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Tile Drainage and Soil Fertility

By J. H. HULETT.

SOME of the evil effects of an over supply of water in the land has been realized for many years but it was but recently that the full benefits accruing to the land because of its being drained, was noticed. It is thought that the Romans used some sort of earthenware pipes to remove surplus water from the soil. However, that may be, it was only in comparatively recent times that any systematic efforts were made to remove both the surface water and the stagnant water within the soil. About a century ago this kind of drainage was attempted in England with success. These pioneers in modern drainage noted many good effects from their practice but failed to fully comprehend many other beneficial results which accrue from thorough drainage of the soil. Removing the surplus water from the soil will make the soil warmer, will make it more mellow, will tend to increase its fertility, will lengthen the season during which it may be cultivated, will enable plants growing thereon to better withstand drouth.

A Wet Soil is a Cold Soil.

When the soil is wet, it is also cold. The principal means of warming soil is by the heat from the rays of the sun. When the heat of the sun warms the surface of the ground, the water that is near the surface is evaporated. This is a cooling process and in turn makes the soil that much cooler.

Any overabundance of water in the soil tends to make the soil particles knit closely together. When a boy I used to make clay balls by saturating lumps of clay with water, moulding them into shape and leaving them in the sun to dry. When thoroughly dry they were hard and firm, in fact, quite difficult to break. We notice this tendency in the fields, for when the surface layer of the earth gets saturated, we say that the land puddles; after drying out it is difficult to work, but breaks up into clods. Removing the surplus water will tend to remedy this condition.

Soil Bacteria.

Many millions of minute organisms live in the soil. They are known by the general name of bacteria. They may be beneficial or harmful according to whether the results of their presence and work will make the soil produce better crops or lesser crops. In general, the beneficial bacteria require air to do their work while the harmful ones get in their work when air is excluded. Thus, the removal of the surplus

water from the soil will tend to increase the bacterial action of the beneficial bacteria, which in turn tends to make the soil more fertile.

A superabundance of water in the soil will prevent its cultivation until

by the natural action of the sun's rays.

The roots of the ordinary plants grown as farm crops cannot live in water. When plants are trying to grow on land where the lower layer is saturated with water, they send their

that has suffered from a surplus of water gives up its moisture much more readily than the more mellow or friable land that has not suffered from this cause. This friable land will hold more water of capillarity than will the hard, packed land. From this, one can see how drainage will enable plants to better withstand drouth.

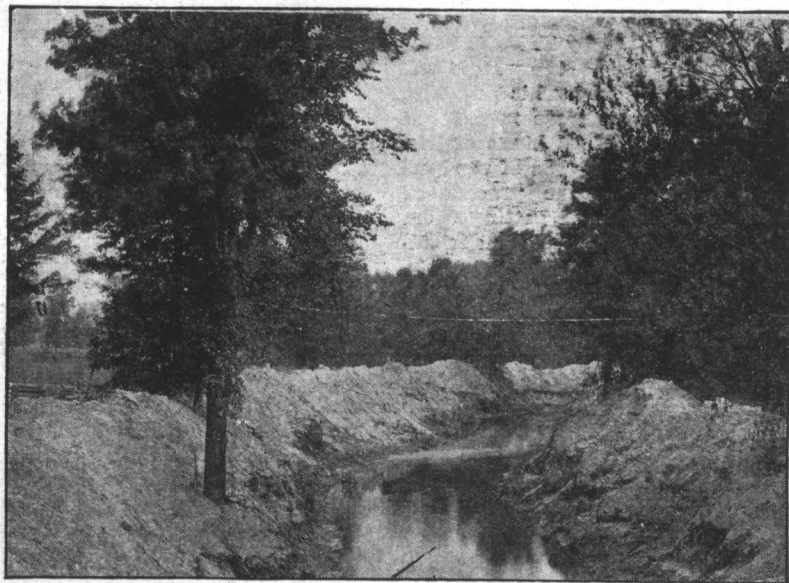
Terminology Defined.

Hydrostatic water may be defined as that water which is prevented from sinking by an impervious subsoil. The surface of this water is what is called the water table. This may be above the surface of the ground, near to, but just beneath the surface, or many feet below the surface. There is no danger of removing this water too far beneath the surface by ordinary drainage. If near to the surface, this water may become water of capillarity to be used by the plant. If too near the surface it may keep the plants from sending their roots down deep into the soil and thus deprive them of needed nourishment.

Water of capillarity may be defined as that water which is held in the soil by means of capillarity attraction. It forms that part of the soil water which supplies the needs of the plants. It moves about in the soil because of the same natural process which forces the oil up the lamp wick to the flame. This water forms a fine film of water over the surface of each soil particle. When it is present we say that the ground is moist. When absent we call the ground dry. Drainage, by making the soil looser and more mellow increases the capacity of the soil for holding this sort of water, which is

that water on which the plants feed, as mentioned above. The average of a large number of tests shows that drained soils will hold about 12 per cent more water of capillarity than similar soils that are not drained. Ordinary soil one foot in depth covering one acre, weighs about 3,500,000 lbs. One inch of rainfall on each acre will weigh about 113 tons. Twelve per cent of 3,500,000 will equal about twice this amount. This gives some idea of the amount of water of capillarity that is held in the soil where it is available for the use of growing plants.

Water which is absorbed by the soil from the atmosphere is called hygroscopic water. In the early morning during the hot, dry summer months one frequently notices that the fine dust in the road is



A Good Outlet is Essential for Successful Tile Drainage.

such a time as the water has left the soil. The early removal of the over-supply will allow the farmer to get on to the land earlier and begin the work of cultivation. This will add to the time that land can be cultivated by just that amount of time which would be consumed in evaporating the water

roots only to that part of the land near the surface which is in a condition wherein they can maintain life. When the summer drouth comes on the top layer of earth dries out, leaving the roots where there is no water to supply their needs. Then, too, it is well known that the hard, baked land



Dredging an Outlet for Tile Drainage in a Low and Level Section of Michigan.

(Continued on p. 123).

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DETROIT, JANUARY 29, 1916

CURRENT COMMENT.

The Visible Supply of Potatoes.

The Bureau of Crop Estimates of the U. S. Department of Agriculture under date of January 21, 1916, published an estimate of the stocks of potatoes in hand in the principal late potato states on January 1, 1916. This estimate shows the supply of potatoes in hand at the first of the present year to be 38 per cent smaller than the similar supply one year ago, 15 per cent smaller than two years ago, 30 per cent smaller than three years ago and 16 per cent larger than four years ago. The states included in this estimate produced 66 per cent of the 1915 crop.

The total number of bushels estimated to be held on January 1 is 105,345,000 as compared with 169,554,000 bushels one year ago, 123,292,000 bushels two years ago, 149,845,000 bushels three years ago and 90,778,000 bushels four years ago.

While imported potatoes are never a very large factor in our markets yet in 1912 there were imported 13,734,695 bushels. This importation of foreign potatoes which was the largest in the history of the country would bring the total of stocks in hand on January 1 four years ago, to nearly the same aggregate given in the above estimate for the present year. Under present conditions of war in Europe, in addition to a quarantine against foreign potatoes to prevent the introduction of dangerous potato diseases, importations will be practically suspended for the present year. Naturally potatoes will continue to share in the increased price of all foodstuffs now prevailing so that growers who still have potatoes in their cellars may feel assured of receiving remunerative prices for them at any time they may desire to sell them during the marketing season.

Whether it will pay to hold for higher prices than now prevail is a question for the grower to settle for himself. While it is a fairly safe assumption that prices will not permanently decline unless forced so high as to greatly curtail consumption, yet there are comparatively large speculative holdings in many centers of consumption which may be expected to keep the market from making further rapid advances after the holders begin to let them go upon the market, at least until this supply is considerably depleted. The price at which speculative holders will unload is, of course, problematical, but it is considered by some well informed students of the market that if carload prices should reach \$1.25 per bushel during the coming month, a fairly large percentage of these holdings would be moved.

In any case prevailing values will appear very attractive to growers who are fortunate enough to have a mar-

ketable crop in hand, and should the bulk of the Michigan crop be marketed at an average price which would approximate present values, the total income to the farmers of the state from a crop now estimated in the above report at 20,945,000 bushels, would be greater than the total income from last year's crop of more than 44,000,000 bushels.

Live Stock for Northern Michigan.

which occurred at the Live Stock meeting at M. A. C. last week was the unanimity of opinion with regard to the future of northern Michigan as a live stock producing country. Mr. W. F. Raven, live stock field agent of the College for the Upper Peninsula, spoke before the Michigan Sheep Breeders' and Feeders' Association with regard to the adaptability of the Upper Peninsula as a sheep raising country. Several years' experience in that section has convinced him that the Upper Peninsula of Michigan affords advantages in sheep growing which are excelled by no other region in the state or country. Data with regard to some of the experiences with sheep which Mr. Raven has had opportunity to observe were given to substantiate his position.

In a paper written by T. B. F. Sotham and read before the Hereford Breeders' Association by his son, just as strong arguments were introduced for the production of all kinds of live stock on the cut-over lands of the lower peninsula during the process of subduing the brush and getting them in condition to be cleared for agricultural purposes. The nature of Mr. Sotham's arguments will reach the reader through the publication in another column of this issue of the major portion of his address.

Another northern Michigan man present who had some convincing figures regarding the suitability of the cut-over lands of northern Michigan for beef production was G. A. Prescott, Jr., of the Prescott Ranch in Ogemaw county. Mr. Prescott showed the writer weights of droves of steers which had made an average daily gain of nearly three pounds over a two-month's feeding period on pasture during the hottest part of the summer. May lambs sold in the fall from the Prescott ranch averaged 71 pounds from grass last year.

Feeders from lower Michigan who were unable to get feeding stock through the regular channels last fall found a supply of excellent feeding cattle in the northern part of the state. The grazing operations for the most part have been confined to relatively small areas of the better cut-over lands of the northern counties up to the present time. There are great opportunities for similar development in nearly all sections of the northern counties awaiting the attention of the capitalist or fore-handed farmer who is in a position to utilize them for grazing purposes.

It has been well pointed out that the northern part of the lower peninsula and the great agricultural areas of the upper peninsula may be profitably utilized during the process of development to produce live stock which the feeders of the lower counties need to carry on their feeding operations and which is with increasing difficulty secured from the western ranges. The price now commanded by good feeding stock of all kinds is certain to increase rather than diminish in future years and offers attractive possibilities for the profitable agricultural development of Michigan's great area of unoccupied cut-over lands.

Winter Use of Automobiles.

A few years ago even the most enthusiastic believer in the future use of the automobile had grave doubts as to the practicability of the general use of such machines on ordinary country roads. The great strides in the im-

provement and perfection of the automobile have long since removed these doubts. Still more recently the most enthusiastic automobilist regularly put his machine away for the winter along about Thanksgiving time when the roads became rough and frozen, as he considered it impractical if not impossible, to keep it in commission or make it useful during the winter months.

Here again modern improvement has brought about a marked change in the usual practice. Today one sees automobiles traveling country roads at almost any time when the snow is not so deep or drifted so badly as to make them practically impassable to any wheeled vehicle. The improvement which has brought about this changed condition has been the general improvement of the highways. Wherever the roads have been permanently improved, they are not softened by the fall and early winter rains to make them muddy nor cut up by the traffic over them so as to make them rough and impractical of travel to pneumatic tired vehicles after they have become frozen.

In view of these unexpected changes in winter transportation in the open country it is a most reasonable prophecy that in a few more years when the permanent improvement of the trunk line roads of the state has been completed, that automobile travel in the country will be quite as general in the winter as it now is in the summer. This improved means of winter transportation will greatly facilitate the farmer's business, since it will not only permit the winter operation of pleasure cars but will make possible the hauling of farm products direct to city markets on auto trucks over a very considerable portion of the state. Already the use of such trucks is general by farmers living within twenty-five or thirty miles of large city markets in the delivery of all sorts of farm products. Such operation is perfectly feasible for double this distance just as soon as the roads are permanently improved so as to make such transportation feasible at all seasons of the year. The radius of the practical operation of this method of transporting farm products is rapidly increasing each year, and the time is close at hand when it will be very general throughout the more thickly populated country districts of the state. What effect this may have upon the agriculture of the state and related industries is, of course, problematical, but it is certain that the effect will be a beneficial one from the standpoint of increased opportunity and larger profits as well as a broader and less isolated life for the farmers of Michigan.

HAPPENINGS OF THE WEEK.

Foreign.

The European War.—Changes in positions held by belligerents occurred in the Balkan states and also in Asia Minor. The Russians are crowding back the Turks in the big campaign through the Caucasus Mountains where they have occupied a number of positions. On the other hand, the British forces in Mesopotamia have had difficulty in holding their advantages against the Turks, reports indicating that weather conditions have been unfavorable toward forward movements. The Austrians have extended their command of the Adriatic coast from Trieste to near the Albanian frontier through the recent capture of the Montenegrin forts of Antivari and Dulcigno. In Galicia the Russians are advancing on the Dniester and Pruth rivers. Nothing of importance has been reported along the middle and northern sections of the eastern battle front. In the west little of importance has occurred outside of the occupancy on Sunday by the Germans of 200 yards of first line trenches north of Arras.

An agreement has been reached between the German and French governments to set free civil prisoners in both countries who are not subject to military service. Under this agreement all men under seventeen years of age and over fifty-five years will be released and sent home. Also all other men unfit for military duties, and all women.

The identity of the submarine which sunk the Persia in Mediterranean wa-

ters has not as yet been disclosed. Both the German and Austrian admiralities have announced that the Persia was not sunk by one of their submarines.

The British government has decided to place a ban upon the importation of luxuries during the remainder of the war. The step has been taken to conserve resources for whatever necessities may be required.

Statistics show that during the year 1915 ship-building was reduced one-third through the influence of the war. All the combatant nations have suffered extensively through this loss.

The appearance of the new German air monsters capable of carrying 27 men and fitted with motors developing 700 horsepower, has been reported from French sources.

National.

The advance in gasoline prices throughout the country has brought numerous petitions to representatives at Washington for a federal inquiry into the alleged manipulation of the gasoline market.

Already a bill providing for a tariff commission has been drafted to be introduced at the present session of Congress. It will probably be accompanied by a message from President Wilson.

Major General Goethals, governor of the Panama Canal Zone, has sailed for the United States to appear before the congressional appropriation committee relative to canal bills.

Lack of funds will probably make the Michigan business men's military camp an impossibility during the coming summer.

Protest is being made to Michigan congressmen against the proposed repeal of the mixed flour law. It is now unlawful to mix corn flour with wheat flour without labeling the product as such a mixture. There is general opposition to any letting down of the bars against adulteration of pure wheat flour.

President Wilson is mapping a tour of the middle-west in the interest of the administration preparedness campaign.

Dr. J. O. Reed, former dean of the literary department of the University of Michigan, died Sunday at the home of his brother in Cleveland.

The usual evidence of slackening trade has not yet appeared to any degree in the business centers of the country. More attention is being given in the market for investment securities, which indicates confidence in the legitimate progress of general business activity. Everywhere the feeling of optimism is growing and just now the only likelihood of restriction appears to be in the capacity of manufacturers to produce goods by reason of shortages in raw material.

Damage by floods in the Yuma Valley in Arizona amounted to more than one million dollars. Bonds will soon be issued to provide funds for the rebuilding of docks at Tucson, Arizona.

FARMERS' INSTITUTES.

County Institutes.—Leelanau, Sutton's Bay, Feb. 1-2; Bay, Munger, Feb. 1-2; Grand Traverse, Traverse City, Feb. 2-3; Tuscola, Caro, Feb. 2-3; Antrim, Bellaire, Feb. 3-4; Charlevoix, Ironton, Feb. 4-5; Huron, Bad Axe, Feb. 4-5; Sanilac, Crosswell, Feb. 7-8; Oceana, Hart, Feb. 7-8; Allegan, Martin, Feb. 8-9; St. Clair, Port Huron, Feb. 8-9; Osceola, Leroy, Feb. 8-9; Macomb, Warren, Feb. 9-10; Muskegon, Cloverville, Feb. 9-10; Newaygo, White Cloud, Feb. 9-10; Lapeer, Hadley, Feb. 10-11; Ottawa, Holland, Feb. 10-11; Mecosta, Big Rapids, Feb. 10-11; Saginaw, Saginaw, Feb. 10-12; Barry, Hastings, Feb. 11-12; Genesee, Flint, Feb. 11-12; Kent, Grand Rapids, Feb. 11-12; Berrien, Three Oaks, Feb. 14-15; Cass, Cassopolis, Feb. 14-15; St. Joseph, Sturgis, Feb. 15-16.

One-day Institutes.—Lenawee, Medina, Jan. 31; Lime Creek, Feb. 1; Morenci, Feb. 2; Fairfield, Feb. 3; Ogden Center, Feb. 4; Madison, Feb. 5.

Livingston.—Fowlerville, Jan. 31; Deerfield Center, Feb. 1; Oak Grove, Feb. 2; Hamburg, Feb. 3; Pinckney, Feb. 4; Gregory, Feb. 5.

Kent.—Grattan, Jan. 31; Cannonsburg, Feb. 1; Rockford, Feb. 2; Byron Center, Feb. 3; Sand Lake, Feb. 4; Alpine, Grange Hall, Feb. 5.

Ottawa.—Nunica, Feb. 3; Georgetown, Feb. 4; Jamestown, Feb. 5; Zeeland, Feb. 7.

Washtenaw.—Salem, Feb. 3; Ypsilanti, Feb. 4; Dixboro, Feb. 5; Chelsea, Feb. 7; North Lake, Feb. 8; Northfield, Feb. 9; Willis, Feb. 10; Salem, Feb. 11.

Clare.—Harrison, Feb. 1; Farwell, Feb. 2.

Midland.—Pleasant Valley, Feb. 3-4.

Ingham.—Stockbridge, Feb. 7.

Macomb.—Davis, Jan. 31; Meade, Feb. 1; Washington, Feb. 2; Fraser, Feb. 3; Armada, Feb. 4.

Jackson.—Brooklyn, Feb. 8; Norvell, Feb. 9; Michigan Center, Feb. 10; Waterloo, Feb. 11; Henrietta, Feb. 12.

TILE DRAINAGE AND SOIL FERTILITY.

(Continued from first page).

quite damp. This is water that has been absorbed from the air. While there is little doubt that plants use this water to some extent during a period of drouth, hygroscopic water does not compare with water of capillarity in agricultural value. Fine, mellow soils have more power for absorbing hygroscopic water than hard, cloddy ones; cultivated soils more power than hard soils or those protected by growing crops.

Drainage an Economic Question.

