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Bracing Fruit and Shade Trees

By W. I. GILSON

BRACING the limbs of fruit trees is largely a commercial proposition for its purpose is mainly to save a portion of the crop of fruit that would otherwise be lost and also to insure the future life of weak members of the tree crown for bearing crops. To preserve perfect symmetry or outline is in this case secondary.

With shade trees the purpose is mainly aesthetic, although due attention should be given to anchoring the limbs which, in falling might endanger the lives of those who pass or the utility of buildings standing underneath. The principles involved in bracing the weak and broken limbs of both shade and fruit trees have many points in common.

Weak wooded trees such as the apple, peach, pear and plum of the fruit tree varieties and soft maple and basswood of the shade trees are particularly subject to breakage and splitting. Good evidence of the need of bracing can be gained when the limbs are heavily laden with fruit, snow or sleet or when subjected to the effects of heavy wind. To avoid disturbing the trees when about to ripen the fruit, it is a good precaution to tend to the bracing early in the season. An added advantage is that there is less danger of breakage while the work is being done and the branches are easier to hold in place while braces are being tightened.

One passing through the farming or fruit growing districts of the state when the heavier fruits are ripening must be impressed with the great extent of injury to trees and to the enormous loss of fruit in the aggregate caused by the breaking down of heavily laden branches. Breakage may occur at a time near enough to that of the ripening of the fruit that it will mature on the broken branch. The liability of breakage increases as the fruit nears maturity and may occur even on calm days due to the gradually increasing weight of the fruit. The fruit grower attempts to prevent breakage by timely and judicious pruning and removal of the more imperfect specimens of fruit previous to ripen-

ing but is not always successful in his efforts.

It is very evident that as we are dealing with growing trees, many of the bracing methods used in structural

years' additional growth the loop of wire will be completely filled and the branch must die from strangulation unless the wire is very fine in which case a healthy callous may grow completely

od of bracing is by attaching weaker limbs to others capable of giving support. For all but the heaviest limbs, wire, either single or doubled, depending upon the strain it is to be subjected to, is ordinarily satisfactory and is also cheap.

In case the strain is moderate, a screw eye can be inserted into each of the limbs to be braced and these connected by a single piece of No. 10 or 12 galvanized wire.

There is also another method which requires no equipment except a brace and bit and nails and wire. A small hole is bored through each limb at the point where the brace is to be fastened and approximately in the direction in which the brace is to pull. The wire is fastened by passing it through the hole then bending the end back to form a loop. The nail is inserted in the loop and the free end of the wire tucked into the hole an inch or more when the loop is pushed into the hole drawing the nail tight to the bark. The nail should be parallel to the grain of the wood and the bark cut away in under it sufficiently that the callous can grow over the nail.

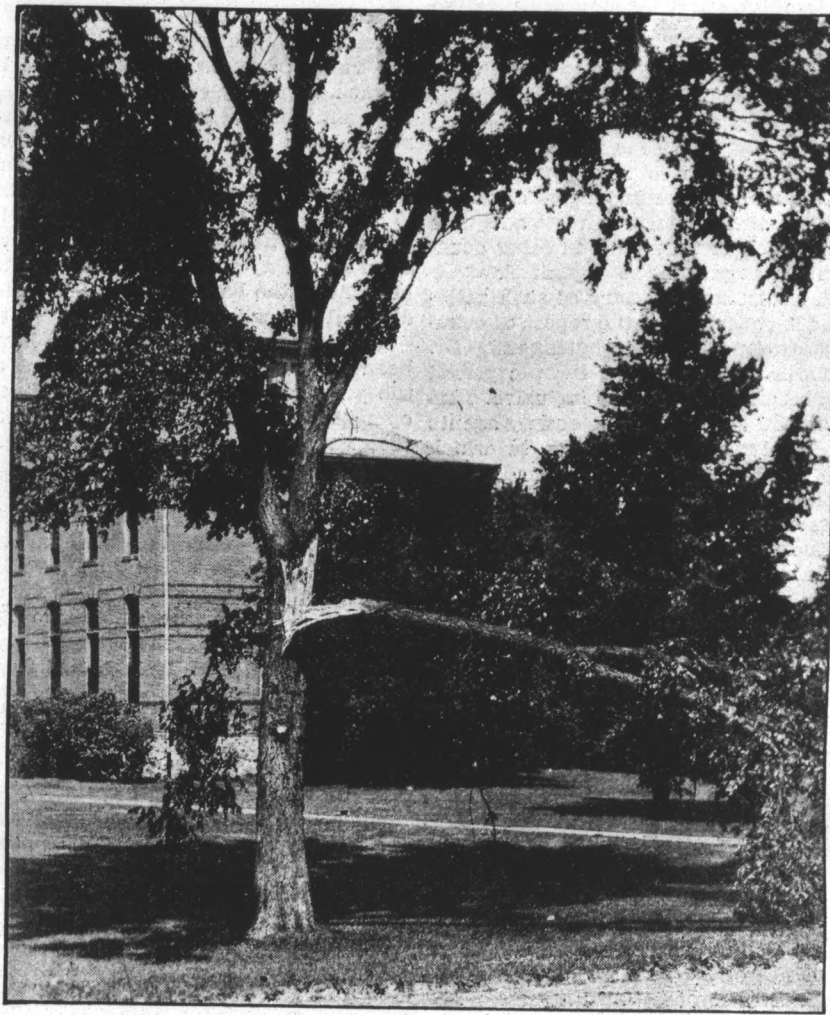
Wire braces may be attached by boring two holes through the branch instead of one, starting them at the same point but having them diverge so as to come out about an inch and a half apart on the opposite side. The wire is then passed through one hole and brought back through the other. The method of attachment to each limb is the same.

Bracing Heavy Branches.

The methods already described are well adapted where the strain is not great but for large fruit trees, and especially for full-grown shade trees, chain is rather bulky and unsightly when rusted badly. Aside from its appearance it serves the purpose well. Wire rope or cable is neat in appearance and inconspicuous when in place. Wire twisted or doubled several times has about the same value.

To fasten the brace to the tree in a firm manner, bore a hole through the

(Continued on page 732).



Timely Bracing Prevents the Formation of Ugly Wounds.

work are not adapted here. The best methods are aimed toward securing firm support of the limbs and at the same time causing the minimum of injury to the living tissues of the growing tree.

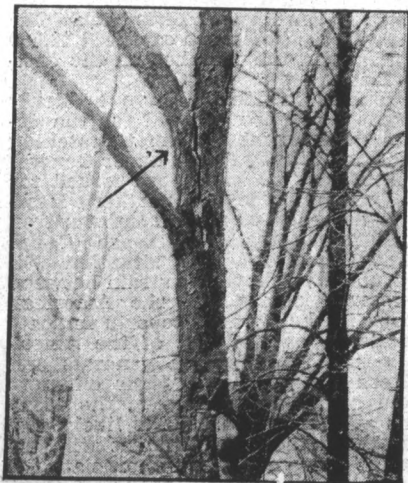
Common but Injurious Methods of Bracing.

The simplest and most common method of bracing is to place a rigid support from the ground to the weak branch. The several disadvantages of this are that the pole forms an obstruction beneath the tree, the wind is liable to raise the limb and allow the brace to fall, and bark injuries are caused where it makes contact with the branch. In other cases, common wire has been used to attach weaker limbs to stronger ones capable of giving support. The opposite ends of the wire are usually attached by placing one end completely around the limb to be braced and the other around the supporting branch. The result is the girdling of one-half or more of the circumference of each limb. With a few

Correct and Simple Methods of Bracing Limbs.

The simplest method of bracing is by using a pole with one end resting on the ground and the other supporting the branch. Instead, however, of using a forked stick which would cause injury to the bark, the supporting pole is prepared by boring a small hole in the end lengthwise of the pole and inserting into it tightly a small piece of rod iron, allowing the end to protrude an inch or more. Next a hole of the same size is bored on the under side of the limb and the projecting rod inserted into it. A prop of this kind will stay in place and may be even lifted from the ground when the limb is raised by a gust of wind but remain in position to support the limb again when it returns to natural position.

The most neat and satisfactory meth-



Bracing Should be Done in Time to Prevent Branches Splitting Apart.



A Vigorous Tree May Form a Callous Over Wires Encircling Branches.

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DETROIT, JUNE 10, 1916

CURRENT COMMENT.

Milk Producers Should Organize. Milk producers in every section of the state where there is not now in existence a local organization of dairymen, should take early steps toward the formation of a milk producers' association, which will include in its membership every dairyman in the community. The state organization known as the Michigan Milk Producers' Association, which was formed at East Lansing on May 23, cannot effectively work for the interest of the milk producers of the state without their general affiliation and co-operation to that end.

The declared purpose of this state organization is "to promote in any and all legal ways the interests of the milk producers of Michigan by mutual co-operation in producing, buying, selling and marketing all milk and dairy products within the state of Michigan." Undoubtedly the question of marketing is one which will receive comparatively early consideration since all the available data tend to show that milk is being marketed from Michigan farms at a price which does not pay adequate compensation for the cost of production, including ordinary wages for the work expended in this department of farm production.

Figures compiled regarding the cost of producing milk show wide variations. The Extension Division of the Michigan Agricultural College recently published a circular giving official data from six different sources showing the local cost of production and varying from \$1.586 per cwt in an official trial conducted in Michigan last year, to \$2.42 as reported by the Massachusetts Experiment Station. The Michigan trial conducted in Kent county in 1914 showed a cost of \$1.674 per hundred pounds, as compared with \$1.586 in a similar test in 1915. This represented the net cost after a reasonable allowance had been made for returns from the dairy other than the milk, and inasmuch as these are lower than any other official figures presented in the circular, it is a safe conclusion that they are conservative. The same circular shows the May price of standard market milk at different points in the state to vary from \$1.25 per hundred weight to \$1.40 per hundred weight, with the price at three of the five points given at \$1.30 per hundred weight.

Under these conditions, and in view of the successful campaign conducted by the organized dairymen in the Chicago district, there is no question but that the milk produced upon Michigan farms can be marketed to much better advantage under a plan of co-operative bargaining than under the plan now in

vogue of permitting buyers and distributors to fix a schedule of prices which does not take into account the cost of production. In order that this may be accomplished, it is essential that an effective organization be in existence in every dairy community and closely affiliated with the state milk producers' association.

The other benefits which may be derived from organization will likewise be more easily accomplished if the local organizations throughout the state include practically all commercial dairymen within the state. Such an organization can be of great benefit to the dairymen of the state along other lines included in the above noted declaration of purposes. One of the particular things which the state association will try to do will be to secure the protection of their industry by an effective protest against the admission of milk in cans, duty free, with a view of preventing unjust competition at the close of the great war. There are many other ways in which such an organization can be useful to the industry, but as above noted, if it is to be of maximum use, it must include in its membership practically all the dairymen of the state, for which reason this appeal for early organization is addressed to the dairy farmers of every community where such an organization does not now exist.

County Agricultural Work. While the activities of county agricultural agents have come to be fully appreciated in counties where farm bureaus are maintained and county agents are employed, there is not a very adequate conception of that work in other counties not at present so organized.

A statistical summary of such activities is contained in the report of county agricultural work in Michigan by Dr. Mumford, state leader, for the period from April 3 to April 29 inclusive. This summary shows that the county agents in the twenty-two counties in which the work is now organized made farm visits to the number of 1,023, received personal calls at headquarters from farmers numbering 1,124, answered telephone calls on county agent to the number of 1,197, published a total of 29 articles on local agricultural problems in the local press, wrote a total of 2,611 letters and distributed 1,603 bulletins and 5,328 circulars.

When it is considered that these activities of the county agents had to do with pressing local agricultural problems in the counties where they served, the importance of this direct personal work will be more generally appreciated. In addition to this personal work, 46 demonstrations were conducted and 54 meetings held during the month, at which there was a total attendance of 758 farmers. Besides these demonstration meetings, a total of 222 other meetings were held by agricultural agents during this period, which were attended by a total of 9,985 farmers. This direct personal means of distributing up-to-date agricultural information and conveying ideas which the experience of other farmers suggested, is a very potent force for the betterment of the agriculture of any county which is sufficiently progressive to organize a farm bureau and secure the services of a trained man as county agricultural agent.

In this connection it is of interest to note the wide variation in the leading activities of county agents in different parts of the state. In counties where hog cholera was prevalent, this was among the leading subjects given attention by the county agents. In the fruit producing counties the conducting of orchard demonstrations was noticeably frequent. In other counties the organization of boys' and girls' clubs and farmers' marketing associations were among the leading activities of the county agent. In other counties soils and crops were noted as leading projects, while farm management and the betterment of live stock came in as

prominent projects in a great many counties.

This line of work has now been in operation in many Michigan counties for a sufficient length of time so that its benefits have become apparent, and farmers are increasingly enthusiastic with regard to its possibilities for the betterment of the future agriculture of their communities.

Bankers Aid Agriculture. Michigan farmers have become familiar with boy and girl club work through the development

of that work in Michigan in recent years. The boy and girl club idea was first tried out in the southern states by the department of agriculture co-operating with the agricultural colleges of various states. This work has gradually been extended, and during the past year pig clubs have been the new development along this line in several southern and a few other states.

Business men and bankers in the southern states have been particularly interested in this movement because of the need of a greater diversification of agriculture in the southern states. A recent report from the department of agriculture tells how the banks in many sections have aided in this work. A case in point is that of a Texas bank, the president of which placed 326 pigs among the pig club members of his county, taking their personal notes for the value of same. This method of financing the pig club work gave the boys and girls an insight into business methods as well as pork production, thus affording a double benefit from their club activity. As a natural course of events, this was also profitable to the bank, which through this method secured many new patrons which brought to the bank over \$75,000 in individual deposits.

Michigan bankers and banks have been most liberal in their support of the propaganda for agricultural development in this state. In many cases they have been active workers for and liberal contributors to funds for the employment of county agents as a means of introducing this work into their counties. The State Bankers' Association has also taken an active interest in agricultural development through a permanent committee appointed for this purpose.

While much good has resulted from their activities along this line, the methods employed by the southern banks as above mentioned in encouraging juvenile interest in agriculture may well afford them a suggestion for application in Michigan wherever the opportunity affords to aid the boys and girls of their respective communities in the carrying out of agricultural projects, and at the same time giving them valuable business experience and training.

The Pere Marquette Reorganization.

The Public Relations Department of the Pere Marquette Railroad has announced that at the request of a committee representing the holders of a majority in amount of the securities of the company, application has been made to the Michigan Railroad Commission for the approval of a tentative plan of reorganization which has been agreed upon after many months of effort to arrive at a plan which would be satisfactory to the various interests involved.

Comment on the details of this plan would be premature at this time, since the hearing by the Railroad Commission will not occur until June 20. Generally speaking, the plan involves a reduction in the total capitalization of the company from \$114,439,563 to \$105,000,000, which amount will include \$16,000,000 of new money for the payment of accumulated indebtedness and the providing of needed equipment and adequate working capital for the road. The plan would also reduce the annual interest charges by the very substantial amount.

Whether or not the proposed plan

will be acceptable to the Railroad Commission cannot, of course, be foretold. From the standpoint of the people of the state, particularly those located on the least profitable of the branch lines of this system, it is undoubtedly desirable that some settlement of the problem be reached whereby the integrity of the system may be maintained and needed service given to these outlying communities. Undoubtedly the natural growth of the agriculture and business of these communities will in time make these branches profitable.

The point which must, of course, be considered by the Commission is the protection of the interests of the whole people of the state in approving or rejecting the plan, which to the layman would seem to be as fair and reasonable a basis of settlement as the better protected interests under the old organization could be expected to approve. But whether or not the plan submitted will meet with official approval, it is to be hoped that it may be at least the starting point of an equitable settlement of the tangled problems of this much abused railroad system upon which a considerable portion of the people of Michigan depend for transportation facilities essential to the profitable conduct of their business.

HAPPENINGS OF THE WEEK.

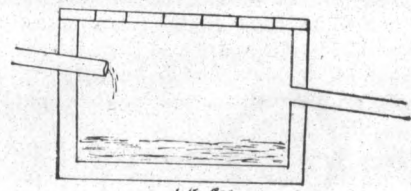
Foreign.

The European War.—The important event of the war this past week was a naval engagement between British and German warships in the North Sea near the coast of Denmark. While reports of the engagement are conflicting, and even a verdict as to who was victorious is lacking, it is certain that few, if any, naval battles in the world's history resulted in greater destruction of war craft and men. The number of British vessels destroyed has been estimated from 12 to 20, and the number of German vessels from 10 to 18. Many of these were small craft but included are some first line battleships and dreadnaughts of the most modern type. A number of scouting boats of the British fleet met the German vessels and engaged them in battle at short range until the main portion of the British fleet could arrive and dispose of the German vessels. By reason of the invisibility of the German boats, and a mist, the latter were able to evade the British fleet and escape to cover.—The German land forces made a vigorous attack on the western line near Ypres which was defended by Canadian troops. The invaders succeeded in capturing 3,000 yards of trenches which, however, were retaken by the Canadians in a plucky fight with bayonets and bombs.—The new drive of the Germans against Verdun following the arrival of re-inforcements from other fronts, was succeeding nicely until Sunday, when the French stopped the invaders on both sides of the Meuse river. The Germans have now been operating for nearly four months to capture this position.—On the Italian front the Austrians have been checked in their advances, and the Italian forces have regained confidence in their ability to hold the enemy on the present line. The French commander at Saloniki has declared martial law in the entire zone occupied by the Allied forces preparatory either to a better protection of their positions against attack or to an offensive movement. Last week the Turks undertook to check the advance of the Russian forces by bringing into action large numbers of troops. At some points they were successful in forcing the Russian lines back. The Czar's forces in Europe captured 13,000 Austrians in the marshes on the eastern front.

Troubles in Mexico have suddenly become more complicated for the defacto government by the threatening of Mexico City by forces under General Zapata. Orders have been issued for the Carranza troops in northern Mexico to be ready to move southward on quick notice for the defense of the Mexican capital. This situation will undoubtedly relieve the strain between Carranza's forces and the American troops in the north. Reports indicate confidence on the part of the Americans that the Mexican generals and officers are sincere in their effort to avoid any conflict between the Mexicans and Americans. It is likely also that the defacto government will, under the new conditions, appreciate the presence of American troops on Mexican soil and be ready to enter into some special agreement that will insure order and satisfy both sides.

(Continued on page 736).

A YOUNG college graduate was asked by his father what he considered the best paying investments on the farm. The boy immediately replied that silos and tile drains gave the largest returns for the money expended. Many farmers have learned the truth of this boy's statement, especially in regard to the silo, but there are many who have yet to learn the great value of draining the land. I believe that I am safe in saying that there are not many farms in Michigan which do not need some draining. And I think that I am just as safe in saying that there are a great many farms which haven't a foot of tile or any other kind of a drain. The principal growth of land drainage has occurred during the last thirty years, starting in with small tracts like the garden and gradually expanding to larger



tracts. At the present time there is scarcely any limit to land drainage as it involves whole counties in a single tract.

Effects of Drainage.

The effects of drainage are many and important. The most important effects are as follows: Drainage opens the inter spaces between the soil particles, thus allowing the air to enter the soil. Air in the soil is necessary for the growth of bacteria in the soil. Drainage makes a greater depth of soil, thereby allowing a greater depth of root growth. The deeper the roots of the plants go, the greater supply of plant foods the plants have to draw from. Drainage increases the temperature of the soil from six to ten degrees by removing the cold water. By raising the temperature of the soil, the seasons are made longer. Drainage causes fertilizers and plant food to be deposited in the soil by drawing the rain water through the soil. It is estimated that about eight pounds of nitric acid and the same amount of ammonia are deposited each year on an acre of land by rainfall alone. Drainage improves the sanitary conditions, decreasing the diseases among people, as well as the farm animals. Drainage removes heavy rains without the washing out of crops. Drainage takes away the excess water in wet weather, and by making the soil a better absorbing mass and aiding capillary action, lessens the effects of a drought. Drainage promotes a more vigorous growth of crops, thereby increasing the profits. Drainage also improves the general appearance of the farm.

The Superiority of Tile Drains.

There are two methods of draining land, namely the open ditch and the closed tile drain. Perhaps a discussion of their respective advantages and disadvantages would be worth while. Open drains are cheaply constructed and are often advantageous for collecting drainage from large areas. Open drains also may form a supply of drinking water for stock. However, open drains do not allow the rain water to pass through the soil, the sides of the open drain are easily broken down and open drains not only occupy considerable valuable space but they often divide fields disadvantageously.

Tile drains form a perfect and uniform channel, the alignment of which is not easily disturbed. Tile drains force the rain water to pass through the soil, the fertilizing elements being left in the soil. Tile drains render no space whatsoever unfit for cultivation.

Establish the Grade Carefully.

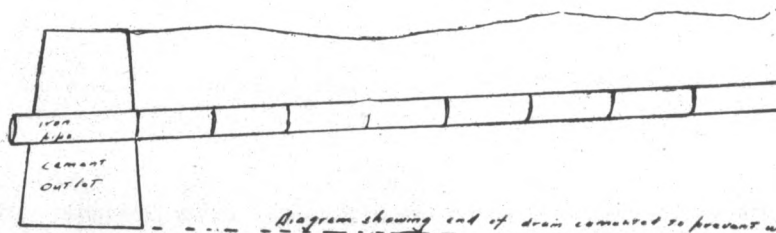
The disadvantages of the tile drain are the cost of materials and construction, the expense of repairs, the difficulty of locating obstructions, and the

fact that tile drains are not always available for intercepting drains.

The grade of any drain is very important. Where drainage is needed the most, there is usually the least grade. A grade of three inches to one hundred feet is possible with a four-inch tile. In any case the grade must be uniform to be effective. In the best jobs, the grade is established before the ditch is dug. The land is surveyed and stakes or cross bars are placed at intervals along the drain. By these, it is easy to get the exact grade line. If it is not handy to get someone to make the survey for you, a straight-edge and carpenter's level can be used to advantage. Suppose you took a straight-edge six feet long, figure out the amount of inclination that your ditch should have in six feet and then drive nails in one end to hold it at that inclination. Then by putting this board on the tile and using the level on the board, you can tell when your tile are laid right. Or for short distances, I have often used a straight-edge and level in the same way that you use a surveyor's level and set the cross stakes by this.

Laying the Tile.

Laying of tile should be started at the outlet because of creeping during construction. The tile should be laid as closely together as possible because even then there will be enough opening for the water to come in. The end tile is liable to wash out so it is better to use a cast iron pipe at the end



and cement it into a wall. The outlet should be in as convenient a location as possible. The outlet should make an acute angle with the stream, entering so that the drain flows with the stream.

Mains should follow the lines of natural drainage while the laterals should follow the lines of deepest descent. A main is a collector of laterals. It has been recommended that the ends of

the main. A hole chipped out of the main for the lateral to enter is no good and often gives a great amount of trouble.

Depth and Frequency of Laterals.

The depth of the tile drain is a question which is much discussed. I think that a tile drain should be laid at least three feet deep, and more if practical. A drain which is laid quite deep in the soil will not work as quickly as will a shallow drain but it will draw from more surface and will make a deeper depth of soil.

The distance between the laterals is another question on which different people have different ideas. There is an old rule which says that the dis-

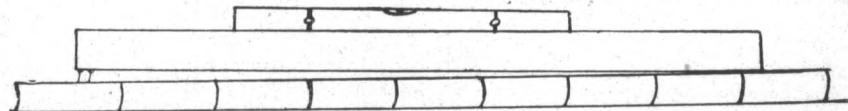


Diagram showing use of straight-edge and carpenter's level.

tance between the parallels or laterals should be as many rods as the tile is feet beneath the surface. As a guide to work from, I think that this old rule is about correct. However, one must alter this rule to meet his own particular conditions and requirements.

Silt Basins.

Silt basins should be put in the line of tile so that the silt or sediment may be collected. The check given to the flow of water as it passes through the silt basin causes the sediment which

experience I had in trying to locate a sewer. By inquiring, I found three men who could tell just exactly where this sewer was located. The trouble of it was that they did not agree by over a hundred feet but they were all positive that they were right. I gave each man's location a trial, but did not find it in any of the three locations. Finally I started in at one side and dug straight across the path of where they said the sewer was located and after digging some seventy-five feet, I found it. This is just an example to show that a man cannot readily remember locations.

