring Pomonas of Wayne and Washtenaw was recently held at Plymouth. Some 300 people attended, representing every Grange section of the two counties.

Plymouth Grange, upon which largely fell the responsibility of hostess, is admirably outfitted and met the occasion finely. Its commodious, well-equipped building, with hall, dining-room, kitchen, and smaller rooms, afforded comfort and delightful hospitality to all.

Both of these old Pomonas are well officered, Wayne having for its master, Hon. Chas. E. Downing; Lecturer, Mrs. Edith M. Wagar; Secretary, J. W. Brighton. Washtenaw's leaders for 1915 are, Master, Joseph Glasson; Lecturer, Mrs. C. E. Sperry; Secretary, Mrs. H. H. Kelly. Annual reports of progress, membership and financial resources made by each organization was a feature of the morning meeting, which showed both to be in sound, prosperous condition.

Resolutions were adopted as follows: 1, commending the market commission bill to favorable attention of all local Granges; 2, protesting to Representative Beakes, of the second congressional district, against his vote on submission of the prohibition amendment to the people.

The program of the day was a joint product. Music was furnished by Plymouth Grange orchestra and North Sylvan quartette, both of which have more than local reputations for attractive musical ability. Lecturers reported plans for the year; the lecturer of Harmony Grange telling of a capital new plan in vogue in her Grange whereby officers and chairmen of committees meet occasionally for round-table conference upon good of their local Grange. A paper by Mrs. Wm. Scotney, lecturer of Ypsilanti Grange, upon "Reading as a Recreation for Farmers' Wives," was a bit of poetic prose, evidently out of the writer's happiest field.

JENNIE BUELL.

If you don't make the Grange meetings pleasant and enjoyable, your young folks will go somewhere else in search of a pleasant hour.

Carry out the Ritual faithfully, and do it in a way that wins the approval of the members.—Lecturer's Bulletin.

COMING EVENTS.

Washtenaw and Wayne Pomonas in joint session, at Ann Arbor, March 9.—Master J. C. Ketcham will be state speaker.

Farmers' Clubs

Address all communications relative to the organization of new Clubs to Mrs. J. S. Brown, Howell, Mich.

Associational Motto:

"The skillful hand with cultured mind is the farmer's most valuable asset."

Associational Sentiment:

"The Farmer: He garners from the soil the primal wealth of nations."

CLUB DISCUSSIONS.

A Prosperous Year and Outlook.—Looking Glass Valley Farmers' Club is enjoying a most successful year. Beginning with a banquet where 150 guests were seated, while 25 sons served, and the same number of daughters catered, with a fine orchestra, Prof. Anderson as speaker of the evening, former President A. B. Niles, toastmaster, and a long array of toasts by McBride, of the state, Townsend, of the county, and several by the local Club, the program of the year has moved with a rush. We have had an apple day, poultry day, and corn day, with fine exhibits at each, also a musical day, with women's day still in store for March. The Club has studied "Renovation of wornout soils," discussed "My best crop and how I raised it," and "co-operation." At the February meeting Mrs. Libbie Rice gave our Club history in rhyme, stating that we were 11 years old and had held 84 regular meetings, besides picnics, parades and patriotic celebrations as side issues. Mrs. Rice was elected Club historian. The Club is maintaining a lecture course costing \$245, and have plans well under way for a still better course another winter. We have a twine and fertilizer committee, whose business it is to purchase these articles for the Club. While the Club has done much to better our community, we are hoping that the future will open up many and broader fields of usefulness.—Bel Maier, Program Committee.