Will land be benefited by drainage? This question is one that always confronts the farmer who would increase the production of his land. In general, if the crops are good, grow well all the season, produce a maximum yield, I do not think drainage will materially benefit the farmer. The general contour of the land sometimes precludes the idea of drainage. To be drained, land must be level enough to admit of leading the water off it.

Where there is ground that seems too wet for cultivation, one can, by means of digging small pits from two to four feet in depth, tell whether the soil water will settle into the spaces thus formed. If it will not, there is little likelihood of its getting into tile laid at that depth. These pits should be left throughout the year, if possible, so that some idea of the height of the water-table can be obtained. However, the height of the water-table is not the only element that has to be taken into consideration in determining whether it will pay to drain the field or not. The kind and habits of the crops to be grown thereon are quite as important elements that need to be considered before arriving at the final decision.

The appearance of the surface of the ground will carry its own conviction to the man experienced in tile drainage as to the advisability of tiling the field. Land that dries unevenly in the spring is likely to have surplus water that it will be wise to get rid of. However, the source of this water must be taken into consideration. If this should be water overflowing from some spot where later the water-table will be lowered sufficiently as to prevent the water from getting onto the spot, there is some question as to the advisability of under-drainage. The appearance of the cultivated crop grown will also serve to indicate whether there is any excess of moisture. Crops growing upon land show by their size and comparative thrift whether there are wet spots or not. The cereals and grasses are small and will have a general unthrifty appearance when the water-table lies too close to the surface of the ground. Clover, too, is much more apt to winter-kill in the wet spots than in places having good drainage.

An Investment, Not an Expense.

One should view the question of drainage as he would any other investment. He should not expect too big returns from his outlay. If the increase in value of the land will cover the cost of drainage—and it usually will—he should consider this a good investment. He should not expect to get his money back in a year or two but should only look, from year to year, for what the same amount of money would bring him if invested in some other enterprise. If the drainage pays the legal rate of interest on the investment, he should consider that as a good return. Of course, if one has an unsightly place that is an eyesore to him and the whole community, he will do well to get rid of it at any price—that he can afford to pay. It is safe to say that one can afford to lay out any expense that does not more than cover the increased value of the property and where a good rate of interest upon the investment is paid by the increase in production.

Money spent in drainage should represent only an added sum which is to

increase the original investment in the farm. If the land is to be worth no more after drainage, if the returns are not going to increase, then why drain? There must be some recompense for the increased expenditure. In some instances exceptional cases or conditions exist, as in the case of the disposal of sewage, or conditions making it expedient to raise crops which without drainage would be unable to grow to advantage.

The Source of Water to be Drained.

It is necessary to make a careful study of the source of water on land which it is desirable to drain because the expense of drainage will depend to a great extent upon this source, and the methods that will effectively remove the surplus water from one place may prove inefficient in removing it from some other.

If the water comes from seepage, cutting off the supply will remove the excess from the soil. This may be done with only one line of tile, while if the water comes from the ordinary rainfall the whole surface of the field may have to be drained. Drainage of the uplands may drain the lowlands also; drains necessary to carry the water of precipitation in a rather tenacious soil will have to be laid much closer together than in carrying the same kind of water from a porous, rather sandy soil. Ooze or seepage is water that has fallen upon other land, generally at a higher level than the surface of the land where it makes its appearance. This is brought out upon the surface by an impervious subsoil and is known as spring water.

Tile drainage has been spoken of frequently because this is the method which should be used wherever practicable. Open ditches are unsightly, difficult to maintain in an efficient condition, more expensive in the long run, and should only be employed under conditions where it is impracticable to use tile.

Water flowing through a field should be broken up into as small streams as

practicable for the erosion from a small stream is much less than from a large one. Through tile drains where these can be maintained in a satisfactory conditions; where they cannot, it may be fed through furrows.

But when we learn that a given amount of rain water at 60 degrees—the usual temperature of the water falling in the spring rains—contains ten heat units, each of which can raise the temperature of a pound of sand 5.24 degrees providing said temperature is below 50 degrees, and when we remember that the vital forces of life begin to take on activity only after the soil has reached a temperature of about 48 degrees; that the early spring temperature of the soil is much lower than this, we begin to realize the advantage of the slow percolation of the rainfall through the soil, as promoted by tile drainage. The slow percolation of water through tenacious soils tends to make them more friable because it makes them more porous which makes it more easily broken down and pulverized. Anything that will help to cause the slow percolation of rain water through the soil will help to diminish the effects of floods. As the timber becomes removed, the number of shallow drains or "gullies," as they are called, increase. These agencies tend to remove water of precipitation or melting snow at the earliest possible date. The discharge of this water so quickly into the natural streams is the principal cause of the disastrous floods which sometimes sweep over large sections of the country. Drains, by making the soil more porous, have the effect of causing the rain water to sink into the ground where it falls and thus tend to diminish the evil effects of the floods.

Work to a Definite Plan.

Before starting to drain a piece of land, one should be in possession of a well matured plan. Water that is present on the land at one season may come from a very different source from the water that is on the land at

other seasons. Drains are permanent fixtures and cannot be too carefully considered. One must take into consideration the amount of water to be removed, the size of tile necessary to carry the surplus water, the different grades possible, the obstructions to be overcome, and everything that will have any bearing on the laying of the tile and efficiency of the system of drainage after it has been installed.

A carefully prepared map should be made, and kept, of the field so that one can readily locate and continue at any later date any line of tile that requires extending. This map will be of great service to him in locating any sort of an obstruction that may chance to get lodged in the tile. Knowing just where to find any line of tile at any given place in the field may save an immense amount of hard digging at some time when it becomes necessary to inspect the working of the drain.

Factors to Consider.

The cost of labor is one great factor that should be taken into consideration in planning a system of drainage. High-priced labor may make it necessary to cut down on the number of tile laid as well as the depth at which it is to be laid.

The character of the soil will determine to a large extent, what it will cost to lay any given line of tile. Hard clay soils excavate much slower than sandy soils. Also, tile laid in sandy land may be placed much farther apart, because it is so much more porous and water will reach it much more readily.

The price of tile is another factor that must be considered, if you are to work economically and efficiently. While large tile are to be preferred to smaller, for with the large size tile you are sure that your drain will have sufficient capacity to take care of all the surplus water, there is no use of incurring the added expense of laying the larger size.

The location of the outlet will have to be taken into consideration and where practicable it would be at some open spot. To make an outlet in porous soil will cost much more than an outlet in some stream or ditch. This outlet must be kept at all times, free from obstructions and should be located in some protected spot where frost will not get in, follow up the line and assist in breaking down the tile.

Deeply laid tile will drain a much larger area in soil that is porous but it is possible to get the tile too deep in soil that is close grained and tenacious. The shallower laid tile placed closely together will effect a removal of the surplus water much more quickly in hard ground. Then, too, the last foot at the bottom of the ditch costs much more to dig than does any other foot of its depth.

Practical Considerations.

A grade of about one per cent, or of one foot in each hundred feet, is about the right slant. However, there is a chance for a wide variation from this estimate. If there is a free outlet above the surface of any water, tile may be laid for short distances perfectly level and yet give good results. Where possible, all tile should be laid as laterals. Mains should be done away with wherever practicable for they do not furnish a clear and unobstructed outlet for the tile. The water flowing into a main makes currents therein which are liable to throw down soil that in turn may clog the flow of the water.

The cross-sectional area of circles is proportional to the square of their respective diameters. Thus, doubling the size of a common cylindrical tile will multiply its capacity by four. And even more than that when we consider small diameters for it also reduces the friction of the water on the sides of the tile. The longer the line of tiles, the less area it is able to drain when running full. C. G. Elliott, in his book on "Practical Farm Drainage," says: "A three-inch tile will drain five acres,



A Good Crop of Potatoes

I have taken your paper for a number of years and find I could not do without it. I read every article, pertaining to my line of farming, which it contains. Recently I read a number of articles by different farmers telling how they get their large crops of potatoes. As I am interested in potatoes myself, thought I would tell my experiences of the past season. The accompanying picture was taken October 13. The potatoes shown were yielding about two and a quarter bushels per square rod, or at the rate of 360 bushels per acre.

The field was covered with barnyard manure in the fall of 1914, it being a clover sod, in which quite a lot of June grass had started. It was plowed April 12 and 13. After plowing we went over it three times with a spike-tooth harrow. This was done at intervals of about five days and the last time was May 10. It was then marked and planted May 11 and 12, to Dusky Rurals. We took the seed just as they were dug the year before and

cut the seed as we were planting. The field was marked both ways, rows being 33 inches apart.

About a week after planting we began cultivating (by mark the first time) with a five-tooth shovel cultivator. We cultivated once a week until the middle of July when the potatoes were "set" so that it wasn't safe to disturb them.

We sprayed three times (July 16-26 and August 7), with Paris Green. The last time they were sprayed it was almost impossible to walk down the rows, the vines being so rank that when held up lots of them would reach to a man's shoulder.

They were ready to dig before we got to them, but we were busy filling silos so they were left until October 11-12-13-14. The field averaged 280 bushels per acre, cost of production being 16 cents per bushel, no counting the hauling half a mile to the market. We still have a large per cent of the crop.

Kalkaska Co.

I. D. WORDEN.

and should not be of greater length than 1,000 feet. A four-inch tile will drain 12 acres; a five-inch, 20; a six-inch, 40; a seven-inch, 60 acres." Another rule taken from another source is as follows: "Squaring the diameter of the tile and dividing by four, if the fall is less than three per cent, if more than three per cent, dividing by three, will give the area drained by a given sized tile." This rule would require tile of a larger diameter for draining a given area and is, to my idea, the safer of the two. You never hear a man complain that he has laid too large tile nor that the tile are too close together.

Water enters the tile from the bottom and not from the top, as has been supposed by some. When the bottom is obstructed, it will enter from the next lower free opening. There is no necessity for placing stone or other open matter at the top of the tile. That will not help the water to get into it as has often been supposed.

The grade at which the tile is to be laid should be established before there is any work done towards digging the trench. If the field should be so level that it is impossible to tell which way the slope faces, one may find that he has no grade down which the water may run. The early establishment of the grade will give one the opportunity to give his drains the steepest slant possible and enable him to make his grade greatest at the outlet, where it should be instead of at the head of the ditch, as it may be should he not know what and where his grades are.

Care should be exercised in laying a drain that no tile with less capacity is placed in the ditch below those having greater cross-sectional area. All tile should be inspected carefully and the crooked or dented, or those that for any reason have lesser capacity should be laid at the head of the drain.

All joints should be inspected carefully and the tile turned until they will fit accurately. If the bottom is of such a nature that the tile do not lay flat, as in quicksand, there may be a firm bottom made of stiff clay or a board laid so that the tile will not get misplaced. Some lay tile from the top end of the trench by means of a tile hook. Some others cover the tile as it is laid to a depth of five or six inches so that it will be held firmly. Soil should be packed all around it in order that no water will flow along on the outside against the tile and thus destroy its bed.

Silt Basins.

A silt basin is a trap to catch the sediment that flows down with the water. It may be of sewer pipe or of good solid plank. It should be placed so that it may be cleaned readily. If possible, it should come up above the top of the ground and should always be kept covered so that vermin cannot enter. If it is absolutely necessary to come from a greater to a lesser grade, there should be a basin so that the sediment which comes down with the swifter current will be deposited there in where it can readily be removed.

Only in the most general manner can one discuss the laws to which one must conform when he starts in to drain his farm. On general principles, the land-owner cannot do that which will injure his neighbor. A man may drain his own land, providing he does not turn the overflow on to his neighbors' ground in such a manner that it will reduce the value of the neighbors' land. In most states a man may do that which benefits himself, although it hurts his neighbor, if he can show that his action is a benefit to the community at large. The neighbors' source of water supply may be cut off and diverted without his having any redress, provided that water supply is under ground. However, it is always good policy and in the interest of the community that the consent of all concerned be secured, wherever this is possible. In all cases, this old saying applies: "Be sure you are right, then go ahead."

Michigan Experiment Association

UNUSUAL growth characterized the past year's work of the Michigan Experiment Association, the annual meeting of which was held at the Agricultural College last Thursday and Friday. A year ago the organization had 250 members and included ten local associations in different sections of the state. Today there are 766 members and 50 local associations. This remarkable growth is the result of apparent economic advantages coming to the members and to the communities in which local associations have been established and to the constructive work of President Scully and his staff.

The prime purpose of the work is the production and distribution of pedigreed farm seeds and the carrying out of co-operative experiments. Particularly in the first line of work have noteworthy results been accomplished. Higher yielding varieties of oats, wheat and rye, have been introduced into a large number of communities through the efforts of the society, and one entirely new grain, a winter barley, which holds out wonderful possibilities to Wolverine farmers, has been given to the agriculture of the state.

Through the secretary's office orders for seeds of different kinds of grains to the amount of 3,400 bushels have been received and filled. This has been done through the co-operation of members and by a moderate amount of advertising in the agricultural press and local newspapers. The possibilities along this line seem almost unlimited. The increased yield from fields sown with seeds recommended by the association is arousing general comment and suggests that before long the business of the organization will demand a larger force to take care of the work.

The finances as reported by Secre-

tary-treasurer V. M. Shoesmith, of East Lansing, show a balance of \$114.27 on hand January 1, the receipts for the year being \$646.57 and the expenditures \$532.30. It was voted at the meeting that members of local associations shall hereafter be required to pay into the state organization 50c per year instead of 25c, and the local associations are empowered to vote whatever amount of dues they deem necessary for carrying on their local work.

The officers elected for 1916 are: President, I. E. Parsons, Grand Blanc; vice-president, Fred Cornair, Chesaning; secretary-treasurer, V. M. Shoesmith, East Lansing; assistant secretary, A. L. Bibbins, East Lansing; plant breeder, F. A. Spragg, East Lansing; executive committee, I. E. Parsons, Fred Cornair, V. M. Shoesmith, J. Robert Duncan, of Vicksburg, C. Hunsburger, Grand Rapids, and D. E. Turner, Hillsdale.

Reviews of the addresses given at the session of the association will appear in future issues of this journal, also a list of the awards in the contests in connection with the annual meeting.

The committee on resolutions reported the following resolutions which were approved:

1. That the Experiment Association express their appreciation to the executive committee and the various speakers for the splendid program delivered at the 1915 annual meeting.
2. That the congressmen from Michigan be requested to distribute farm seeds only to such persons as are recommended by the experiment station.
3. That the Michigan Experiment Association favor legislation, leading to more complete crop statistics.
4. That owing to the damage done to the farm crops in the state of Michigan by the weather conditions in 1915, the farmers be requested and advised to test all seeds for germination before planting the crop of 1916.

Salt as a Substitute for Potassium

By PROF. M. M. MCCOOL

RECENTLY the writer has received a number of inquiries as to the advisability of using commercial salt as a possible substitute for potash. He takes this opportunity to give the present status of this subject.

Salt, or chloride of sodium, is constantly carried inland from the sea as spray and also distributed in dust by the atmosphere. These amounts are almost insignificant several miles from the sea coast, however. Sodium occurs in appreciable amounts in several soil forming minerals and is therefore present in small amounts, at least, in all arable soils. When sodium is present in the chloride form it is readily washed or leached out of the soil, thus in humid, or regions of normal or high rainfall, it does not accumulate in the soil mass.

Sodium is present in appreciable amounts in the ash of most cultivated plants. Several eminent scientists have studied its role or importance in plant nutrition. It is generally agreed that sodium is not essential for the maturity of crops and seed production, on the other hand, numerous other reliable experiments show that it may be beneficial, due to its indirect action. It was found by Birner and Lucanus, as early as 1866, that certain salts of sodium aided the passage of phosphoric acid into the plant. In 1885, Goodale suggested that sodium may take the place, in part, of the potash in plant nutrition, and more recently, Wheeler and co-workers at the Rhode Island Experiment Station conducted elaborate experiments, the results of which in general show that sodium is unable to take the place of potash in plant nutrition in toto, but it may, and often does so in part, and thus causes the plant to make a more economical use of potash.

Too Much Salt Injurious to Crops. Commercial salt may be injurious to

crops when present in the soil in too large amounts, it being one of the constituents of the so-called "alkali soils" that occur quite generally in certain of the arid regions. In general, one part of salt to about one thousand of soil may prove injurious to young plants. Furthermore, when applied to acid or sour soils it has a tendency to intensify this condition, whereas applied repeatedly on soils high in carbonate of lime, the very injurious so-called "black alkali" or carbonate of soda is formed.

It has been conclusively shown that salt when applied to certain soils acts as an indirect fertilizer in that it unlocks portions of the phosphorous and potash from difficultly soluble or unavailable complex mineral compounds in the soil. It is probable that it is most active in this respect when applied to soils that are low in carbonate of lime. It should be recalled that land plaster, which was formerly quite extensively used in parts of Michigan and other states, acts in a similar manner. The salt, inasmuch as it liberates these compounds, is a soil stimulant, but when it functions in place of part of the potash in plant nutrition, or causes a crop to make a more economical use of potash, it is a fertilizer.

Perhaps of lesser importance, salt decreases the amount of water removed from soils by crops, and to a certain extent decreases the loss of water by evaporation from the surface of soils; in fact, it is generally held by farmers who use it that salt helps to retain moisture, therefore being most important in this connection on sandy soil. Moreover, certain farmers maintain that celery is more crisp and of a better quality when the soil is treated with small amounts of this substance. However, an application of potash may result in similar conditions.

The application of salt to soils and the results obtained therefrom have occupied the attention of agricultural writers for centuries. Griffiths, in his treatise on manures, (published in 1889), called attention to the generally recognized importance of salt when applied to soils, stating that about 250,000 tons of finely crushed common salt were used annually for agricultural purposes in the United Kingdom.

Experimental Results.

Certain German investigators found that salt when applied to soils very low in available potash, appreciably increased the yields of several crops. Others found that a substitution of salt for a part of the potash in fertilizers, result in increased yields on certain soils.

Rather extensive field experiments have recently been conducted in Austria at the Royal Agricultural Station at Magyarovar, to determine the value of salt as a fertilizer for sugar beets. The results obtained in 1909 and again in 1911 show that under certain conditions the beet re-acts satisfactorily to judicious applications of this substance, but where the soil is too heavy cracks form and the beets may be injured. These studies were continued in 1912 in four groups comprising 23 experiments. In group one, experiments were conducted with clay soil on eight estates. Applications of 315 pounds per acre increased the yield in four cases, reduced it in one, and in three had no effect. The second group of experiments included studies on seven different estates, 235 pounds per acre being added. The yields were increased in four cases. Group three comprised four experiments in which 160 pounds per acre of salt was applied. Two gave good returns, and in two it had no effect on light sandy soils. The fourth group comprised experiments to determine the amounts of salt to apply. The results obtained show that at least 160 pounds per acre must be applied, and it is more efficacious when 320 pounds were employed.