Size of Tile to Use.

I have not mentioned anything about the kind and size of tile to be used. As to the quality and grade of tile, each man ought to be his own judge. As to the size, I do not think that anything

smaller than a four-inch tile is economical under any conditions. A smaller tile has not enough capacity and gets clogged too easily. A four-inch tile for the laterals and larger tile accordingly for the mains and sub-mains make an ideal system.

Drainage has been practiced for centuries. It has reclaimed acres and acres of otherwise useless land and made it fertile and profitable. Where we find the most intensified methods of farming in operation, there we find the most drainage. Intensified farming and drainage go together. The time is coming when we will have to work our land more intensely. Hence we will have to make one acre produce more and better crops. One of the things which is going to help us solve this problem is drainage.

SPECIALIZING AS A FACTOR OF SUCCESS.

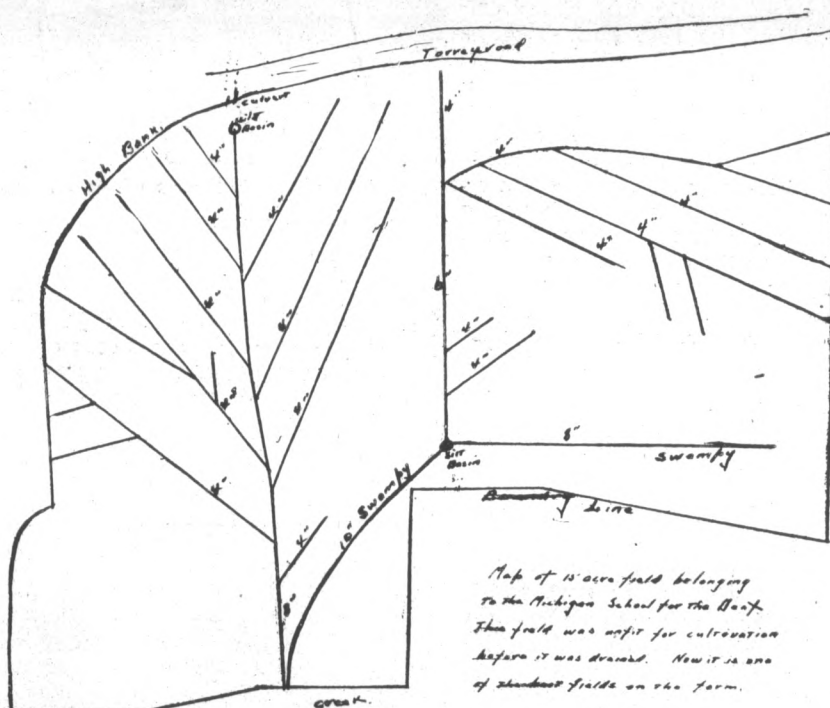
So far as my observations have extended, the farmers who are most successful are those who follow some special line of production, such as raising fruits, stock raising or giving attention to chickens or the poultry business in general.

There was a time when men in the newspaper business not only printed newspapers, but did job printing as well. Changes have come and now job printing has been given over to firms who make this work a specialty.

Now, a farmer cannot do everything well. Each man is fitted by nature to do some particular thing well. Other things he could not do well, no matter if there were "millions" in it. The day of the "Jack of all Trades" has passed. What is wanted is the capability of doing something well, even better than one's neighbor.

Specialization is the order of the present day. A railroad gives to a Pullman or a Wagner the privilege of attending to the wants of their customers who have the money to pay for the luxuries of travel. Why? Because these companies have made a special study of that branch of railroad business. In still plainer words, they have mastered the details of how to do it well.

A farmer, to be a successful stock raiser, must have an aptitude for the business, a natural instinct that fits him to make a success of it, and the same is true of other branches of farming. "Know thyself" is one of the hardest lessons to get by heart. If men could easily find out just what they are adapted for this world would have less business trouble in it. Some men are measuring calicoes and getting starvation wages for it, who would be successful at agriculture, and some are starving on farms who would make money peddling tinware. They have missed their callings, and so it is in all branches of both farming and business.



Map of 10-acre field belonging to the Michigan School for the Deaf. This field was unfit for cultivation before it was drained. Now it is one of the best fields on the farm.

the laterals, especially those which come up at the fence or other unworked place, should be brought up to the surface so that air will have a chance to pass through the drain and thereby pass out through the soil. The ends of the laterals can be brought up to the surface by means of an elbow. Y branches should be used to make the connections between the laterals and

location of all mains, sub-mains, laterals, connections, etc. Many people have drains on their farms and do not know where they are. We have all seen men dig all over the place trying to locate some drain; perhaps we have done that same thing ourselves. A map should be drawn of the whole system so that every part of the drain can be located. I remember a little

The world is made up of the successful and the unsuccessful. It is not necessary for a man to be entirely successful to be happy, but it is desirable to be a partial success in life, because it adds greatly to one's ability to be useful, for it takes not only brains and good intentions to do good, but also means and influence.

Farmers must study, as they are their own bosses and cannot look to others for the wisdom required to make a livelihood. Thinking and working are two of the greatest adjuncts of farm life, and often the former is of as much importance, and sometimes more, as the latter. It is often said, "That man is lucky, everything that comes in his hands changes into money." It is not luck, but careful study and good management that is the cause of his so-called luck, and not getting into one certain rut and not making any endeavor to lift himself out of it.

Shiawassee Co.

D. H. M.

BUCKWHEAT AS A CASH CROP.

All varieties of buckwheat flourish best on light soils containing only a small proportion of nitrogen, consequently a rich soil or fresh manure will cause it to lodge before it is ripe, give a poor yield and be difficult to harvest. It is generally sown on the poorest land on the farm, because land that will produce a tolerably good crop of buckwheat is generally too poor to yield a paying crop of any other grain.

Buckwheat will grow on poorer land, and on ground less carefully prepared, than will any other grain, but will do better on land of moderate fertility, and respond quickly to better preparation of the soil. Its natural home is in cool elevated regions, on hills, and mountains. Unlike corn, buckwheat does not delight in hot weather, especially when the kernels are in the milk stage. At that time a hot sun will blast or shrivel many of the kernels, and nearly ruin the crop.

The Time to Sow.

The proper time to sow buckwheat depends on the latitude and elevation of the district where raised. The later it can be sown and get ripe before the fall frosts come, the greater will be the yield. The kernels which are not ripe when frost comes, will never ripen and are worthless. Here in northern Pennsylvania we plow buckwheat ground as soon as the spring crops are planted but do not sow it until the last of June or the fore part of July.

Buckwheat does not tiller like wheat and rye. One kernel throws up but a single stalk, but it branches like an apple tree, if not sown too thickly, so that one bushel per acre is ample, and some farmers think three pecks is better. We sow one bushel broadcast drilled in, less would be sufficient.

Buckwheat reaches after, seizes upon and appropriates the fertility that is scattered through the soil in minute quantities. It throws out an immense number of roots that pulverize and mellow the soil as no other plant has power to do. When rye is sown after buckwheat in the fall, the ground does not need any plowing; a good harrowing answers every purpose. When ripe, it is cut with either a cradle or machine, and set up in small conical bunches, usually without binding, as the interlacing of the branches will hold the bunches together for handling, and they will dry out better standing loosely for the air to circulate through them.

Varieties.

The most popular variety with us, is the gray, or silver hull. When the Japan was introduced into our locality it was hoped that it would prove a valuable acquisition and be superior to all other varieties, but it has not met with the favor expected. After several years' trial, most of our farmers have abandoned it, and returned to our old varieties. Its only claim to superiority is the larger size of its kernels. Its greatest defect is that it does not branch

much, and the kernels are chiefly found in a close bunch on top of the main stalk, which causes it to sprout more quickly than other varieties when there comes a warm rain after it is ripe. I have seen it sprouted before it was cut. It will not make as many pounds of flour per bushel, as the gray, the flour is not as white, and our millers will not pay as much for it.

There is one serious objection to raising buckwheat. It does not fit well into any regular rotation of crops usually raised in the buckwheat region. Except for this reason, there is no doubt that a great deal more would be produced.

Acreage and Value.

Less buckwheat is raised in the United States than any of the other cereals, and the amount does not increase like the other grains. More was produced in 1868 than in 1912; but the production fell off to 8,000,000 bushels in 1874. The average production for the last three years was 16,877,000 bushels per year. The average number of acres devoted to buckwheat the last three years was 859,666. The average number of bushels produced per acre, was 20.4. The average farm value per bushel was 71.4 cents. The average farm value per acre in the United States during the last four years was \$14.56. The average farm value of wheat per acre in the United States the last four years was \$12.84. The average farm value of corn per acre in the United States the last four years was \$14.30. It will be seen that the average buckwheat crop of the United States for the last four years was worth 26 cents more per acre than the corn crop, and required no expense for cultivation like corn. It was worth \$1.72 per acre more than wheat, and required no expense for fertilizers. In the year 1912 Pennsylvania produced 7,405,000 bushels, beating New York, which has usually led the Union.

Pennsylvania.

J. W. INGHAM.

CROP AND FERTILIZER QUESTIONS.

What Grasses to Grow on a Wet Field.

I have about five acres of wet land which is now too wet to sow to oats. I want to get this land seeded. What kind of seed should I use, how much per acre, and when should it be sown, and could I sow something with the grass seed to make pasture this year after harvest, as the balance of the field is sown to oats. This land has generally produced good grain but is quite wet.

Ionia Co.

W. A.

Red-top, timothy and alsike clover are about the best grasses for wet land, but even those will not do well if the land is too wet. The surest and quickest way to get this field to grass is to prepare it well just as soon as it is dry enough to work and seed to these grasses alone. To get a good start they ought not to be pastured this year. The tramping of the stock will injure the plants, besides some of the young plants will be pulled out by the roots. If you should seed the grass with oats, the oats would need pasturing when they got nicely started, say six or eight inches high, and this would surely injure the young grass plants.

My advice would be to seed the grass with the oats and not pasture. If the grass does well you may be able to cut a fair crop of hay in late August or early September.

Corn on Muck Land.

I have a nine-acre field which is about half muck. It is well drained. Corn grown on this land is always short and seldom makes any ears on the muck. I am going to plant it to corn again this year, and would like your advice on how to treat it. I have been thinking of getting stone lime and when it is air-slaked put a handful on each hill. What is the best thing for me to do, and where could I get the lime if this is advisable?

Hillsdale Co.

W. H. R.

Lime nearly always is beneficial to muck land. It not only furnishes this ingredient to plants, but it sets free or makes available the nitrogen in the raw, undecomposed organic matter.

But some muck contains little or no available potash. On this type of muck potash is simply a specific. You can't grow corn without supplying it. From the description given I should say this muck land needed potash, also phosphorous. Potash is abnormally high-priced now, owing to the great war. Very little can be purchased at any price.

Could you not get enough unleached hardwood ashes to treat these muck places in the field? Ashes would furnish both the potash and the lime. Then if in addition you would apply 200 pounds of acid phosphate per acre I think you would get corn that would produce ears. I would apply all fertilizer and lime broadcast. You will see lime advertised by several firms in the Michigan Farmer.

COLON C. LILLIE.

CULTIVATE THE CORN SHALLOW.

We are opposed to deep culture of corn after the roots get any length, although the first time we go through it with the cultivator we set it moderately deep. There are few farmers who have any idea how rapidly the corn roots grow. Last season we measured one root that was eleven inches long when the corn plant was hardly three inches high.

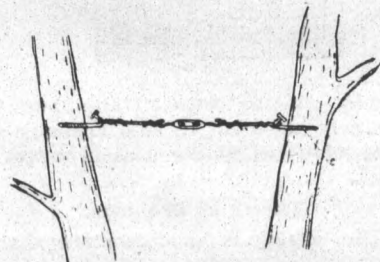
It might be well to suggest to readers that they select a corn plant or two and examine the growth of the roots during the season. They will notice how near to the surface they grow, and how soon they will fill the space between the rows. A knowledge of these things would modify the opinions of many about deep culture of corn through the season.

In corn culture, a thorough preparation of the soil before planting is half the battle. If corn land has been plowed early, and has been harrowed at least half a dozen times before planting, it will stand drought much better than if plowed at the latest moment and harrowed only a few times. Harrowing often before planting conserves the moisture and then all that is required after the corn is ready to be cultivated is a shallow scratching

A somewhat simpler method which is also satisfactory is to use wood screws which extend only part way through the limb. A hole a little smaller in diameter than the screw itself is first bored and the wood screw is turned in with the wrench. The head of the screw is then bent over with a hammer to make a hook as a place of attachment for the brace.

It is not difficult to force small branches toward each other while the braces are being put in place, but special equipment is required for large ones. Ordinarily a block and tackle is sufficient, but one's ingenuity will usually suggest many arrangements for forcing the limbs together. It may be by connecting the limbs with several strands of wire and twisting these together to draw up the limbs until the braces are placed.

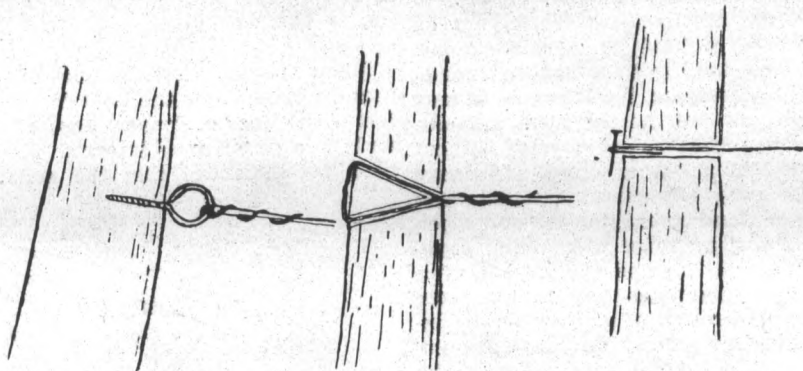
The braces should be drawn tight only when the limbs have already started to split apart and then a waterproof filling should also be put in the split crotch. Otherwise a little slack



Method of Using Wood Screws and Turnbuckles for Tightening Braces.

should be left so that the braces are tight only when the branches are laden with fruit, sleet or snow, or when blown by the wind. Branches that have some freedom of motion before the braces are drawn tight are not so apt to be broken by the force of the wind as when held rigidly in position by inelastic bracing material. The higher up the points of attachment to the limbs, the less will be the force of pull upon the braces and the liability of breakage of the wood at these points will be correspondingly decreased.

Braces can be constructed so as to facilitate shortening or lengthening at will by attaching a turnbuckle near



Correct Methods of Attaching Wires to Limbs in Tree Bracing.

about once a week, or every time after each rain.

On clay soils we cultivate a little deeper than on sandy soils. If clay soils were drained an average of at least thirty per cent more corn can be grown. Drained soil is warm, and corn cannot do well in a cold soil.

Indiana.

K. K.

BRACING FRUIT AND SHADE TREES.

(Continued from first page).

limb in the direction of pull, using ordinarily a half-inch bit. Fit a bolt made with an eye on one end and threaded on the other tightly into this hole. The cable, chain or wire is fastened into the eye and the burr is screwed on the threaded end. It is important to sink the head of the bolt into the wood so a callous of wood can grow over it and to use a washer under the burr to prevent its grinding into the wood when being tightened. It is a good precaution to put a coat of tar or asphaltum paint on the bolt and ends of the hole to prevent the accumulation of moisture and the entrance of decay.

the center, the length of which is changed by twisting the middle portion which is fitted to a threaded bolt on each end.

Bracing is not a costly operation. Timely attention along this line prevents the breakage of limbs and the formation of wounds where decay is very liable to start later on. An ornamental tree may be very valuable while all its main branches are intact, but lose its symmetry when one is broken away. Similarly, fruit trees are made less picturesque by having portions dismembered and the fruit producing area is diminished.

There are many modifications of the methods described to fit special cases. The principles of application, however, have been included in this discussion. Bracing is largely a preventive measure as little can be done excepting to remove the limb and smooth up the wound after damage has once occurred.

Bracing is practicable from an economic standpoint and valuable as a preventive measure in preserving the form and outline possessed by desirable shade trees.

Solving the Small Growers' Problems

THE small grower of fruits and vegetables is the one who often has the most serious market problem to solve. Large growers can ship to the larger centers with profit and in those localities where certain special crops are largely grown and co-operation has been put into practice, the problem is even simpler. The small grower finds his conditions altogether different. His market is often a limited one or again so distant as to be almost prohibitive. He does not raise enough to make car shipments possible and express shipments as a rule are out of the question. A few have been able to utilize the parcel post to their advantage, but after this has been used to the limit of profit, there still remains products that cannot be handled by such methods.

A young man came into possession of a farm in a back-country district. It was a large farm and a fairly good one. He had been living near a large city and growing vegetables on a few acres. At once he saw possibilities in the same line on the larger place. It did not take him long to learn his mistake. The first season was disastrous. He learned the lesson, however, and was not caught the next year with beets, turnips, cabbage, and such things on his hands. The only market was too far away to reach with such products. The facts of the case were that he grew things next year that his neighbors did not, in fact it may be said that his next-door neighbors became his customers. A small village, supporting a single manufacturing plant, was right at his door. Practically every one of the employees of the company had their gardens and raised their own vegetables, that is, the common ones. He noticed, however, that while cabbage was plentiful, what cauliflower the housewives got for their pickles had to be shipped in from out of town. The next year he supplied the local demand for cauliflower and made a good profit. Celery for Thanksgiving and Christmas also came in from the city the first year he was there but the second year this was not necessary. He supplied the demand and more celery was sold in that town than ever before.

All through the summer and fall five or six boxes of melons were shipped into town each week. The next year he had these fruits in variety for several weeks and cut off the demand for outside supplies. Instead of trying to sell cucumbers the next year he made pickles and disposed of them during the winter.

As to fruits, he soon learned that few of the residents raised strawberries, hence he got busy and set a patch. None of them went to waste. A row or two of raspberry and blackberry bushes also produced berries that

found ready sale. He soon learned to gauge the market and knew about how much he could sell of each product.

Occasionally when he found he had a surplus of anything he made a trip to the city twenty miles away. While he could not take such trips regularly with any profit, he found it desirable to take a load in once in a while rather than let the stuff go to waste.

The small grower who attempts to govern his plantings by the methods of the larger producers soon learns his mistake. There is no community, however well it may be supplied, but is short on certain products. The small producers should find out what they are and endeavor to supply them.

New Hamp.

C. H. CHESLEY.

PROVIDE NOW FOR THE 1917 CROP OF APPLES.

Exceptionally favorable conditions in 1915 for the development of fruit buds on apple trees may be accompanied with danger to many orchards this year. As a safeguard early provision of the moisture and food supply of the trees for future apple crops is urged.

Moderate rainfall in late May and liberal rains in June, 1915, caused an unusual development of fruit buds, which will produce this year's apple crop. The buds for the 1917 crop are now forming, and at this time the trees require an abundance of plant food and moisture. Proper care of the orchard is more important this year because of excessive blooming and of a possible drouth.

Conserving the moisture in late May and early June, offers a means of providing for the fruit-bud development for the 1917 apple crop. To this end orchards that are in grass should have an early application of fertilizers and mulches about the trees, and an early cutting of any cover crops. Thinning the fruit will not take the place of such practices.—Ohio Experiment Sta.

ARSENATE OF LEAD AS AN INSECTICIDE.

Arsenate of lead is the most generally used insecticide now on the market. It is considered the standard of all arsenical sprays for use against the chewing insects. In the past it has been used almost entirely in the wet or paste form. The federal insecticide laws require that in this form it contain not more than 50 per cent water and not less than 12½ per cent arsenic oxide, and not over three-fourths of one per cent soluble arsenic.

In the dry lead the water is absent, so the percentages of chemicals present would be double what they are in the paste.

The inspection by both the federal and state authorities is so strict that

it is only very rarely that a sample is found that is not up to the standard required for the chemical ingredients. This does not necessarily mean that a lead arsenate is as good for an insecticide as it should be. Much depends upon its mechanical condition.

Arsenate of lead does not go into solution. If it did, it would burn the foliage. It is only in suspension. The finer the particles the better it will remain in suspension in the water, and the more uniformly it can be distributed over the foliage or fruit. So it is important in buying the paste lead to see that it is a smooth, uniform product with no granules that can be felt between the finger and thumb. The powder should be a light, fluffy product that will not settle into a solid mass in the container.

The experience of growers that have used both forms demonstrates that equally good results can be expected from the paste or powder when the above requirements are met.—Col. Ag. College.

TROUBLE DEPARTMENT.

Arsenate of Lead for Potato Bugs.

It seems doubtful if we can get Paris green at any price this year. I would like to know the value of arsenate of lead as an insecticide for potatoes and full directions for using. Is it more liable to burn the foliage than Paris green if applied strong enough to kill the bugs?

Isabella Co.

H. C. O.

Arsenate of lead for spraying potatoes is not as good as Paris green for the control of the potato bug, because it is not as quick a poison, but if used thoroughly will give you very good results in keeping the vines free from the bugs. While it sticks better than Paris green it should be applied just as frequently in order to cover the growing foliage.

It should be used at the rate of at least three pounds to 50 gallons of water, and while it is supposed to be harmless to the foliage, occasionally it will slightly burn it, therefore, for preventive purposes it would be advisable to add at least a pound of slaked lime to each 50 gallons of spray.

If you are using Bordeaux mixture with the poison to control the blight, the addition of the lime will not be necessary, as the lime in the Bordeaux will counteract any injurious effect that the arsenate of lead may have.

There is no poison better than Paris green for the control of potato bugs, and it is to be regretted that it is so hard to obtain this year.

Paint for Trees.

Will you kindly advise me if it would be injurious to trees if white paint is used on the trunk in place of whitewash or the like?

New Jersey.

F. V. H.

The use of paint instead of whitewash on trees is not advisable, as the paint contains various chemicals that are injurious to the bark. Recent investigations show that even the use of pure white lead and oil on wounds of trees has a retarding effect on the process of healing.

Aside from the effect of the chemicals in the paint, it would almost entirely exclude the air from the bark, and this would have an injurious effect on the tree. Whitewash has some slight value in keeping insects from the trunks of trees, but to thoroughly control insect and fungus troubles, spraying is advisable. We shall be glad to give you specific directions for spraying if you will tell us the kind of trees you wish to treat.

Peaches are a perishable product and the farmer with a large crop in prospect can scarcely begin too soon to study the marketing facilities. A fine local market for peaches is an asset to the grower. The less competition you are forced to meet on the large city markets the more sure you will be of profitable prices for your peaches. Study the home market.

R. G. K.



Last season was favorable to a heavy setting of buds. If the weather continues good a large crop of plums will be assured. Thorough spraying and thinning in addition to other good cultural methods will do much toward successfully maturing the crop and maintaining the trees in good vigorous condition. Spraying and thinning are two essentials of successful plum growing.

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Power and weight are necessary factors in heavy traction work like plowing. Many attempts have been made and are being made now to do this class of work with light-weight explosive engines. They do not and cannot get the same economical results that properly designed and constructed Oil-Gas Tractors can accomplish.

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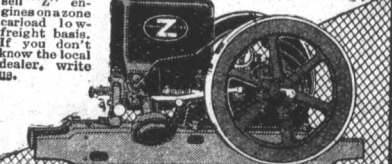
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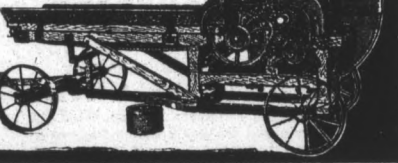
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Fecundity In Swine

AMONG the desirable characteristics possessed by our domestic swine, is that of fecundity, or fruitfulness. With the most of the improved breeds it has become a fixed trait which has been inherited through a long line of ancestry.

The fact should be kept in mind that fecundity is an acquired characteristic, and its perpetuation depends, to a great extent, on the management of the breeders. Both of the ancestral lines, on that of sire as well as dam, should be studied and so controlled, that it may enable the farmers who keep the breeding stock and raise the pigs from which our pork is made, to be able to do so in the most economical manner. Six brood sows that farrow, on an average, ten pigs each per litter, will produce as many pigs as ten sows which produce but six pigs per litter. The fact should be kept in mind that it costs 40 per cent more to keep the ten sows during the year than it does the six. It does not require a deep reasoning philosopher to see that at this point there is a chance to make a great saving in the cost of keeping a herd of brood sows.