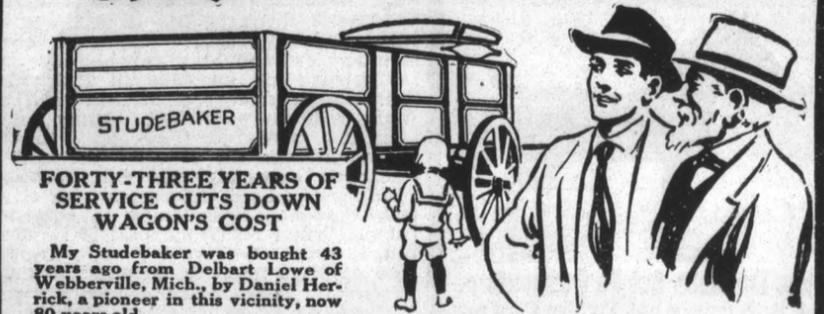
Plan Union Meeting.—The February meeting of the Indianfields Farmers' Club was held on Thursday, February 18, at the pleasant home of Mr. and Mrs. Roy Henry, in Juniata. A large crowd of members and invited guests were present. Among them were Mr. and Mrs. C. Edgar, who were charter members, and Mr. Edgar was the first president of the Club about 15 years ago. A fine dinner was served by Mrs. Clara Miller, and after the usual social hour the committee made their report in regard to the union meeting to be held at the M. E. Church, March 4, at Caro. Mrs. Robt. Park read a paper, "Washington as a Farmer." Paper by Mrs. Agnes Terry, and two solos by Mrs. Castle Taggett. The question box was full of timely questions which were answered satisfactorily. The Club adjourned to meet March 18 at the home of Mr. and Mrs. Frank Arnold.—Mrs. Margaret Arnold, Cor. Sec.

Elect New Officers.—The February meeting of Columbia Farmers' Club was held at Riverside, with Mr. and Mrs. W. J. Randall. An excellent paper "The Farmer of the Future," was read by Mr. C. J. Harper. Mrs. Ball read a selection. Mr. and Mrs. Hitt gave a vocal duet and Miss Jedel, of Dexter, a guest of the Club, gave a piano solo. Mrs. Jennie Neely read a paper on "Club Duties," and thought the members were not so hospitable now as some twenty-eight years ago, when the Club was first organized. The election of officers was held as there was no January meeting. The next meeting will be held with Mr. and Mrs. C. H. Hewitt in March. Following are the officers for the coming year: President, Clarence Cook; vice-president, Mrs. C. J. Harper; secretary, Mrs. George Friedrich; treasurer, Miss Jennie Neely; chorister, Mrs. C. M. Davison; chaplain, A. W. Dann; reporter, Miss Maude Smith.—Maude Smith, Reporter.

A Lincoln Meeting.—The Watson Road Farmers' Club met in February at the pleasant farm home of Mr. and Mrs. William Richardson for an all-day meeting. There were about 50 present who did ample justice to the bounteous dinner served by the ever ready ladies. Each one answered to roll call by naming a money-saving proposition. Discussion on "How can the producer come in closer contact with the consumer?" led by Daniel Baughman. Discussion on household saving devices, led by Mrs. Pearly Richardson. The question box was very interesting. A paper on the life of Lincoln, by Mrs. A. P. Rogers. The program also consisted of songs, readings, and prayer by the chaplain. Club adjourned to meet at the home of Mr. and Mrs. Claude Fliinn, March 11.—Andrew Richardson, Cor. Sec.

Studebaker

WAGONS BUGGIES HARNESS



FORTY-THREE YEARS OF SERVICE CUTS DOWN WAGON'S COST

My Studebaker was bought 43 years ago from Delbart Lowe of Webberville, Mich., by Daniel Herrick, a pioneer in this vicinity, now 80 years old.

In 1887, S. E. Dean bought the wagon from A. B. Herrick, Daniel's son.

Eight years ago L. C. Dean, son of S. E. Dean, bought the wagon from his father and still uses the wagon on his farm.

The wagon has stood out of doors for 26 years; a yard and a quarter of gravel can be drawn in it now.

Levi C. Dean,
 R.F.D., Webberville,
 Mich.

A Studebaker that has served three generations—

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Think of the money that sturdy Studebaker wagon has made for every one of its four owners.

But that's the way with Studebaker wagons—they are a fine investment for they always pay dividends on the original cost.

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It is true a Studebaker wagon may cost you a few dollars more than a cheaply made wagon but when you consider the years of service you get from the Studebaker isn't it much the cheaper wagon in the end?

In fact, it is a safe proposition to judge

your wagon by what it costs you per year. Records prove that you can expect at least thirty-five years of service from a Studebaker. Figuring that way it is the cheapest wagon in the world. Studebaker also makes Buggies and Harness warranted to give satisfaction.