The results of these experiments vary or differ appreciably, but in general they show that under some conditions a judicious use of common salt will increase the yields of beets and that it should be used with caution on heavy soils.

Wheeler and co-workers carried on exhaustive field and laboratory experiments with many different crops for a number of years to determine if sodium will take the place of potash in fertilizers. The results of these well controlled experiments show that great benefits are derived from a soil low in potash when salt is applied in conjunction with small amounts of potash. Wheeler fixes upon the point that various sodium compounds, including salt, should be best used for growing such crops as mangels, radishes and turnips. There are on record many other reports of the results obtained from the use of common salt as a fertilizer, some of which show positive and others negative returns.

The situation seems to be as follows: Common salt on some soils undoubtedly will increase the yields of various crops, especially the root crops or those that require large amounts of potash. Furthermore, it should be looked upon chiefly as a soil stimulant, inasmuch as it liberates both phosphorous and potash from less available complex compounds, and should be used only as an emergency on soils that are very high in these substances, or in conjunction with an application of potash and phosphorous. Too large applications will prove injurious, inasmuch as it may injure the structure of some soils and increase the acidity in others. It seems that the optimum amounts to apply under most conditions, at least, range from 200 to 300 pounds per acre. Certainly the use of common salt on soils in Michigan have not passed the experimental stage, and indeed the writer does not advocate its general use.

The Farmer's Professional Library

Agriculture, as a profession, is now on the same plane as engineering, chemistry or any of the occupations which are founded on applied science. An inquirer or a chemist would not think of trying to carry on his work without the aid of a professional library to which he could constantly refer. One can hardly take up an engineering journal without seeing a page or two given to the advertising of technical books, but it is comparatively rare to see agricultural books advertised in the farm papers, and rarer still to find a farmer who possesses anything like an adequate working library. Probably this difference is partly due to the fact that the farmers, as a class, are not yet as well educated as a body of men as the engineers and do not understand so well the use or value of technical books. Yet it is unusual to find a farmer who does not believe in agricultural schools and colleges or who does not think it worth while to listen to what the teachers of agriculture have to tell him. I have known farmers who would gladly drive ten miles to hear Joseph Wing give a talk on "Alfalfa," but who would ridicule the idea of buying a book on the subject. Yet a careful reading of Wing's book on alfalfa will give as much information as he could have given in a half dozen lectures, besides the book is always at hand to be consulted at any time.

There are now a great many agricultural books by men, who are authorities in their line, which are not so difficult as to be beyond the comprehension of the man with a common school education. A library of such books need not be expensive. Ten to twenty dollars is sufficient to make an excellent beginning and by adding one or two books a year a fine professional library can soon be built up. The value of such a library can hardly be overestimated. There is probably no other occupation so diversified as farming. Problems in economic botany, in entomology, in veterinary medicine, in mechanics, in feeding, and in the physics and chemistry of the soil are constantly arising. Think of the many questions concerning correct methods of tillage, that come up every year with the different kinds of seasons, which a book on soils will help to solve. When a crop is suddenly attacked by an unfamiliar insect pest a book on practical entomology will usually enable you to identify the insect in a few minutes and will give the best methods of fighting it. In nearly every case, what is thought to be a new pest is only a well known insect that for some reason has suddenly increased in numbers so as to become a nuisance. In stock feeding it is necessary to have a correct understanding of food values and rations if the flock or herd is to bring a profit rather than a loss. We have seen cases where a few hours' careful study of feeding problems would have saved the feeder, in one winter, many times the cost of a whole farmers' library. When called on to prepare a paper or give a talk before your Grange or Farmers' Club think of the satisfaction in having a reliable source of information at hand, which when used in the light of your experience, will enable you to present something of real value.

Some of the book companies will send their books subject to examination. It is usually best to select the books of fairly recent copyright, as agricultural knowledge is making rapid strides these days and some books soon get out of date. One good way to select books is to go to a public library and ask to be allowed to examine their books on agriculture and applied science. With a little experience you will be able to pick out almost at a glance, the books which will be of value to you. The members of the faculty of the agricultural college are usually glad to recommend books on their special lines of work. It is

best to accompany such request by a self-addressed and stamped envelope. The editor of your farm paper will always be glad to advise you in the matter of selecting reference books, many of which are given notice as they come out. Every progressive farmer should get a list of up-to-date reference books covering the general and special subjects in which he is most interested and lay the foundation of a professional library if he has not already done so.

Allegan Co.

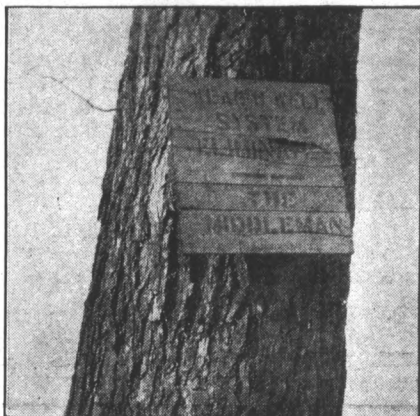
O. F. EVANS.

CASH VALUE OF TREES.

Several years ago in the campaigns to save trees the Ladies' Club would occasionally have a "tree article" on the program and it might be entitled, "Save the Beautiful Trees," or "Protect the Lovely Forests." Practical farmers frequently looked upon these appeals as purely sentimental, entirely devoid of practical value, and extremely useless. Trees were looked upon as worth so much for lumber or firewood and in the mind of the practical farmer they had no other value.

In this age it is said that everything is commercialized. The natural beauty of the farm has been commercialized at the same time and it is a good thing, as it makes a man think twice before he injures a valued tree on his premises. If you do not believe that shade trees are real estate assets, place your farm on the market and visit with the city man who may come out to view your place as a prospective investment. Fine trees have their appeal and the appeal goes right to the pocket book. If you are expecting to retire some day and sell your farm, it might be well to remember that a few dollars invested in good trees from a reliable nursery will pay much better interest on the investment than would the money placed in the savings bank. Trees are not expensive and their growth is slow but the years seem to fly on the farm and somebody will be farming your land a hundred years from now and thanking you for the shade trees which you have planted. Possibly 30 years from now these trees will add \$5,000 to the cash value of your farm if you place it on the market.

Michigan was a state of fine forests and many of the large trees have been saved in sections where they are scarcely appreciated. This fact is noted from the large number of advertis-



ing signs nailed to fine shade trees. A short time ago I drove by a rural school on a corner where stood three large elms. Two of these trees were decorated with advertising signs, no doubt a fine example to the children who attended the school. A campaign against advertising on trees should be taken up in every rural school. The merchant who objects to signs being removed from shade trees along the road, should lose a lot of trade in his community. It is bad enough to see the barns and fences ornamented and pasted up with gaudy colors, but when it comes to the best trees along the road, the publicity business has gone too far.

A tree has a cash value. Sentiment is a very nice thing but unfortunately

it sometimes fails to impress the masses except at rare intervals. The tree has become commercialized on the best of farms and there is no cheaper way to permanently improve the real estate value of a farm than to plant fine shade trees.

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CATCHING RATS.

For years we believed nothing better than a Thomas cat for catching and completely eradicating rats. We have changed our opinion now, as we have found that the wire cage traps sold in stores are far ahead. It is said to be a French invention and of late years has been sold quite extensively in this country.

The trap is manufactured in two sizes, a small one for mice, which will also answer for rats, if the rodents are not very plentiful, but the large size is a more effective rat exterminator. A neighbor caught fourteen rats in one night with one of these traps. The most we have ever caught in one night as seven. Some have estimated that every rat caught is one dollar saved in grain. We consider this rather a high estimation, but it certainly pays to catch them when they can be caught so easily.

In setting our trap the first time, we set it in the corn crib. Not a rat ventured in for over a week, and it seemed they would not go in as long as there was plenty of feed outside. Finally they began to go in. It seemed that when one has gone in, others are pretty sure to follow. For this reason, we never kill all we catch, but leave one or two in the trap to induce others to go in. We believe that here lies the great secret in catching rats with a cage trap.

Indiana.

A. B.

A FARM WORK-SHOP—ITS EQUIPMENT.

A good workshop is, without any doubt whatever, a valuable asset to any farm, and in consideration of the slight cost of putting up such a building and equipping it with a few tools, no farmer can profitably do without one. In a great many instances we can convert an old building, otherwise of very little value, into a modern workshop which will hold all necessary tools and equipment and the cost will be comparatively small.

The proper size of such a building, of course, will vary, this depending greatly on the amount of work to be done and the equipment. Our workshop is 18x22 feet and contains an overhead storage room where we keep lumber and other necessary supplies. By this arrangement much valuable space is saved and gives us plenty of room to do our work on the lower floor where we have a work bench, forge, and other necessary equipment.

It is not necessary to have a full equipment of tools in a farm workshop, but we must have the following at least: A good hatchet, hand-saw, rip-saw, steel square, a good plane or two, set of chisels, a good brace and set of bits, set of taps and dies, a good axe, some tongs, and a good blacksmith's hammer. The above will do to start with and other tools can be bought from time to time as the need arises.

A great many farmers have special talent along this line. Some have been mechanics at some time or another, while others are quite handy with tools, and in this way a great many dollars can be saved in the course of a year which otherwise would be paid out of the farm profits for the different repairs arising from the constant use of the farming equipment. A farm workshop is a good investment because on the average farm it will pay back to the owner the price of its construction and equipment in the course of a year.

We keep on hand a stock of bolts of different sizes and lengths, as they are

sure to come in handy at some time of the year. In our shop we are able to mend harness, sharpen harrow teeth, mattocks, replace mower knives and broken parts, make single-trees, fit horseshoes, and many other small jobs that often run up into many dollars in the course of a year. This work is usually done on rainy days or during the winter when our work is not rushing. However, it is in the busy season that the workshop is appreciated, especially when something breaks. In a few hours' time we have generally the broken part mended and oftentimes are at work before we could make a trip to the village blacksmith shop. Aside from this we perhaps save a day's wages, which is just that much more earned, to say nothing of saving a lot of hay or some other valuable farm crop which otherwise would suffer if not attended to when conditions were favorable.

Our workshop, while not large, is a great saving in time and labor and is a good investment as it has already saved many times its cost during the past few years.

Penn.

H. W. SWOPE.

SEED POTATOES FOR MICHIGAN.

There will be an unusual demand for seed potatoes in many parts of Michigan the coming season. No doubt many growers will send to other states to get their seed. While the supply of first-class seed may be limited in this state there will be a large quantity of potatoes available for seed purposes which will be as good as most of those shipped in from other states. By buying near home the growers will not only save freight charges but will not run the risk of bringing powdery scab and some other diseases which are not known to be in Michigan, into the state. Imported seed is more or less dangerous on this account, especially when bought from sections where the powdery scab is known to be present. Perhaps the chief thing which stands in the way of growers getting their seed within the state is the lack of knowledge as to where it can be purchased. Realizing this the Extension Service of the Agricultural College will try and locate as much good seed as possible and advise those who make inquiries as to where they can get good seed. Blanks have been printed which will be sent upon application to anyone having good seed potatoes for sale and who desires to get in touch with prospective seed purchasers. Any person residing within the state who may desire to take advantage of this opportunity may do so by writing C. W. Waid, Secretary Michigan State Potato Association, East Lansing, Mich. The blanks which will be sent to the applicants should be filled out and returned promptly. About the middle of February the information which is given on the blanks which have been returned will be compiled and put into shape for distribution.

The fact that this work is to be done will be advertised freely and there should be a liberal request for information about seed potatoes. Those residing outside the state will be furnished the list if they desire it and will make their wants known to the secretary. This service is entirely free and is available to all within the state. It is one feature of the extension work with potatoes. There is a close co-operation between the College and the Michigan State Potato Association in this work. We are trying to so shape the work that many growers will realize the importance of it and become sufficiently interested to join the State Association. Those who desire information as to the other lines of work which are being undertaken by the Extension Department of the Agricultural College in co-operation with the Michigan Potato Association may secure the same by writing the secretary.

C. W. WAID,
Sec'y Mich. State Potato Assn.



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Mention The Michigan Farmer When Writing Advertisers

Nat'l Wool Growers' Convention

By ROSCOE WOOD.

THE Fifty-second Annual Convention of the National Wool Growers' Association held at Salt Lake City, January 13 to 15 inclusive, was claimed to be the largest meeting of stockmen ever assembled in convention in America. The prosperity of last year, the fear of threatened adverse land legislation, the realization of the power of organization, and the necessity of voicing the appreciation and supporting an exceptionally effective force were combined factors in producing this attendance.

The one predominating feature of the entire convention was the discussion of the land question. Various systems of preparing and marketing wool were considered, the losses incident to predatory wild animals and to poisonous plants were noted, a representative of the forestry department described several interesting experiments which involved a change of present range methods with good results, and other interesting addresses were made, but all these were subordinated to the problem of securing such congressional action as would most equitably conserve the interests of the stockmen in the disposal of the remaining unappropriated public domain. It was felt that some action is coming soon, and that the industry most affected by such legislation is entitled to consideration. The sheepmen are a unit with the cattlemen as to certain questions, and the final unanimous sentiment of this convention is expressed in the resolutions.

An Interesting Program.

From the opening address of President Hagenbarth to the closing remarks of Prof. Marshall, the sheep expert of the federal government, the program was unusually interesting and instructive, and given full appreciation by those in attendance. While some of them would be of little interest to eastern farmers, others will furnish valuable information. In his address the president warned against inflation and over-enthusiasm because of prevailing high prices, and advised the payment of debts instead of their creation; he argued for the leasing of the open range, and for the necessity of regulating the market supply of lambs by extending the time of marketing; he noted the need of improved methods of care and breeding, and deemed a public ram sale advisable.

Mr. E. Clifton, New Zealand Commissioner of Live Stock at the Panama-Pacific Exposition, gave a very interesting paper upon sheep conditions in that far away island. Twenty-five million is the number there usually maintained, while their marketings are about eight million annually, most of which is exported to Great Britain. Sheep there run on grass the entire year, under fence. The Romney breed predominates by a large percentage, while the Lincoln is also popular. The Corriedale, about which we hear much in America, is of comparatively small importance, although this is its native land. It has been developed by crossing Lincoln rams upon Merino ewes, and then inter-breeding the crosses, rejecting many of the produce in the process of selecting animals which would breed approximately near to the type desired, which is practically that of the first cross of the two breeds named.

Of similar interest was the talk of Prof. Marshall upon Australian conditions, which country he visited last year as the representative of the American government. There sheep are handled in immense pastures, fenced rabbit- and dingo-proof with high woven wire, the only labor required being a fence rider. As many as four thousand are run in a single pasture. These pastures are made possible by the government leasing the lands for long terms, at rentals proportionate to the number of sheep per acre the land will carry. An average rental is

about one and one-half cents per acre. Ninety per cent of the sheep are Merino, but in recent years there has arisen a tendency to use longwool rams in certain sections. In the Merino breeding the aim is to produce a long, robust wool, (which we would call coarse in fiber), as they have found that it produces more profit per acre than a finer wool.

Regarding wool classing, or grading, as we term it, the conditions are so at variance with American conditions that the practicability of their adoption here is seriously questioned. There the wool is never sold as an entire clip, but is classed, sent to the seaport town, and sold at public auction through a selling agent. Their classing is based more upon shrinkage basis, as the flocks are very well graded when they come to the shearing shed. The production of good mutton there is a long way in the future, while the extension of sheep raising is hardly possible, the richer lands near the sea coast being turned toward intensive farming while the deserts in the interior are practically inaccessible and furnish little feed at any time. Drouths, labor troubles, and taxes are the great drawbacks to the business, but it has a stability that the American range sheep industry can not hope for until the land question is settled so that sheepmen can put their business upon a permanent basis.

Dwight B. Heard, President of the American National Live Stock Association, gave a forcible exposition of the land situation, and regarded any congressional action which gave the west-

ern stockmen justice as requiring a classification of the public lands, that land subject to homestead entry must be of such character as to enable the entryman to reasonably support a family, that stock water should be conserved for the use of live stock, and that all public lands not fit for homesteading shall be leased under federal control, similar to the forest reserves.

Resolutions.

Resolutions adopted are summarized as follows: Petitioning Congress to secure more revenue by an amendment of the tariff on sugar, meats, and wool, through a non-partisan tariff commission; asking the Department of Agriculture to require the sterilization of all wool and other animal products imported from countries in which foot-and-mouth disease prevails; supporting the Department of Agriculture in its methods of eradicating the foot-and-mouth disease; asking Congress to enact legislation providing for the classification of the public domain into lands suitable for crop production and lands suitable only for grazing, the former to be opened for settlement in tracts of such size as will adequately support a family, the latter to be leased to those who will use them for the production of live stock; asking the Secretary of the Interior to set aside unoccupied government land for stock trails; petitioning Congress to enact a pure fabric law; commendation of the National Wool Warehouse; soliciting the support of all flockmasters to the National Wool Grower; a disavowal of lawless acts by individual sheepmen.

The old officers were re-elected, including F. J. Hagenbarth, Spencer, Idaho, president, and S. W. McClure, Salt Lake City, Secretary.

The Annual Live Stock Meeting

THE annual meeting of the Michigan Improved Live Stock Breeders' and Feeders' Association, and the meetings of the allied breed organizations held at the Michigan Agricultural College January 18 to 21 inclusive, brought out a larger number of breeders than usually attend this important winter event. Due to the fact that the meeting was extended over four days instead of being crowded into two, as has been the custom in former years, the attendance at the general meeting on Wednesday and the banquet on Wednesday evening, was not as largely attended as has been the case in some former years. More farmers and stock breeders were however, in attendance at the various sessions than at any previous meeting of these allied organizations.

Excellent programs were given both at the general meeting and at the dividend breed meetings. Owing to the fact that these meetings were held in dif-

ferent rooms in the agricultural building, scattered over a period of three days, it has been necessary to gather the report through the official channels of the organization, making it impossible to give a complete report of the business meetings of these different organizations in this issue. Such a report will, however, be published in the next issue, and arrangements have been made for the publication of the major portion of the principal addresses given at the general meeting and the more important of the breed meetings. The first of these which was given at one of the earlier breed meetings appears in another column of this issue and will be succeeded by others in future issues. Altogether the meeting was one of great profit to the live stock breeders of the state, and its effects should be reflected through the various breed interests of the progressive Michigan farmers who were in attendance.