Developing Pigs from Big Litters.

I am aware that some will say that the sow that farrows but six pigs will do better by them than the sow that farrows ten pigs. Under the old plan of letting the sows furnish all the feed the pigs get up to weaning time, there might be some argument in that state-

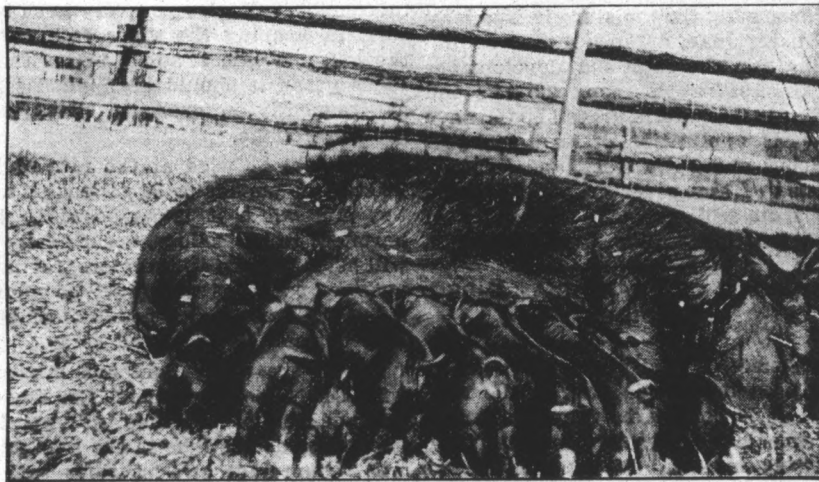
ment, but the best breeders and farmers do not allow the pigs to draw heavily on the sows. They have learned that by supplementing the sow's milk with some dainty, and yet very nutritious feeds, they can give the pigs a better start than the sow can, and it does not matter if the sow has ten or twelve pigs in the litter, a large number can be started along as readily and as quickly as a few. And farther, the pigs that are fed in a little trough by themselves, expand their stomachs younger, learn to eat a variety of food, get the thrifty habit sooner, and can reach the popular market weights quicker than the few that have been compelled to depend entirely on their mother's milk for the first six weeks of their life.

cline to the opinion that the prolific females are more likely to breed for a longer period of years than those that farrow but small litters. The mothers of small litters are not drawn upon very heavily while the pigs are with them, and the accumulation of adipose membrane around the organs of generation, is likely to be more frequent and prevent conception than with the sows that are drawn upon more heavily by a large number of pigs.

How to Secure and Retain Fecundity.

In their wild state the sows farrowed but two pigs at a litter. By surrounding both the sire and dam with good conditions where there was an abundance of food and agreeable surroundings, the capabilities of reproduction increased. After a series of many successive generations the characteristic of prolificacy was acquired and it became inherent, following some families in a greater degree than others.

In order to retain this characteristic it is a matter of necessity that considerable pains be taken in selecting the breeding stock. While I do not desire to take space to trace out the matter in detail, I will say that the farmers who raise the pigs should select their brood sows from large litters. Remember that the best pigs in the litter are none too good. Some sow pigs manifest the characteristic in a greater degree than others. The sow should be distinctly feminine and have a long under line. The young sow that has



First Prize Under Six Months' Gift at Ohio State Fair, 1915, and Litter, Owned by Hamilton Farms.

twelve teats on the abdomen is more likely to be prolific than the one that has but six or eight.

The registry records can be made use of to good advantage, because the number of pigs in the litter from which the animals recorded came, is usually indicated. The longer the line of ancestors that have been prolific, the more certain the characteristic will be fixed.

Some seem to doubt the necessity for being as particular about the selection of the sire as of the dam. It is my opinion that it is of first importance to select a sire from a fruitful family. In my own experience which extended over forty years, I have invariably found that the sire has much to do with the size of the litters. A boar from a family of small litters will sire small litters. A boar from a family of large litters will sire many large litters.

Remember that both sire and dam have an influence on the size of litters, and do not expect one or the other can do great things without the assistance of the other.

Another fact should be kept in mind. The surroundings, or environment, has much to do with retaining or destroying this characteristic. If the hogs are well cared for, well fed and made comfortable, this desirable characteristic can be retained. If the breeding stock is poorly fed and compelled to suffer hardships, there will be a tendency to revert back to the traits possessed be-

fore the improvement in life habits were made, and undesirable results will follow.

Wayne Co.

N. A. CLAPP.

LIVE STOCK AND SOIL FERTILITY.

The problem of the American farmer today is how to conserve the fertility of the soil and yet insure a reasonable income. In considering changing from grain farming to the raising of live stock, the Missouri farmer asks himself if this change has been successful in maintaining soil fertility. From the New England states westward to the Dakotas, he sees a trail of once depleted soils reclaimed by substituting dairying and stock farming for exclusive grain farming. The result of profitable systems of live stock farming on even the poorest of soils is to be seen in Holland. Denmark is another example of a country whose soils were becoming depleted by wheat producing but where a system of live stock production conserved the soil fertility.

Permanent success from exclusive grain farming has not yet been demonstrated, so modern farm practice is showing the importance of the development of animal husbandry. The close relation between the fertility of the soil and keeping of live stock is demonstrated at experiment stations and by the successful farmer. Productiveness of the acre of land is the main factor for which the farmer is everywhere striving. Because the productiveness of the land is maintained and often increased is sufficient reason for the keeping of animals on the farm, not even taking into consideration the increased profit from the live stock farm.

Farm manure is now, and always has been the greatest available resource for maintaining soil fertility on the typical middle-west farms. Generally speaking, the most prosperous farms of this section today are those on which live stock is a large, if not a chief factor of production.

While the practice of plowing under clover, and that of adding straw and stover directly to the soil will unquestionably keep up the humus or vegetable matter supply, such materials are too valuable for the nutrition of animals to be thus employed. At the Missouri Agricultural Experiment Station for two years, the average income of clover pastured off with hogs amounted to \$40 per acre.

All such materials as stover, hay, straw, and grass can be profitably marketed through animals and at least 50 per cent of their soil building value saved and at the same time a considerable profit secured from feeding the animals.

Mo. Ag. Col.

F. B. MUMFORD.

HARVESTING CROPS WITH SWINE.

In tests made by the Ohio Station three lots of pigs were fed 30 days as follows: Lot one, ear corn and clover pasture; lot two allowed to hog down rye, and lot three ear corn and rape pasture. In addition all lots were fed approximately a quarter of a pound of tankage daily per pig. The respective lots made average dairy gains of 0.82, 0.57, and 0.75 pounds per pig, and consumed, aside from pasture, 2.66, 6.34 and 2.91 pounds of feed per pound of gain. Lot two was then put in with lot one on clover and lot three remained on the rape, where the pigs were fed for 26 days. The pigs on clover made an average daily gain per pig, of 0.75 pounds, consuming 3.64 pounds of feed aside from pasture per pound of gain, and the lot on clover, 0.87 pounds gain, consuming 3.16 pounds of feed per pound of gain.

When the farm horses are idle, if but for a single day, their grain ration should be reduced - a means of avoiding attacks of azoturia, which are caused by inactivity of highly fed horses.

Judging Dairy Cattle

I would like to know how to judge cattle. Would like to know the points on Jerseys and also the beef type. Does a high-scoring animal always prove to be a good high-producing one? I am about to buy a registered Jersey bull. Can you tell me how to pick out one (about one year old) intelligently? What are the best producing families of Jerseys?

Montcalm Co.

R. J. G.

It is no small task to tell how to judge cattle. The Professor of Animal Husbandry at one of our Agricultural colleges would doubtless take several weeks to tell a class how to judge cattle. It can not be very satisfactory answered in a brief article.

To judge cattle one must know the history and characteristics of the different breeds. Cattle judging consists in selecting the best individual in some class of some particular breed. It is not comparing breeds, as some seem to think. No one could judge Holsteins and Shorthorns in the same class. The breeds do not have the same characteristics. It would not be proper to attempt to judge Shorthorns and Herefords in one class, because, while they have a similarity of type in one respect—beef conformation, yet they differ materially in many characteristics and

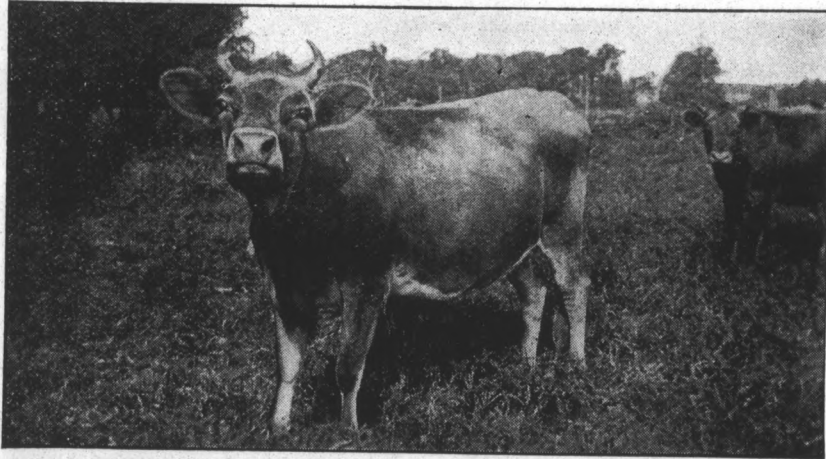
transmitted in no small measure. But sometimes this is not transmitted in any great degree, and one is never sure of the value of a dairy sire until his heifers mature. Results are what is wanted. You are not absolutely sure of these results until you see them in his heifers.

To state that one family of Jerseys is superior to another is only stating an opinion. It could scarcely be substantiated by facts.

COLON C. LILLIE.

VARIATIONS IN THE CREAM TEST.

One of the most common causes of dissatisfaction on the part of the man who sells cream on the butter-fat basis, rises from variations in the test. This is especially true if each can is tested separately and the best way for the seller to convince himself that the tester is neither careless nor dishonest is to secure a little outfit for himself. A well made, accurate, and satisfactory tester can now be bought for five dollars and its use will not only satisfy the seller that he is getting honest treatment but will enable him to detect the boarders in his herd. The fol-



A Good Dairy Cow has to be Wedge-shaped Conformation.

can not well be compared. One must be familiar with the type of each breed and make comparisons between individuals of one breed, comparing each with the standard for that breed.

However, breeds are divided for convenience of study into three classes. Beef breeds, dairy breeds and dual-purpose breeds. All breeds belonging to one of these classes have characteristics that are general and common. But the breeds belonging to one class—dairy or beef—have each individual breed characteristics and should be judged by themselves.

In a general way the beef breeds have a massive body, broad level backs, straight top and bottom lines, short thick necks. They are squarely built, with heavy loins and thighs that are well let down.

The dairy type is almost the opposite to the beef type. The dairy cow has an angular body, narrow back, high arching flank, long slim neck, and has a wedge-shaped body.

The dual-purpose type is a happy medium between these two extremes.

Unfortunately production does not always go with type in dairy cows, though as a general rule it does.

The selection of a dairy sire is a great question. His value depends on his prepotency, that is, his power to reproduce in his offspring the desirable characteristics of his race or his ancestors. Economical production of milk and butter-fat, together with breed type, is the quality sought for in his heifers.

Knowing the breed we select a bull as true to type as possible. He should possess masculinity. We want him to be a splendid representative of the male of his breed.

We shall select one whose ancestors are known producers; the greater producer, other things being equal, the better. It is reasonable to suppose that this quality of production will be

lowing are likely causes of variations in the cream test:

A change in the speed of the separator immediately causes a change in the tests of the cream, the higher the speed the greater the amount of skim-milk thrown out and so the higher the test of the cream secured. Putting it in another way, a low speed results in a larger quantity of thinner cream.

The use of the float does not always insure a uniform flow of milk into the separator, because the faucet may not always be opened equally wide and the flow will be more rapid when the tank is full than when it is nearly empty. Anything which makes the inflow more rapid will increase the proportion of skim-milk which goes through, and lower the test of the cream secured.

The amount of water used in flushing may easily be varied a pint or more, and this without any other cause or variation may change the test by two, three, or even four or five per cent.

The test is, of course, readily controlled by means of the cream screw, but as it is seldom changed in this way, on the average farm, there should be no trouble because of variation from this source.

Variations in cream tests are practically never caused by changes in the feed of the cow as every well informed cream seller is now aware.

Mistakes are most likely to result from carelessness in taking samples, as they must be very carefully and skillfully taken if they are to tell the truth and result in a fair payment, but actual dishonesty is probably much rarer than many sellers believe. A clever thief would manipulate the reported test in such a way as not to arouse the suspicion that an honest report sometimes brings up in the mind of the man who does not consider all the possible hidden causes of variation.—Mo. Ag. College.

The Separator That's Having Such Remarkable Sale

THIS
Is the Separator
That Broke Its Own Record.

Over 100,000
SOLD IN
TWO
YEARS

The sales during the last two years have been enormous—over 100,000 and still climbing. Reliance Cream Separators have met with ready sale for the last twenty years and more, but two years ago the manufacturers decided to outdo themselves, to make of the Reliance a separator that would excel any separator made—a separator extraordinary—absolutely self-oiling—one that wouldn't miss a speck of cream—a separator that would prove the greatest profit-maker farmers ever had—and the housewife was not forgotten. The Reliance had to be of right height for easy handling, and so simple that the cleaning of it would be no work at all. They succeeded. The new model

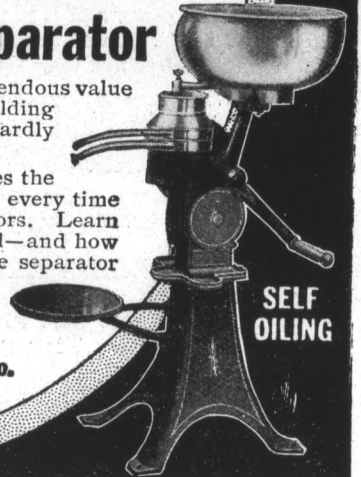
Reliance Cream Separator

has twelve important points, whose tremendous value and added excellence in separator building have shot sales up so fast we have hardly been able to keep up with orders.

Write for Reliance book which describes the self-oiling device. Machine oils itself every time it is turned. No cups—no lubricators. Learn about the wonderful Reliance bowl—and how it skims so closely. Here's the separator that possesses all the features farmers have wished and hoped for. A profit-maker at every turn.

Reliance Engineering Co.
Box 563
LANSING, MICH.

WRITE
FOR
RELANCE
BOOK



All Steel ~ a Work Saver



THIS all-steel churn is just what you have been waiting for. Make good butter without the hard work. Drawn steel barrel, heavily tinned inside—easy to clean—sanitary—cannot soak up moisture. Beautifully trimmed in red and blue. Ask your dealer or write us for Circular No. 5

Sturges & Burn Mfg. Co., Chicago, Ill.
Established in 1865

Sturges Steel Churns



THAT'S GUARANTEED
—to produce more milk than any other ration either home mixed or purchased and do it without giving your cows constipation or udder trouble. Ready to use right out of the sack without any mixing.

Larro-feed

Absolutely free from adulterants and fillers, just like the feed you would mix for yourself, is a special combination of choice cottonseed meal, dried beet pulp, gluten feed, corn distillers' grains, wheat bran, wheat middlings and a little salt, that's all; each ingredient weighed by automatic scales and all thoroughly mixed in huge power driven mixers, so that it is always absolutely uniform—and always good. An extra quart or two of milk daily from each cow may turn a loss into a profit. Try LARRO-FEED for more profits. Sold on "money back if not satisfied" plan, the decision being entirely up to you. LARRO dealers almost everywhere; write if none near you.

THE LARROWE MILLING CO 1655 Gillespie Bldg., Detroit, Mich.

MONARCH LINE of

Wind Mills,
Pumps and
Steel Tanks



This mill can be fitted on any make of tower. Write us for prices.

The Celina Mfg. Co., Celina, Ohio

VEGA

Cream Separator — The "Star" Performer
Successful in Europe since 1885. Received Grand Prizes at 4 different World's Expositions. Marvel of simplicity. Above all in quality, efficiency, durability and appearance; yet low in price. Easiest cleaned and assembled—no complicated parts. Fewer discs; all alike; interchangeable; no numbers. Self-balancing bowl. Enclosed gears.

Closest Skimmer on the Market
Recent test of New York State School of Agriculture showed loss of but one pound of butter fat in 5 TONS of skim milk!

Investigate the "VEGA"
Get more information about this wonderful separator, which has caused such favorable comment by State Experimental Stations, Agricultural Authorities, and Dairyman everywhere. Send a postal for free catalog and name of nearest Dealer.

The Vega Separator Co., Dept. 11, Fostoria, Ohio



Kalamazoo Silos

Make new friends every day—scores of them—in every community. Twenty years experience behind every one insures the best design, workmanship and material producible. No guess work when you buy a Kalamazoo—freight paid to your station—GUARANTEED.

Glazed Tile Silo "Permanent Farm Profit Producer."
The double wall vitrified tile block, glazed both sides, is far superior to the common tile or cement block. Moisture fully retained, with frost barred out, means perfect silage with minimum loss. Ample reinforcement. Securely anchored by its own weight.

Wood Stave Silo Your choice of four most lasting woods. The Kalamazoo is the only factory where this outfit is manufactured complete from the raw material to the finished product. Service and satisfaction.

A success secret of Kalamazoo Silos is the all steel, hot galvanized, continuous opening door frame, fitted with a series of everlasting Redwood doors, and either the floor wood is easily erected by home labor. Let us prove to you the Kalamazoo quality. Tell us the size and kind of silo you want and we'll save you money by our co-operative sales plan. Write today.

KALAMAZOO TANK & SILO COMPANY
621 Harrison St.
Kalamazoo, Michigan

Mich. State Brand for Butter

By FLOYD W. ROBISON.

THERE can I get good butter?" is the despairing cry of the housewife in Michigan, says Commissioner James W. Helme of Michigan. She goes to market and sees tub after tub of butter labeled "Elgin," "Creamery," "Extras," etc., and buys some that in 48 hours has a billy goat beaten for odor.

"Much good butter is made in Michigan. It is shipped to New York and Philadelphia. Much poor butter is made in Michigan. It is sold in Michigan for two reasons: First, because other states won't take it except at a very low price. Second, because the dealer can sell this butter at a cent or two cheaper than good butter and make a bigger margin on it besides. Much butter now on sale in Michigan is creamery butter placed in cold storage in Chicago last summer. Chicago now sells it at 27 cents and it is retailed here at 37 cents. Cold storage butter six months old is not long for this world after being taken out. For developing flavors that will paralyze a skunk, cold storage butter has cold storage eggs beat a mile.

"The last legislature authorized the State Dairy & Food Department to establish a state brand for butter. Before any creamery can sell butter under the state brand, the creamery must make a grade of butter that will uniformly sell in the New York market as 'Extras.' To bring this about, three expert buttermakers visit a creamery, inspect and regulate its methods, insist on clean factories and clean dairies supplying it, and instruct and educate the buttermakers and farmers how to obtain a clean, healthful uniform product. They put in several weeks at each factory. By January 1 we shall have enough factories up to the standard of 'Extras' to put out the state brand. This brand will guarantee the buyer an extra quality of butter. If a factory lowers the quality of its product, the state brand will be taken away. We will then establish selling agencies over the state to sell 'State Brand Butter.' In the meantime parties who wish to buy an extra grade of butter will be furnished the names of creameries that are producing such goods, by writing to the State Dairy & Food Department, Lansing, Michigan." —Quoted from the American Food Journal, May, 1915.

Since the legislature of 1905 made it the duty of the State Dairy & Food Commissioner to foster and encourage the dairy industry in this state the various executives in charge of that department have devoted considerable of their energies to improving the sanitary conditions under which milk and cream are produced, and likewise the sanitary surroundings of the creameries and cheese factories.

The Scoring Contests.

Former Deputy Dairy & Food Commissioner, Mr. Lillie, established in this state the monthly scoring contests for butter and the various creameries of the state were invited to send samples of their butter to this scoring contest and have its merits passed upon by an expert butter judge. This was continued for a considerable period of time and those creameries which took advantage of the opportunity which the state offered in this way received a great deal of benefit.

Michigan Butter Has Not Been High Grade.

The object of this proceeding was not only to make the business of butter-making a better business financially for the dairy interests of the state, but it was likewise to improve in a marked degree the food properties of the butter on the market. Some of our western states, particularly Wisconsin and Minnesota, have enjoyed a marked distinction in the eastern markets because of the superior qualities of the average butter produced in these

states. On the contrary, Michigan has not been recognized in this respect, due to the exceedingly miscellaneous character of the butter which she has produced. The reason for this has been an entire lack of uniformity in method among the buttermakers and the almost entire absence of any uniformity of grading cream.

Creameries throughout the state have been zealously bidding against each other. Competition has been so rife in this respect, at least in certain sections, that almost any product which contained butter-fat would be purchased by the creamery and that regardless almost entirely of the conditions of sanitation under which it was produced.

This peculiar condition regarding butter is difficult to understand. Certainly in the long run it works in a way antagonistic to a good butter market and furnishes at the same time much of the ammunition which the oleomargarine interests of the country so readily take advantage of.

The State Brand Authorized.

The last legislature in this state authorized another statute in the interests of better milk products. It authorized the establishment of a state brand of butter and directed the Dairy & Food Commissioner to permit the use of this state brand by any creamery which would reach a certain degree of perfection in the manufacture of butter. In this way this brand of butter becomes analogous in a sense to the certification of milk. The idea is an admirable one and we think should go a long way toward accomplishing the results which have been attempted for so long. The only requisite to the successful maintenance of a state brand of butter, as we see it, is the maintenance of a competent staff of dairy inspectors. If this brand becomes a popular one among creameries, as we think it should, provided the standard is kept high and no one is permitted to undermine it, it will require the vigilance of several inspectors who must be selected because of a peculiar fitness for this particular work.

We look forward with much interest and anxiety to the working out of the production of better butter in the interests not only of the consumer but in the real interests of the producer and creameryman, and of the idea underlying the marketing of a state brand of butter for Michigan.

HAPPENINGS OF THE WEEK.

(Continued from page 730).

National.

Several hundred additional marines have been ordered to Santo Domingo to aid in protecting foreign lives and property and also to assist the island government in overthrowing the Arias revolution.

As a protest against the attempt to question their loyalty to the United States, 20,000 German-American, Austro-Hungarian-Americans and Irish-Americans celebrated American Liberty Day at Sheepshead Bay, June 4. The big parade was made up of floats representing historical events in American history.

Reports from 131 centers throughout the United States show an increase in bank clearings for the month of May, 1916, over the same month in 1915 of 40.5 per cent, which indicates business prosperity in every part of the country.

The Plattsburg military training camp opens Monday for a four weeks' training course for business and professional men. Nearly 700 men from New York City and Philadelphia left early this week to become students in this military school. A much larger contingent is expected to take the work during the four weeks beginning July 2.

James J. Hill, known as the empire builder of the Northwest, a financial and industrial statesman and railroad man, died in Minneapolis last week.

David Stott, one of Detroit's leading manufacturers and financiers, and a leading miller of the middle west, died suddenly at his home in Detroit, Sunday morning.

Woman's Work is Quickly Done

And done easily in farm homes where these modern conveniences are provided to aid her.

No more of the drudgery of cleaning and filling dirty oil lamps—no more carrying of kindling and building fires in the old cook stove—none of the distasteful labor of the old fashioned country kitchen.

But instead, freedom from all this, by the aid of the

Pilot-Carbide-Outdoor Lighting and Cooking Plants

Every woman owes it to herself and to her children to take advantage of every convenience within her reach. Every husband and father owes it to his wife and family to provide the home comforts within his means.

Hundreds of thousands of people with homes like yours are today enjoying the benefits which the *Pilot* provides. You will be pleased to find out how little it will cost to put these same year round conveniences in your home. Write today for our illustrated catalogs and descriptive booklets giving all the facts. These will be sent free by return mail.

A. R. GRAHAM, Supervisor

810 Mason St., FLINT, MICH.

OKWELD ACETYLENE COMPANY, CHICAGO

Largest Makers of Private Lighting and Cooking Plants in the World.