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HORSE**

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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, No. 26-38 East Congress St., Detroit,
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state that the ringbone is cured. I give her severe
drives ever since, without any trace of lameness. This
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Hingbone—Thoroughpin—SPAVIN or ANY—Shoulder,
Knee, Ankle, Hoof or Tendon disease. 19 Years a
Success.

WRITE and we will send our "SAVE-THE-HORSE
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in your home who
can lay the table?

Girls who are learning to help mother and thus
becoming good housekeepers—girls who are am-
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symptoms of the case in full; also
name and address of writer. Initials
only will be published. Many ques-
ries are answered that apply to the
same ailments. If this column is
watched carefully you will probably
find the desired information in a re-
ply that has been made to someone
else. When reply by mail is request-
ed, it becomes private practice, and a
fee of \$1.00 must accompany letter.

Looseness of Bowels—Hide-bound
Horse.—We have a 12-year-old brood
mare that was served last October
which is troubled with looseness of
the bowels. We feed her two quarts
of oats and a few ears of corn; she
has hay and straw to eat. We also
have a 13-year-old mare that is hide-
bound, has a rough shaggy coat and
scratches on one hind leg. I forgot to
say that we keep them in the same
stable with our cows. J. W. S., Fre-
month, Mich.—Give your mare 1 dr.
of powdered sulphate iron, 2 drs. of
powdered catechu, 1 dr. of ground cin-
namon, ½ oz. ground ginger at a dose
in feed three times a day. Give your
hide-bound horse a teaspoonful of
hypo-sulphite of soda and a table-
spoonful of Fowler's solution at a
dose in feed three times a day. Apply
one part oxide of zinc and three parts
vaseline to sore heels twice a day.

Ringworm.—My calves, ranging
from six months to one year old, all
seem to have a growing scab disease
over the eye and I am quite sure one
gives it to the other. E. A., Washing-
ton county, Mich.—Your calves suffer
from either ringworm or warts. Ap-
ply iodine ointment to sore parts cau-
tiously every day or two.

Caked Udder.—I have a cow that is
troubled with a caked udder and as
she has been fresh for only four
weeks, I am anxious to save her bag.
B. N. C., Sherman, Mich.—Apply one
part fluid extract phytolacca, one part
fluid extract belladonna and five parts
olive oil to caked portion of udder
twice a day. Give ½ oz. of hypo-sub-
phite of soda at a dose in feed three
times a day.

Indigestion.—I have a bunch of pigs
three months old that went wrong on
account of feeding them too much salt
in swill. They appear to have lost
use of hind legs and are inclined to
eat rotten straw in preference to good
food. D. B., Emmett, Mich.—Discon-
tinue feeding your pigs corn, but feed
oats, oil meal, a little tankage and
give each one 15 grs. hypo-sulphite of
soda and 20 grs. ground gentian at a
dose in feed or as a drench two or
three times a day.

Bunches in Udder—Enlarged Liver
in Chickens.—I have a cow that has
three or four hard bunches in one-
quarter of her bag, and she does not
give more than one-half as much milk
out of this quarter as she should.
What can I do to prevent chickens dy-
ing of enlarged liver. G. B., Hudson-
ville, Mich.—Apply one part iodine
and nine parts fresh lard directly over
bunches every day or two. Feed less
fat-producing food to your chickens
and see that they get more exercise.

Leucorrhoea.—I have a mare that is
14 years old, troubled with leucorrhoea
and I would like to know what to do
for her. W. G. H., Vestaburg, Mich.—
First of all your mare should have
good care, not overworked, and well
fed. Give 1 dr. of sulphate iron at a
dose in feed three times a day. Dis-
solve ½ dr. tannic acid and 2 drs. of
carbolic acid in a quart of water and
inject her twice a day.

Hacking Cough—Scours.—My driv-
ing horse has been troubled with a
hacking cough for sometime and a
sort of rattling in his throat. I would
also like a remedy for scours in calves
that are raised on creamery milk. S.
D., Lawndale, Mich.—Rub throat with
one part aqua ammonia and two parts
camphorated oil every day and put 1
oz. of guaiacol in 15 ozs. of raw lin-
seed oil and give 1 oz. at a dose two
or three times a day. Give each calf
a teaspoonful of bicarbonate soda at
a dose with their milk two or three
times a day. This is dose enough for
a calf six or eight weeks old. I also
suggest that you feed calf out of a
clean pail.