Live Stock for Mich. Waste Places

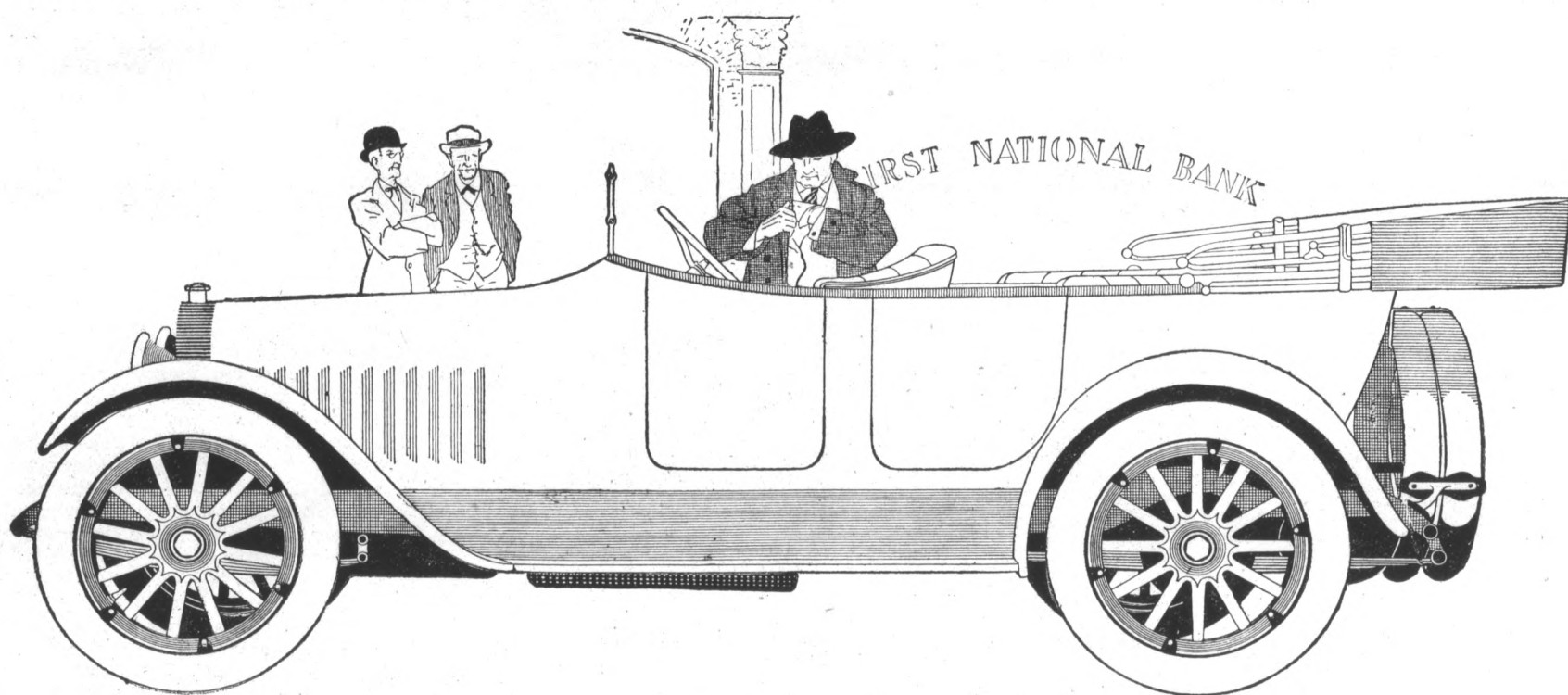
Paper by Thos. F. Sotham, Read Before the Michigan Hereford Breeders' Association.

THE greatest obstacle barring the way to adequate progress in the development of Michigan waste places is Michigan's own ignorance of their real value and certain future. The average Wolverine citizen living within a hundred miles of the Indiana or Ohio border is a dog in the manger when the settling of Michigan territory further north is considered, he knows little and cares less about the cut-over lands to the northward, and he either damns them with faint praise or in his ignorance condemns them altogether. Dollars by the million have been sent out of the four southern tiers of Michigan counties to tame the wilderness of the west and south and north, from Panama to Alaska. Investments from this self-consciously superior region have been enthusiastically hazarded in seven figure amounts on Saskatchewan, where frost and snow is a common August visitor, and ice locks the grain shocks to the ground to insure the thresher

with employment in the spring months. And yet, only suggest to those investors that there are splendid, cheap land investments above Saginaw Bay, and lo and behold, with brazen assurance they inform you that the polar regions lie thereabouts. Boo! And the worst of it is that the Buckeye or Hoosier faring northward through the southern counties of Michigan is deterred by the ignorance of Clare and Ogemaw and the like, that is nourished there.

A very dear friend of the writer, who has profited over a million dollars through the unearned increment inherent to his late father's farm as it receded farther and farther within the limits of Michigan's greatest city; exclaimed upon being urged to do something for Michigan's waste places: "What! that God-forsaken country." Yet this same friend saw the cattle on one of his western ranches lie down and die in the Arizona desert by thousands for the sheer lack of water and

(Continued on page 149).



This is the New 3400 r.p.m. Chalmers; 45 H. P.; 2660 Pounds—the Price \$1050

600 merchants, who sell a great many thousand cars every year, took one look at this new 3400 r. p. m. Chalmers and bought \$22,000,000 worth in forty minutes.

Perhaps half of them came from county-seat towns, some from smaller communities. They took almost half the Chalmers output.

That means about 10,000 of the new 3400 r. p. m. Chalmers are going on the farm.

The other half will go to the cities, which for eight years have absorbed the greater share of Chalmers production.

You can stand on Fifth Avenue any day and watch a million dollars' worth of Chalmers go by. Stand on Jackson and Michigan Boulevards, Chicago, and you will think half the city is riding to work in Chalmers.

Minneapolis, Boston, St. Louis, Kansas City, San Francisco, Cleveland, Detroit, daily show the Chalmers conquest.

Now comes this new 3400 r. p. m. Chalmers; up goes the demand, new buildings, production. And down comes the price to \$1050.

That is \$300 less than any Chalmers model ever built before, and some \$900 less than the Chalmers of three years ago.

The hundreds of Chalmers dealers who sell a great many cars to farmers every year have bought more than \$10,000,000 worth of these

new cars because \$300 saved is \$300 earned, and \$300 is six per cent. on \$5000.

They bought so heavily because they knew, as good merchants, that this was a good-sense kind of a car for a farmer to drive. It develops 45 horse-power at the usual cost of 25 H. P. (And gasoline isn't getting any lower).

The engine is rather small beside the big hulk of an engine it used to take to turn up 45 horse-power. The cylinders are $3\frac{1}{4} \times 4\frac{1}{2}$ —six of them. But they deliver the stiffest wallop that ever came out of an engine of its size. It "turns over" 3400 revolutions per minute, or better than 56 a second.

You understand the "kick" that is back of speed. Some cars do 1400. Some 1800. Some 2200. Others 2400. One or two get around 2600; one reaches 3000 r. p. m.

But this is the highest engine speed ever developed in an American stock car.

It means great power from a small engine; a light-weight chassis; quick acceleration; long mileage on gas; abnormal tire life; and ability to pass your neighbor almost at will.

One minute with your foot on the accelerator makes you want to own the car.

When you go to town again look up the Chalmers dealer; and send for a catalog now.

\$1050 f. o. b. Detroit

Chalmers Motor Company, Detroit, Mich.



Quality First

Look Out Men!



For Bad Seed

Once more I warn you to look out for bad farm seed. No living man can recall a year when Seed Grain and Grass Seed were so foul. Last summer's exceeding wetness did it. Rank weeds infested almost every field. Weed seeds by billions were harvested along with the grain. Moreover, a big per cent of the grains themselves are running to low quality and are unfit for planting. Mark my word, the man who sows Grain or Grass Seed this year without first scientifically removing both the weed seed and the bad grains will pay a fearful penalty at harvest. It means money—big money to you—to clean and grade your seed now—before planting time. This is true no matter what crops you grow.

Let This FREE Book Save You Big Crop Losses

My sensational Crop book, "A HARVEST OF GOLD," tells how to clean and grade any and all seed; tells the entrancing story of multiplied Wheat Yields; extra bumper Corn Crops; bountiful Oat yields; record-breaking Harvests of Barley, Flax, Timothy, Clover, Alfalfa, etc.—all results from sowing CLEANED and GRADED Seed Grain! A large part of the story is told by farmers themselves—in their own exact words. It is a handsome, illustrated Book. Worth \$100 to any farmer—but yours for the asking.

SPECIAL OFFER on Chatham Mill

The surest, quickest, cheapest way to clean, grade and separate any and all farm seed is with a Chatham Mill. Thousands of farmers in your state will tell you that the "Chatham" is the biggest profit-paying machine they ever owned. Let me send you their letters.

For the next 30 days I am making a very Special Offer—reduced prices, 30 days free trial and liberal credit. Write at once for my outstanding new Proposition on the Chatham Mill and for my famous Crop Book, "A Harvest of Gold," which is free.

Manson Campbell Co., Dept. AA-111, Detroit, Mich., Kansas City, Mo., Minneapolis, Minn.

Wheat and Rye

Separates chaff, blasts out oats, chaff, etc. Keeps screenings free of weeds and all black seeds. Uses the new principle of wild oat separator. Grades all varieties of wheat perfectly.

Oats

Removes chaff, mud, card and all black weed seeds. The scalper throws out straw joints, chaff, and thistle buds.

Barley

Cleans, grades, and separates all weed seeds and foreign grain including oats and wild oats.

Beans and Peas

Removes splits, pods, shrunken beans. Makes an eight pound picker a good sample. Handles

Corn

Blasts cobs, chaff, and all weeds. Removes broken grains, shoe pegs, tips, butts and unusable kernels; grades flat, even grains for 95 per cent perfect crop.

Clover

Removes buckhorn and clover weeds. Saves and separates alfalfa and timothy.

Timothy

Removes plantain, pepper grass and 33 other weeds. Saves volunteer timothy from oats and wheat.

Alfalfa and Flax

Removes dodder and foxtail; heads, stems, fibres, wild oats, mustard, barnyard grass, false flax, broken wheat. Blasts out shrunken, frozen or droughted seed.

Ask how to Separate Rye and Vetch absolutely

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The greatest forage plant that grows. Superior to all as a fertilizer. Equal to Alfalfa for hay. Exceeds for pasture. Builds up worn-out soil quickly and produces immense crops, worth from \$50 to \$125 per acre. Easy to start, grows everywhere, on all soils. Write today for our Big 100-page free catalog and circular about unhulled and scarified hulled sweet clover. We can save you money on best tested, guaranteed seed. Sample Free.
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Crop very short. Buy before advance and save money. Get our special low prices and free samples of our pure, Iowa Grown, New Crop Re-cleaned Tested Clover and Timothy Seed. Also Alfalfa, Alsike, Sweet Clover. All kinds grass seed. 100-page catalog free, quoting all field seeds. Save money by writing at once.
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Trees—Roses—Vines

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Wet weather damaged nearly all seeds. Most are full of blasted grains and weeds. Buckhorn, Thistle, and Dock. Ours are not, and are far the cheapest to sow. Scarcity of good seed makes early buying advisable. Samples and instructions "How to Know Good Seed" Free. Write today. O. M. SCOTT & SONS CO., 36 Main St., Marysville, O.

Pruning Apple Trees

PRUNING is a natural process intensified. Useless and weak limbs are choked out by the lack of sunlight in nature's way, but the process is slow and the dead brush is still left in the tree. In pruning we select limbs which will form the desired head of the tree and make them strong by cutting out others and thereby eliminating the struggle of the survival of the fittest among limbs. By pruning we also control the shape of the tree so that it will be more convenient for the carrying on of our modern orchard operations.

What Pruning Accomplishes.

We can also correct evil tendencies of growth by pruning and control to an extent, the habits of bearing fruit. In the matter of growth a variety may grow too upright or too spreading to make the ideal shape. If so these tendencies can be corrected to a great extent by cutting off of limbs which grow inward on upright trees and those growing outward on spreading trees. In the matter of correcting bearing habits we can cut back the tips of limbs if it is characteristic of the variety to grow fruit on the ends of the branches and thus encourage the formation of spurs in the tree. Trees which overbear can be brought down to bearing a moderate crop by a thinning out of the short fruit spurs while those which are slow in coming into bearing should have little pruning and only in such a way as to leave as many of the fruit spurs in the tree as possible. This can usually be accomplished by pruning out the large limbs and leaving as much as possible the smaller and shorter ones which are more likely to have fruit buds on them.

In general the tendency is toward less pruning rather than more. A yearly cutting back on general principles is not considered policy any more but, instead, just enough pruning to accomplish the real purpose of pruning, that of directing the growth is deemed essential.

Pruning Young Trees.

In the pruning of young trees before setting the broken roots should be cut off and the others cut back to about six inches in length and the top, if a whip limb, should be cut back to about knee height if there are plenty of live buds beneath that. To cut away all of the live buds in pruning the top of a nursery tree makes it necessary for the tree to force out dormant buds at the most critical period of its life. If the tree is branched high the top can also be cut to knee height if plenty of live buds remain. If not, then the branches should be thinned out to about four, which should be so placed

as to make the framework of a well balanced top and at least two inches from each other on the trunk.

Light Annual Pruning Best.

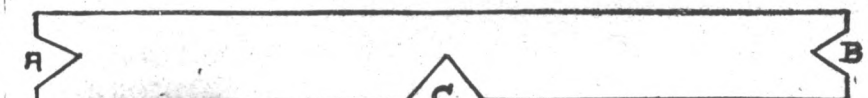
Bearing trees should have a light annual going over. Spasmodic pruning does not shock the tree in the real meaning of the word shock, but it is likely to upset the balance between wood growth and fruit bud formation and will consequently result in temporarily checking production.

Very often when a bearing orchard is taken in hand there will be needed a lot of pruning to correct the mistakes or carelessness of the past. In such cases one of any two limbs close to each other and nearly parallel should be cut out, no matter how large. Also all crotches should be remedied if possible by removing one of the limbs which form it. If several large limbs have to be cut out it is advisable to cut them out and leave the necessary thinning out of small brush until the next year. If severe pruning, such as cutting back the tops, is necessary, it is best to do the pruning in the spring when the crop prospects of the tree are good. In doing this the growth of a large amount of water sprouts is generally prevented as the energies of the tree are devoted to maturing the fruit crop.

As varying conditions of tree growth need different pruning, so will different varieties need different pruning because varieties different in their habits of growth. For instance, it would not be wise to prune a Duchess in the same way as a Greening. The same variety under different soil conditions may also require different pruning. The main object in all pruning is to make the tree bear as near as possible annual moderate crops of good-sized and well-colored fruit. An endeavor to keep a balance between the wood growth and the fruit bud formation will do much toward accomplishing this.

MAKING A PLANTING BOARD.

Next to selecting the wrong varieties there is no more permanent monument to carelessness than irregular planting. In setting out an orchard, whether it be large or small, the trees must be properly planted to look well. A handy planting guide can be made of a board about six feet long and four inches wide by placing a notch at each end and one on the side. After the orchard plot has been measured off and the stakes set for the trees at the correct intervals, the planting board can be laid on the ground with the notch C against the stake where the



The Use of a Planting Board will Insure Straight Rows in the Orchard.

tree is to be planted. Then stakes can be placed at the points, A and B, and the planting board removed to dig the hole.

After a fairly large hole has been dug to give the roots plenty of room the planting board is returned between the stakes at the points, A and B, and the point, C, will be exactly where the original stake was located. This gives the planter the exact spot to place the tree. This method is much better than pulling up the original stake, digging the hole and trusting to luck that the tree will be planted in the correct alignment. While the planting board is over the hole and the tree standing in the notch the earth may be shoveled back and pressed down. When the board is removed the tree will be firmly situated in the right place and the remaining earth may be thrown in the hole and firmly tamped down.

Ingham Co. R. G. KIRBY.

THE VALUE OF TREE PRODUCTION RECORDS.

With the development of stronger competition in fruit growing more efficient methods of carrying on orchard work will develop and become common practice. Practically all of the methods of present-day orcharding were at one time in the experimental stage and even after their value was apparent it took time to convince enough individual growers of this to make them common practice.

We all know of the value of individual production records in the case of dairy cows and hens, but we have never thought of such work with reference to the orchard. Tree individuality is an established fact and in order to learn of the best individuals in the orchard individual records are of importance. The U. S. Department of Agriculture has realized this and is keeping some interesting orchard records. Assistant Pomologist L. B. Scott, in the following, gives a hint of the value of this work.

"We have had some deciduous bud selection investigational work in Connecticut and also in your own state in co-operation with the Michigan Agricultural College. In Michigan we have had two years' performance records on Northern Spies and Baldwins and we believe there is going to be found in those varieties just as great a variation as we have found in the case of citrus fruits. Our Northern Spy study plot is located in the orchard of L. E. Hall, near Ionia, Mich., and the Baldwin study plot in the orchard of B. F. Hall, near Belding, Mich. We have found certain trees which were poor producers in 1914 that were also poor producers in 1915; other trees that bore very heavy crops in 1914 which duplicated that performance the following year; still other trees appear to have an alternate habit of bearing one year a heavy crop and the next year practically nothing.

"The work so far with deciduous fruits is in a preliminary state. However, we have gone far enough in the California citrus work to demonstrate conclusively that there is a considerable amount of variation encountered in all standard fruit varieties. However, we believe that, by keeping definite statements of individual tree records, that is, by keeping track of the amount of fruit and quality of fruit borne by each individual tree in an orchard and then only propagating from the standard type or ideal type trees, eventually by such a method of selecting budwood you would secure an orchard which would have uniformly productive type trees.

"The work of serving commercial individual tree records has been begun by a number of growers, not only in California but in Florida as well, and some deciduous growers in various sections of the United States. One firm in California is picking every tree separately on 1500 acres of citrus fruits; they have been doing that now for four years and find it pays them to do so. When they find a tree, after a series of three or four years, which is a good healthy tree but is a consistently poor producing one, they rebud it or topwork it, going to good type trees on which they have actual performance records and getting their budwood from these good standard trees. Eventually this firm hopes to work over every tree in its orchard to a high producing tree."

According to the New York Cornell Station, both Bordeaux mixture and lime-sulphur solution may be used for the control of leaf blight which is said to attack not only the sweet cherry, but is quite common on sour cherries and certain varieties of plums. A 5:5:50 solution of Bordeaux mixture or a lime-sulphur solution at a strength of one gallon to 50 gallons of water are recommended

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Note These Features

Control—Full control of entire outfit from operator's seat.

Enclosed Gearing—Every gear a steel gear and all cut gears excepting bull gear—all gears encased and running in oil, including bull gear.

Roller Bearings—Roller bearings exclusively used throughout.

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No Extras—Prices are for tractor complete with plows.

This new Rumely model has met with instant success because it fills all requirements for a small farm tractor—and it is built by a company that knows how.