SHARPLES SUCTION- FEED SEPARATOR

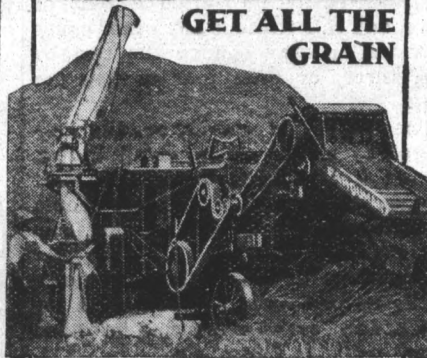
makes three cows earn more for you than four cows without it. And it will save from 7 to 13 pounds of butter per cow yearly that every other separator loses through imperfect separation. Still it is simpler, easier washed and easier kept clean than any other separator—no discs, no oil holes, no high lifting. It's truly a woman's separator. Ask for catalog, "Velvet" for Dairymen, and see your dealer as well.

The Sharples Separator Co., West Chester, Pa.

Also Sharples Milkers and Gasoline Engines

Branches: Chicago San Francisco Portland Toronto

FARQUHAR THRESHERS GET ALL THE GRAIN

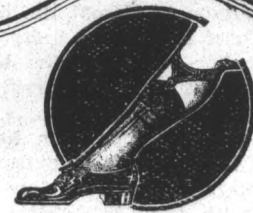


Farquhar Threshers handle all varieties of grain, are long lived and easy to operate. Our construction, though simple throughout, provides for ample separating and cleaning facilities. This means fast, efficient threshing with light operating power.

The Farquhar Vibrator as illustrated above, answers every requirement of the merchant thresherman. It is built in six sizes and can be supplied with all latest labor-saving attachments, such as Self Feeder, Wind Stack, Weigher, etc. For the individual user with light power, the Farquhar Rake makes an ideal outfit.

1916 Thresher Book will explain why you should own a Farquhar. Write us concerning your requirements, and we'll send a copy without charge.

A. B. FARQUHAR CO., Ltd. Box 512, York, Pa. We also manufacture Engines, Sawmills, Hydraulic Cider Presses, Potato Diggers, Grain Drills, Cultivators, etc.



Boston Garter

Fits smoothly—does not bind, slip or let go. Will not injure the hose. Light, easy and comfortable. Get the garter that gives the greatest satisfaction—ask for the "Boston." Lisle 25 cents. Silk 50 cents.

GEORGE FROST COMPANY, MAKERS, BOSTON

Reliable Watches at Bargain Prices



Elgin or Hampden Jewel movements in 20-year gold-filled cases, 12 or 16 size. Regularly \$10 and \$12. My special prices open face \$8.25; Hunting case \$10. Money refunded if not satisfactory. Write today. Jewelry catalogue FREE.

J. W. DONLAN, Flint, Mich. References: Industrial Bank or National Bank of Flint.

Magazine Section

LITERATURE
POETRY
HISTORY and
INFORMATION

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

The **FARM BOY**
and **GIRL**
SCIENTIFIC and
MECHANICAL

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

YEAR by year, the importance of our bird life becomes more and more apparent. The number of bird lovers is constantly increasing with the increased knowledge concerning the feathered folk.

Almost too late, law makers are awakening to the fact that some of our most useful birds are becoming almost extinct for the lack of proper protection. The army of insects that would in a few decades, literally devour the earth, is kept in check by the birds which wage ceaseless war on the ravaging hosts. In our own state, the quail is a notable example of a most useful bird that well nigh became ex-

True Incidents About Birds

By J. A. KAISER

tinct because of lack of proper laws protecting it. As the case now stands, the laws in regard to this bird are made largely in the interest of the sportsman, but the time is not far distant when the interest of the farmer will be paramount, and the quail will be protected from the gun of the sportsman for all time.

In the light of the ever-increasing interest and importance of bird life, incidents connected with our more com-

mon birds have a lively interest for a constantly increasing number of people. The following brief narratives are true in the minutest detail, and will doubtless be read with interest by many of the readers of this publication:

My first tale has to do with an oriole, that vigilant and useful insectivorous bird whose presence among fruit trees means destruction to thousands of insects. This oriole in question, resort-

ed frequently to a plum tree located within a few feet of the dining-room window. The tree was white with blossoms, and the gay oriole in his spring suit of orange and black, flashed amid the branches of snowy whiteness like a gleam of burnished gold. He coquetted and whistled in front of his mate who was also an occupant of the tree, and seemed to know only joy in his world.

Of a sudden, a change came over the dapper young bridegroom. With ruffled feathers and throbbing breast, he darted at the near-by window and hit the pane with a bang. Returning to the tree, the performance was again

WORLD EVENTS IN PICTURES



Statue of George Washington Recently Unveiled at West Point, Donated by a Patriotic Citizen and Veteran of the Civil War.



Col. Roosevelt Aroused Much Enthusiasm at his Recent Visit to Detroit.



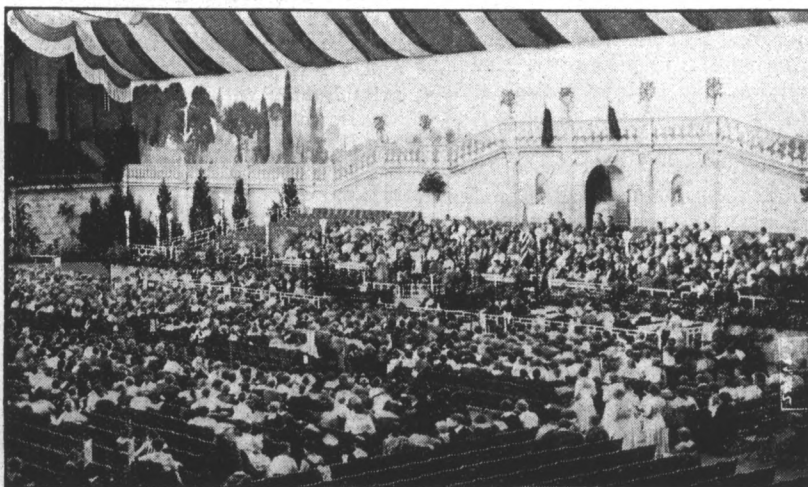
Aerial Performer Flying over Broad St., During Newark 250th Anniversary.



Lieut. Patton Aided in Capturing Capt. Cardenas, a well-known Lieutenant of Gen. Villa's.



American Photographer with Bulgarian Forces in Serbia Faces Death many times, Being Suspected as a Spy.



Federation of Women's Clubs, 20,000 Strong, in Session in New York City.



At Right is Lieut. Navarre, the French Aviator who has Brought Down Sixteen German Warplanes.

repeated, and was kept up at intervals for hours, the exasperation and annoyance of the bird growing more marked with each fresh effort.

An investigation into the cause of the strange action, revealed the fact that the light was reflected from the window in such a way that the oriole could see himself in the glass. Unable to explain the phenomenon with his bird intellect, he could draw but one conclusion. That pert, fine-looking male oriole was a dangerous rival, a menace to the peace and happiness of his household, and therefore, a deadly enemy. The numerous attempts of the oriole to close with his antagonist were amusing to the observer, but full of baffled rage and near tragedy to the bird. The incident shows that the feathered folk, like human beings, sometimes borrow imaginary troubles and are visited by illusions that are the cause of much useless and nerve-racking worry.

The second tale relates to some crow blackbirds. These birds are neither so beautiful nor so musical as the oriole, but their usefulness can not be questioned. The writer has seen a flock of them following all day, the farmer's drag, and picking up in almost unbelievable numbers, the cut-worms that were waiting to destroy the young corn. The birds would carry a beakful—sometimes as many as six or eight worms to a clump of evergreen a quarter of a mile away, and in a few minutes would return again to the field for fresh prey. The evergreens sheltered several nests containing young birds. But to return to my second tale:

A lady had spread some lace curtains on the fresh green grass, in the warm May sun, and had pinned the curtains in place on the sod by the use of tooth-picks. Chancing to look that way sometime later the lady beheld one of these crow blackbirds leisurely drawing the tooth-picks from the ground in which they had been placed. The bird was making a trip around the curtain, pulling each tooth-pick in its turn and dropping it. He seemed to have no particular use for the little pieces of wood, and his act resembled more the work of a mischievous child than anything else.

The third account has to do with a robin, the most common and perhaps the most widely-known and loved of all our birds. But the robin in these days, is not without his enemies among men. He dotes on strawberries and cherries, and there are those who say he destroys more than he saves of the earth's products. Of course, this is not true, although it must be admitted that the robin's inroads among berries and cherries are sometimes exasperating to a marked degree. His cheery, wholesome song in itself, counteracts any damage he may do, and who after all, would take this familiar bird from our dooryards and orchards!

The robin in question had come every spring for a number of years to the same tree to nest and rear her young. One spring she did not come at the usual time, and the man who had learned to look for her coming, thought she had met with some fatal mishap. At length the bird arrived, several weeks later than usual, and with her mate began the work of home-making. One day the observer noted a peculiarity in the aspect of the bird, and upon closer inspection found that one foot was missing. This, then, was the explanation of the long delay. The robin had lost a foot in some accident, and probably nearly lost her life at the same time. Through the summer months, however, the crippled bird reared her young, the last nest of eggs being laid late, due to the lateness in arrival in the spring. In the autumn, a tragic end came to the bird that had performed with so much bravery and perseverance, her allotted tasks in life. Through her inability to move quickly she fell a prey to a cat that chanced that way.

These three little incidents reveal

something of the comedy and tragedy in the bird world. The birds have a host of enemies, and their slaughter each year is enormous. Hawks, owls, snakes, weasels, red squirrels, boys,

and even men, prey on the beneficial birds. Give the birds about your place a show. Lend them a hand in time of need, and the good you do will return to you an hundred fold.

Light of Western Stars

By ZANE GREY

Beyond Bernardino he sheered off the road and put the car to a long, low-rising slope. Here the valley appeared to run south under the dark brows of the Guadaloupes. Link was heading southwest. Madeline observed that the grass began to fail as they climbed the ridge; bare, white, dusty spots appeared; there were patches of mesquit and cactus and scattering areas of broken rock.

She might have been prepared for what she saw from the ridge top. Beneath them the desert blazed. Seen from afar, it was striking enough, but riding down into its red jaws gave Madeline the first affront to her imperious confidence.

She saw a bare, hummocky ridge, down which the car was gliding, bounding, swinging, and this long slant seemed to merge into a corrugated world of rock and sand, patched by flats and basins, streaked with canons and ranges of ragged, saw-toothed stone. The distant Sierra Madres were clearer; bluer, less smoky and suggestive of mirage than she had ever seen them.

The bouncing of the huge car, throwing Madeline about, fastened her attention upon the way Link Stevens was driving and upon the immediate foreground. Then she discovered that he was following an old wagon-road. At the foot of that long slope they struck into rougher ground, and here Link took a cautious, zigzag course. The wagon-road disappeared, and then presently reappeared; but Link did not always hold to it. He made cuts, detours, crosses, and all the time seemed to be getting deeper into a maze of low red dunes, of flat canon beds lined by banks of gravel, of ridges mounting higher.

Still Link kept on and never turned back. He never headed into a place that he could not pass. Up to this point of travel he had not been compelled to back the car; and Madeline began to realize that it was the cowboy's wonderful judgment of ground that made advance possible. He knew the country; he was never at a loss; after making a choice of direction he never hesitated.

Then, at the bottom of a wide canon, he entered a wash where the wheels just barely turned in dragging sand. The sun beat down white-hot; the dust rose; there was not a breath of wind; there was no sound save the slide of a rock now and then down the weathered slopes and the labored chugging of the machine.

The snail pace, like the sand at the wheels, began to drag at Madeline's faith. Link gave over the wheel to Madeline and, leaping out, he called to Nels. When they untied the long planks, and laid them straight in front for the wheels to pass over, Madeline saw how wise had been Link's forethought. With the aid of those planks they worked the car through sand and gravel otherwise impossible to pass.

This canon widened and opened out, affording an unobstructed view for miles. The desert sloped up in steps, and in the morning light, with the sun bright on the mesas and escarpments, it was gray, drab, stone-colored, slate, yellow, pink, and, dominating all, a dull rust-red. There was level ground ahead, a wind-swept floor as hard as rock.

Link rushed the car over this free distance. Madeline's ears were filled with a droning hum, like the sound of a monstrous, hungry bee, and with a

strange, incessant crinkle, which she at length guessed to be the spreading of sheets of gravel from under the wheels. The giant car attained such a speed that she could only distinguish the colored landmarks to the fore, and these faded as the wind stung her eyes.

Then Link began the ascent of the first step—a long, sweeping, barren waste, with dunes of wonderful violet and heliotrope hues. Here were well-defined marks of an old wagon-road, lately traversed by cattle. The car climbed steadily, surmounted the height, and faced another long bench which had been cleaned smooth by desert winds. The sky was an intense, light, steely blue, hard on the eyes. Madeline veiled her face, and did not uncover it until Link had reduced the racing speed.

Presently another height was reached, and here Madeline fancied that Link had driven the car to the summit of a high pass between two mountain ranges. The western slope appeared to be exceedingly rough and broken. Below it spread out another gray valley, at the extreme end of which glistened a white spot that Link grimly called Douglas. Part of that white spot was Agua Prieta, the sister town across the line. Madeline looked with eyes that fain would have pierced the intervening distance.

The descent of the pass began under difficulties. Sharp stones and cactus spikes penetrated the front tires, bursting them with ripping reports. It took time to replace them. The planks were called into requisition to cross soft places. A jagged point of projecting rock had to be broken with a sledge.

At length a huge stone appeared to hinder any further advance. Madeline caught her breath. There was no room to turn the car; but Link Stevens had no intention of such a thing. He backed the car to a considerable distance, then walked forward. He appeared to be busy a moment, and returned down the road on the run. A heavy explosion, a cloud of dust, and the rattle of falling fragments told Madeline that her indomitable driver had cleared a passage with dynamite. He seemed to be prepared for every emergency.

Madeline looked to see what effect the discovery of Link carrying dynamite would have upon the silent Nels.

"Shore now, Miss Majesty, there ain't nothin' goin' to stop Link," said Nels with a reassuring smile.

Madeline began to see her cowboy driver with clearer eyes, and his spirit awoke something in her that made danger of no moment. Nels likewise subtly responded; and though he was gray-faced, light-lipped, his eyes took on the cool, bright gleam of Link's.

Cactus barred the way—rocks barred the way—gullies barred the way, and all these Nels addressed in the grim humor with which he was wont to view tragic things. A mistake on Link's part, a slip of a wheel, a bursting of a tire at a critical moment, an instant of the bad luck which might happen a hundred times on a less perilous ride—any one of these might spell disaster for the car, perhaps death to its occupants.

Again and again Link used the planks to cross washes in sand. Sometimes the wheels ran all the length of the planks, sometimes they slipped off.

Presently he came to a ditch where water had worn deep into the road. Without hesitation he placed the planks, measuring distance carefully, and then started across. There was

grave danger of ditching the machine. One of the planks split and sagged a little, but Link made the crossing without a slip.

The road led under an overhanging cliff and was narrow, rocky, and slightly down hill. Bidding Madeline and Nels walk round this hazardous corner, Link drove the car ahead. Madeline expected to hear it crash down into the canon, but presently she saw Link waiting to take them aboard.

Then came steeper parts of the road—places that Link could run down if he had space below to control the car, and, on the other hand, places where the little inclines ended in abrupt ledges upon one side or a declivity upon the other. Here the cowboy let the car slide down with ropes on the wheels and half-hitches upon spurs of rock.

Once, at a particularly bad spot, Madeline exclaimed involuntarily:

"Oh, time is flying!"

Link Stevens looked up at her as if he had been reproved for laziness or neglect of orders. Like a glint of steel on ice, his eyes brightened coldly. Perhaps that utterance of Madeline's was needed to liberate his recklessness to its utmost. Certainly he put the car to seemingly impossible feats.

He rimmed gullies, he hurdled little ridges, he leaped breaks in the even road. He made his machine cling like a goat to steep inclines; he rounded corners with the inside wheels higher than the outside; he passed over banks of soft earth that caved in the instant he crossed weak places. He kept on and on, threading tortuous passages through rock-strewn patches, keeping to the old road where it was clear, abandoning it for open spaces, and always going down.

At length a mile of clean, brown slope, ridged and grooved like a wash-board, led gently down to meet the floor of the valley, where the scant grama-grass struggled to give a tinge of gray. The road appeared to become more clearly defined and could be seen striking straight across the valley and leading to a deep, narrow wash. It plunged down on one side and ascended on the other at a still deeper angle. The crossing would have been difficult for a horse; for an automobile it was impassable.

Link turned the car to the right, along the rim, and drove as far along the wash as the ground permitted. The gully widened and deepened all the way. Then he took the other direction. When he made this turn Madeline observed that the sun had perceptibly begun its slant westward. It shone in her face, glaring and wrathful.

Link drove back to the road, crossed it, and kept on down the line of the wash. It was a deep cut in red earth, worn straight down by swift water in the rainy seasons. In some places it was only five feet wide; but Link drove mile after mile looking vainly for a place to cross. Finally progress to the south was obstructed by impassable gullies where the wash plunged into the head of a canon.

It was necessary to back the car for some distance before there was room to turn. Madeline looked at the imperturbable driver. His hard, immutable face revealed nothing. When he reached the narrowest part of the wash he got out of the car and walked from place to place. Once, with a little jump, he cleared the gulf. Then Madeline noted that the farther rim was somewhat lower. In a flash she divined Link's intention. He was hunting for a place to jump the car over the crack in the ground.

Soon he found one that seemed to suit him, for he tied his red scarf upon a greasewood bush. Then, returning to the car, he clambered in and broke his long silence by muttering:

"This ain't no air-ship, but I've outfiggured thet durned wash!"

He backed up the gentle slope and halted just short of steeper ground. His red scarf waved in the wind.



"Sharing a Treat."

Hunching low over the wheel, he started, slowly at first, then faster and faster. The great car gave a spring like a huge tiger. The impact of suddenly formed wind almost tore Madeline out of her seat. She felt Nels's powerful hands on her shoulders. She closed her eyes.

The jolting headway of the car gave place to a gliding rush. This was broken by a slight jar; then above the hum and roar rose a cowboy yell. Madeline waited with strained nerves for the expected crash. It did not come. Opening her eyes, she saw the level valley floor without a break. She had not even noticed the instant when the car had shot over the wash.

Pulling the hood down over her face, she sank low in the seat. The whirr of the car now seemed to be a world-filling sound. Again the feeling of excitement, the poignancy of emotional heights, the ever-present, impending sense of catastrophe, became held in abeyance under the sheer intensity of physical sensations.

There came a time when all her strength seemed to unite in an effort to lift her breast against the terrific force of the wind, to draw air into her flattened lungs. She became partly dazed. The darkness before her eyes was not all occasioned by the hood that pressed like a stone mask on her face. She had a sense that she was floating, sailing, drifting, reeling, even while being borne swiftly as a thunderbolt. There was a long, blank period, from which she awakened to feel an arm supporting her.

Then she rallied. The velocity of the car had been cut to the speed to which she was accustomed. Throwing back the hood she breathed freely again.

The car was bowling along a wide road upon the outskirts of a city. Madeline asked what place it could be.

"Douglas," replied Link. "An' jest around is Agua Prieta."

That last name seemed to stun Madeline. She heard no more, and saw little, until the car stopped.

Nels spoke to someone. Then the sight of khaki-clad soldiers quickened Madeline's faculties. She was on the boundary-line between the United States and Mexico, and Agua Prieta lay before her.

A soldier, evidently despatched by Nels, returned and said that an officer would come at once. Madeline's attention was centered in the foreground, upon the guard over the road, upon the dry, dusty town beyond, but she was aware of noise and people in the rear. A cavalry officer approached the car, stared, and removed his sombrero.

"Can you tell me anything about Stewart, the American cowboy who was captured by rebels a few days ago?" asked Madeline.

"Yes," replied the officer. "There was a skirmish over the line between a company of Federals and a large force of guerrillas and rebels. The Federals were driven west along the line. They say that Stewart fought recklessly and was captured. He got a Mexican sentence. He is known here along the border, and the news of his capture stirred up excitement. We did

all we could to get his release. The guerrillas feared to execute him here, and believed that he might be aided to escape; so a detachment took him away to Mezquital."

"He was sentenced to be shot Thursday at sunset—tonight?"

"Yes. It was said that there is some personal resentment against Stewart. I regret that I can't give you definite information. If you are friends or relatives of Stewart, I might find—"

"I am his wife," interrupted Madeline. "Will you please read these?" She handed him the telegrams. "Advise me—help me—if you can!"

With a wondering glance at her the officer received the telegrams. He read several and whistled low in surprise. His manner became quick, alert, serious.

"I can't read these written in Spanish, but I know the names signed." Swiftly he ran through the others. "Why, these mean that Stewart's release has been authorized. They explain mysterious rumors we have heard here. Greaser treachery! For some strange reason messages from the rebel junta have failed to reach their destination. We heard reports of an exchange for Stewart, but nothing came of it. No one started for Mezquital with authority. What an outrage! Come, I'll go with you to General Salazar, the rebel chief in command. I know him. Perhaps we can find out something."

Nels made room for the officer, and Link sent the car whirling across the line into Mexican territory.

Madeline's perceptive sensibilities were now exquisitely alive. The white road led into Agua Prieta, a town of colored walls and roofs. Goats and pigs and buzzards scattered before the roar of the machine. Native women wrapped in black mantles peeped through iron-barred windows. Men wearing huge sombreros, cotton shirts and trousers, bright sashes round their waists, and sandals, stood motionless to watch the car go by.

The road ended in an immense plaza, in the center of which was a circular structure that in some measure resembled a corral. It was a bull-ring, where the national sport of bull-fighting was carried on. Just now it appeared to be quarters for a considerable army. Ragged, unkempt rebels were everywhere, and the whole square was littered with tents, packs, wagons, arms. There were horses, mules, burros, and oxen.

The place was so crowded that Link was compelled to drive slowly up to the entrance to the bull-ring. Madeline caught a glimpse of tents inside; then her view was obstructed by a curious, pressing throng. The cavalry officer leaped from the car and pushed his way into the entrance.

"Link, do you know the road to Mezquital?" asked Madeline.

"Yes, I've been there."

"How far is it?"

"Aw, not so very far," he mumbled.

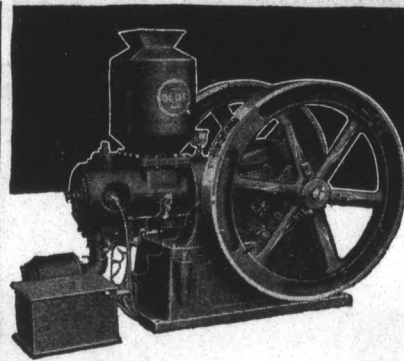
"Link! How many miles?" she inquired.

"I reckon only a few."

Madeline knew that he lied, and asked him no more. How stifling was this crowded, ill-smelling plaza. The sun, red and lowering, had sloped far down in the west, but still burned with furnace heat. A swarm of flies whirled over the car. The shadows of low-sailing buzzards crossed Madeline's sight. Then she saw a row of the huge, uncanny birds sitting upon the tiled roof of a house. They had no air of sleeping or resting. They were waiting!

She fought off a horrible, ghastly idea before its full realization. These rebels and guerrillas—what lean, yellow, bearded wretches! They watched Link curiously as he worked over the car. No two were alike, but all were ragged. They had glittering eyes, sunk deep in their heads. They wore huge sombreros of brown and black felt, of straw, of cloth. Every man wore a belt or sash into which was thrust some kind of a weapon. Some wore

(Continued on page 744).