Bog Spavin.—Eight-year-old horse is
troubled with bog spavin and I would
like to know how to treat him. E. B.
P., Sherman, Mich.—Clip off hair and
apply one part powdered cantharides
and four parts fresh lard, or you can
safely use any of the commercial spav-
in remedies that are regularly adver-
tised in this paper. The treatment
should be persevered in, in order to
obtain permanent results.

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**A Horse Knows a Good
Thing When He Sees It!**



If your horses or
mules are clipped
before the spring
work begins they
will get all the
nourishment from
their feed — be
healthier and look
better. They will dry
off quickly, be more
easily cleaned and feel
better generally — that
means work better.

If you want to sell them, they'll bring a much better price.
Insist on having the Stewart, the machine that turns easier,
clips faster and closer and stays sharper longer than any other. Gears
are all cut from solid steel bar. They are enclosed, protected and run
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You can easily net from 15 to 20 percent more from every sheep you
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old, wt. 2800 lbs.; One Pair of 5 yr.
old Percherons, wt. 2300 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 lb. foal to 2200
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one Bay Road Horse 4 yrs., sired by Online. Horses
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at bargain prices. Terms to
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30-lb. cow and 3 beautiful daughters. 25-lb. cow and daughters. Others with records up to 24.75 lbs. Every producing animal with an A. R. O. record, nearly all out of A. R. O. dams. Mostly granddaughters of Hengerveld DeKol and Pietertje Hengerveld's Count De Kol. Write for catalog.

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CATTLE.

ABERDEEN-ANGUS

HERD FOUNDED IN 1900. Strains represented consist of Trojan Ericas, Blackbirds and Prides, only, Black Quality Itos, a bull of rare individuality and merit, heads the herd. WOODCOTE STOCK FARM, Ionia, Mich.

AYRSHIRES—One of the foremost dairy breeds. The most economical milk producers. Calves for sale. White Leghorn cockerels; Duroc Jersey swine. Michigan School for the Deaf, Flint, Michigan.

Four Pure Bred Angus Bulls. Extra good ones. One show bull. Eight and nine months old. Priced reasonable. Inquire F. J. WILBER, Ohio, Mich.

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BEACH FARM GUERNSEYS

OUR HERD BULLS ARE:

1st Rosett's Strainford of Ingleside No. 22583 with six dams that average 706 lbs. fat.

2nd Violet 3rd, son of Iowa No. 24107, with four dams that average 697 lbs. fat and three sires with over 90 A. R. Daughters, and his grand dam is champion three-year-old cow of all breeds.

3rd Horizon No. 23091 whose dam made 632 lbs. fat. Bull calves from these Sires and A. R. Dams and also a few older Bulls for sale.

EVERY BULL GUARANTEED TO PLEASE. CAMPBELL & ANGEVINE, COLDWATER, MICHIGAN.

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FOR SALE

at reasonable prices some fine young registered

Holstein Bulls

from 3 months to 15 months old, from A. R. O. Dams of high butter records.

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Registered Holstein Friesian Sires—Grandsons of the World's Greatest Dairy Sire. They are out of choice A. R. O. dams. Their sire is:

Half brother to the World's record cow 44.15 pounds in 7 days. Average record of 59 dams in his pedigree 31.25 lbs. in 7 days. Average per cent of fat three nearest dams 4.37. Sires in first three generations already have over 500 A. R. O. daughters. Prices reasonable so you can have the best.

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Ready For Service.

From a grand daughter of The King of the Pontiacs, bred by a bull that is more than a half brother to the Champion Holstein Cow of the World, and whose dam is a 30 lb. 6 1/2% fat daughter of Pontiac Aggie Korndyke who has more 30 lb. daughters than any other living bull. If you do write for pedigree.

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Reg. Holstein Bull calves and Herd Bull. Can supply all wants in Reg. Chester White swine. Ray B. Farham, Bronson, Mich.

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March 12 Opholt Bros. O.I.C. Bred Sow Sale March 12

FRIDAY, MARCH 12.

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A high class offering of choice O. I. C. bred sows and gilts and fall gilts, sired or bred to such famous boars as Frost's Challenger, Glenwood Chief, Frost's Glenwood, Glenwood O. K., Sid's choice, a son of the Grand Champion boar, Mikado II. A great chance to get choice foundation stock. Don't miss it.