It is strictly a one-man outfit—tractor and plows are combined in one machine, and the control of the entire outfit is from the operator's seat.

With the Rumely you plow just the same as with a horse gang—the plows are where you can see them and you know how the outfit is working every minute. You can back with your plows, make short turns and cut square corners.

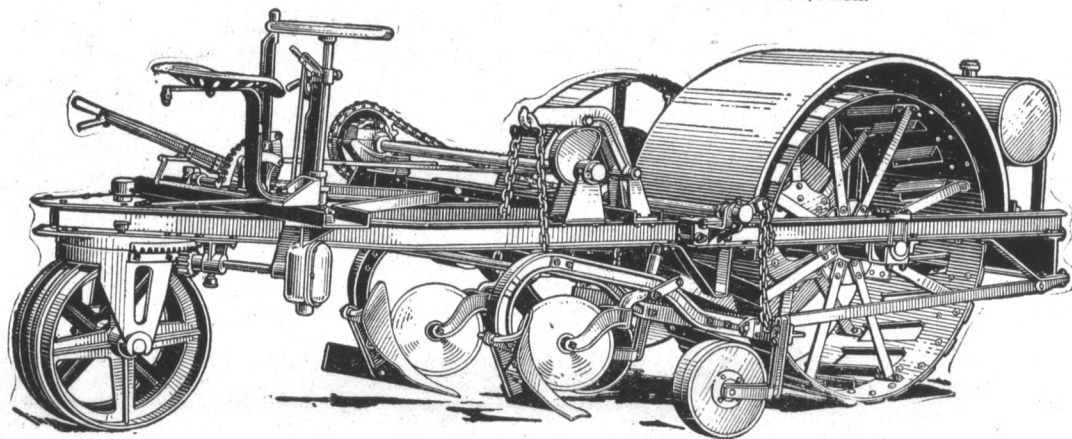
Besides plowing, this tractor will pull your discs, harrows, mowers, drills and binders—it will operate your silage cutter, hay baler, corn sheller, small separator and feed grinder. In fact, handle all your power jobs, draw-bar or belt. When used for other than plowing, plows are quickly detached.

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La Porte (Incorporated) Indiana

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Northern Grown Yellow Dent Corn
Crop of 1914

Our Test 100 %. We guarantee 94% Germ. Send for Sample and Test it yourself. Write for prices.

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We will ship you any Barrel Spraying Outfit in our catalog for a thorough Ten-Days' FREE Test.

Get Our New Catalog—Special Free Trial Offer—Direct-from-factory-to-farm Selling plan saves you fully 40%. If not greatest bargain you ever saw, return it—test costs nothing. Wm. Stahl Sprayer Co., Box 428 Quincy, Ill.

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A pair of mated EVERBEARING STRAWBERRY PLANTS FREE if you will report as to your success with them. Will bear loads of big, red, berries from June to November. We have counted 480 berries, blossoms and buds on a single plant. A postal will bring the plants, also enough seed of the new CEREAL, FETERITA to plant a rod square of ground. Also a pkt. of perennial ORIENTAL POPPY seed. Send 10 cts for mailing expense or not, as you please. Write today and get acquainted with THE GARDNER NURSERY COMPANY Box 745, Osage, Iowa.



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9 sizes of sprays from one nozzle. Starts or stops instantly—saves solution and work. Send for catalog. Agents wanted. Rochester Spray Pump Co., 189 Broadway Rochester, N. Y.

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Clover, Timothy, Alsike, Alfalfa and all kinds of PURE FIELD SEEDS direct from producer to consumer; free from all noxious weeds. Ask for samples. A. C. HOYT & CO., Box M, FOSTORIA, OHIO.

SWEET CLOVER seed, special scarified, hulled and unhusked. Circular and prices on request. John A. Sheehan, R. 4, Falmouth, Ky.

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TWO years ago the Reliance Engineering Co. announced they would build a new model cream separator; a cream separator which would be absolutely self-oiling and so perfect in construction, so efficient, that it would be the most profitable separator for the farmer to purchase. During February, 1914, a few of these separators were shipped from the factory and a few individual good opinions began to be formed. The growth of this volume of good opinion was in ratio to the growth of the volume of production. In a very short time, the news of its performance traveled faster than the supply, and there was a waiting list in all parts of the country. In spite of the larger increased output today—the same conditions exist. Every farmer you meet has a clear-cut idea of the superiority of this separator. The fact that more than 100,000

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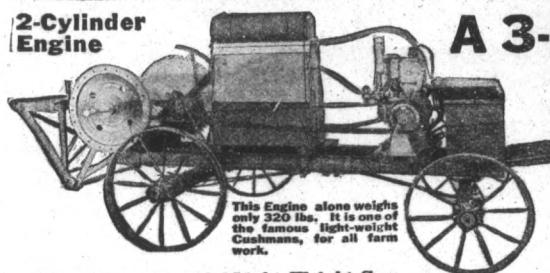
have been bought by American farmers in the last two years proves the feeling created by the Reliance. Reliance prestige is steadily growing greater. The Reliance demand will go right on expanding in volume and in enthusiasm. We urge you to assure yourself of immediate delivery so that you may guard against disappointment. If you can secure a Reliance now, protect yourself and take it.

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Are the most useful engines for farm work. Run very quietly and steadily, on account of Throttle Governor and perfect balance. No violent explosions and fast and slow speeds. Very light in weight and easy to move around from job to job. 4 H. P. weighs only 190 lbs.; 8 H. P. only 320 lbs.; 15 H. P. only 780 lbs.; 20 H. P. only 1200 lbs. Cushman Engines are not cheap, but they are cheap in the long run. Engine book free.

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Why Pay Seven Cents Per Pound,

for having your beans picked over at the elevator, when you can PICK THEM YOURSELF, on one of bean pickers, that cost \$4.00 Vassar. Send your money, or write for catalog, to, The Miller Co., Vassar, Mich.

Clean, Disease-Free
SEED POTATOES
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WANTED—RYE AND VETCH MIXTURE
SEND SAMPLES FOR BID TO
YOUNG-RANDOLPH SEED CO., Owosso, Mich.

Government Farmers Wanted. \$30 to \$125 monthly. Write, OZMENT, 17 F. St. Louis.

When Writing to Advertisers Please
Mention The Michigan Farmer.

BIG HATCHES Vigorous Chicks

Best materials—latest improvements. Genuine California Redwood—Hundreds of dead air cells protect eggs against sudden changes. Double Disc Regulator—Copper Hot Water Heater—Deep Nursery—Double Doors—Safety Lamp, Tester, etc. 100 per cent. hatches common. Bargain.

Tells why chicks die

E. J. Reefer, the poultry expert, 1081 Farmer Bldg. Kansas City, Mo., is giving away free a valuable book entitled, "White Diarrhoea and How to Cure it." This book contains scientific facts on white diarrhoea and tells how to prepare a simple home solution that cures this terrible disease over night and actually raises 98 per cent of every hatch. All poultry raisers should certainly write Mr. Reefer for one of these valuable FREE books.

\$2.50 for 25 to 50 CHICK HOVER

Made of Galvanized Steel. Can be used in any box. Safe and durable. Hot water heat. All complete. Incubator book free. We make 75 different articles.
WENDELL INCUBATOR CO., Holly, Mich.

Marketing Maple Syrup

By W. L. GILSON

SOME of our living ancestors can well remember in the early part of their careers when maple sugar was not a luxury but an article of every-day use. It is even fortunate that a cheaper article, such as cane sugar, which is capable of meeting the demands for quantity has been produced. The demand for maple sugar and even syrup, purely as an article of luxury is now greater than can be met by the pure products alone. The increased demand has not been met by increased production but by fabricators and mixers. When seven cents represents the actual cost of production of sugar per pound, and 60 cents the cost of producing syrup per gallon, it is evident that it cannot compete with an adulterated product which contains a very little real maple, or an artificial flavoring entirely. In view of this fact, what I shall have to say on marketing maple products will be aimed partially toward selling maple products with the mixers' and adulterators' products as competitors.

Quality-Goods Necessary.

It is an axiom, I believe, of all business that permanent trade must be built upon personal honesty and quality of goods. It follows then, that customers must know the goods are as represented. As a uniform grade of maple produce cannot be made during all seasons and at all times in the same season, they should be sold at prices accordingly, abandoning the idea that perhaps the customer will not notice the slight difference in taste or color.

Co-operative marketing associations of various kinds have met with considerable success selling various products. The only one conforming its endeavors to maple products is operated by the Vermont Maple Sugar Makers' Association. It has met with singular success in winning for Vermont maple sweets the reputation they now have through the United States. All members of the association ship to a central point where the grading is done and later the sales are made by one experienced in marketing. This is supported by a commission on the sales, and allowing for this, the receipts of each individual maker are greater than if he made his own sales in a market not entirely familiar to him.

Register Under Pure Food Law.

One of the most effective methods of gaining the confidence of purchasers is to register the product under the pure food act and place the serial number on each package or can. The procedure is, first to write the Department of Chemistry at Washington, stating that you are manufacturing a pure product and wish to register it. In return you receive blanks upon which sworn statements are made before a notary regarding the purity of your sugar or syrup. Upon receipt of this in Washington, a serial number will be given the maker, which he is free to use upon all maple goods of standard quality. This procedure must not be understood to lead to a guarantee of purity from the government. The guarantee comes from the maker himself and the government merely agrees to prosecute any person misbranding or adulterating the labeled product. This means of protection is open to every maker of standard quality maple goods with a cost to himself extremely insignificant. The maker is thus reasonably assured that his goods reach the consumer pure.

How to Get Customers.

Unless an entire output is consumed locally a certain amount of advertising pays for itself by getting new customers and reaching the most desirable ones. Among the good customers, the past residents of the community who now live in states not producing maple products are the very best, both for

their own trade and for the number who buy through their influence. To get such names the list of subscribers to the local paper will be of assistance. It makes advisable the printing of a small but attractive pamphlet, or some direct means of communication to each prospective customer must be used. Such advertising pays for itself in that a class of customers are reached who are willing to pay the price for dependable goods. Among others of the best customers are prominent hotels and eating houses. In fact, any kind of disposal from which many people can carry the name of the maker or the trade name of the product away with them is valuable in advertising it. Among those to avoid as customers are the mixers and fabricators because instead of passing their maker's name or brand along, it becomes at once concealed and that of the mixer substituted. The aim is always to make one portion sell another and this principally by honest quality and keeping the name of the goods before all possible customers.

The Department of Forestry, of the Agricultural College, now operates a sugar bush annually with a view of solving many perplexing problems for the sugar and syrup makers of Michigan. The industry is developed to a very small extent in Michigan compared to what it can be with its abundant resources of maple trees. The Forestry Department welcomes inquiries upon this subject from any to whom assistance can be given.

LOSSES FROM DECAY OF FRUIT.

The experiences of the citrus fruit industries of California serve to exemplify the truth that losses from decay are large. Fruit handling investigations of the department had their inception and inspiration in the Riverside district. These studies have become classic in this field of work, and have served as models for similar lines in all parts of the United States and even in foreign countries. The reduction of the decay loss to a negligible quantity through the application of the results of the work in actual practice has served as the basis for the extension of the careful handling campaign throughout the length and breadth of the land. A few years after the department's workers withdrew from the field in California, another serious invasion of decay was experienced during a season more favorable than usual for the development of the decay fungus. The growers had not altogether forgotten the importance of the department's work, but they had been led unconsciously into a sense of security by a series of years during which the decay loss was not serious. An appeal to the department for further work brought about a general survey of the existing conditions, with the result that the earlier work was amply corroborated, more strongly than ever, indicating the importance of extra effort during unfavorable seasons. A type of handling sufficient to insure soundness during seasons unfavorable for the development of disease may be insufficient during warm, moist weather or other conditions most favorable for the growth and spread of decay mold.

For a third time the industry has been compelled to appeal to the department for assistance in solving the decay problem. Decay losses during the current season have been higher than usual, and in some instances have been severe. Investigations during the season by the department are again confirming the earlier work. It is being shown that the natural intrinsic shipping and keeping qualities of the fruit have not been noticeably reduced.

MARKETING BY PARCEL POST
AND EXPRESS.

During the past few years a considerable public sentiment has developed in favor of the promotion of direct, or more nearly direct, dealing between producer and consumer, with special reference to food products. While it is probable that the existing means and methods of distribution never will be entirely displaced, there undoubtedly is a field with which direct dealing may become effective, with no other intermediate agency than the transportation companies or the United States mail, in the shape of freight (rail or water), express, or parcel post.

As a result of this demand for direct marketing, especially by parcel post, the Office of Markets and Rural Organization, Department of Agriculture, has carried on extensive experiments in this method of selling various farm products. Many successful experimental shipments have been made with eggs, butter, and lettuce, and on a less extensive scale shipments of strawberries, cherries, blackberries, gooseberries, grapes, cauliflower, and tomatoes have been tried.

One of the difficulties encountered in the practical application of marketing by parcel post is the matter of contact between producer and consumer. A producer in the country may be ready to do business by parcel post but does not know of a person in the city who wants his produce, whatever it may be; and the consumer in the city who desires to buy direct from the producer by parcel post is similarly handicapped by not knowing where to find the farmer or producer who has the produce he wants. Attempts are being made to find satisfactory methods whereby growers and consumers may come into contact with each other.

There are only two reasons why the consumer should undertake the additional trouble in securing produce by mail. These are economy in cost and greater freshness of product. The difference between the country and the city price must be shared fairly between the producer and the buyer, and all transactions must be made with scrupulous honesty, for otherwise there is little prospect of making a success of parcel-post marketing, and the benefits which should accrue to both the farmer and his customer will be lost entirely.

Crop and Market Notes.

Michigan.

Berrien Co., Jan. 17.—Good sleighing and ten below zero. Fall grains have been well protected nearly all winter. Corn not all cribbed yet, and much of it very poor quality. Most live stock healthy, not many cattle or sheep on feed. Rough feed in sufficient quantity for home use. Wheat \$1.17; oats 40c; potatoes \$1; apples 75c@1; hay \$12@14; cows \$50@70; butter-fat 32c; butter 30c.

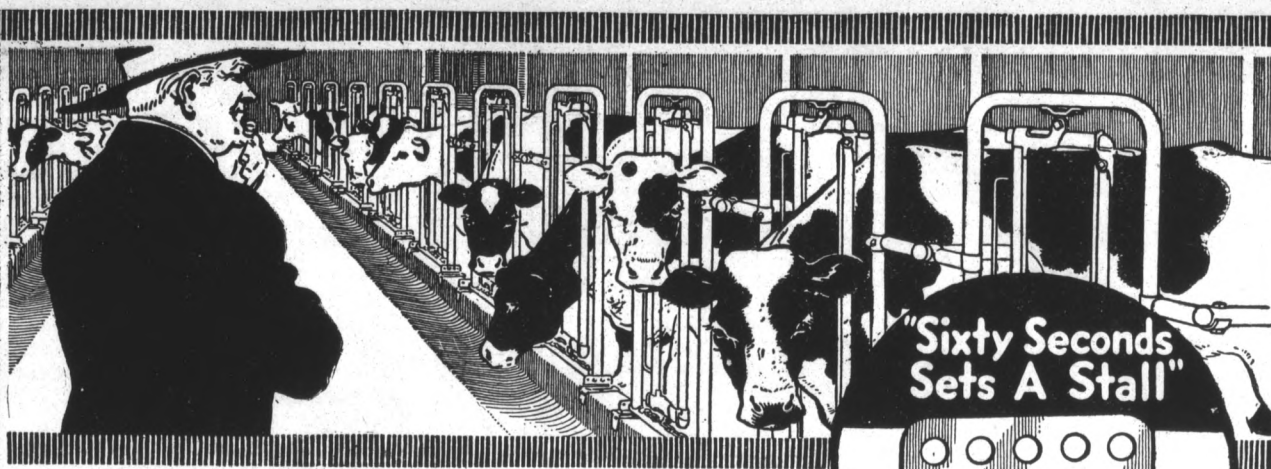
Lapeer Co., Jan. 18.—Wheat in good condition as yet. Farmers seem to have plenty of feed for own use, and lots of stock to feed it to. Sheep are pretty well sold off. Eggs are scarce since severe weather, bringing 31c; cream 30c; wheat \$1.08; corn 75c; beans \$3.40; potatoes 80c; hay \$17; cattle \$6; hogs \$5@7.

Sanilac Co., Jan. 19.—Wheat and meadows seem in good condition, although there is a little too much ice on the ground and very little snow. Hay being cheap and the corn crop large, there is an abundance of rough feed, and a little above the average amount of stock fed. Hens are beginning to lay. Eggs 26c; butter-fat 30c; wheat \$1.01; beans \$3.50; potatoes \$1; hay \$7@11.

Saginaw Co., Jan. 17.—Wheat and rye fair, though there is very little snow on the ground. Many farmers are short of feed, with usual amount of live stock on hand. Hogs scarce owing to the small amount of soft corn. Hens not laying well. Wheat \$1.14; corn 64c; oats 41c; beans, hand-picked \$3.50; hay \$13@14; potatoes \$1.10; butter 31c.

New York.

Orleans Co., Jan. 17.—Fall sown
(Continued on page 144).



What's Your Herd Worth?

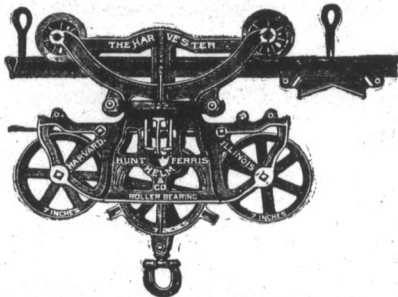
THE worth of your herd is based on the **profit** it makes for you. Is that a fair statement? All right. If you can **permanently** increase your earnings without enlarging your herd, isn't that just about the best place in the world to invest a little money? You **can** do that very thing. STAR BARN EQUIPMENT leads the way to a healthier herd—cows that give **more** milk—and **better** milk—and all with about half the labor it now takes. We can prove every word of these statements.

The reasons why you'll buy STAR BARN EQUIPMENT in preference to other kinds lie in its patented features—exclusive with our make—found in no other.

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Harvester Hay Carrier



Biggest in size and value. Roller Bearing and built for heavy duty. Ask your dealer or write us for details.