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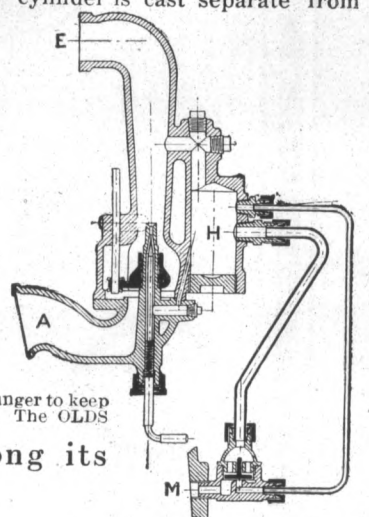
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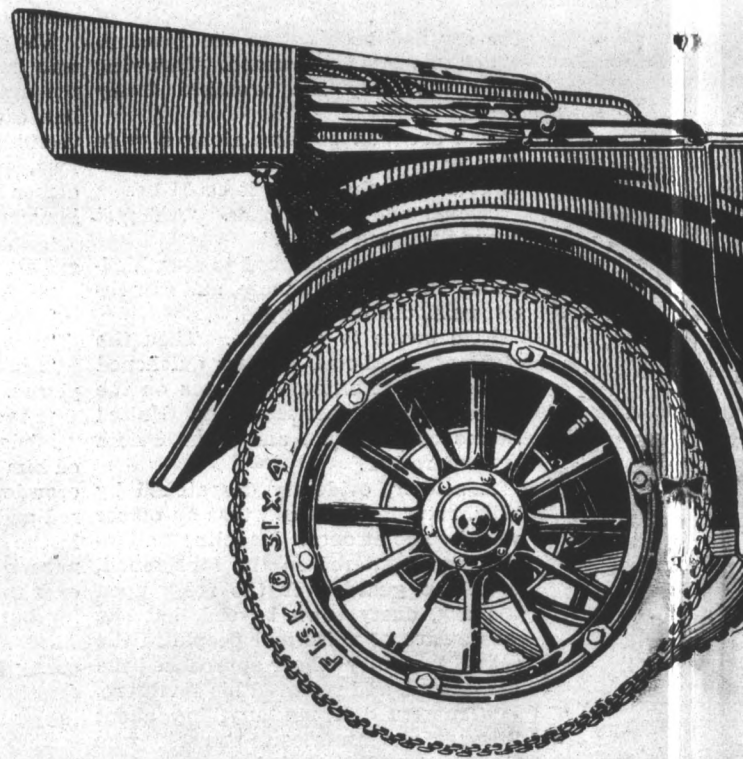
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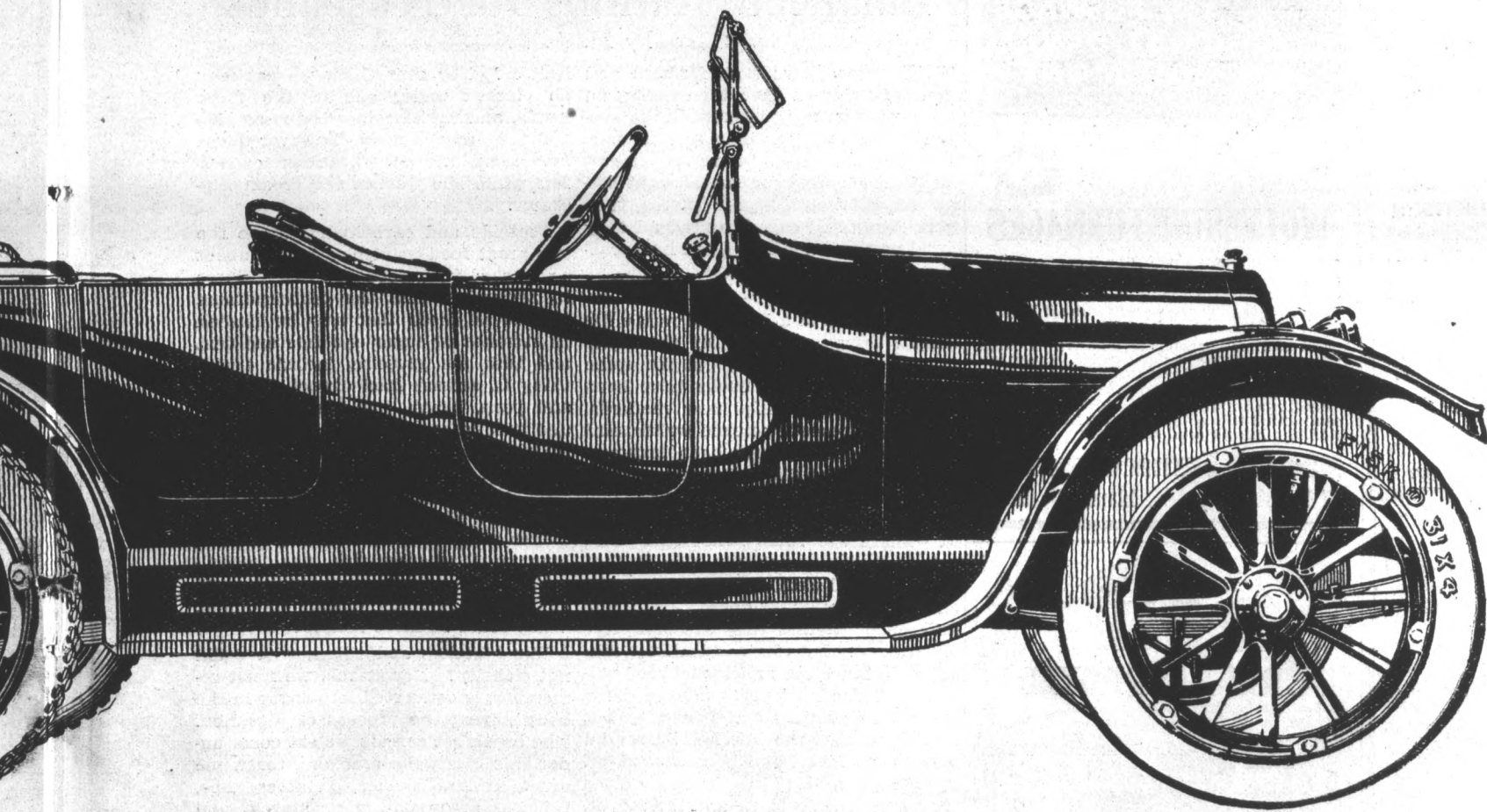
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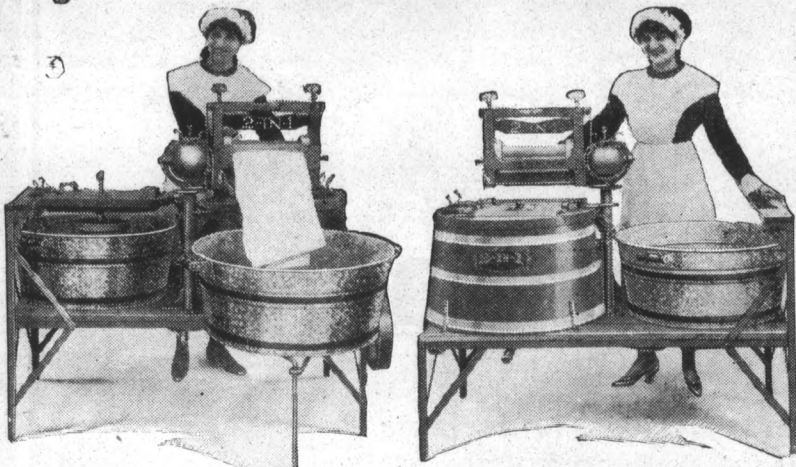
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Woman and Her Needs

Life More Than Money-Making

I MAY have written this incident before. If I have, please forgive me, but it made such an impression on me that it still persists in bobbing up every so often, though it is three years since I first heard it.

A young couple who had been married just eighteen months were sitting before their fireplace.

"What do I mean to you, dear," said the husband, putting his hand tenderly over his wife's.

"Just \$25 a week," she came back promptly, "and I was just thinking you haven't handed it over yet tonight."

The story was told as a joke, but somehow it makes me shudder instead of smile. That life should become so sordid that a woman can see nothing in it but work and money, that a husband means nothing but his weekly pay check, could anything be more ghastly? In justice to the wife in this particular instance, it must be admitted that circumstances were very much against her. They were buying a home, there were city, county and state taxes to pay, a sewer tax, a paving tax, a new baby to feed and clothe and indigent relatives on each side to give a weekly dole. It took all the young woman's wits and business ability to make that \$25 do the things expected of it, and hard work, with no play, had forced her into a position where life meant only the necessity of paying bills and meeting sudden demands on time and pocketbook.

Yet the fact that "life is more than meat and the body than raiment," is just as true today as it was hundreds of years ago when the words were first spoken, and before modern strenuousness

and so-called "improvements" of civilization had forced so many of us into the position of machines for making money. Life was meant for us to enjoy, not simply to endure. And the best way to enjoy it is to give up the chase for money.

Now do not mistake me. This is not an argument in favor of shiftlessness. But aren't most of the hard workers simply engaged in chasing a few extra dollars when they already have enough to make them comfortable? Why work hard to have a little finer home than our neighbor when after we get it we are either too tired to enjoy it, or just get it in time to have the funeral in it? Why stay home from the fair or the falls, or refuse to take a trip to California when we have the time or money, in order that we may buy more land or get a mortgage on our neighbor's farm, when we already have more land than we can work? Why crush all jollity and fun and happiness out of life when there are so many simple pleasures which may be had for the taking?

We Americans two generations old sneer at the foreigner who has not yet gotten over his habit of play. But after all, he has the better of us. He knows that life at best is hard enough, and that a little play, even if it looks like buffoonery, is going to make the next hour's work a bit easier. He acts like a child, yes. But why not? Aren't the work-weary adults always wishing they were children again? Let's all keep a little of the play spirit and make of life something besides a grind where work is prime minister and the dollar is king.

DEBORAH.

Balanced Rations for Husbands

By M. A. L.

FOR some years now farmers and stock raisers have been taking an ever-increasing interest in the subject of balanced rations for animals. As soon as it was conclusively shown them that a proper ration brought better animals and higher prices they were ready and eager to read all they could on the subject and put into practice the teachings of scientists on the subject of feeding.

The subject of a balanced ration for human beings came up for consideration at the same time, but for some reason mothers and cooks have been much slower to adopt new methods, and while domestic science writers and household editors have been hammering away on the subject of proper feeding of children and adults, the women who cook have been strangely apathetic. There are some men enough to say that the reason for this is that husbands and children can not be sold, and that therefore it doesn't make any difference whether they are fed properly or not. I prefer to think the reason is because the articles on food values and food properties have been made so technical and generally cut and dried that the hurried, harassed women readers have been scared off by the glimpse of words and names they hadn't time to go and look up in the dictionary.

Really the matter of a balanced ration is so simple that children who are still reading only words of one syllable may be made to understand the subject. We need only to remember that the body needs food to keep it growing, food to keep it warm and food to give us strength to work, and that these three things are done by three kinds, or two classes, of food. Simple,

Proteids and carbohydrates are the two great food principles talked about so learnedly by food experts. Please to remember that the carbohydrates include all foods that may be classed as starches or sugar and fats and oils, and that the proteins include everything in animal food except the fats, and peas, beans, and lentils as well, and your lesson is all but learned. Proteids are also sometimes called albuminous and nitrogenous foods, and the best specimen we have of a proteid is the white of egg. This class also includes skim-milk, the curd of cheese, lean meat, whether fish, fowl or animal, and the part of grains which gives the sticky, stretchy quality to dough. What could be more simple?

The starches and sugar, who could not classify? For starch, we must remember, is converted into sugar in the body during the process of digestion. The breakfast cereals we eat come under this class, the crackers, toast, pie crust, cakes, cookies, potatoes, rice, tapioca, arrowroot, corn starch, and everything of like nature. The salad vegetables, lettuce, cabbage, tomatoes and others containing a good deal of water, and most acid fruits are eaten not for either starch or proteids, but for the mineral substances found in their juices which the body needs as well as needing hearty food.

Fats and oils, of course, we get in butter, cream, fat meat, olive oil and other vegetable oils, and in small quan-



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titles in many other foods which will be mentioned in later articles.

As to balancing the ration properly, what could be easier? The adult having gotten his growth, needs only enough protein to keep his worn-out cells built up, but as he must work hard, he needs plenty of food to give him strength and heat. The strength-giving foods are found in starches and sugars, hence he needs more starchy foods than he does meat and eggs. His food should be on the average about three-fifths starch and sugar, one-fifth fats and oils, or fat meat, butter, cream, etc., and one-fifth proteins, or lean meat, eggs, cheese, baked beans. Besides, give a dash of fruit and watery vegetables to keep the blood cool and in good condition.

Children, who are growing, must have cell-building foods to make them grow, as well as to replace the cells worn out in their rough and tumble play. Hence they need rather more milk and eggs and lean meat in proportion to the starches than do adults. What this proportion is to be each mother has to figure out for herself, by trying just what each child can take and keep in perfect health. No two people can be fed alike, hence the balanced ration is peculiarly a home problem for the mother.

A SUCCESSFUL RURAL CO-OPERATIVE LAUNDRY.

Blue Monday as a result of the drudgery of wash-day has been banished from the vicinity of Chatfield, Minn. A cheap and most successful co-operative laundry has worked this wonder and the housewives, both of the town and on the surrounding farms now devote themselves to better things than bending over washtubs.

Some years ago the butter-maker of the Chatfield co-operative creamery equipped a discarded churn for the washing of his laundry. The secretary of the creamery saw the equipment and conceived the idea of operating a rural laundry in conjunction with the creamery. Fortunately, the stockholders of the creamery had on hand about \$2,000 in undivided dividends. The creamery being a strictly co-operative concern it was necessary to put the proposition up to all the stockholders so a big basket picnic was held, when a vote was taken, including the women as well as the men, and the result was overwhelmingly in favor of embarking on the new enterprise. The stockholders of the creamery company own about one-third of the stock in the laundry, the remainder of the 224 shares being held by the town people as well as the farmers. Both creamery and laundry plants are run together which is of course, economical, and the result has been entire prosperity for the laundry and moderate prices for laundering. The charges are five cents a pound, which includes ironing of all flat work, underwear and stockings. About one-half of the patrons have their ironing done at the laundry. The average cost per week for a family washing has been \$1.05 and patronage is about equally divided between city and country. The business done last year amounted to \$5,856, of which \$735 was profit, refunded to the stockholders.

The farmers bring their laundry when they bring their cream and get it on the following trip. The collecting and delivering of laundry within the city limits is done by a local drayman. In lieu thereof, the farmers get a 10 per cent rebate based on the actual amount of patronage. All city laundry is delivered C. O. D., while the creamery patrons have their laundry bills deducted from their monthly cream checks.

The laundry has received many letters of praise, both for the good work turned out, but more especially from the wives, who declare that the lifting of the burden of home washing and ironing has been a load which they did not realize was so great until they

were relieved of it. One of these letters which contains a strong plea for the establishment of co-operative laundries reads as follows:

"In the conservation of mothers on the farm, rural co-operative laundries rank first, in my opinion. Having had 25 years' experience as a farmer's wife, I can say that I have taken more comfort the past three years than ever before because of having dispensed with the washing and ironing. This change gives me two days of recreation that I can call my own every week and also gives me more time in which to accomplish the household duties. I have never had cause for complaint, as all articles come back in good condition and I see no reason why the work is not as satisfactory as that done at home, if not better, as it leaves no backache or tired muscles in its wake. I am sorry all women can not see the advantages such an enterprise has in the community and all patronize it. Some send part of their clothes, and others none, cherishing the foolish idea that they are economizing. Strength and health, two priceless gifts which go a long way toward making home happy, are sometimes sacrificed. The men on farms have sane ideas about the laundry as a labor-saver, and are proud of the fact that by milking a few extra cows to compensate for the extra outlay, they are doing their share to help lighten the household work. The rural laundry, like other good things, is jostled in its infancy, but is too good to drop, and will continue to prosper as well as the creameries and cheese factories of this time. When this comes to pass there will be no need for sympathy for the poor farmer's wife, and instead of pity, she will become the envy of her city sisters."

HOME QUERIES.

Household Editor.—I note that M. E. H. inquires in March 18th issue, concerning a method of staining curtains ecru. We have found a satisfactory method in using yellow ochre tied in a cloth bag in last rinsing water the same as blueing might be used. Five cents worth of yellow ochre will last for years. I shall greatly appreciate the favor if you will kindly give me a basket pattern for patch work.—A. S.

Household Editor.—Will you please tell me how to get old wall paper loose from the plaster, before putting on the new paper?—Reader.

Why remove it? Professional paper hangers paper over the old, only tearing off the loose bits. Large cracks through paper and plaster should be covered with strips of cheesecloth.

Household Editor.—Will someone tell me how to dress the backs of two rugs, one a velvet and the other a body Brussels, to make them lie flat on the floor? I have tried every way but putting on a dressing.—Mrs. Wm. J. B., Brighton.

When rugs do not lie flat the fault is often in the way the rug is made. The carpet is drawn too tightly some place when the strips are fastened together or when the border is put on, and little can be done to make them lie smoothly. If the sizing is out of your rugs the best thing to do is to send them to professional cleaners and have them re-sized. You can not do a good job at home. You might try a thin coat of paste or a very thin coating of glue. Of course, the rugs must be absolutely clean and dustless before the dressing is put on.

RECIPES.

Delicate Fried Parsnips.—Scrape the parsnips and parboil them in salted water. Cut in slices lengthwise, dip each piece in molasses and fry in sweet beef or mutton fat.—L. M. T.

The Best Fruit Juice.—Put the juice of four lemons with that of two oranges. Strain, and add one cup of white sugar, then pour in one pint of grape juice. Stir well and add one quart of water. Place it on ice until it is ready to serve.—Z. I. D.



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LIGHT OF WESTERN STARS.

(Continued from page 735).

boots, some shoes, some moccasins, some sandals, and many were barefooted. They were an excited, jibbering, gesticulating mob. Madeline shuddered to think how a frenzy to spill blood could run through these poor revolutionists. If it was liberty they fought for, they did not show intelligence in their faces. They were like wolves upon a scent.

Every man of the horde over which her swift glance roamed, however dirty and bedraggled he was, wore upon him some ornament, some tassel or fringe or lace, some ensign, some band, bracelet, badge, or belt, some twist of scarf, something that betrayed the vanity which was the poor jewel of their souls. It was in the race.

Suddenly the crowd parted to let the cavalry officer and a rebel of striking presence get to the car.

"Madame, it is as I suspected," said the officer quickly. "The messages directing Stewart's release never reached Salazar. They were intercepted. Even without them we might have secured Stewart's exchange if it had not been for the fact that one of his captors wanted him shot. This guerrilla intercepted the orders and then was instrumental in taking Stewart to Mezquital. It is exceedingly sad. Why, he is a free man this instant! I greatly regret—"

"Who did this—this thing?" cried Madeline, cold and sick. "Who is the guerrilla?"

"Senor Don Carlos Martinez. He has been a bandit, a man of influence in Sonora. He is more of a secret agent in the affairs of the revolution than an active participator; but he has seen guerrilla service."

Madeline sank down, almost overcome. Then two great hands, powerful, thrilling, clasped her shoulders, and Nels bent over her.

"Miss Majesty, shore we're wastin' time here," he said.

His voice, like his hands, was uplifting. She wheeled to him in trembling importunity. How cold, bright, blue, the flash of his eyes! They told Madeline that she must not give up; but she could not speak her thought to Nels—she could only look at Link.

"It figgers impossible, but I'll do it," said Link Stevens in answer to her voiceless query.

The cold, grim, wild quality in her cowboys blanched Madeline's face, steelled her nerve, called to the depths of her for that last supreme courage of a woman. The spirit of the moment was nature with Link and Nels; with her it must be passion.

"Can I get a permit to go into the interior—to Mezquital?" asked Madeline of the officer.

"You are going on? Madam, it's a forlorn hope. Mezquital is a hundred miles away; but there's a chance—the barest chance—if your man can drive this car. The Mexicans are either murderous or ceremonious in their executions. The arrangements for Stewart's will be elaborate; but, barring unusual circumstances, it will take place precisely at the hour designated. You need no permit. Your messages are official papers. To save time, and perhaps delay, I suggest that you might take this Mexican, Senor Montes, with you. He outranks Don Carlos and knows the captain of the Mezquital attachment!"

"Ah! Then Don Carlos is not in command of the forces that are holding Stewart?"

"No."

"I thank you, sir. I shall not forget your kindness," concluded Madeline.

She bowed to Senor Montes and requested him to enter the car. Nels stowed some of the paraphernalia away, making room in the rear seat. Link bent over the wheel.

The start was so sudden, with such crack and roar, that the crowd split in wild disorder. Out of the plaza the

car ran, gathering headway; down a street lined by white and blue walls; across a square where rebels were building barricades; along a railroad track full of iron flat cars that carried mounted pieces of artillery; through the outlying guards, who waved to the officer Montes.

Madeline bound her glasses tightly over her eyes and wound veils round the lower part of her face. She was all in a strange glow; she had begun to burn, to throb, to thrill, and she meant to see all that was possible.

The sullen sun, red as fire, hung over the mountain range in the west. How low it had sunk! Before her stretched a white road, dusty, hard as stone, a highway that had been used for centuries. If it had been wide enough to permit passing another vehicle it would have been a magnificent course for automobiles; but the weeds and dusty flowers and mesquit boughs and arms of cactus brushed the car on both sides as it sped by.

Faster—faster—faster! Link Stevens hunched low over the wheel. His eyes were hidden under leather helmet and goggles, but the lower part of his face was unprotected. He resembled a demon, so dark and stone-hard and strangely grinning was he.

Madeline realized how matchless, how wonderful a driver was this cowboy. She divined that weakening could not have been possible to Link Stevens. He was a cowboy, and he was really riding that car—making it answer to his will as it had been born in him to master a horse. He had never driven to suit himself, had never reached an all-satisfying speed, until now. Beyond that his motive was to save Stewart—to make Madeline happy.

His own life was nothing to him. That gave him the superhuman nerve to face the peril of the ride. Because of his disregard of self he was able to operate the machine, to choose the power, the speed, the guidance, the going with the best judgment and the highest efficiency possible. Madeline knew that he would get her to Mezquital in time to save Stewart or would kill her in the attempt.

The white, narrow road flashed out of the foreground and slipped with inconceivable rapidity under the car. When she marked a clump of cactus far ahead it seemed to shoot at her, to speed behind her, even the instant she noticed it. Link took the turns of the road as if he knew the way was cleared before him. He trusted to a cowboy's luck. A wagon in one of those curves, a herd of cattle, even a frightened steer, meant a wreck.

Madeline never closed her eyes at these fateful moments. If Link could stake himself upon such a chance, what could not she stake? So, while the great car hummed and thrummed and darted round the curves on two wheels and sped on like a bullet, Madeline lived that ride and meant to feel it to the uttermost.

But it was not all swift going. A stretch of softer ground delayed Link, made the car labor and pant and pound and grind through gravel. Moreover, the cactus plants assumed an alarming ability to impede progress. Long, slender arms of the ocotillo encroached upon the road, broad, round leaves did likewise; fluted columns, fallen like timbers in a forest, lay along the narrow margins; the bayonet cactus and the bisnagi leaned threateningly; clusters of maguey, shadowed by the huge, looming saguaro, infringed upon the highway to Mezquital. And every leaf and blade and branch of cactus bore wicked thorns, any one of which might be fatal to a tire.

It came at length, the bursting report. The car lurched, went on like a crippled thing, and halted, obedient to the master hand at the wheel. Swift as Link was in replacing the tire, he lost time. The red sun, more sullen and duskier as it neared the black,

bold horizon, appeared to mock Madeline, to eye her in derision.

Link leaped in and the car sprang ahead. The road-bed changed, the trees changed—all the surroundings changed except the cactus. There were miles of rolling ridges, rough in the hollows, and rocky bits of road and washes to cross, and a low, sandy swale where mesquits grouped a forest along a trickling sheet of water. Green things softened the hard, dry aspect of the desert. There were birds and parrots and deer and wild boars. All these Madeline remarked with clear eyes, with remarkable susceptibility of attention; but what she strained to see, what she yearned for, prayed for, was a straight and unobstructed stretch of road.

But the road began to wind up; it turned and twisted in tantalizing, lazy curves; it was in no hurry to surmount a hill that began to assume proportions of a mountain; it was leisurely, as were all things in Mexico except strife. That was quick, fierce, bloody—it was Spanish.

The descent from the elevation was difficult, extremely hazardous, yet Link Stevens drove fast. At the base of the hill rocks and sand all but halted him for good. Then, in taking an abrupt curve, a grasping spear ruined another tire. This time the car rasped across the road into the cactus, bursting the second front-wheel tire.