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Our Herd Sire

Long Beach De Kol Korndyke

Has a \$20,000 Sire, a \$10,000 Dam,

(year's record: Milk 21393; Butter, 1226 lbs. 50% fat.) She has a \$20,000 sire with 9-30 lb. daughters. She also has a \$10,000 dam, (year's record: Milk, 23022; Butter, 1083 lbs. Bull calves ready for Service \$100 up. F. S. KENFIELD, Proprietor, LONG BEACH FARM, Augusta, Mich.

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A few females for sale.

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Purebred Registered

HOLSTEIN CATTLE

Superintendent Smith of the Geneva Experiment Station says the average production of butter-fat per cow in New York State is about 100 pounds per year. The State College in Ithaca has a cow descended from common stock on one side and from a line of purebred Holstein sires on the other. This cow has produced 479 pounds of fat in a year.

This is interesting as proof that intelligent improvement of grade herds can multiply the butter yield by four and five.

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Herd sire Maplecrest Korndyke Hengerveld, the only sire of any breed having a dam and grand dam that each made more than 1200 lbs. of butter in a year, and he was sired by the only bull of any breed that sired three cows each making better than 1200 lbs. of butter in a year, one but four years old. Maplecrest Korndyke Hengerveld is in a class by himself.

A few fine young bulls sired by him from A. R. O. cows for sale; also a few choice females in calf to him for sale.

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A "BARGAIN" "ONLY" \$50

Regis tered Holstein Bull Calf. Best blood and best A. R. O. backing on both sides. 3/4 black. Perfect and handsome individual. Rougemont Farms, Detroit, Mich.

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My herd is headed by Smithdale Alcatraz Pontiac, whose dam is the famous Alcatraz Polkadot. Have few young bulls and females for sale at reasonable prices. Will buy a few heifers about 15 months, not bred. Farm 1/2 mile from court house. SETH B. RUBERT, Howell, Mich.

FOR SALE—Fine 3 year old Holstein heifer

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\$50 cash, balance note, sets H. F. bull calf. You will be proud of both breeding and individuality. When buying buy good ones. M. L. McLaughlin, Redford, Mich.

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Extra large fine young bull, 3/4 white, born Oct. 4, 1913. Dam has official record of 29.40 lbs. butter in 7 days. 17.50 lbs. in 30 days. Sire's dam is a 25.61 lb. 4-yr.-old daughter of a 29.59 lb. cow. MCPHERSON FARMS CO., Howell, Michigan.

HOLSTEINS FOR SALE

5 Good Bulls, ready for service.

10 Very Choice Bull Calves.

2 Two-year-old Heifers, bred.

1 Six-year-old grand-daughter of King Segis, due in December.

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For list of stock for sale and Jersey facts write MRS. F. H. WALKER, R. R. No. 3, Kalamazoo, Mich. If a breeder and a member of M. J. C. O. send list of stock for sale to the above.

Lillie Farmstead—Jersey Cattle, Yorkshire Hogs, Oxford Sheep. Write for what you want. COLON O. LILLIE, Coopersville, Michigan.

THE WILDWOOD JERSEY HERD

Registered Jersey Cattle, rich Majesties Wonder No. 9077, one of the best sons of Royal Majesty is at the head of herd. His sons show type and class and his daughters are producing a large flow of high testing milk. Write your wants, Alvin Baiden, Oshtemo, Mich.

MAPLE Lane Register of Merit Herd—Tuberculin

tested by the U. S. Government. For sale, bulls, bull calves and heifer calves from R. of M. dams and grand-dams, and Hood Farm sire whose dam's and grand-dam's records average 812 lbs. of butter. Irvin Fox, Allegan, Mich.

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Three fine Hood Farm Point's 9th. from Register of Merit dams. FISHERTON FARM, Pontiac, Michigan.

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FOR SALE CRYSTAL SPRING STOCK FARM, Silver Creek, Allegan County, Michigan.

FOR SALE, Registered Jersey Cows

freshen soon. WATERMAN & WATERMAN, Meadowland Farm, Ann Arbor, Michigan.

JERSEYS—YEARLING BULL READY FOR SERVICE.