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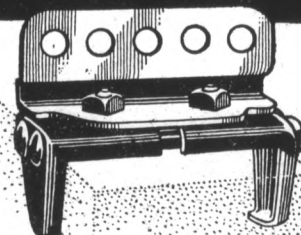
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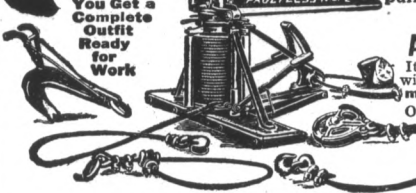
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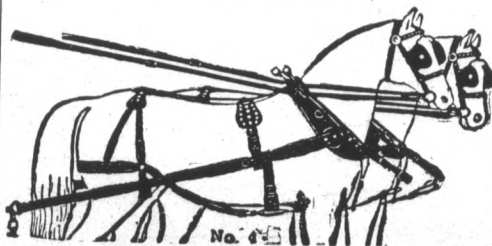
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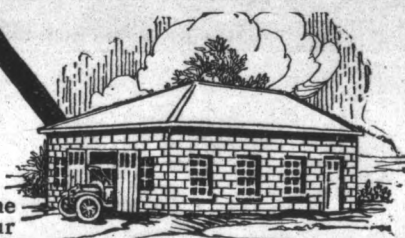
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A perfect ensilage preserver in all parts, through all weather conditions. Handsome, durable, convenient is this, the "skyscraper of the farm," and a most valuable addition to your farm buildings.



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Well ventilated, clean,
warm—makes fowl happy,
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Thousands In Use giving splendid satisfaction justifies investigating our wonderful offer: a brand new, well made, easy running, easily cleaned, perfect skimming separator only \$15.95. Skims one quart of milk a minute. Different from picture, which illustrates our low priced large capacity machines. Bowl is a sanitary marvel and embodies all our latest improvements.

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A Jump in Her Record

Most every herd has one or more cows that seem sluggish and low in yield without any apparent reason. In many cases this may be due to some vital organ becoming overworked. Proper treatment is needed to build up the system and fortify the cow against serious disease.

If you have such a cow, buy a package of Kow-Kure from your feed dealer or druggist and use according to directions. You'll be surprised at the difference it makes in her general health and milk yield. Kow-Kure is especially recommended as a preventive and cure for Abortion, Barrenness, Milk Fever, Scouring, Lost Appetite, Bunches and Retained Afterbirth.

Write for free Treatise, "The Home Cow Doctor."

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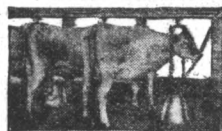
Cheap Feed Dried Salvage Grain from Mill fire—feeding value uninjured. Price low—Ask for sample.
BARTLETT CO., Mill H. Jackson, Michigan

Milks 15 Cows in 45 Min.

Mr. A. D. Miller of Woodland, Mich., writes: "The *Hinman Milking Machine* that I bought of you last fall is just as you represented it to be. I have a herd of 15 registered Holstein cows and can milk them alone in 45 minutes. Would not be without the *Hinman* at any price."

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FREE MILKER BOOK explains the many exclusive advantages of the simple *Hinman Milker*. It will help you see for yourself that a *Hinman* outfit in your stable will save enough in one year to more than pay its original cost.

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Steel Wheels

will make your old farm wagon as good as new. Save money because they never need repairs. Write for our big free book telling all about them and how they pay.
Empire Mfg. Co., Box 789 Quincy, Ill.

Keep a Cow Diary

If you have kept a record of the date of service of your cows, it will be a simple matter to tell when they are due to freshen. The average cow should have a rest of at least six weeks before calving, and the careful dairyman will dry her up at this time, and give her a special ration until she freshens.

The average cow is far from her best unless she has this rest and is in proper condition to bear the burden of maternity. One of the laws of nature is that the mother must draw upon her body for the support of her offspring, and when food is limited and the mother is in poor condition the offspring and mother will each show the result of improper attention. Therefore, the great demand of a record of service.

As soon as the cow is dry begin feeding her a ration of such feeds as bran, oats and oil meal, which are bulky and cooling to the system. The amount fed should be increased as the cow will clean it up until she is receiving about four pounds daily. This should be continued until about two weeks before she calves, when it should be decreased to one-half or less than this amount.

Corn has no place in the ration at this time and should never be fed. Cows which are due to freshen in the spring when soiling is practiced, or

not only next to godliness but it means the production of pure, wholesome cream and butter and the safe-guarding of the health of the consumers of the dairy products.

Probably the most neglected thing about the dairy business are the utensils used for containing the milk. Too many dairymen still cling to the wide-top pails that catch just about all of the dirt that is going, or to the rough galvanized or wooden pails that cannot possibly be kept clean. When the narrow top pail in some form or other finally comes into general use by our dairymen the standard of quality of their product will have been raised several degrees.

In choosing pails or other vessels that are intended for use in the dairy always choose those that are seamless or as nearly so as possible. Where seams cannot be avoided see that they are filled and covered over completely with a smooth coat of solder. Seams and rough places form lurking places for all sorts of germs and foul odors and the greatest care used in cleaning and sterilizing will not always remove them.

Washing the dairy utensils is not the most pleasant task imaginable, hence many dairymen are likely to slight the task. The first things essential to a good job are plenty of warm water and a good, stiff brush. Don't be afraid of using too much wa-



A Good Bunch of Youngsters.

when they are turned out onto fresh pasture, need not be grained, but they should be allowed the six weeks' rest from milking. Intelligent care at this period will have a decided effect on the milk production of the cow all through the season and will repay the dairyman for the additional work and expense, if it is considered such.

But all of the success gained from following the above facts will re-point to the need of records correctly kept by the farmer, and any farmer engaged in dairying or stock raising who fails to keep accurate records, is working under a great handicap. If these records have not been kept, start an individual record of each animal now. Show what time she was dried, the amount of rations and kind fed, the production of milk and all information in regard to feeds and the effect on the milk production.

When the time comes to have the cow served, record the date and such information in regard to the sire as may prove valuable. This information will not only be of great value to the present owner, but will be greatly appreciated by the future owner, if it should be desirable to sell.

After you have kept these records and reaped the following benefits, you will be certain to appreciate the full value of becoming a member of your community cow-testing association, for this work only forms a continuance of the business-like manner of handling the dairy herd, and is an insurance policy against depressed creamery checks and an insurance of profit in the undertaking. By all means keep a record of your cows.

New York.

E. W. GAGE.

CLEANING THE DAIRY UTENSILS.

The old adage about cleanliness being next to godliness should be adopted as a first principle of the creed of every dairyman because cleanliness is

ter or of wearing the brush out. Scrub every seam and corner thoroughly and then scald the vessel with boiling water or, what is better, live steam if it can be secured. The best job of cleansing we ever saw performed was by a dairyman who lived near a big industrial plant. Each day he took his cans to the boiler room where there was no limit to the hot water and steam he could use, and we are sure there was no possible chance for any living germ to remain in those cans after he had completed his job of washing. Of course, there are very few so situated that they can follow that man's plan, but facilities at hand can frequently be greatly improved upon.

If a thorough job of washing has been done the vessels should be free from all germs, but unpleasant odors may yet adhere to them so it is necessary that they be given a good sunning. Sunshine is one of the best purifiers known and will soon remove any odor that yet clings to the vessels.

During the first half hour after the milk is drawn from the udder is the time that it is most susceptible to contamination from odors; hence the advisability of removing it from the stables as quickly as possible.

Ohio.

SHERLEY CONNELL.

BALANCED DAIRY RATINGS.

Most feeders of dairy cows can produce protein more cheaply than they can buy it, according to C. H. Eckles, of the Missouri College of Agriculture. Wise is the man who has a good supply of legume forage on hand from his alfalfa, clover, cowpea, or soy bean fields, for the dairy cow cannot do her best on corn, timothy hay, or fodder, even with good succulent silage to help maintain summer pasture conditions.

Bran at a dollar a hundred furnishes

protein at a cost of about eight and a half cents a pound, while cottonseed at \$1.90 a hundred furnishes it at a cost of a little over five cents a pound. The cost of producing the protein on the farm in alfalfa, clover, or other leguminous crops varies with local conditions so that no such definite figures can be given, but almost any farmer should be able to supply himself at much less than five cents a pound. If he has neglected to do so, however, he must purchase protein in some form to supplement the silage and corn which he has on hand.

Feeding two pounds of cottonseed meal a day to a cow that has been giving milk on such a ration as corn, fodder, and timothy hay will increase the flow to a surprising degree. In spite of the many things that have combined to raise the price of cottonseed meal this year, it is probably the cheapest concentrate to buy for this purpose.

Some recommended dairy rations which will give good results are:

- (1) Corn silage 25 lbs; clover hay 10 lbs; corn 4 lbs; bran 4 lbs.
- (2) Corn silage 30 lbs; alfalfa or cowpea hay 10 lbs; corn 6 lbs; bran 2 lbs.
- (3) Clover hay 20 lbs; corn 4 to 5 lbs; bran or oats 2-4 lbs.
- (4) Clover hay 20 lbs; corn-and-cob meal 5 to 7 lbs; gluten or cottonseed meal 2 lbs.
- (5) Alfalfa or cowpea hay 10 lbs; corn fodder 10 lbs; corn 5 to 7 lbs; bran 2 lbs.
- (6) Alfalfa or cowpea hay 15-20 lbs; corn 8-10 lbs.

Each of these rations includes a whole day's feed for the ordinary cow, half to be given in the morning and the other half in the evening, but they are not intended for the cow of unusual dairy capacity, or one that is being fed for heavy production, or to make a record. The amounts specified are those to be fed to a cow giving from 20 to 25 pounds of milk a day, and cows giving more than this should receive more feed, especially more grain, while those giving less milk should have the grain cut down. The general plan followed is to give each cow all the roughage she will eat, and about one pound of grain for each three pounds of milk produced.

DAIRY PROBLEMS.

The Principle of the Balanced Ration.

I would like to know what per cent of protein, fat, etc., a balanced grain feed should have. Also would like to know what per cent of the above are contained in corn meal, also in ground oats. Could you recommend a good work on feeding dairy cows? That is, something that covers the ground thoroughly, including balancing of rations, etc.?

Washtenaw Co.

N. F. P.

Careful feeding experiments show that a dairy cow giving a good flow of milk should have a ration containing about 2.5 pounds of digestible protein, 12.5 pounds of carbohydrates and 0.4 pounds of fat for 1000 pounds of live weight. This ration will contain about 15 pounds of total nutritive substances and 24 to 25 pounds of total organic or dry matter.

The feeding problem is to provide such feeding stuffs to mix with what is ordinarily grown on the farm so the cow or other animal will not only be provided with these several amounts of food nutrients but at the same time there will be little or no waste.

It is not necessary to figure the ration out mathematically correct. Some leeway can very well be left for the individuality of the cow and the feeder. But it pays well to keep the principle well in mind when combining our feeding stuffs, and see that they conform fairly well to the standard.

Of course, this standard takes into consideration the food nutrients in the roughage as well as in the concentrates. Corn contains 7.1 per cent of digestible protein, 62.7 per cent carbohydrates and 4.2 per cent fat. Oats contain 9.1 per cent protein, 44.7 per cent carbohydrates and 4.1 per cent fat. In oats the food nutrients are

very well balanced. In corn the carbohydrates are in excess of the protein. However, we cannot feed grain alone. It is not bulky enough. Clover hay and ground oats are a well balanced ration, but clover hay and corn meal would lack protein. Cornmeal and alfalfa hay furnish the food nutrients in nearly correct proportions.

The best work on feeding by all odds is Prof. W. A. Henry's work entitled, "Feeds and Feeding." This has been translated into several different languages, and a number of editions have been exhausted. It can be ordered through the Michigan Farmer.

Poor Silo Doors.

I have a cement silo, the blocks of which are solid and four inches thick. Every two feet there is a door. The doors are two feet square and fit in a frame just like a door of a house. Now I always have two feet of spoiled silage which would amount to enough for two cows. I covered the doors and frames with tar paper one year and also tried it with tin, and that did not do any good. Can you give me any information about this. My neighbors are troubled with the same thing.

Ottawa Co.

J. L.

The door frames must fit poorly into the cement tile. Plaster around the frame with cement mortar. If the doors do not come flush in the inside with the surface of the tile, there will be spoiled silage because it will not settle well there. If these doors do not come flush on inside, make them do so. Do this, and I can see no reason why silage should spoil.

Wet Brewers' Grains.

I would like to know the value of malt after the brewery has brewed it. It is shipped here from Columbus, O., at \$6.50 per ton.

Washtenaw Co.

D. C.

Wet brewers' grains contain about three times as much protein as corn silage. They analyze as follows: Protein 3.9 per cent; carbohydrates 9.5 per cent; fat 1.3 per cent.

Where one lives within hauling distance of a brewery, these grains are worth considering, but they contain over 75 per cent water and one cannot afford to haul them very far. It would seem to me that in this case one might better purchase the dried grains. It takes fully five tons of the wet grains to make one ton of dried grains. The price ought not to be five times as much, besides the cost of hauling wet grains from the depot would be fully five times as much as hauling the dry.

I never before heard of the wet brewers' grains being shipped by rail.

COLON C. LILLIE.

WHEN THE BUTTER WON'T COME.

Strain your milk in a pan and then set it on the stove until it begins to crinkle over the top. Once a day will do. I would not let it stand over 36 hours, as I think that makes it bitter. If the milk is strained in pans that have been used but are not sour the cream will raise sooner.

Mrs. G. H.

The following remedy to use when the butter won't come was given my mother by a neighbor many years ago and it has always worked satisfactorily whenever we have had any trouble with the butter failing to come or to gather.

Put into the cream crock before beginning to save the cream, a piece of saltpeter the size of a small pea, with a scant teaspoonful of salt and the same amount of sugar. Pour on enough boiling water to dissolve, stir well each time the cream is put in.

Last year I noticed the milk was bitter and after scrubbing all the dairy utensils in suds with a little carbolic acid in it, which seemed to make no difference in the milk, I talked to my husband about it. He seemed to know at once what was the matter for he stopped feeding some beet tops which he had not removed from the roots and which he had thrown into the barn for feeding in the fall. He did not discontinue feeding the roots, only broke the tops off. They had wilted and undoubtedly gave the bitter taste.

—N. S. C.



The milk in the pail the cow kicks over is lost forever

AND the butter-fat that goes into the can through the skim-milk spout of a cheap, inferior or worn-out cream separator is just as surely lost as the milk in the pail the cow kicked over.

If you are trying to get along without a cream separator; or with an inferior or worn-out machine, you are losing butter-fat right along and butter-fat is money.

Get Your
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Now — Right Away
every day you use it it will be paying for itself out of its own saving.

If you haven't the spare cash right now that need not hinder your immediate purchase.

We have an arrangement with De Laval agents which makes it possible for any reputable farmer to secure a De Laval on the partial payment plan—a small payment at time of purchase and the balance in several installments, so that a De Laval really pays for itself while you are using it and getting the benefit from it.

Let the De Laval start saving cream for you right now while butter and cream prices are highest. See the nearest De Laval agent at once, or if you do not know him, write us direct for any desired information.

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165 Broadway, New York 29 E. Madison St., Chicago
50,000 BRANCHES AND LOCAL AGENCIES THE WORLD OVER

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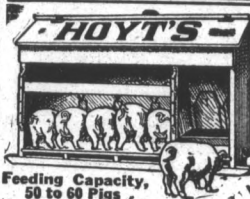
33 cents worth of UNICORN plus 26 cents worth of roughage made 100 lbs. Milk in Official Holstein Tests made by Bayliss Griffin, Sylvania, Ohio. 1 pound of UNICORN made $4\frac{1}{2}$ lbs. of milk. Hundreds of UNICORN feeders are doing as well. YOU CAN TOO. . . .

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is equally as profitable for tests or every day dairying. TRY IT.

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MAKE MORE MONEY IN HOGS THIS YEAR by having this self-feeder. Sold on 30 DAYS' TRIAL. Write today for full particulars. A. C. HOYT & CO., Dept. M FOSTORIA, OHIO

80% More Power

*Efficiency Almost Doubled
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\$1375
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Patented by Hudson
December 28, 1915
Patent No. 1165861

Hudson Super-Six

Costly Cars of Every Type Outrivalled

THESE are facts of overwhelming import to a man who buys a car.

A new invention—called the Super-Six—has proved itself by 80 per cent the best motor in the world.

It has been compared, in official tests, with the finest cars heretofore built. That includes Eights and Twelves. And, against them all, it has won the world's records.

So the Super-Six stands supreme. Not by any minor margin, but by 80 per cent, as compared with like-size motors of the past.

A HUDSON PATENT

This motor is a Hudson invention, secured by Hudson patents. No other car has anything like it. So what this car does is not even approached by any other car in the field.

Please remember that. Last year many cars had motors much alike. Now this one car—the Hudson Super-Six—has an 80 per cent better motor. And the results of that supremacy mean everything to you.

IT HAS 76 HORSEPOWER

This motor is a small, light Six. The size is identical with last year's Hudson Six-40.

But old-type motors in this size yielded about 42 horsepower at their best. The Super-Six delivers 76 horsepower.

Just consider what that means. Think of almost doubled power without added size.

Think what vast reserve power. Hills are climbed without effort. The hardest roads are easy. You can creep on high gear. You can pick up instantly.

BIRD-LIKE MOTION

What we have done by this invention is to end vibration.

We have built the smoothest-running motor ever known.

All this 80 per cent of added efficiency is power that was heretofore wasted. It was consumed within the motor.

So that means vast fuel economy. It means almost no engine wear. It saves your tires by saving jerks. It means a saving in these ways of hundreds of dollars.

And riding is like flying in this Super-Six. You never knew such luxury of motion. The car is so quiet that it seems to move by magic.

No more power is created than in former like-size motors. No more fuel is consumed. But you get 80 per cent more efficiency from it by this saving in vibration.

YOU WILL WANT IT

Once ride in the Hudson Super-Six and no other car will content you. You will laugh at a car about half as efficient, with a motor just as large.

The vast reserve power, this smoothness, this flexibility multiply the joys of motoring. And the luxurious bodies—the finest you have ever seen—make the car look its supremacy.

Yet, with all these advantages, the Super-Six is an economy. We are building this season \$42,000,000 worth. This matchless output in a fine car gives you a value heretofore unknown.

This enormous saving in fuel, in engine wear and tires amounts to vast sums in the long run. A car without this motor, sold at half the Hudson price, might cost you more than this.

Let the nearest Hudson dealer prove these facts to you. Go riding with him. See the luxury of the Super-Six. When you do that you are bound to want this car.

7-Passenger Phaeton, \$1375 at Detroit
Five Other Styles of Bodies
Ask for Our Super-Six Catalog
HUDSON MOTOR CAR COMPANY
Detroit, Mich.

World's Record Breaker All Records Up to 100 Miles

These tests were made at Sheepshead Bay with a 7-passenger Super Six—a touring stock car—under official supervision of American Automobile Association.

100 miles in 80 min., 21.4 sec., averaging 74.67 miles per hour, with driver and passenger.