Like demons indeed, Link and Nels worked. Shuddering, Madeline felt the declining heat of the sun, saw with gloomy eyes the shading of the light over the desert. She did not look back to see how near the red sphere was to the horizon. She wanted to ask Nels.

Strange as anything on this terrible ride was the absence of speech. As yet no word had been spoken. Madeline wanted to shriek to Link to hurry; but he was more than humanly swift in all his actions. So, with mute lips, with the fire in her beginning to chill, with a lifelessness menacing her spirit, she watched, hoped against hope, prayed for a long, straight, smooth road.

Quite suddenly she saw it—miles, seemingly, of clear, narrow lane, disappearing like a thin white streak in distant green. Perhaps Link Stevens's heart leaped like Madeline's. The huge car, with a roar and a jerk, seemed to answer Madeline's call, a cry no less poignant because it was silent.

(Concluded next week).

WHAT A PRIZE PIG DID.

An energetic school teacher set out among the parents of her pupils and succeeded in selling enough subscriptions to win a prize pig. When the pig arrived the pen was already built by the school children on the school grounds for its reception. The parents were invited and talks on pig raising were made. The rest of the day was spent in driving around to some of the best pig farms in the county where various kinds of live stock were scored and discussed.

The pupils learned that a pig could not thrive entirely on scraps from lunches and occasional ears of corn. An interested member of the school committee offered the use of his team and implements and the pupils started to work clearing the forest land to use as a forage pasture. They then planted crops of rye, wheat, rape, and grass to afford the pig grazing plots of green forage. A cold frame was also put in and cabbage plants were grown for sale, the money thus realized being turned over to buy whatever additional feed was needed to keep the pig.

As a result of the interest aroused, taxpayers and members of the school board have given their support to the establishment of a small demonstration farm. More land is to be purchased and the county agent is to visit the school each week. Since the pig was brought into the school less than a year ago, the membership of the county pig club has more than trebled.

Farm Commerce.

Federating Our "Co-Op" Associations

Dr. W. O. Hedrick of the M. A. C. Points Out the Next Logical Step in the Development of Co-operative Associations in this State

THE co-operative movement among farmers in Michigan has reached a new stage of development. Among the co-operative creameries in the neighborhood of Grand Rapids, the Grape Growers' "Co-operatives" of Southwestern Michigan, and the co-operative cattle shipping associations located in Hillsdale and adjacent counties completed or nearly completed, federations have been made during the past two months.

The interests represented in these three federations or near-federations are nearly equal in size, for while the grape growers have only five associations to be bound together and the other two have near twenty each, still the larger membership and business field of the grape growers compensates amply for the smaller number of associations. Each of the new organizations will serve a federated membership of approximately 3,000 producers.

The federation is the logical outcome of the whole co-operative idea. The local associations, of which there are several hundred in Michigan at the present time, came into being upon the principle of mutual helpfulness. Each member secures a common benefit which no member unassociated with the others would be able to secure for himself—a market facility, a creamery, a telephone exchange or some other one of the half dozen things for the securing of which farmers customarily unite.

The Functions of the New Movement.

With a federation it is exactly the same way. A number of associations territorially adjacent to each other and rendering similar service to their members may join together for a number of common ends. A more comprehensive marketing scheme including advertising, may be undertaken if entered into by a sufficient number of associations. Production areas are agreed upon so that the management of one association is not weakening the support of another by drawing away its members. Better terms can be secured in buying supplies where the purchases are made for many, than if simply made for a single association. In fact, most of the general benefits upon which associations thrive may be easier secured if gone after by the federation rather than if sought for by a single association. It is a clear case of the union that gives strength.

The Michigan Co-operative Associations are almost invariably local in origin—springing up naturally in different neighborhoods as they become necessary to oppose bad conditions or desirable in creating new ones. There has been no mania nor organized agitation for increasing their numbers, consequently not being the products of feeling or excitement they seem stable and necessary and very promising.

Local Associations Merely Economize in First Handling of Goods.

The starting of a co-operative association is elementally simple—two or three neighbors in some locality find it desirable to sell directly to the wholesale markets. They are unable of themselves to furnish enough products to make a carload. Neighbors are asked to co-operate and the great advantages of carload shipments are made possible. None of these farmers are familiar with marketing methods so in time they hire a manager to take up this side of the project for them and in this simple way a live stock, potato, fruit or general produce exchange is formed. Usually the co-operators in a marketing exchange save the profits which had formerly gone to the local shipper

for themselves and in addition they enjoy some of the benefits in the way of purchasing.

The co-operative creamery presents no principle which is different from those of the "exchange." Notwithstanding the manufacturing feature it is a scheme for marketing, since all creameries sell their products in the large cities and therefore act as agents for transferring butter-fat from the farm to the city. The creamery requires more equipment—a bigger plant than is required by the "marketing exchange" but this is easily provided by selling shares of stock bearing a fixed rate or through selling a sufficiently large number of "memberships." The saving here to the co-operator is almost the difference between the market price of butter and the price paid for butter-fat by the private creamery man, since many good dairymen claim the "over-run" in a "co-operative" should nearly pay the expense of business.

Many Societies Are Started through Success of Others.

A great many associations in this state have originated through direct imitation of some successful neighboring association. Indeed, some of these experienced successful co-operative associations may be said to have fairly spawned their kind throughout nearby regions. Thus the Litchfield Cattle Selling Association some five years old, may well be considered the parent of the twenty or more associations which are entering into the Hillsdale federation. The Elkton Co-operative Grain Elevator was the pioneer among a half-dozen neighboring elevator associations in the "Thumb." The Middleville Co-operative Co-partnership Creamery Association, Limited, is the acknowledged model for fifteen other associations in that territory and the Greenville Produce and Supply Company selling potatoes has found imitators in all the nearby towns.

The fast growing popularity of the producers' unions in Michigan is easily explained. The agriculture of our state is "shot through with specialties." Each of these specialties has its own market and its own problems. Is it any wonder therefore, that each should become the basis of co-operative effort among those participating in this particular specialty?

The Reason for Success of Co-operative Efforts.

The striking merits of co-operative associations, too, as a scheme of organization are also winning favor. The distinctive place which service has in the essentials of these associations separate them widely from other business organizations of all sorts. Increased incomes they do give to their members but they also give incentives for the improvement of products, for the conserving of results and opportunity for the right relationships such as no other business organization can possibly give. Service to the association is the reason for existence of the management in these organizations, just as helpfulness to the association, by dealing through it is not only the basis of a member's income in a well organized association but is also his natural interest as well.

The movement toward federation seems to have had a larger history in the "grape belt" than in either of the two other regions under consideration. The grape growers of southwestern Michigan are uniquely situated so far as their product is concerned through

(Continued on page 747).

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Markets.

GRAINS AND SEEDS.

June 6, 1912.

Wheat.—Values for wheat have continued to decline largely through the improvement of general crop conditions. There has also been a lack of demand from foreign countries and the heavy stocks in terminal elevators give a bearish tone to all cash transactions. One year ago No. 2 red wheat was quoted on the local market at \$1.38 per bushel. Quotations for the past week are:

	No. 2 Red.	No. 1 White.	May.
Wednesday	1.13 1/4	1.08 1/4	1.14
Thursday	1.11 1/4	1.06 1/4	1.12 1/4
Friday	1.09 1/4	1.04 1/4	1.10 1/4
Saturday			
Monday			
Tuesday	1.11 1/4	1.06 1/4	1.12 1/4

Chicago.—July wheat \$1.05 1/4 a bu; Sept. \$1.07 1/4.

Corn.—Although quotations are ruling lower, the decline in corn values has not been so great as for wheat. The outlook for corn is not the brightest, late planting and cool weather militating against the proper development of the crop. They were paying 73c on the local market for No. 3 corn a year ago. Last week's Detroit quotations were:

	No. 3 Mixed.	No. 3 Yellow.
Wednesday	70	72
Thursday	70 1/2	72 1/2
Friday	70 1/2	72 1/2
Saturday		
Monday		
Tuesday	71	73

Chicago.—July corn 70 1/2 c per bu; Sept. 69 1/4 c.

Oats.—With a fair supply of moisture and moderately cool weather prevailing, the oat plant, despite late sowing has been doing nicely and dealers have been inclined to crowd values downward in harmony with those of wheat and corn. The supply and demand are about normal. Standard oats were quoted at 45c a year ago. Detroit quotations last week were:

	Standard.	No. 3 White.
Wednesday	41	40
Thursday	41	40
Friday	41	40
Saturday		
Monday		
Tuesday	42	41

Chicago.—July oats 40c; Sept. 38 1/2 c.

Rye.—Owing to small supplies and steady demand, this grain remains steady at 97c for Cash No. 2.

Beans.—Further advances have been made in bean prices. Cash beans are now quoted at \$4.10 per bushel. Chicago market is small, with prices higher. Pea beans are quoted at \$4.25, with samples selling at \$3.75; red kidneys \$5. At Greenville \$3.50 was offered.

FLOUR AND FEEDS.

Flour.—Jobbing lots in one-eighth paper sacks are selling on the Detroit market per 196 lbs., as follows: Best patent \$6.20; seconds \$6; straight \$5.60; spring patent \$6.50; rye flour \$6.

Feed.—In 100-lb. sacks, jobbing lots are: Bran \$24; standard middlings \$25; fine middlings \$30; cracked corn \$33; corn and oat chop \$29 per ton.

Hay.—No. 1 timothy \$21.50@22; standard timothy \$20.50@21; light mixed \$20.50@21; No. 2 timothy \$19@20; No. 1 mixed \$16@16.50; No. 1 clover \$13@14.

DAIRY AND POULTRY PRODUCTS.

Butter.—The market is steady with little change in prices. Extra creamery 29c; firsts 27 1/2 c; dairy 23c; packing stock 21c.

Eggs.—The market is steady at last week's price. Price for the week, based on sales is 29c.

Chicago.—The feeling is steady at last week's prices. The trade is ample to prevent any accumulations, although receipts are liberal. Quotations as follows: Extra creamery 29c; extra firsts 28 1/4 @ 28 1/2 c; firsts 27 1/2 @ 28c; dairy extras 28 1/2 @ 29c; packing stock 23c a pound.

Eggs.—The demand is active with the price for firsts 1/4 c lower. Current receipts are quoted at 21 1/4 c; firsts 21 1/4 c per dozen.

Chicago.—A steady feeling exists, with prices unchanged. Trade is good for fine eggs but slow for poor lots. Firsts 20 1/4 @ 21c; ordinary firsts 18 @ 20c; miscellaneous lots, cases included 20 @ 21c.

Poultry.—Market is easy with prices unchanged. Fowls 18 @ 20c; broilers 35 @ 40c; ducks 18 @ 20c; geese 11 @ 12c.

Chicago.—The market is lower and the feeling rather weak for fowls. Good quality turkeys sell well. Quotations for live as follows: Hens 18 1/2 c; ducks 12 @ 16c; geese 10 @ 12c; roosters 11 1/2 c; broilers 1 1/4 @ 1 1/2 lbs. 30 @ 32c; 1 @ 1 1/4 lbs. 27 @ 27 1/2 c; turkeys 20c.

FRUITS AND VEGETABLES.

Apples.—Apples easy and in good supply. Quotations as follows: Baldwins \$3.25 @ 4; Steele Reds \$4 @ 5; Ben Davis \$3 @ 3.50. At Chicago the supply of good stock is low and held steady. Quotations: Baldwins \$3 @ 3.25; Spys \$5 @ 6; Ben Davis \$2.75 @ 3; Wine Saps \$4 @ 4.50.

Potatoes.—Potatoes are easy at a decline of 15c in price. Carlots on track \$1 @ 1.10 for white. At Chicago the trade is active and market firm for good stock. No Michigan stock is quoted but others sell from 88c @ \$1.10 per bushel. At Greenville potatoes are selling for 80c.

WOOL AND HIDES.

Wool.—Despite the fact that this is usually a quiet season for dealers, a considerable volume changed hands in Boston and other primary wool markets the past week. England has placed an embargo on merino wools from Australia, which has added to the firmness of the market in this country, inasmuch as dealers expected to replenish their supplies from that continent. Growers in the west are holding for higher quotations. Michigan unwashed delaines are quoted in Boston at 30 @ 31c; do combing 32 @ 37c; do clothing 26 @ 31c.

Hides.—No. 1 cured hides 18 1/2 c; No. 1 green hides 15c; No. 1 cured bulls 13c; No. 1 green bulls 10c; No. 1 cured veal kip 20c; No. 1 green veal kip 18c; No. 1 cured murrain 18c; No. 1 green murrain 16c; No. 1 cured calf 28c; No. 1 green calf 25c; No. 1 horsehides \$6; No. 2 horsehides \$5; sheepskins as to amount of wool 50c @ \$2.50; No. 2 kip and calf, 1 1/2 c; other No. 1 hides 1c off.

GRAND RAPIDS.

Fire home-grown strawberries from the Benton Harbor district will arrive this week, selling at \$2 to \$2.25 per crate. The Michigan strawberry crop is late and will be large. The high price of sugar will affect canning operations and it is expected will curtail the demand for all kinds of fruit. Potatoes are pretty well out of farmers' hands now and the market is a speculative one. Eggs are bringing 21c a dozen. Poultry prices continue high, being influenced by the high price of meats. No. 2 red wheat starts off this week at \$1.03.

DETROIT EASTERN MARKET.

There was a fairly large number of farmers at the market Tuesday morning. Prices firm. Lettuce 55 @ 70c per bu; potatoes \$1.10 @ 1.25; tomato plants two dozen for 25c; onions six large bunches \$1; radishes four bunches 25c; eggs 26 @ 30c per dozen; veal 16c. Very little hay is coming forward at this time.

LIVE STOCK MARKETS.

Buffalo.

(Special Report of Dunning & Stevens, New York Central Stock Yards, Buffalo, N. Y.)

Receipts here today as follows: Cattle 156 cars; hogs 95 d. d.; sheep and lambs 15 d. d.; calves 1500 head.

With 156 cars of cattle today, there were around 60 cars of shipping cattle. The strictly choice shipping cattle sold about steady, but the medium and good cattle sold slow to 10c lower. The good butcher cattle sold fully steady, but cows and heifers and low priced steers showing grass sold 15 @ 25c lower. The good choice dry-fed bulls sold about steady, but the medium and light grass bulls were fully 25c lower. We look for a fair run of cattle next Monday and a good market on the corn fed cattle, but we would advise you to be very careful in buying these grass cattle, as they are bound to work lower.

We had a fairly liberal run of hogs today, demand very light and the general market for everything but pigs was 10 @ 15c lower than Saturday's best time. Selected hogs sold at \$9.70 @ 9.75; yorkers from \$9.50 @ 9.70 for the best; pigs and lights \$9 @ 9.25; roughs were extremely dull, selling from \$8 @ 8.40 and stags \$6 @ 7. Our late market was very dull and with a number going over unsold prospects are not very encouraging for the next few days.

Market was active on sheep and lambs, with prices 15c higher than the close of last week. About all sold and we look for steady to possibly a shade higher prices last of the week.

We quote: Clipped lambs \$9.75 @

10; heavy lambs \$9 @ 9.25; cull to fair \$6 @ 9.50; yearlings \$8.75 @ 9.25; bucks \$4.50 @ 6.50; handy ewes \$7 @ 7.25; heavy do \$6.50 @ 7; wethers \$7.75 @ 8; cull sheep \$5 @ 6; veals, good to choice \$11.50 @ 11.75; common to fair \$8 @ 11.25; heavy \$6 @ 9.

Chicago.

June 5, 1916.

Cattle. Hogs. Sheep. Received today. 15,000 40,000 15,000 Same day 1915. 15,871 35,427 10,374 Last week. 46,369 125,578 69,573 Same wk 1915. 36,751 128,704 43,491

Only 8,005 hogs were shipped from here last week, and prices started off today a dime lower, with some sales 15c lower, the range of sales being at \$8.90 @ 9.70. Hogs received last week averaged 221 lbs. Cattle open this week slow at about steady prices. Not much change was seen in sheep, trade opening late.

Cattle sold wider apart last week than heretofore. The previous top price for steers was \$10.75, but such beeves sold last week at \$10.80 @ 11.05, with no really choice cattle offered below \$10.60 and good steers taken at \$10 and upward. Cattle have been averaging the highest in prices ever known. Steers of medium grade brought \$9.25 and upward, fair light steers \$8.25 and upward; distillery fed steers \$10.20 @ 10.75, the highest prices ever reached. Cows were taken at \$6.15 @ 9.50; heifers \$6.25 @ 9.85; cutters \$5.35 @ 6.10; canners \$3.75 @ 5.30. There was an active trade in bulls at \$5.75 @ 9, with prime little yearlings the highest sellers. Calves sold actively at \$5 @ 11.65, with light vealers taken usually at \$10 and upward. Stockers and feeders were in good demand, with sales at \$6 @ 9 for inferior to prime offerings. Half fat yearlings are in the same unsatisfactory condition as the intermediate grades of heavier steers, with slow sales at declining prices. At the week's close steers sold below \$9.50 which is 40 @ 50c lower than the recent high spot and the general run of female cattle showing an even greater decline; the week's receipts being much increased, with too many undesirables.

Hogs were steady last week. Receipts were ordinary. The principal weakening factor was the poor eastern shipping demand. Provisions were apt to be bearish, although stocks held in Chicago warehouses are decreasing and are much lower than a year ago. Prices for pigs are off. At the week's close hogs brought \$9 @ 9.80, comparing with \$9.15 @ 9.90 a week earlier, while pigs sold off to \$6.50 @ 8.35, the best heavy packing hogs going at \$9.60 and prime light shipping hogs at \$9.70.

Sheep and lambs suffered big declines in prices recently on account of much larger offerings, but the sensational breaks caused smaller receipts and substantial rallies in values. Prices closed last week as follows: Spring lambs \$7 @ 11.50; fed lambs \$6 @ 10.35; yearlings \$8.15 @ 9.50; wethers \$7.25 @ 8.15; ewes \$2.50 @ 7.75; bucks \$6 @ 6.50.

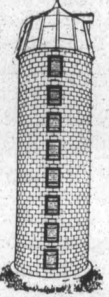
Horses were marketed in unusually large numbers last week, the Monday receipts breaking all past records, and there was an excellent demand for artillery and cavalry horses at firm prices. Local and shipping buyers took hold fairly at the recent quotations, with inferior horses taken at \$60 @ 100, farm workers selling mostly at \$100 @ 125, farm mares at \$130 and upward, commercial chunks at \$165 @ 235 and drafters at \$240 @ 300.

LIVE STOCK NEWS.

Prime heavy long-fed steers sold within a short time for \$10.90 per 100 lbs. on the Chicago market, with the next best price paid the same day \$10.50, a very good illustration of the extreme scarcity of strictly prime beeves. On the same day average prices broke 10 @ 25c for steers and from 25 @ 40c for most lines of cows and heifers, the day's receipts (Monday) being 22,794 head. In normal times that would not be regarded as a large supply to start the week with, but when prices average the highest ever known, overloading the market is not a difficult matter. Luxuriant grass in the pastures of the country and fancy prices for finished cattle, as well as for the other kinds, are acting as a powerful incentive for purchasing stockers and feeders, but these cattle have been advanced to such high prices as to discourage purchases. Up to latest advices western markets had sent to feeding districts about 25 per cent more cattle than for the corresponding period of 1915, but of late fewer of these have been offered for sale, and furthermore packers have been securing most of the best feeders by outbidding country buyers and thereby curtailing the future prime beef supply. In various parts of the country farmers are awakening to the importance of producing more beef, and sales of choice breeders are increasing,

while beef calves, as well as the good breeding heifers, are reserved for this purpose.

John Clay, who has for many years been prominently identified with the live stock interests of the United States, has traveled extensively over the western range country, and reports rapidly growing interest in Montana in the cattle breeding industry. He says: "The day of the big herd of cattle has passed, and we are faced today with the farmer and his little band. The dry farmer is on the trail and has to be reckoned with. Last year 6,700 brands were recorded in Montana. In March of this year 850 were placed on record. Every brand represents a farmer, and these farmers will have all the way from one to 50 head of cattle. These herds will increase, and this means more beef. The big range is disappearing, and the sheepmen are beginning to feel the encroachment already, just as it bore on us in Wyoming. It is hard to get to and from the summer range."



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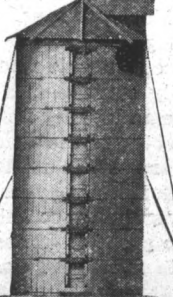
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DETROIT LIVE STOCK MARKET.

Thursday's Market.
June 8, 1916.

Cattle.

Receipts 1991. There was a good fair supply of cattle on sale at the local stock yards this week, but the quality was not nearly as good as for several weeks past, the bulk of the receipts being grassers and with the exception of best heavy steers quotations shown below are for grassers. While dry-fed grades brought strong last week's prices and were picked up quickly the grass grades were 15@25c lower and bulls fully 50c lower than they were a week ago and a slow market. Milch cows of all kinds were very dull and the best grades would not bring over \$65. Small loads bought by countrymen for feeding purposes and returned to the farm. Prices ranged as follows: Best heavy steers, dry-fed \$9@10; best handy weight butcher steers \$8@9; mixed steers and heifers \$7.50@8.25; handy light butchers \$7@7.50; light butchers \$6.75@7.75; best cows \$6@7; butcher cows \$5.25@6; common cows \$4.50@5.25; canners \$3@4.25; best heavy bulls \$6.25@6.95; bologna bulls \$6@6.50; feeders \$7@8; stockers \$6@7.50; milkers and springers \$4@6.5.

Sandel, S. B. & G. sold Mason B. Co. 11 butchers av 923 at \$8.65, 1 cow wgh 830 at \$8, 1 do wgh 910 at \$7; to Hammond, S. & Co. 11 butchers av 872 at \$7.40, 3 cows av 860 at \$6.90; to Breitenbeck 11 cows av 1101 at \$6.50, 2 bulls av 1580 at \$6; to Feldman 1 do wgh 1200 at \$7.50; to Bray & B. 1 cow wgh 770 at \$5; to Newton B. Co. 2 cows av 900 at \$7, 1 do wgh 1060 at \$6, 20 steers av 993 at \$9.15; to Kamman B. Co. 20 do av 944 at \$9.25, 1 do wgh 910 at \$9, 2 do av 735 at \$8.10, 1 cow wgh 930 at \$6.50; to Heinrich 26 steers av 914 at \$9.05; to Newton B. Co. 1 do wgh 1160 at \$11, 3 do av 1140 at \$9, 1 cow wgh 1170 at \$6.25, 3 do av 977 at \$6.25, 6 butchers av 800 at \$7.50, 5 do av 836 at \$7.50; to Breitenbeck 3 do av 950 at \$7.15, 25 steers av 878 at \$9.40; to Thompson 13 butchers av 908 at \$8.35; to Mich. B. Co. 4 cows av 1085 at \$6.65, 3 do av 1033 at \$6.65, 1 bull wgh 1040 at \$6, 2 do av 1285 at \$7.25, 1 do wgh 1230 at \$7.25, 2 cows av 975 at \$6; to Kamman B. Co. 2 steers av 1055 at \$8.75, 6 butchers av 845 at \$7.50, 4 cows av 1000 at \$6.75, 1 heifer wgh 700 at \$7.75; to Nagle P. Co. 8 steers av 965 at \$8.90; to Mich. B. Co. 3 cows av 1023 at \$6.75; to Fromm 3 heifers av 900 at \$7.50.

Veal Calves.

Receipts 1091. The veal calf trade for anything good was active from start to finish at last week's prices, good grades selling at from \$11.50@12; medium and common \$8@10; heavy coarse grades and bobs not wanted and are still being watched closely by the meat inspectors who will not allow them to be sold for food.

Erwin & S. sold Rattkowsky 4 av 155 at \$11.50, 6 av 145 at \$7.50, 2 av 155 at \$11.50; to Burnstine 9 av 150 at \$11.50; to Sullivan P. Co. 10 av 138 at \$11.50, 10 av 184 at \$11.35, 9 av 165 at \$11.50; to Hammond, S. & Co. 8 av 150 at \$11; to Thompson 14 av 140 at \$11.75; to Burnstine 3 av 185 at \$12.

Sheep and Lambs.