Brookwater Farm, R. F. D. No. 7, Ann Arbor, Mich.

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Fresh due soon. Male calves eligible to registration. CHAS. B. COOK FARM, Owosso, Michigan.

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from high-producing dams, with testing Assoc. records, also on semi-official test. O. B. Wehner, R. 6, Allegan, Mich.

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Registered Bulls For Sale.

Big and strong in prime condition for immediate use, 15 to 22 months old. Priced for quick sale. Albion Stamp 352670 by Ch. Shenstone Albino, in service. Write or see them on farm at Lake Shore & Michigan Southern Depot, or five minutes walk from Detroit, Toledo & Ironton Depot.

BIDWELL STOCK FARM

Box D. Tecumseh, Michigan.

SHORTHORN COWS FOR SALE.

Two Shorthorn cows, 5 years old in June, in calf. Will calve next month by the Service Bull Adjutant Duke No. 37225. Cows sired by Adjutant No. 28135. They are in fine condition. The first check for \$250 will take them. Farm 2 1/2 miles northwest of Rivers Junction, Jackson Co., P. O. Onondaga, Mich. H. W. Darling.

MILKING SHORTHORNS—Young bulls sired by a

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Shorthorns—Dairy or beef bred. Breeding stock all

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Scotch Shorthorns of Beef Type—Bulls and females,

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FOR SALE—Shorthorn Bulls, red and roans, by

sons of Avondale and Victor Linwood, both International winners. John Schmidt, R. 2, Reed City, Mich.

Dairy Bred Shorthorns of Best Bates

STRAIN. J. E. HUMMEL, Mason, Michigan.

SHORTHORNS; 6 CHOICE YOUNG BULLS FOR SALE

W. W. KNAPP, Howell, Michigan.

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IT PAYS TO BUY PURE BRED SHEEP OF

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OXFORD-DOWN SHEEP, NO STOCK FOR SALE.

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Durocs & Victorias

Grand bunch of Gilts due March and April. Comprising the blood of Superba, Defender, Much Ool., Orions and others. A few young boars. M. T. STORY, Lowell, Mich.

Berkshire Hogs—Choice gilts bred to farrow in March

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BERKSHIRES—Open or bred sows.

Registered, \$30 for choice, all guaranteed. G. H. RIDER, Almont, Mich.

BERKSHIRES: Sows and Gilts Bred for April

and May farrowing; of the best breeding. A. A. PATULLO, Deckerville, Michigan.

BERKSHIRES

Choice spring boars and gilts, priced to move quick. Farmers stock. ELMHURST STOCK FARM, Almont, Mich.

HAMPSHIRE Swine—Breeding stock of all age

from most popular strains. Write for breeding. Inspection invited. Floyd Myers, R. 8, Decatur, Ind.

Hampshire swine, some good Boars for Breeding and some

Fall pigs both sexes at right prices. West Wind Farm, Pontiac, Mich. E. P. Hammond, owner. N. A. Wisner, manager.

CHESTER WHITES, August and September pigs, from

Chickens and Bed. Modeler, Bronson King. A certificate of registry with each pig. John Ginting, Bronson, Michigan.

O. I. C. Fall Pigs—Choice gilts bred to one of the

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THIS O.I.C. SOW WEIGHED 932 LBS. AT 23 MONTHS OLD

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I have started more breeders on the road to success than any man living. I have the largest and finest herd in the U. S. Every one an early developer, ready for the market at six months old. I want to place one hog in each community to advertise my herd. Write for my plan, "How to Make Money from Hogs." G. S. BENJAMIN, R. No. 10 Portland, Mich.

O. I. C.'s—STRICTLY BIG TYPE. For 12 yrs.

I have been breeding for size and length with quality. Lengthy Prince one of the largest boars the breed ever produced, heads our herd, assisted by White Monarch and Frost's Choice. 2nd prize under six months bear at Mo. Inter State Fair 1914. Stock for sale at all times. Prices reasonable. Address, NEWMAN'S STOCK FARM R. No. 1, Marietta, Mich.

O. I. C.—Spring boars all sold. We have some

fine fall pigs ready to ship. JOHN BERNER & SON, Grand Ledge, Michigan.