75.69 miles in one hour with driver and passenger.

Two laps made at 76.75 miles per hour.
Standing start to 50 miles per hour in 16.2 sec. A new record in quick acceleration.

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Magazine Section

LITERATURE
POETRY
HISTORY and
INFORMATION

MICHIGAN FARMER
AND *LIVE STOCK* JOURNAL
PUBLISHED WEEKLY.
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

FROM time to time discussion arises over the most famous phrases in Lincoln's Gettysburg address: "Government of the people, by the people, and for the people." The words were not struck out by Mr. Lincoln on a purely original impulse; the thought had been in the minds and on the lips of lovers of liberty and democracy for many years as the following references to previous utterances would indicate.

"Of the People, By the People"

By DR. L. K. HIRSHBERG

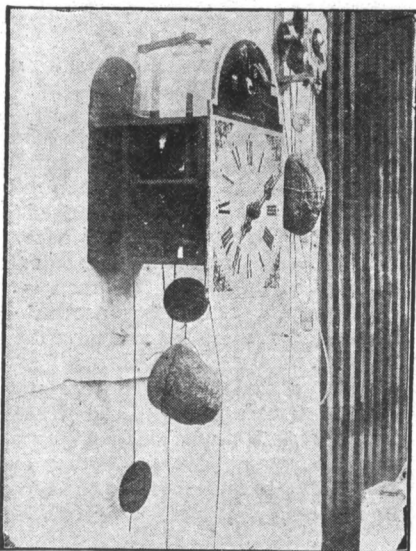
In 1850 Theodore Parker, addressing an anti-slavery convention at Boston, spoke of the American idea as a "government of all the people, by all the people, for all the people." Twenty years before, in the course of the reply to Hayne, Daniel Webster voiced

the same thought. "The people's government, made for the people, made by the people, and answerable to the people" is the form in which he left the thought.

Still earlier, the germ of the historic phrase can be found in William Wirt's

"Life of Patrick Henry" published in 1818. In describing the tenets of the republican party of which Jefferson became the leader, he said: "They declared themselves * * * firm advocates of a government of the people, by the people * * * considered man as the only title of nobility which ought to be admitted, and his freedom and happiness the sole objects of government."

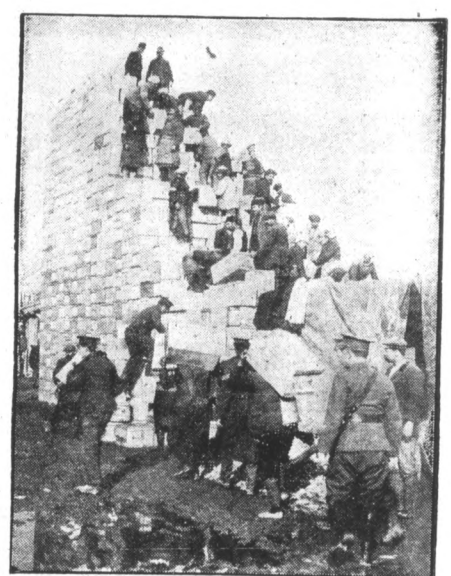
WORLD EVENTS IN PICTURES



Copper Clock Weights Used by Germans are Replaced by Stones.



Women Fighters in Austrian Ranks, One was Decorated for Bravery.



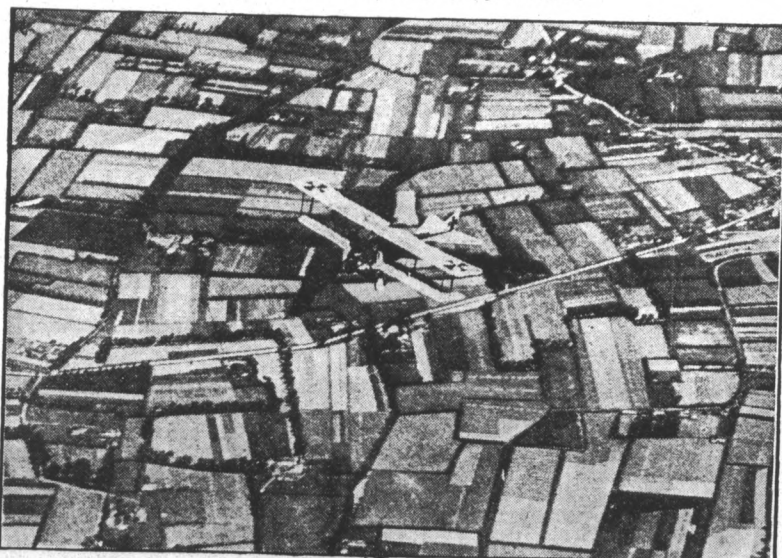
British Ship Immense Quantities of Biscuit to all War Fronts.



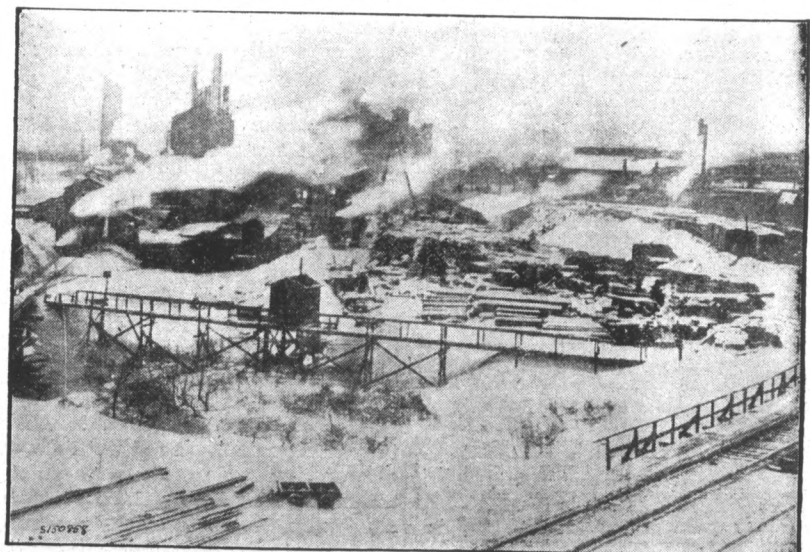
Kut-el-Amara on the Tigris River where British Forces Under Gen. Townsend were Surrounded by Turks.



Well-known Americans Spending the Winter in North Carolina Instead of Patronizing European Resorts.



Remarkable Picture, Showing Fields, Hedges and Roads, Taken in Northern France from German Flying Machine.



Steel Mills at Youngstown, Ohio, where Rioting Started which Resulted in Loss of Life and Much Property.

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are lower priced than ever and the quality has been maintained throughout. In spite of the increased cost of all materials, on account of the large volume going through my factories, I am able to again cut and slash cream separator prices. The 1915 prices are not in force any more. My new low 1916 prices and new easy selling plans, such as no money down—a year to pay, etc., have taken their place. 10,000 separators now coming through my factories—all to be sold on special proposition between now and grass.

In addition to the famous line of separators I have been building I have added a new size which I am selling for less money than ever before. It is identical in quality and design with the other sizes, and fully described in my 1916 BOOK—NOW READY!

250 PAGES—If you buy a separator in the next twelve months you should have this book. It tells how I build the Galloway Sanitary Bath-in-Oil Cream Separators from the ground up. Read this book before you buy a cream separator of any make at any price!

Don't be misled on cream separators thrown together and sold for a price. Buy direct from a real factory, get a better machine and save from \$25 to \$50 on a machine of the highest quality. Shipped from Waterloo, Kansas City, Council Bluffs, St. Paul or Chicago—the nearest point.



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Heavy, high carbon steel gear shafts and bowl spindle; extra long bearings; strong, sanitary bowl, discs not fastened together; oil bath lubrication; big, roomy, seamless, pressed steel supply tank; both gear shafts and both spindle bearings supported by one solid casting; heavy sanitary tinware; low bowl speed reduces wear on bearings and gears. No raw, sharp edges in the bowl to break up the globules of butter fat. Drop us a postal today.

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This dressing will keep the leather in your work shoes soft and strong, protect it from barnyard acids, keep out water.

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All Steel Triple Power Stump Puller pulls an acre of stumps a day—increases the value of your land 100%. Makes room for money crops. Guaranteed for 3 years against breakage from any cause. Send name for fine free book, 30 days free trial offer and special low-price proposition.

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When writing to advertisers please mention The Michigan Farmer.

Land O' Nod Stories.

By HOWARD T. KNAPP

The Ant's Dairy

COME on your majesty, it is time we were getting back to the city," said the captain of the guard when the Queen of the Ants had milked so many aphids, or ant cows, that her crop was swollen to twice its natural size.

"Well, if you say so, I suppose I must go," grumbled the Queen, and she turned and started down the stalk of the rose bush, followed by Billy Be By Bo Bum and Tinker Teedle Tee.

"Would you like to stop in and see our dairy on the way back?" asked the Queen when they reached the ground.

"Why, I thought we just came from the dairy," said Billy.

"Gracious no," replied the Queen. "That was only one of our herds out to pasture. We milk them in good weather, but our real dairy on which we depend for our main supply of milk is underground and the cows never see the sun from one year's end to the other. What do you say, captain, do you mind if we return to the city by the way of the dairy?"

"Not at all," replied the leader of the guard, and he led the way to the mouth of a tunnel hidden between the roots of the rosebush. Billy and Tinker followed, and before they had gone very far the tunnel widened out into a big room, the walls and roof and floor of which were broken by the roots of the rosebush that grew above. And these roots were covered by hundreds and hundreds of aphids or ant cows, their sharp beaks fastened in the tender bark, drinking the sweet sap, while dozens of worker ants were satisfying their hunger by milking the cows.

"This is our main dairy," said the Queen proudly. "You see the workers do not have time to go out and forage for their food, so when they get hungry they come here and fill up on milk."

"But how did you get such a big herd of cows way down here underground?" asked Billy.

"How does any farmer get a herd of cows?" asked the Queen by way of answer.

"He raises them, of course."

"And that is how we get our cows,"

"Now you're trying to josh me," protested Billy. "You can't make me believe ants raise a herd of cows as a farmer raises his calves."

"I don't care whether you believe it or not," retorted the Queen, who was just a wee bit provoked that Billy should think she was telling him something that was not so. "And if you will think a minute, you will realize that there is nothing so very strange about it after all. It's not half so wonderful as many other things you have seen since you came to Antland."

"That is so," agreed Billy, "but for the life of me I don't understand how you can raise a herd of cows way down here underground."

"In the spring and summer the aphids lay their eggs on the stalks and leaves of the rosebushes," replied the Queen. "Every gardener knows all about it, for he calls my cows plant lice and tries to kill the eggs and baby cows with smoke and other horrid poisons. One fine day the Shepherds, those worker ants whose duty it is to care for the cows, go up and carry the eggs down into the city. The nursemaids care for the eggs just as carefully as they do for those I lay myself, and when the baby cows hatch out, they are tended and fed until they are old enough to care for themselves. Then the Shepherds place the young Aphids on the roots of the rosebushes where they live all winter, feeding on the sweet sap, and we always have a supply of fresh milk on hand."

"Now out in Colorado we have a family of cousins called the Honey Ants who do not have to depend on a herd of cows for their milk. Like the Aphids, they feed on the sweet sap of bushes and young trees, but instead of converting this sap into milk, as do the Aphids, they transform it into honey as good and sweet as that made by any bee. In fact, it is so good that the Indians eat it and regard it as a great delicacy."

"You mean to say people eat ants' honey?" asked Billy in surprise.

"They do more than that," replied the Queen. "They not only eat the honey, but the ants who made it."

"Eat the ants?" exclaimed Billy.

"Yes, sir, and they like it better than candy. Why, Billy Boy, if you were to visit an Indian and he wanted to give you something especially good to eat to show his friendship, he would

set before you a dish of Honey Ants which you would be supposed to eat, honey, ants and all, as you would candy.

"These ants are wonderful diggers, for they hollow out their homes in the sandstone rocks. Now, I think it is mighty hard work digging in the dirt, but just imagine cutting galleries and rooms out of solid rock. It makes me faint even to think of such a thing. If you cut open one of these cities, you would find all the passages led to one central room, the roof of which would be covered with ants, clinging to the ceiling like flies, their bodies swollen to many times their natural size by honey. If you were an Indian, you would give a whoop of joy when you uncovered the nest and scoop up the gorged ants and eat them."

"Well, I'm not an Indian, thank goodness," said Billy. "And, although I'm very fond of honey, I do not care to eat the busy workers who made it. So I guess I'll stick to the bees for my honey."

"Everyone to his own taste," said the Queen as they resumed their journey back to the city, and next week I'll tell you about the Marriage Flight.

Educated Out of School—No. 2

By WILLIAM JONES

MANY years ago boyish speculation led us to learn, if we could, wherein each of our friends was superior to other men of our acquaintance. And strange as it may seem, we were unable to find a single person among the humblest and most ignorant of the community, who could not outdo his neighbors in some physical or mental work. Somewhere in the duties or activities of life each man had gained a community reputation.

In after life this boyhood survey of our small world has been a real help to us. We were taught by it that every life has some contribution to make or encouragement to give towards one's advancement, and on the other hand that we are in a position to assist our companions or associates. It is perhaps the same observation that the Oriental student made twenty centuries ago when he discovered that the foolish things of the world are used to confound the wise.

A case in question in which the writer was a losing party was enacted recently. Last summer I remodeled the second story of my farm home. Having completed a course in one of the large educational institutions of the state and given especial attention to economics, and especially to the efficient use of labor, I was of the opinion that the job could not be done at less expense. Accurate account had been kept of every item so that I knew the total cost of materials and labor.

On the old state road lives Widow Smith with her eighteen-year-old son, Bruce. The boy has been deprived of many common advantages and largely for this reason is not considered among the well-prepared youths of the community, a matter on which I have more doubt than I had a year ago. Their home was badly in need of repair and one day I made a proposition to the boy.

"Bruce," I said, "from what you say, those two rooms are practically the same size as the two I remodeled. Now I know just what it cost me for materials and labor outside of my own work. If you can do your job for less than mine cost me, not counting your own time, I'll give you what you consider the best calf in my yard."

"I don't know, Mr. Jones, that there would be any use in my trying. I'd like one of those calves and if you're not foolin' I'll accept your offer."

I assured him of my sincerity and he left. It was six weeks before I again talked with the boy. We met on the street in Brannock.

"Well, Mr. Jones, I have the rooms

fixed and I've got the cost list here," and as he talked he pulled papers from his pocket and handed them to me.

The list was neatly arranged and each item for materials was accompanied with an invoice of local dealers, but he had no charge for labor.

"Where is your labor account and what kind of a job did you have done?" I asked.

"You stated that we were not to count our own work. I did it all myself and I think it looks pretty good and I know it's solid. Mother and I would like to have you see the rooms," he replied.

Mrs. Jones and I motored over a few nights later and I confess we both were surprised at what the boy had done. His rooms were every bit as well finished as ours and I'm not sure but that Mrs. Jones was right when she remarked that she really liked them better.

He learned from a local engineer of a new material called plaster-board. It comes in pieces about a half-inch thick and in various sizes. There being no grain to it the material can be cut in any direction with a hand saw and is nailed like a board directly to the studing, or, as the boy did, right over the old plaster. And its stronger than a board of equal thickness.

With this he covered the walls and ceilings of the room, painted over the surface and then nailed strips of wood over the joints. The strips give a very nifty appearance to the room and Mrs. Smith assured us that the rooms were as warm and cosy as any she had ever been in.

I then showed my expense account to Bruce and he was more surprised than I had been to learn that he had beaten me out by \$32.46. Of course, most of this difference was in labor but his actual cost of materials was \$4.89 less than what mine was.

My confidence in the untutored youth was increased when he selected the calf. He objected to taking it on the ground that he had not chanced anything in the contest, but insistence on our part finally led him to do so. Mrs. Jones invited them to dinner last week when Bruce went through the bunch of calves and after careful study picked the one that won first place at the local fair last fall.

This incident confirms my early views that those who may think themselves wise should be watchful and humble lest they miss good lessons from their unpretending neighbors. It argues for universal education, for democracy and that great educational institutions do not control the source of knowledge but merely offers the easiest means of reaching the supply.

Work and Play

By W. S. HASKELL

AFTER all the difference between work and play is not great. Both are general terms denoting physical or mental exercise. Both require energy, planning or designing and both have objects in view. The difference usually noted is that work serves some economic end, while the object of play is to satisfy a desire for amusement.

But in actual life this difference does not always obtain. The professional ball-player is apt to make work out of his play, while many men find real amusement in their daily tasks.

It is not the amount of energy used that drives so many people to look upon work as drudgery and upon a game of some sort as recreation. The fact is that in either physical or mental play one is more frequently called upon to use a greater amount of effort than in his business.

But the reason for a general prejudice against work appears to lie in the attitude of the mind, and this attitude no doubt is the result of that old familiar law of human nature which sets in motion a desire for the uncommon. What we call work is everywhere about us. Our capacity for it is usually well filled. On the other hand, we play incidentally, or perhaps a few minutes each day; hence, the longing for amusement is never fully satisfied. The mind naturally reflects this over-supply of work and lack of play in abhorring the one and seeking the other.

Notwithstanding this, some men have trained themselves not to observe the difference, and they are amused the whole day long. To them life is a game. They get entertainment out of their work. The uncertainties of fate have a charm even more alluring than the gridiron, the diamond or the race course.

And the philosophy of such an attitude of mind seems to be a very sane one. To keep score on a field of corn, figure the influence of a wide ration on the dairy cow, forecast tomorrow's weather, speculate on grain prices, these and a thousand other problems ought to keep the farmer, at least active and consequently young.

The man who is playing the game and thereby keeps himself in condition, who is ready to use every muscle to its capacity, every nerve and brain cell to their limit, is not only the man who is most likely to succeed from a business standpoint, but is the one who will get from life the highest satisfaction. He will have bridged the great gulf that too many men find between work and play, by emancipating work from over-seriousness and encumbering play with dignity.

No beauty is really beautiful which in any way hinders righteousness or weakens spiritual life.

—Phillips Brooks.

WATCH YOURSELF GO BY.

BY T. G. MORRIS.