Receipts 1190. The supply of sheep and lambs was again very small and the quality on the common order, few being good enough to bring over \$9.75. The close was steady as follows. Thin grass sheep and lambs not wanted at any price. Best lambs \$9.75@10; fair lambs \$8.75@9.50; light to common lambs \$6.75@8; fair to good sheep \$6@6.75; culls and common \$4@5.50.

Bishop, B. & H. sold Hammond, S. & Co. 4 spg lambs av 50 at \$11, 7 sheep av 110 at \$6.50; to Nagle P. Co. 30 lambs av 65 at \$9.75; to Sullivan P. Co. 25 sheep av 75 at \$5.50, 37 lambs av 60 at \$7, 26 sheep av 90 at \$5, 10 do av 123 at \$6.50, 80 lambs av 65 at \$9.25, 20 do av 55 at \$7.25; to Mich. B. Co. 229 yearlings av 97 at \$8, 13 sheep av 85 at \$6.

Sandel, S. B. & G. sold Sullivan P. Co. 7 spg lambs av 57 at \$11.50; to Nagle P. Co. 18 sheep av 120 at \$5.50, 5 do av 160 at \$6; to Mich. B. Co. 12 do av 105 at \$6.75, 7 yearlings av 70 at \$7.50, 5 lambs av 75 at \$8.50.

Worthy sold Sullivan P. Co. 20 sheep av 85 at \$6.

Hogs.

Receipts 6935. The hog market especially on Wednesday, was a hard blow to the shippers; packers would not pay over \$9 for anything and few were sold, quite a bunch going on east in first hands. On Thursday they were some better and sold as follows: Pigs \$8.50; yorkers and heavy \$8.90@9.20.

FEDERATING OUR "CO-OP" ASSOCIATIONS.

(Continued from page 745).

the fact that they have no important competitors throughout the whole middle west. The supply of American grapes upon which cities depend from Minneapolis to Galveston, and from Indianapolis to Denver, is grown almost wholly within the two counties of Van Buren and Berrien. In spite of this almost perfect control of the yield of this widely used fruit, the growers in these counties were "played off" against each other so far as prices are concerned, by the different buyers who swarmed each year to Lawton or Paw Paw or St. Joseph or Benton Harbor during the grape marketing season. Some ten or twelve years ago the producers in these different neighborhoods asserted themselves and one or more co-operative grape selling associations were organized in the first three places named and essentially all grapes have been sold through these agencies since. It is then these five or six associations which are federating at the present time.

The methods and successes of these associations have already been described at various times in the columns of the Michigan Farmer so that the movements toward combination of these associations alone remains to be discussed. Not less than six years ago the managers of these associations awakened to the wastefulness which came from marketing grapes, each association independently of the other. For one thing the commission men of the cities succeeded at times in getting the different associations to underbid each other, thus bringing down the price. Again, the associations acting independently of each other commonly oversupplied the different cities to which they shipped, thus ruining markets and lowering prices. Eventually the first of these evils was overcome through the joint employment by the associations of an official known as an "arbiter" whose duties required him to ascertain and to report daily to each association the sales and prices of grapes sold by all associations. The indispensableness of "arbiters," to the grape sellers, or their mischievousness, is shown by the recent agreement of the co-operative associations to employ during the coming season two "arbiters"—one from each county, "who shall daily confer on the market situation."

Many meetings have been held in recent years by the grape growers to effect still further co-operation among their associations that the persistent wastefulness of "over-glutting" markets, needless telegrams, "bad" bills and "cross shipments" might be further reduced. Many prominent grape growers have given time and money toward this end—a Mr. P. A. Hubbard, of Lawton, as an example, alone having visited 426 growers at their homes last summer in the interests of this matter. Finally a meeting at which all the associations were represented met at Hartford April 14, and among other things appointed a committee which should draft a constitution for the complete federation of all the grape selling organizations toward the end of the joint selling of this product.

The federation of the creamery associations at Grand Rapids encountered no such difficulties as met the grape growers during their many years of endeavor. Among the creamery managers it was a plain case of the economies to be secured through acting all together. The result was that the federation known as "Co-operative Creameries No. 1" has been organized in Grand Rapids and on April 1 a federation manager, Mr. W. B. Liverance, took charge as chief executive of the general interests of the eighteen or nineteen associating creameries. He is to secure and report to all members, so the constitution of the federation says, "all information possible relative to the production, manufacturing and marketing of dairy products" and to act in a general advisory capacity to the federation.

The federation of the twenty or more live stock associations at Hillsdale into the "United Co-operative Societies" was also the product of foresight and opportunity rather than the result of struggle and necessity. This federation whose headquarters are at Hillsdale attempts nothing further than an advisory service at present. It undertakes the distribution of information to its members with regard to prices, the purchasing of supplies and in general to act as a "clearing house" of

usefulness. The territory served by this federation is the most productive of shipping stock of any in the state. The stock feeders of that district are of the right sort to make co-operative selling successful—not large enough shippers to ship alone and still cattle feeding is a side-line with everybody—consequently the new federation has an assured future.

The federation movement seems clearly under way in this state—even as this is being written the various associations of milk producers in the state are pledged to a joint meeting at the college this month with clear prospects of a federation in view. Supporters of the co-operative organization idea may well take heart, too, from the course that this idea is taking in Michigan since it is the old, the wealthy and the well organized—the grape growers—that are willing to go the farthest in this state of any of the federations in supporting that root notion to all co-operative associations—joint marketing.

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33 by 4	11.95	13.65	3.30
34 by 4	12.10	13.95	3.40
35 by 4	12.25	14.25	3.50
36 by 4	12.75	14.75	3.80
35 by 4 1/2	16.80	18.55	4.25
36 by 4 1/2	17.10	18.95	4.35
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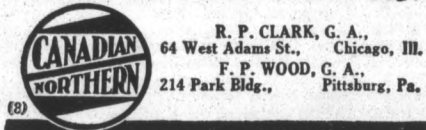
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Fowlers' Buff Rocks: Prices reduced one half, balance of season. Utility eggs \$1.50 for 15, \$1.50 for 30, \$2 for 50, \$3.50 for 100. **R. B. FOWLER, Hartford, Mich.**

Leghorns, Baby Chicks, Prices Reduced. S. C. White and Brown, \$8. per 100. 5000 chicks first of June. Order Early. **SUNNYBROOK POULTRY FARMS, Hillsdale, Michigan.**

LILLIE Farmstead Poultry, B. P. Rocks: R. I. Reds; W. Leghorns. 15 eggs \$1; 25 eggs \$1.50; 50 eggs \$2.50. P. P. delivery free. Colon C. Lillie, Coopersville, Mich.

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Rose Comb Brown Leghorn Eggs \$1 per setting, \$5 per 100. W. China Geese 25 cents each. **CLAUDIA BETTS, Hillsdale, Mich.**

RHODE ISLAND WHITES win at the National Egg Laying contest. Cold weather don't stop them. Eggs \$1.50, 2 settings, \$2.50. H. H. Jump, Jackson, Mich.

BUFF LEGHORNS—Cockerels, hens, pens or eggs. Anything you wish in Buff Leghorns. Great laying strains. Dr. William Smith, Petersburg, Mich.

Planting Poultry Crops.

IN this planting for the poultry crop it is not chickens we are raising except in an indirect manner. I have found it very important, however, to plant these crops freely if I would harvest a good egg crop at least.

The most important poultry crop in my estimation, is the beet. Grow plenty of the large mangel beets so the hens can have all they will consume when succulent food is not to be had out doors, and they will respond. Beets should be planted very early if the best success is to be had. The seeds should not be covered very deep, either. I usually tried to get mine covered with about a half-inch of firmed soil. More beet seeds are lost by burying too deeply than in any other way. They should be planted shallow and the soil made firm over them, and there will be little trouble from a poor stand.

Beets are easily transplanted, and if there are spaces that are missing plants from other places where they are thick can be transplanted into such places. It is important to thin out the plants where they are too thick, also. Leave a plant every five or six inches.

Carrots for Poultry Feeding.

Carrots are good for the hens, also, and I found them more easily kept than the beets. They are harder to get to grow in the first place as the seeds are fine, and they grow so slowly at first that one must battle with the weeds. After they get well started they are not difficult to grow, and they are thrifty.

There are many other root crops, such as turnips, winter radishes, artichokes, chufas, etc., but beets and carrots will make a good team.

Another crop that will be good for the hens is sunflowers. Plant a row or two of Russian sunflowers, for they are of great food value, and also of medicinal value. The heads can be stored in a dry place after they have been cured, and the seeds will remain in them, so all that is necessary is to throw a few heads to the hens at intervals. You will soon know whether they appreciate it or not, and the brighter plumage and increased happiness of the flock will be reflected in the egg basket.

Put Buckwheat on Waste Ground.

Buckwheat is a splendid crop to sow for the poultry if one has a piece of waste ground that is not being used in the fall. Sow it where the hens can get at it and they will harvest the crop themselves. It costs little to sow buckwheat for the seeds are not very large, and the stalks are so branching they need to be seeded thinly. If you have bees this crop will be of great importance to them in inducing brood rearing in the fall, insuring a good strong colony in the spring.

Mustard and cayenne peppers are splendid condiments that will help to keep the appetites of your flock up to high pitch. To get the best results with hens as winter layers it is necessary to make them eat as much as possible. Anything that will cause them to eat more will help to produce eggs. I would not feed either mustard or pepper too freely, but used with moderation either will be beneficial. Mustard is so easily produced there is no need of neglecting it. I would grow the white variety. The peppers require more work, as they have to be grown with more care. Start the seeds in boxes or hoibed early, and transplant to the garden when the weather is warm.

For green food during the summer I always plant a patch of rape and a few rows of Swiss chard. The Swiss chard grows a little slowly at first, but it continues to produce leaves until frost. Rape will do much the same if the heart is left uninjured.

Lettuce is a valuable green food, and I would sow a lot of it, as well as the

southern curled mustard. These can all be cut and given to them, or the hens can be allowed to pasture on them a part of each day.

Besides these regular crops there are several by-products that can be utilized with advantage. When the cabbages are cut the stalks can be allowed to remain until frost, and then they can be pulled and buried much as though there were heads in them. If the heads were removed early, often there will be considerable bunches of leaves produced. These can be fed during the fall and early winter. Then the small potatoes can be saved and put with the root crops. They will make an excellent change. Turnip tops, beet tops, and all such green stuff as it is removed from the vegetables, makes fine food for the hens if they are shut up.

Another thing that can be done that will make the hens happy. When you clip the lawn you can save the clippings and dry them well, not exposing to the sun, and as soon as they are well cured store away for winter use. Clover leaves, especially, will be relished. When you are ready to feed them just pour a little boiling water over them. They will be freshened and the hens will eat them greedily.

It will pay you richly to sow a patch of millet for the hens for scratch material. The little Hungarian is best. When it is ripening cut and stack it where the hens will be able to get to it only when you want them to do so. I would prefer to have a shed for a scratching place for them, and have a rack in the center to be filled with the hay. This rack could be a couple of feet from the ground with a slatted bottom, so the hens could pull the straws down by jumping for them.

Kansas.

L. H. COBB.

TRANSFERRING BEES.

I have purchased eight colonies of bees, and wish to transfer them as soon as possible. They are in removable eight-frame hives, but the combs are not built in straight, therefore making it inconvenient in handling. Some of these colonies are weak and some strong, which makes me think that the weak ones have a disease. Would you tell me the best method of transferring them? Relating to the method published in your paper of April 8, 1916, in transferring strong colonies, do you think that the bees would carry the disease from the lower box to the upper? Also, do you think bees which are swarming will carry a disease from the combs which they came to their new home?

Wayne Co.

W. T. M.

When we consider methods for transferring bees from box or immovable frame hives, we must be certain the colonies are free from foulbrood, otherwise it would be best to transfer by the direct method and to destroy, by fire and burying, all the old combs and boxes at the time of transferring. If the hives are standard size and in good condition, one can scrape and scorch all the woodwork on the inside including covers and bottoms, and use full sheets of foundation in the frames, all old combs must, however, be destroyed.

The transferring should be completed as early as possible in the clover flow, usually the first week in June.

If bad weather comes on, the bees can be fed a little sugar syrup daily, about a pint to the colony, two parts water to one of sugar. Feed until the weather is settled and bees gather nectar. It is better to unite several weak colonies and make the colony strong, if surplus honey is desired, but if increase is wanted the weak colonies may be allowed to build up.

The direct method of transferring is as follows:

The hives with frames containing full sheets of foundation are prepared ready, and placed on the stand previously occupied by the box hive, which should be removed a few feet

from the original stand for the transferring. Have the smoker well filled and emitting a heavy smoke, then turn box hive upside down, minus cover and bottom, and rest one end on a tile or board so that this end is a few inches higher than the other end. With an empty box on top of the upturned box hive, placed so that bees cannot escape between the two boxes, we are ready. Give several good puffs of smoke in at the bottom and with a hammer or other appliance drum on the sides of the box hive, near the bottom. Continue this drumming and occasional puffs of smoke for five minutes or more, and most of the bees will have ascended into the empty box; this can be removed and the cluster of bees shaken out in front of the newly prepared hive on the old stand. Be sure you have the queen, and continue the drumming until almost all the bees have left the box hive.

The transferring will be more easily and quickly accomplished on a fine warm day when bees are flying freely and some nectar is being gathered.

The method of transferring described in the issue of April 8 would not do for disease-infected colonies, as the bees would almost certainly carry up some germ laden honey and so continue the disease in the new hive. A swarm of bees, hived on frames containing full sheets of foundation rarely carry the disease, the disease is usually contributed by robbing or from other causes, after the swarm has been hived some time.

It is useless to treat disease infected colonies unless all old combs and honey are utterly destroyed, or placed beyond reach of the bees at the time the colonies are treated or transferred and so kept for all time. A little carelessness in this regard and all the treatment will have been in vain.

Agri. College.

F. E. MILLEN.

FEATHER TROUBLES.

I would like to know what I can do for my hens; they are losing all the feathers from their heads and some as far down on their necks as the crop. Their hide seems to be very dry and parched. The trouble does not seem to affect their laying any.

Mecosta Co.

Mrs. D. S. A.

The cause of your hens losing their feathers on the head and neck is either a disease called "favus," or the result of the feather-eating habit.

Favus is a fungous disease which frequently attacks the weathers of the head and neck, although it sometimes affects the feathers on the back and around the vent. The feathers usually become stiff and dry and come out in circular bunches, and the skin becomes encrusted with small, cup-like formations. One of the distinguishing symptoms of this trouble is that the diseased hens usually have an odor resembling musty grain or decaying matter.

The method of treatment is to soften these crust-like formations with warm water and then scrape them with the back of a knife, after which an application of lard and sulphur mixed together in equal parts should be made.

The picking off of feathers is one of the bad habits which hens frequently get into when they are confined without exercise, or do not have sufficient animal matter in their feed. It is also sometimes started by the irritation that body lice cause, which the hen tries to alleviate by picking. Should this be the trouble, the best method of control would be to give the hen sufficient exercise, a plentiful supply of animal matter in their food, and to kill off those which have the habit the worst, if they can be ascertained, and make sure that the hens have no lice.

Buy bees by the pound with a good Italian queen.

Furnish a neighbor bee-keeper with a few good hives, with frames and comb foundation starters and pay him for hiving a few swarms in them for you.

Grange.

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AMONG THE LIVE GRANGES.

Peach Plains Grange met at the home of Mr. and Mrs. Borck and had a very busy session. One new member was given the fourth degree, while four new members were adopted. Five more applicants were promised for the next meeting. Work on the new hall will be commenced again this week and the building will be rushed to completion. The social committee arranged a good-times party at Mr. and Mrs. Borck's for Saturday evening, June 3. The co-operative department has been very busy and members are becoming interested in the same. The finance committee announced a donation from Kinney Grange, West Crocker Grange, People's Bank, and Peter Van Zyl, of Grand Haven. Every member of the Grange is at present boosting and all are uniting in getting this new home ready for us. The social committee promise a good time at the dedication.

New Troy Grange for Preparedness.
—At a peace meeting of the New Troy Grange, the largest Grange in Berrien county, having a membership of over 100, the following resolution was introduced by Mrs. D. J. Hayes, and passed by a vote of 52 to 2: Whereas, Considering the present frightful state in Europe, where men are seeing red, a favorite argument with pacifists and that men do see red in the conflicts of opinion and in view of our national danger, resolved, that New Troy Grange of Berrien county places itself on record as favoring adequate measures of preparedness as being the rational means under existing conditions by which peace may be maintained.

Armada Grange, of Macomb county, is discussing alfalfa as a crop. There are quite a number of alfalfa raisers in the north of the county.

COMING EVENTS.

Wayne Pomona Grange will meet with Gibraltar Grange, Saturday, June 17, 1916.

The June Meeting of the Newaygo County Pomona Grange will be held with the Ensley Grange, Wednesday and Thursday, June 14-15, and many subjects pertinent to farm life and activity will be discussed. County Agent Blandford will be one of the speakers.

The program is as follows: Wednesday afternoon: Song, Ensley Grange; invocation; address of welcome, master of Ensley Grange; response, master Pomona Grange; "National Good Roads," J. H. Edwards, Bert Ashley; music; "Bean Crop—how to Prepare the Ground and Control the Diseases," L. M. Clark, Carl Kimbell; subject, Miss Carrie Carter; recitation, Mrs. Alfred Johnson; "Lighting the Farm Home," John McKinley, James Caldwell; subject, H. B. Blandford; song, Mrs. Henry Holmes; recitation, Hazel Hackbart; "My Crop of Potatoes," everybody. Wednesday evening: Business meeting; entertainment by Ensley Grange. Thursday morning: Song by the Grange; "The man who can and doesn't must give place to the man who can't but tries," Mrs. Mary Robertson; "Canning and Preserving Meats," Mrs. Alfred Johnson, Mrs. A. L. Burt; recitation, Blanche Bohn; "Does it Pay to Use Commercial Fertilizer?" W. C. Stuart, R. H. Brownyard; song, Misses Ellen and Julia Hanson; "Medical Examination of Schools," P. M. Miller, Henry Zerlaut; "State-wide Prohibition," Mrs. Wm. Carter, Mrs. W. C. Stuart; recitation, E. R. Clark; dinner.

JUVENILE GRANGES.

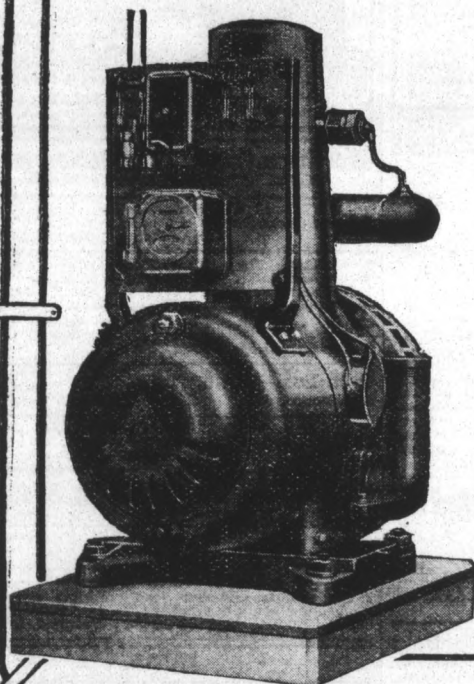
There is great interest aroused in Juvenile work. One new Juvenile Grange was organized in Wexford county; L. C. Tibbits was the promoter. Write to Mrs. Clara Sullivan, Hanover, Mich., state juvenile deputy, for further information, and to Secretary C. M. Freeman, Tippecanoe City, Ohio.

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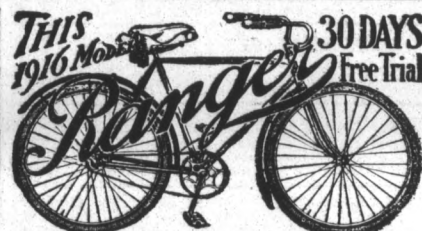
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AYRSHIRES—One of the foremost dairy breeds. The
most economical milk producers. Calves
for sale. White Leghorn cockerels; Duroc Jersey
swine. Michigan School for the Deaf, Flint, Michigan.

VILLAGE FARMS, Incorporated

Grass Lake, Michigan,

GUERNSEY CATTLE

BERKSHIRE HOGS

MILO D. CAMPBELL CHAS. J. ANGEVINE

BEACH FARM
GUERNSEYS

Average yearly production 422.3 lbs. of fat, three-
fourths of them making their records as two year
olds. By the use of a pure bred sire, a big im-
provement can soon be attained if the right
selection is made. The breeding of the Beach
Farm Herd is as good as can be found, and we
guarantee them to be free from contagious dis-
eases and to be satisfactory in every way or
money refunded. Write and let us tell you about
them.

CAMPBELL & ANGEVINE,

Coldwater, Michigan.

Registered Guernsey Bull Calves for sale, May
Rose breeding. Address
Clint Bishop, Watervliet, Mich.

AVONDALE Guernsey bulls all sold. Sorry to dis-
appoint those wishing our stock. Only registered
bull calves left. Avondale Stock Farm, Wayne, Mich.

Guernsey Bulls of service age and calves from
choice. Adv. reg. breeding.
T. V. HICKS, Route 1, Battle Creek, Mich.

For Sale 2 Registered Guernsey Cows, 1 grade
cow, 8 bull calves cheap if taken soon.
JOHN EBELS, HOLLAND, MICH., R. No. 10.

AT Farmers' Prices Registered Guernsey Bull calves from
A. R. dams and dams being tested. If intersted write for
photo, breeding and price. Byers & Barnes, Coldwater, Mich.

Guernsey—Bull calves sold, they were beauties, every
one pleased, 3 cows to freshen this month, better
write now for a good one. J. M. Williams, No. Adams, Mich.

GUERNSEYS

We offer a choice lot of high grade Guernsey cows and
heifers, bred to registered bulls La Tertre of Maple
Lane, No. 23192 and Sir Dena No. 36173. Prices reason-
able. THE JENNINGS FARMS, R. 1, Bailey, Mich.

GUERNSEYS—REGISTERED
BULL CALVES
Containing blood of world champions.
HICKS' GUERNSEY FARM, Baginaw, W. S. Mich.

REG. GUERNSEY Bull calf for sale, four months old
well marked and vigorous. Price
reasonable. Eugene Wilcox, R. 2, Bangor, Michigan

Two young Registered Guernsey Cows, Due Soon.
about, under Government inspection, and free
from tuberculosis. E. W. RUEHS, Caledonia, Mich.

Herefords—One Bull Calf.

ALLEN BROS. PAW PAW, MICH.

HEREFORDS: 7 Bulls,
10 Heifers.
EARL C. McCARTY, Bad Axe, Michigan.

HOLSTEIN BULLS FOR SALE

Four of them from 12 to 17 months old by 31 lb.
sire dam's A.R.O. Price \$100.00 to \$150.00. Younger
bull calves from \$50.00 up.
BLISSVELDT FARMS, Jenison, Michigan

Do You Want A Bull?

Ready For Service.

From a grand daughter of The King of the
Pontiacs. Sired 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% fat daughter
of Pontiac Agate Korndyke who has more 30 lb.
daughters than any other living bull. If you do
write for pedigree.

EDWIN S. LEWIS, Marshall, Mich.

FOR SALE

SOME VERY FINE YOUNG BULLS
Whose sires have as high as 31 lbs. of butter behind
them. As they are young, will make a low price on
them. BIGELOW'S HOLSTEIN FARMS,
BREEDSVILLE, MICH.

HOLSTEIN Bull Calf: Born Oct. 5. A splendid in-
dividual, well grown, and of choice breeding. Dam has
A.R.O. record, butter 7 days 18.64 lbs. milk 419.8 as a 2yr. old. Sire
Albina Bonte Butter Boy No. 93124. W. B. Reader, Howell, Mich.

HOLSTEIN-FRIESIAN CATTLE

Herd headed by grandson of King Segis Pontiac,
and tuberculin tested annually. A few choice
young bulls from dams having official records.
PEACELAND STOCK FARM, Three Rivers, Mich.
Chas. Peters, Herdsman. C. L. Brody, Owner, Fort Huron, Mich.

For Sale: Big Holstein Bull 2 yr. old. Good breeding.
Ferd. J. Lange, Sebawing, Mich.