O. I. C.'s—One boar. Gilts bred for March and

April farrow. Gus and Sept. pigs. I pay express. G. P. ANDREAS, Danville, Mich.

O. I. C.'s—I have extra fine lot of last spring

boars and a lot of this fall pigs, other sex, not akin. 1/2 mile west of depot. OTTO B. SCHULZE, Nashville, Michigan.

O. I. C. SWINE—Write for new price

list, just out. Have on hand service boars, also other sex of Aug. farrow. I am also booking orders for March and April Pigs. A. J. GORDEN, R. No. 2, Dorr, Michigan.

O. I. C's, nothing for sale at present but will take orders for Mar. and Apr. pigs, pairs not akin, Reg. free and shipped on approval. J. W. Howell, Ovid, Mich.

O. I. C.'s—Good thrifty stock for sale at all

times. Choice sows bred for Spring farrow. TED DRAPER, Munith, Michigan.

O. I. C.'s—Spring pigs, pairs and trios, not

akin, from state fair winners. AVONDALE STOCK FARM, Wayne, Mich.

O. I. C. Choice gilts bred for spring farrow. Sept. pigs.

serviceable boar weighing 350 lbs. price \$30. The long bodied and big boned kind. Alvin V. Hest, Grass Lake, Mich.

Duroc Jerseys of the heavy boned type. Bred Sows

and fall Pigs of both sex for sale. M. A. BRAY, Oakemos, Ingham Co., Michigan.

O. I. C.'s—Bred sows and gilts for spring

farrow. Satisfaction guaranteed. A. R. GRAHAM, FLINT, MICHIGAN.

O. I. C. Gilts bred for March and April farrow.

September back ready to ship. H. W. MANN, Danville, Michigan.

O. I. C.'s—Two serviceable boars, sow coming two-yr.

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Duroc Jerseys: A few choice boars and bred gilts.

Also S. C. W. Leghorns and Buff Rock Cockerels. J. MCNICOLL, Sta. A. R. No. 4, Bay City, Michigan.

Duroc Jerseys—A few choice gilts

bred for April and May farrow. Fall pigs either sex. S. O. STAHLMAN, OBERLY LAWN FARM, Shepherd, Michigan.

DUROC JERSEYS—A few fall boars and 12

bred gilts for sale. CAREY U. EDMONDS, Hastings, Michigan.

DUROC GILTS—Bred to farrow in April and

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50 Gilts bred for March and April farrow, bred to White Hall Jr., second prize aged boar Illinois State Fair, and Allen, Jr. Champion at Wis. State Fair, and to Jumbo and Wonder Boy Boars are a pair of big ones and are smooth. Special prices for the month of February. Service males and fall pigs of either sex. Write your wants and come and visit the greatest herd in state. All stock shipped e. o. d. and Reg. Free.

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SPECIAL on Durocs—I will sell 35 choice bred

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DUROC JERSEY—Bred gilts for March and April

farrow; bred right and priced right. W. C. TAYLOR, Milan, Michigan.

Duroc Jersey Boars

From Prize-Winning Stock. Write, or better still, come.

Brookwater Farm, Ann Arbor, Mich., R. F. D. 7.

DUROC JERSEYS—Aug. boars ready for service.

Also Aug. gilts bred for June farrow to prize-winning stock. Shipped C. O. D. for your inspection. F. J. DRODT, Route No. 1, Monroe, Mich.

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It heals without leaving a scar and will grow an entirely new hoof. Morris & Co., the great Chicago packers write: "We have been using **Corona Wool Fat** on our heavy draft horses working on city pavements for four years. We are highly pleased with its results and would not be without it."

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I take all the risk—furnish you with a big can of **Corona Wool Fat** to try on any case you have. If it does what I claim you would not hesitate to pay me a five dollar bill for it. If it does not, it won't cost you one cent. I leave it all to you. Send coupon today and I'll send the trial can of **Corona Wool Fat** by return mail—postpaid—as offered.

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Before and After—Case of Grease Heel

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Gentlemen—Please send me the trial can of your Corona Wool Fat. It is understood that I am to use this for 20 days in accordance with directions and if I am satisfied with the results I will send you 50 cents to pay for it. If it does not do as you claim I will owe you nothing.

Name.....

Address.....

County.....

State.....

Mention at least two no. 12 fitting you intend using it