AUCTION SALE

Butter Cup Dairy Farm

Gladwin, Mich., June 21st 1916

The estate of the late W. W. Steele, will sell at public auction its entire herd
of Holstein Cows, all young, well bred: 90 fresh or nearby springers, 25 year-
lings, both sexes, 20 two year olds, 40 spring calves, both sexes, one 16-
months old bull, Pontiac breeding, Work Horses, Hogs, Implements all kinds,
Sharples milker; 1 Rumley Oil Pull Tractor.

Kiger & Eslick, Auctioneers.

Duroc Jersey Herd Boars

Special Offering of High Class Fall Boar Pigs. Breeding and Individuality good
enough for breeders who appreciate the best.

Also some good farmer's boars. This is the best lot of fall pigs we have ever had to offer. A cor-
dial invitation is extended to visit the farm and inspect the stock. If you wish one of the best
young Jersey bulls in Michigan we have him for sale. For further particulars, address,

Brookwater Farm, Swine Dept., Ann Arbor, Mich.



Purebred Registered
**HOLSTEIN
CATTLE**

Holsteins, the best dual purpose breed.
Holstein owners partners in prosperity.
During the fiscal year ending April 30, 1915 134,
456 certificates of registration of pedigrees were
issued by the Holstein-Friesian Association, pro-
ducing a gross revenue of \$150,814. To the
thoughtful student of facts this great volume of
business, of but one department of this association
is sufficient evidence that the administration of its
affairs has been able and sound. The owner of
purebred Holstein cattle is a partner in all the
benefits accruing from this progressive manage-
ment of the affairs of the most profitable of dairy breeds.
Investigate the big "Black-and-Whites."
Send for FREE Illustrated Descriptive Booklet
The Holstein-Friesian Association of America
F. L. Houghton, Sec'y., Box 164, Brattleboro, Vt.

Bargains In Registered Holsteins
For The Next 30 Days

5 Heifers 2, 4, 5, 7, 8 months old for
\$500. 3 heifers 12, 20, 24 months old,
bred to famous bulls for \$400. Priced
separately on same scale.

A. R. Eastman, Howell, Mich.

\$75 gets Hazel-let grandson of Maplecrest De Kol
Parthena and Pontiac Maid 30.2 lb. Born
March 26. Dam Pontiac Hesperia 2nd, 14.50 lb. 43.6 lb.
her dam's sire brother to sire of world's record cow 3134 lb
milk 1 yr. M. L. McLAULIN, REDFORD, MICH.

I Have Holstein Bulls, Bull Calves and Cows
I can show breeding, records, individuality and attrac-
tive prices. L. E. CONNELL, Fayette, Ohio.

"TOPNOTCH" Holsteins

By careful retention, for many years, of largest pro-
ducing females and use of superior sires, a breeding
herd of wonderful quality has been established. We
are selling young bulls of this "TOP NOTCH" quality,
of serviceable age, at moderate prices. Information,
pedigrees, etc., on application. McPHERSON FARMS
CO., Howell, Michigan.

FOR SALE Registered Holstein Bulls
ready for service, and bull calves, also females.
FREEMAN J. FISHBEEK, Howell, Michigan.

REG. Holstein-Friesian cows and heifers, some fresh
R and some ready to freshen \$25. Reg. bulls \$30 up.
Frank Staffen, R. 3, Box 38, Howard City, Mich.

Holsteins: See my consignment at
the Detroit sale, June 8-9.
A 31 lb. daughter of a 30 lb. cow, her three daughters
and three granddaughters, also, a 27 lb. granddaughter
of Pontiac Butter Boy. Robert W. Fay, Mason, Mich.

WANTED

Six good men to buy pure bred HOLSTEIN BULL
CALVES. Good notes on a year's time accepted in pay-
ment. GEO. D. CLARKE, VASSAR, MICH.

For Sale My entire herd of high grade Holstein
Cows and Heifers. Also one Reg. 3-yr. old
Percheron stud colt or will trade for Reg. Holstein
cows. Arthur N. Birkholz, New Buffalo, Mich.

CHOICE HOLSTEIN BULLS—all from A.R.O. dams
Entire herd on Semi of, test for yearly work. Jr.
2-yr.-old just finished year's record of over 15,000 lbs.
milk, over 1000 lbs. butter record in mature class. Cherry
Creek Stock Farm, M. E. Parmelle, Prop., Hilliards, Mich.

FOR SALE Reg. Holstein females, Pontiac Korndyke
and Hengerveld DeKol Breeding. Price
right. 1 to 5 years. John A. Rinke, Warren, Mich.

6 Holstein Bulls

Ready for service, at farmers' prices. All have high
testing A. R. O. daughters from the world's record sire,
nothing better at any price. LONG BEACH FARM,
Gull Lake, (Kalamazoo Co.) Michigan.

Lillie Farmstead Jersey Cattle. Bull calves from R.
of M. Cows, also heifer calves and several bred
heifers for sale. Colon C. Lillie, Coopersville, Mich.

Jersey Bulls for Sale from high-producing dams, with
testing Assoc. records, also on
semi-official test. C. B. Wehner, R. 6, Allegan, Mich.

One Jersey Bull READY FOR SERVICE, and sev-
eral Heifers and Calves for sale.
NOTTEN FARM, GRASS LAKE, MICHIGAN.

Grade Jersey Herd For Sale
FORTY COWS

The result of twenty years careful breeding and
selection, are now offered for sale. Individual milk
records have always been kept and are open for in-
spection. If interested write for particulars and if
possible visit and examine the herd and their record.
Delivery will be made at any time desired during the
spring or early summer. A few registered Jerseys also
for sale. Address Geo. A. True, Armada, Mich.

The Wildwood Jersey Herd Majesty Breeding
40 head, tuberculin tested,
herd now on R of M test. No females for sale. Choice
young bulls for sale from dams that are on test for
Register of Merit. Write your wants or come and see
them before buying.
ALVIN BALDEN, Capac, Mich.

Hillside Farm Jerseys A 10 mos. old, solid color bull now
offered for sale. Dam is a R. of M.
cow with record of 546 lbs. of butter as a 3 yr. old. He is a
fine individual. Price right. C. & O. Deake, Ypsilanti, Mich.

Maple Lane R. of M. JERSEY HERD offers for sale,
tuberculin tested cows, heifers, bulls,
and bull calves backed by several generations of R.
of M. breeding. IRVIN FOX, Allegan, Michigan.

JERSEY BULL CALF FOR SALE

Ready for service. Majesty—Raleigh breeding.
Meadowland Farm, Waterman & Waterman, Ann Arbor, Mich.

Bargains in registered Jersey bull calves
from high producing dams, write
for information. O. S. Bassett, 430 Drexel, Kalamazoo, Mich.

FOR SALE: Our herd bull, Jacoba's Fairy Emanon
age 4 years, kind, quick and sure.
Must be seen to be appreciated. Reason for selling,
must change sires. Also two yearling bulls from him.
SMITH - PARKER, R. D. No. 4, Howell, Michigan.

BIDWELL SHORTHORNS

For "Beef and Milk"
Registered bulls,
Scotch-topped roans,
reds and white for sale.
Farm at N.Y.C. Depot;
also D. T. & L. R'y.
Address G. R. Schroder Mgr.
BIDWELL STOCK FARM
Box B, Tecumseh, Mich.

Shorthorn Cattle of both Sex for Sale

W. W. KNAPP, Howell, Michigan.

DAIRY Bred Shorthorns of best Bates strains. No
more females for sale at any price.
J. B. Hummel, Mason, Michigan.

FOR Sale—12 Reg. Short Horn Bulls by Maxwellton
F. Monarch 2nd, a son of Avondale, from 5 to 9 mos. old
John Schmidt, Reed City, R. No. 5., Michigan

Shorthorn Cattle. Five cows, Ten heifers. Five bull
calves; also herd bull for sale.
Write. Wm. J. Bell, Rose City, Mich.

SHORTHORN COWS FOR SALE: No Bulls at
present.
R. R. Station, Elsie. H. B. PETERS, Carland, Mich.

Shorthorn AND POOLED DURHAMS FOR SALE.
Have red roan and white. Have over 100
head in herd. C. Carlson, LeRoy, Mich.

Shorthorns—Dairy or beef bred. Breeding stock all
ages for sale at farmers' prices. C. W. Crum
Secy. Cent. Mich. Shorthorn Breeders' Assn. McBride, Mich.

Two yr. red shorthorn Bulls. Roan Calf 9 mo. old
Poll Angus Bull calf, 8 mo. old, not reg. Priced to
move quick. CHASE'S Stock Farm, Mariette, Mich., R. 1.

2 Loads feeders and two load yearling steers. Also
can show you any number 1, 2 and 3 years old from
600 to 1200 lbs. Isaac Shanstun, Fairfield, Iowa. R-8

HOGS.

Royalton Bred Berkshires. Male and female pigs
born March 9th, also
October boars and gilts, registered with papers. Satis-
faction guaranteed. D. F. Valentine, Supt., Temperance, Mich.

Berkshire Hogs Sows bred to farrow in April. Best.
C. S. BARTLETT, Propr. Pontiac, Michigan

Berkshires of best breeding, of various ages, either
sex, all registered stock, no akin,
special reduced price. Write your wants quick.
Mitchell's Lakeside Farms, R. 2, Bloomingdale, Mich.

Berkshires. Of various ages, either sex, open or bred,
prolific strains, Registered, at moderate
price. Elmhurst Stock Farm, Almont, Michigan.

SWIGARTDALE FARM

BREEDERS OF

HOLSTEINS AND BERKSHIRES

Stock for sale at all times, Berkshires of unsurpassed
quality and breeding, at reasonable prices. A choice
bull calf, nicely marked, five months old, sire's dam
with record of over 27 pounds. Dam of calf a grand
daughter of Hengerveld De Kol. Price \$50.00.

Swigartdale Farm, Petersburg, Mich.

Berkshires. I have 6 choice fall gilts bred for Sept.
farrowing at \$25 each for immediate delivery.
A. A. PATTULLO, R. 4, Deckerville Mich.

Duroc Jersey Boars and Red pigs, price, weight,
faction, express prepaid. J. H. Banghart, East Lansing

Duroc Jerseys, some choice Jan. boars, spring pigs,
pairs & trios not akin, a few sows for June farrow
of leading blood lines. W. C. Taylor, Milan, Mich.

Duroc Jerseys—Fall and spring pigs either sex, from
choice strains. S. C. STAHLMAN,
CHERRY LAWN FARM, Shepherd, Michigan.

DUROC JERSEY Bred sows and gilts
all sold. Booking orders for spring
orders for spring pigs. E. D. Heydenberk, Wayland, Mich.

DUROC Jerseys—Fancy fall pigs (either sex). Buff
Rock eggs \$1.25 per 15; S. C. W. Leghorn eggs \$1 per
15. John McNicoll, R. 4, Station A, Bay City, Mich.

Duroc Jersey—Sept. boars ready for service also open
gilts and some sows bred for Aug. and
Sept. E. F. MORRIS, MONROE, MICH.

DUROC JERSEYS—all sold out
present. Wm. W. Kennedy, Grass Lake, Michigan.

DUROC JERSEYS—A few fall
boars for sale.
Carey U. Edmonds, Hastings, Michigan.

Duroc Jerseys I have some good last September
Boars and gilts. Gilts will be
bred for September farrow.
H. G. Keesler, R. No. 5, Cassopolis, Michigan

DOBSON'S DUROCS Combine size, quality, breed-
ing. Boars for sale. Pigs at weaning time. Reg-
istered Jersey bull. Orlo L. Dobson, Quincy, Mich.

Heavy Boned Durocs For Sale, Bred Sows,
Service Boars and
Spring Pigs. M. A. Bray, Okemos, (Ingham Co.) Mich

Duroc Jersey Boars Ready for service. Big,
smooth, lengthy fellows.
Grand Champion blood lines. Gilts bred for Sept. far-
row. F. J. DRODT, R. 1, Monroe, Michigan.

DUROC JERSEYS, with quality, fancy fall sows, 14
few spring boars sired by Principal 4th Swk. old.
J. ROBERT HICKS, R. 3, ST. JOHNS, MICH.



I HAVE started thousands of breeders on the road to
success. I can help you. I want to place one hog from
my great herd in every community where I am not already rep-
resented by these fine early developers—ready for market at six
months old. Write for my plan—More Money from Hogs.
G. S. BENJAMIN, R. P. D. 10 Portland, Michigan

CHESTER WHITES Sows bred for July farrow, spring
pigs in pairs, not akin.
F. W. ALEXANDER, Vassar, Mich.

HOGS—1 yearling, 8 April improved Ches-
ter whites boars, good ones, satisfaction
guaranteed, write your wants. Clare Dorman, Snover, Mich.

O. I. C. BRED GILTS. Also young boars
shipped O. O. D.
J. CARL JEWETT, Mason, Mich.



O. I. C. SPRING BOARS of good type and
Red Polled bull calves.
John Berner and Son, Grand Ledge, Mich.

O. I. C. Choice serviceable boars. Choice gilts all
sold. Fall pigs, either sex, not akin. Write for low
prices and description. A. V. HATT, Grass Lake, Mich.

O. I. C. Swine—A nice lot of spring pigs. Write
your wants. Meadow View Stock
Farm, Holland, Michigan. R. R. No. 5.

O. I. C. October boars weighing 200 lbs. at \$25
each for April shipment.
C. J. THOMPSON, Rockford, Michigan.

O. I. C. Boars for service. Gilts bred for May and
June farrow. 1 prepay
express. G. P. ANDREWS, Dansville, Mich.

O. I. C. Serviceable boars and bred gilts all
sold. Booking orders for Spring pigs.
\$10.00 each. H. W. MANN, Dansville, Michigan.

O. I. C. Swine. I am booking orders for Spring pigs.
Elmer E. Smith, Redford, Mich.

O. I. C. bred gilts all sold, am offering Sept. boars
and gilts, large growthy ones, and booking
orders for spring pigs. A. J. Barker, R. 1, Belmont, Mich.

O. I. C's. 50 Mar. and Apr. pigs, pairs and trios not akin,
5 bred gilts to farrow in Aug. 3 Holstein
Bulls. Cloverleaf Stock Farm, Monroe, Mich. R. No. 1

400 Big Type O. I. C. and Chester White Pigs
From Feb. Mar. and Apr. farrow sired by the five best
boars in the state. School Master 32707 who won more
champions, defeated more champions than any boar
show 1915. Abot 2nd, sire to our undefeated breeders
young herd at 7 state fairs, Allen junior champion at
Wis. State fair 1914, and Captain Jim 33161, under 6
months boar and Junior champion at every state fair
show 1915. Then we have Le Doux model 29013, first
in class at Sioux City, Iowa, 1914. Get our catalogue,
its free. We Register Free; Guarantee satisfaction
in every way.

ROLLING VIEW STOCK FARM, Cass City, Mich.

O. I. C's. A few bred sows to farrow in April, May
and June. I have 20 last fall boars to offer,
also gilts. Have them not akin. All good stock.
Otto B. Schulze, Nashville, Mich. 1/2 mile west of depot.

O. I. C's Some extra good fall boars; also
gilts. Satisfaction guaranteed.
A. R. GRAHAM, Flint, Michigan.

O. I. C. Spring pigs, both sex, \$10.00 each at weaning
time. Booking orders now. Record of Free.
Satisfaction guaranteed. Julian P. Claxton, Flint, Mich. R. 8.

O. I. C's Strictly Big Type
Two Sept. boars, three 1915 July gilts, bred for July
farrow, sired by Lengthy Prince, No. 38161, bred to
Wonder 4th, No. 33287, he by Wonder 18089. One of the
most popular boars of the breed. Have the finest lot
of spring pigs lever raised. Can furnish in pairs not akin.
NEWMAN'S STOCK FARM, R. 1, Mariette, Mich.

O. I. C. September pigs, both sex. Bred
E. B. MILETT, Fowlerville, Michigan.

O. I. C. SWINE: If you are interested in
O. I. C's, let me start
you with a choice pair or trio, not akin, or a gilt, due
to farrow about September first.
A. J. GORDEN, R. No. 2, Dor, Mich.

Boars at Half Price
We still have a few big boned, big type Poland China
boars ready for service, weighing up to 250 lbs. not fat
at \$20 & \$25 each. Registered in buyer's name. Also
registered black Percheron Stallion 2 years old \$250.00.
J. C. BUTLER, Portland, Mich., Bell Phone.

BIG TYPE Poland China sows bred for July and
August farrow, Spring pigs.
G. W. HOLTON, Route 11, Kalamazoo Michigan.

Big Type Poland Chinas—Boars of August farrow,
booking orders for spring
pigs. A. A. WOOD & SON, Saline, Michigan.

FOR SALE P. C. Sows, "Big Type" bred for Sept.
farrow. Extra good 7 months boar. March and
April pigs. S. C. B. Minorcas, R. W. Mills, Saline, Mich.

Poland China Spring Pigs

Our herd sire was Champion and Grand Champion
at the State Fair last fall. Our sows are great big,
stretchy, splendid individuals, with best breeding.
Pigs from such matings will please you. Get our prices.

HILLCREST FARM

KALAMAZOO, MICH.

Large Strain P. C. A few choice fall boars ready
for service, and 1 May boar.
Gilts for early farrow all sold, a few choice Gilts to
farrow in Aug. and Sept., bred to black Wonder and
Oaklands Equal Jr. H. O. Swartz, Schoolcraft, Mich.

Breeders' Directory—Continued on page 751.

Farmers' Clubs

OFFICERS OF THE STATE ASSOCIATION OF FARMERS' CLUBS.

President—R. J. Robb, Mason.
 Vice-president—C. B. Scully, Almont.
 Secretary and Treasurer—Mrs. J. S. Brown, Howell.

Directors—Alfred Allen, Mason; C. T. Hainline, Alma; W. K. Crafts, Grass Lake; Edward Burke, St. Johns; Mrs. C. J. Reed, Spring Arbor; Roy E. Moore, Bellevue.

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

THE ANNUAL REPORT.

The report of the twenty-third annual session of the Michigan State Association of Farmers' Clubs is now being distributed by the associational secretary. It is in the usual form and contains up-to-date Club statistics for the current year. This section of the report should enable the secretary of every local Club to make interesting comment to the members at the ensuing meeting.

CLUB DISCUSSIONS.

Care of the Flock.—The China Farmers' Club met in May at the home of Mr. and Mrs. Frank Layle. After the usual fine dinner, the members and guests numbering about 60 were pleasantly entertained. An excellent paper was read by Mrs. Fred Allington on "Maintaining the efficiency of the great armies and applying the same principle to people of the world in general." C. L. Brody then gave an instructive talk on how to build a standard hen house. He also told of the care of both young and old chickens with special regard to the prevention and cure of diseases to which poultry are subject. The meeting closed after an invitation was given to hold the next Club meeting at the home of Mr. and Mrs. Peter Theison, Wednesday, June 21.

Co-operate with County Agent.—The Aetna Farmers' Club held a profitable and enjoyable May meeting in the Aetna schoolhouse. About 125 people were present. The music for the occasion was furnished by the East Denver choir. The numbers rendered were appropriate and very much enjoyed by the large audience. Rev. J. F. Bowerman was the orator of the occasion and captivated his auditors with an address on "Handicaps." The speaker spoke of the handicaps of indifference of the farmers to their surroundings, of the handicaps of bad methods, and of other handicaps that harass the farmer in the conduct of his daily toil. Mr. Bowerman's address was interspersed with humorous allusions and the speaker was given the closest attention. The Aetna Club has made wonderful progress since its organization. The interest has constantly been at a high pitch and the members have enjoyed the many splendid addresses and the fine entertainment that have been given at the meetings. County Agent Blandford has been able to do much effective work through this organization.

Conditions in Mexico.—Gun Plains Clover Leaf Farmers' Club met Tuesday evening, May 23, with Mr. and Mrs. Frank Barker, with 60 in attendance. The home was tastefully decorated with the season's flowers. The principal feature of the evening was a talk by Prof. Fritz on Mexico, he and his wife having recently returned home from there. He first gave a short sketch of their personal experiences. He is a missionary and such persons coming from America are treated in a hostile manner. The Mexicans are very ignorant and illiterate, 25 percent being unable to read and are mostly of Spanish and Indian blood. The cause of the uprising over five years ago was mainly to secure religious liberty and education. The mines, smelters and factories have closed and persons of wealth and culture gone. Some reforms, however, have been instituted through the leadership of General Carranza. Bull fighting has been abolished and a school for boys erected on the ring site. A church only a block away. Also, strides are being made to close saloons. Mr. Fritz thinks conditions there almost hopeless and that in order to better conditions the United States must intervene. The next meeting will be with Mr. and Mrs. Burt Duggan, June 20.—Cor. Sec.

Veterinary.

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

Worms.—How can I tell if my hogs are troubled with worms? R. E. Bentley, Mich.—Unless hogs have a great many worms, you will not find any unpleasant symptoms—the passing of worms with excrement is positive evidence of the animal being wormy. Unthriftiness, dryness of the skin and bristles are also symptoms. Mix together equal parts fluid extract spigelia and fluid extract senna and give ½ oz. doses two or three times a day until purging sets in, then discontinue use of medicine. Twenty-one days is the answer to your other question.

Scurvy.—My horses and cattle have quite a number of rough scurvy patches on body where the hair is shedding. R. J. F., Beulah, Mich.—Apply one part iodine and 15 parts fresh lard to diseased portions of skin twice a week.

Infected Milk.—I have a cow that freshened last September; she has been perfectly well ever since; her udder seem all right, but when the milk stands over night, the cream will be a sort of pink color. Am feeding corn and oats for grain, the best of tame hay and cornstalks. What and where do you think the trouble could be, and is the milk fit for use? F. A. B., Pinckney, Mich.—I believe your cow is perhaps healthy, but you had better change feed, clean udder before milking, clean and disinfect your stable and remove excrement and filth, not only from stable but premises surrounding your stable, thoroughly clean milking utensils, also milk house. I fully believe the milk becomes infected after it is milked, but I know of no reason why it would be dangerous to use.

Enlarged Gland.—I have a cow with a loose bunch under jaw which first appeared a week ago. W. S., Dryden, Mich.—Clip hair off bunch and apply one part iodine and seven parts lard daily for a few days and the bunch will either soften and open or disappear entirely.

Wart on Neck.—I have a mare that has a large wart high up on neck where throat latch comes and whenever she bumps it, it bleeds. Is there any way of removing it? B. H. I., Milan, Mich.—Warts are usually only skin deep; therefore, you had better cut it out, or apply a saturated solution of salicylic acid in alcohol daily until it is gone.

Leaking Navel.—I have a colt two weeks old which has been leaking urine at the navel for one week. Our local Vet. is treating it and the colt seems to be getting some better. He tied it once and the piece sloughed off. We are now applying a powder twice a day. The colt is thriving and not in pain. Am enclosing a self-addressed envelope for immediate reply. R. R. C., Bancroft, Mich.—Apply equal parts boric acid, tannic acid and iodoform once a day; however, I would suggest that you allow your Vet. to continue treatment as he is perhaps doing as well as can be done for your colt. Perhaps you misunderstand the headlines of this department; if not you should not expect a personal reply regarding your colt's ailment, which, of course, would only interest you and none of the other readers of this paper. This free veterinary advice is intended to benefit every one of our readers as well as individuals.

Knuckling.—I have a three-year-old colt whose ankles are cocked and when traveling the joints snap; there are also some windpuffs above fetlock joint that are soft. C. H. O., Big Rapids, Mich.—If you intend to work this horse, apply equal parts of turpentine, aqua ammonia and olive oil to fetlock joint three times a week but if you can give colt rest, clip hair off and apply one part powdered cantharides and four parts lard every two weeks. This ointment will blister and doubtless give you more prompt and satisfactory results than mild stimulating liniment.

Sprained Hock.—For the past nine months my mare has been lame the result of a sprained hock. Our local Vet. has been treating her with only fair results. She is now running in pasture and has done no work during the winter. G. E. R., Kewadin, Mich.—Clip hair off hock and apply one part red iodide mercury, one part powdered cantharides and eight parts lard to hock every ten days or two weeks.

Punctured Breast.—I have a horse whose breast was punctured with a fork, causing considerable inflammation and swelling, but the wound is now healed; however, the breast is yet swollen. I turned horse out to grass and he is not working. J. S. P., Hunter's Creek, Mich.—Apply equal parts tincture iodine and spirits of camphor to swollen breast once a day.



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