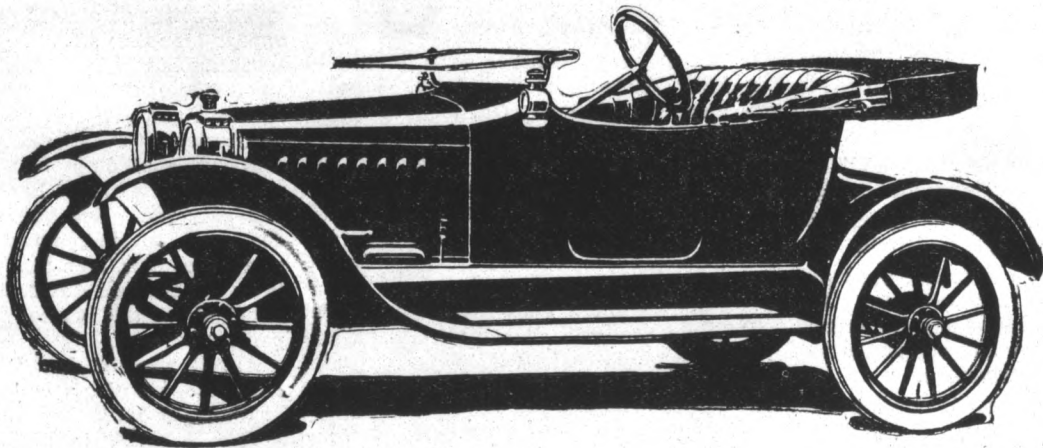
Say, what's the use of taking stock
In all these tales we hear—
Why "rip the lining" out of "Jones"
And make "Smith" look so queer?
You cannot always tell, my boy,
Perhaps 'tis all a lie—
Just step around behind some tree
And watch yourself go by.

You'll find that things look different,
And crooked paths look straight—
That "Smith" is not the only man
Who sometimes "gets home late;"
Perhaps your wife's own husband
Sometimes gets all awry—
So step around behind some tree
And watch yourself go by.

In business as in pleasure,
And in the social life,
It doesn't pay to speculate
Or let your thoughts run rife,
But try to think the best of those
Who in your pathway lie—
Then slip around behind some tree
And watch yourself go by.

SAXON ROADSTER \$395

Costs less to run than horse and buggy



Today's choice—

among two-passenger cars

To those Saxon Roadster attractions which earned its present prestige among 35,000 owners we now add over a score of further improvements. They mark the best practices in roadster construction.

Judge the field of low-priced two-passenger cars by any gauge you like. In the end you'll agree that this new series Saxon Roadster stands out clearly—the pick of its class.

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Mention The Michigan Farmer When Writing Advertisers

Light of Western Stars

By ZANE GREY

Unhooking the stirrups from the pomel, Stillwell let them fall, and began to search the saddle for something which he evidently expected to find. Presently, from somewhere among the trappings, he produced a folded bit of paper, and after scrutinizing it, handed it to Al.

"Addressed to you, and I'll bet you two bits I know what's in it," he said.

Alfred unfolded the letter, read it, and then looked at Stillwell.

"Bill, you're a pretty good guesser. Gene's made for the border. He sent the horse by somebody, no names mentioned, and wants my sister to have him if she will accept.

"Any mention of Danny Mains?" asked the rancher.

"Not a word."

"That's bad. Gene'd know about Danny if anybody did; but he's a close-mouthed fellow. So he's sure hittin' fer Mexico! Wonder if Danny's goin' too. Wal, that finishes two of the best cowmen I ever seen, an' I'm sorry." With that he bowed his head and, grumbling to himself, went into the house. Lifting the reins over the head of the horse, Alfred led him to Madeline, slipped the knot over her arm, and placed the letter in her hand.

"Majesty, I'd accept the horse," he said. "Stewart is only a cowboy, and as tough as any I've known; but he had a better education than most cowboys, and I've seen him show such fine feeling as you'd scarcely except in one of his kind. I liked him pretty well before he thrashed Pat Hawe, and afterward I guess I liked him more. Read the letter, sister."

Madeline bent her gaze from her brother's face to the letter, which ran thus:

Friend Al:
I'm sending my horse down to you because I'm going away and haven't the nerve to take him where he'd get hurt or fall into strange hands.

Maybe it's not just proper what I'm going to ask you, but I'm thinking most of the horse. If it's proper and all right—why, give him to your sister with my respects. And say that if there ever was a horse gentle and noble enough to be worthy of carrying her, he is.

But if you don't like the idea, Al, or if she won't have him—then he's for you. I'm not forgetting your kindness to me, even if I never showed it. And Al, my horse has never felt a quirt or a spur, and I'd like to think you'd never hurt him. It's some strange that a cow-puncher is afraid to have his horse hurt, but this horse was more like a brother to me.

I'm hoping your sister will take him. She'll be good to him, and she can afford to take care of him. You see, Al, I'm all selfish in this deal, thinking of the horse. And that's on the square. All the same, I'm not forgetting your sister's kind words to me. And, while I'm waiting to be plugged by a greaser bullet, if I happen to have a picture in mind of how she'll look up on my horse—why, man! it's not going to make any difference to you. She need never know it.

Between you and me, Al, don't let her or Flo ride alone over Don Carlos's way. If I had time, I could tell you something about that slick greaser. Tell your sister, if there's ever any reason for her to run away from anybody when she's up on that roan, just let her lean over and yell in his ear. She'll find herself riding like the wind.

So-long,

Gene Stewart.

Madeline thoughtfully folded the letter and murmured:

"How he must love his horse!"

"Well, I should say so," replied Alfred. "Flo will tell you. She's the only person Gene ever let ride that horse, unless, as Bill thinks, the little Mexican girl Bonita rode him out of El Cajon the other night. Well, sister mine, how about it—will you accept the horse?"

"Assuredly, and very happy indeed am I to get him. Al, you said, I think, that Mr. Stewart named him after me

—saw my nickname in the New York paper?"

"Yes."

"Well, I will not change his name. But Al, how shall I ever climb on him? He's taller than I am. What a giant of a horse! Oh, look at him—he's nosing my hand. I really believe he understood what I said. Al, did you ever see such a splendid head, and such beautiful eyes? They are so large and dark and soft—and human. Oh, I am a fickle woman, for I am forgetting White Stockings!"

"I'll gamble he'll make you forget any other horse," said Alfred. "You'll have to get on him from the porch."

As Madeline was not dressed for the saddle, she did not attempt to mount.

"Come, Majesty—how strange that sounds!—we must get acquainted. You have a new owner, a very severe young woman who will demand loyalty from you and obedience—and some day, after a decent period, she will expect love."

Madeline led the horse to and fro, and was delighted with his gentleness. She discovered that he did not need to be led. He came at her call, followed her like a pet dog, and rubbed his black muzzle against her.

Sometimes, at the turns in the walk, he lifted his head, and, with ears forward, looked up the trail by which he had come, and beyond to the foot-hills. He was looking over the range. Someone was calling to him, perhaps, from beyond the mountains. Madeline liked him the better for that memory, and pitied the wayward cowboy who had parted with his only possession for very love of it.

CHAPTER XI.

That afternoon, when Alfred lifted Madeline to the back of the big roan, she felt high in the air.

"We'll have a run out to the mesa," said her brother as he mounted. "Keep a tight rein on him, and ease up when you want him to go faster; but don't yell in his ear unless you want Florence and me to see you disappear on the horizon!"

He trotted out of the yard, down by the corrals, to come out on the edge of a gray, open flat that stretched several miles to the slope of a mesa. Florence led, and Madeline saw that she rode like a cowboy. Alfred drew on to her side, leaving Madeline in the rear.

Then the leading horses broke into a gallop. They wanted to run, and it was splendidly manifest to Madeline that she would hardly be able to keep Majesty from running, even if she wanted to. He sawed on the tight bridle as the others drew away, and broke from pace to gallop.

"This will never do. They are running away from us," said Madeline, and she eased up her hold on the bridle.

Something happened beneath her just then—she did not know, at first, exactly what. Much as she had been on horseback, she had never ridden at a running gait. In New York it was neither decorous nor safe. So when Majesty lowered and stretched, and changed the stiff, jolting gallop for a smooth, gliding run, it took Madeline some moments to realize what was happening. She felt the steady, even rush of the wind. It amazed her to find how easily, comfortably she kept to the saddle. She found herself alive, throbbing, and inspired by she knew not what. She loosened the bridle, and leaning far forward she cried:

"Oh, you splendid fellow—run!"

She heard from under her a sudden quick, clattering roar of hoofs, and she swayed back with the wonderfully swift increase in Majesty's speed. The wind stung her face, howled in her ears, tore at her hair. The gray plain

swept by on each side, and in front seemed to be waving toward her. In her blurred sight Florence and Alfred appeared to be coming back; but she saw presently, upon nearer view, that Majesty was overhauling the other horses, was going to pass them.

Indeed he did pass them, shooting by so swiftly as almost to make them appear standing still. He ran on, not breaking his gait till he reached the steep side of the mesa, where he slowed down and stopped.

"Glorious!" exclaimed Madeline.

She was all in a blaze, and every muscle and nerve of her body tingled and quivered. Her hands, as she endeavored to put up the loosened strands of hair, trembled and failed of their accustomed dexterity. Then she faced about and waited for her companions.

Alfred reached her first, laughing, delighted, yet also a little anxious.

"Can't he run? Did he bolt?"

"No, I yelled in his ear," she replied.

"So that was it! That's the woman of you—forbidden fruit. Flo said she'd do it the minute she was on him. Majesty, you can ride! See if Flo doesn't say so."

The western girl came up then, with her pleasure bright in her face.

"It was just great to see you. How your hair burned in the wind. Al, she sure can ride. Oh! I'm so glad—I was a little afraid. And that horse! Isn't he grand?"

Alfred led the way up the steep, zigzag trail to the top of the mesa. Madeline saw a flat surface of short grass, level as a floor.

She uttered a little cry of wonder and enthusiasm.

"Al, what a place for golf! This would be the finest links in the world."

"Well, I've thought of that myself," he replied. "The trouble would be, could anybody stop looking at the scenery long enough to hit a ball? Majesty, look!"

And then it seemed that Madeline was confronted by a spectacle too sublime and terrible for her gaze. The immensity of this redridged, deep-gulfed world, descending by incalculable distances, refused to be grasped. It awed her, shocked her.

"Once, Majesty, when I first came out west, I was down and out—determined to end it all," said Alfred. "I happened to climb up here looking for a lonely place to die. When I saw that—I changed my mind."

Madeline was silent. She remained so during the ride around the rim of the mesa, and down the steep trail. This time Alfred and Florence failed to tempt her into a race. She had been awestruck; she had been exalted; she had been confounded; and she recovered slowly, without divining exactly what had come to her.

She reached the ranch-house far behind her companions, and at supper-time was unusually thoughtful. Later, when they assembled on the porch to watch the sunset, Stillwell's humorous complainings inspired the inception of an idea which flashed up in her mind swift as lightning. By listening sympathetically, she encouraged him to recite the troubles of a poor cattleman. They were many and long and interesting, and rather numbing to the life of her inspired idea.

"Mr. Stillwell, could ranching here on a large scale, with up-to-date methods, be made—well, not profitable exactly, but to pay—to run without a loss?" she asked, determined to kill her new-born idea at birth or else give it breath and hope of life.

"Wal, I reckon it could," he replied, with a short laugh. "It'd sure be a money-maker. Why, with all my bad luck an' poor equipment, I've lived pretty well, an' paid my debts, an' haven't really lost any money except the original outlay. I reckon that's sunk fer good."

"Would you sell, if someone would pay your price?"

"Miss Majesty, I'd jump at the

chance. Yet somehow I'd hate to leave hyar. I'd jest be fool enough to go sink the money in another ranch."

"Would Don Carlos and these other Mexicans sell?"

"They sure would. The don has been after me fer years, wantin' to sell the old rancho of his; an' these herders in the valley, with their stray cattle, they'd fall daid at sight of a little money."

"Please tell me, Mr. Stillwell, exactly what you would do here if you had unlimited means?" went on Madeline.

"Wal, Miss Majesty, it jest makes my old heart warm up to think of sich a thing. I dreamed a lot about it when I first come hyar. What would I do if I hed unlimited money? Listen. I'd buy out Don Carlos an' the greasers. I'd give a job to every good cowman in this country. I'd make them prosper as I prospered myself. I'd buy all the good horses on the ranges. I'd fence twenty thousand acres of the best grazin'. I'd drill fer water in the valley. I'd pipe water down from the mountains. I'd dam up thet draw out there. A mile-long dam from hill to hill would give me a big lake, an' hev'in' an eye fer beauty, I'd plant cotton-woods around it. I'd fill thet lake full of fish. I'd put in the biggest field of alfalfa in the southwest. I'd plant fruit trees an' garden. I'd tear down them old corrals an' barns an' bunk-houses, to build new ones. I'd make this old rancho some comfortable an' fine. I'd put in grass an' flowers all around, an' bring young pine-trees down from the mountains. An' when all thet was done, I'd sit in my chair an' smoke an' watch the cattle string-in' in fer water an' stragglin' back into the valley. An' thet red sun out there wouldn't set on a happier man in the world than Bill Stillwell, last of the old cattlemen!"

Madeline thanked the rancher, and then rather abruptly retired to her room, where she felt no restraint to hide the force of that wonderful idea, now full-grown and tenacious and alluring.

The next day, late in the afternoon, she asked Alfred if it would be safe for her to ride out to the mesa.

"I'll go with you," he said gaily.

"Dear fellow, I want to go alone," she replied.

"Ah!" Alfred exclaimed, suddenly serious. He gave her just a quick fling of eyes, then turned away. "Go ahead! I think it's safe. I'll make it safe by sitting here with my glass and keeping an eye on you. Be careful coming down the trail. Let the horse pick his way. That's all."

She rode Majesty across the wide flat, up the zigzag trail, across the beautiful grassy level to the far rim of the mesa, and not till then did she lift her eyes to face the southwest.

Madeline looked from the gray valley at her feet to the blue Sierra Madres, gold-tipped in the setting sun. Her vision embraced in that glance distance and depth and glory hitherto unrevealed to her. The gray valley sloped and widened to the black sentinel Chiricahuas, and beyond was lost in a vast, corrugated sweep of earth, reddening down to the west, where a golden blaze lifted the dark, rugged mountains into bold relief.

The scene had infinite beauty; but after Madeline's first swift, all embracing flash of enraptured eyes, the thought of beauty passed away. In that darkening desert there was something illimitable. Madeline saw the hollow of a stupendous hand; she felt a mighty hold upon her heart. Out of the endless space, out of silence and desolation and mystery and age, came slow-changing, colored shadows, fancies of peace, and they whispered to Madeline.

They whispered that this was a great, grim, immutable earth—that time was eternity—that life was fleeting. They whispered for her to be a woman—to love some one before it was too late—to live any one, every one—to realize the need of work, and

in doing it to find genuine happiness. She rode back across the mesa, and down the trail, and once more upon the flat she called to the horse and made him run. His spirit seemed to race with hers. The wind of his speed blew her hair from its fastenings. When he thundered to a halt at the porch steps, Madeline, breathless and disheveled, alighted with the mass of her hair tumbling around her.

Alfred met her, and his exclamation, and Florence's rapt eyes shining on her face, and Stillwell's speechlessness, made her self-conscious. Laughing, she tried to put up her hair.

"I must—look a—fright!" she said. "Wal, you can say what you like," replied the old cattleman, "but I know what I think."

Madeline strove to attain calmness. "My hat—and my combs—went on the wind. I thought my hair would go too. There is the evening star. I am very hungry!"

And then she gave up trying to be calm, and likewise to fasten up her hair, which fell again in a golden mass.

"Mr. Stillwell," she began, and paused, strangely aware of a hurried note, a deeper ring in her voice. "Mr. Stillwell, I want to buy your ranch—to engage you as my superintendent. I want to buy Don Carlos's ranch, and other property, to the extent, say, of fifty thousand acres. I want you to buy horses and cattle—in short, to make all those improvements which you said you had so long dreamed of. Then I have ideas of my own, in the development of which I must have your advice and Alfred's. I intend to better the condition of those poor Mexicans in the valley. I intend to make life a little more worth living for them and for the cowboys on this range. To-morrow we shall talk it all over and plan the business details."

Madeline turned from the huge, ever-widening smile that beamed down upon her, and held out her hands to her brother.

"Alfred—strange, is it not, my coming out to you? Nay, don't smile. I hope I have found myself—my work—my happiness—here under the light of that western star!"

(Continued next week).

BACK TO THE LAND.

BY R. S. OWEN.

I left the rustle and the roar,
I'm back to open fields once more.
I'd often thought I'd like to go.
Where bells don't ring nor whistles blow;
Where I could have more time for thought
Upon the things which God has wrought.

So I struck out and looked around
And soon a pleasant home I found,
Where are the fruits and flowers so grand,
The rolling hills and meadow lands,
A place of rest from constant grind
And relaxation of the mind.

We love the whispers of the trees,
The songs of birds, the hum of bees,
The river's rippling over stones
In soft subduing undertones.
'Tis nature's melody like these
That soothes the weary heart with ease,
That lifts the soul from earthly clod
Through nature up to nature's God.

My heart goes out to friends and kin
Who live in city's dust and din
Yet long the country life I know,
And, sighing, say, "I'd like to go."
I wish that they might join our band
And make life's fortune from the land.
The dearest fortune one can find
Is strength of body, peace of mind.

Then come, dear friends, we welcome you,
Where air is fresh, and sky is blue.
The luscious fruit on tree and vine,
The meadows green, the patient kine,
Invite you, too, from urban strife,
To share the bliss of country life.

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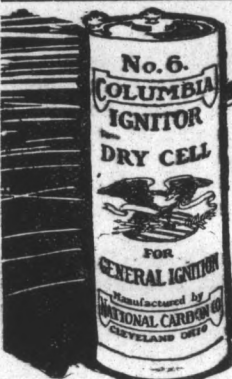
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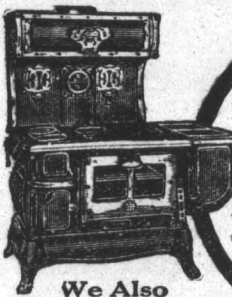


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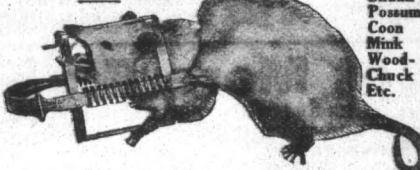
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Woman and Her Needs

At Home and Elsewhere

The Domestic Crucible—20 Grace Changes the Color of "Blue Monday"

GRACE LUDLOW lifted the heavy pail of dirty suds, and pressing her left hand tightly against her aching side trudged toward the door. Down eight steps and across the back yard she carried it, to dump it down the little hill back of the house whence it would trickle away towards the drain. Ten times she had been up and down those steps to empty the tubs after washing, and if she rinsed and blued as she should she would probably go up and down ten times more before the last garment was on the line. Then there would be the floor to scrub and that water to empty, dinner to get, dishes to wash, beds to make, rooms to tidy and supper to plan for the evening.

She sighed impatiently as, back in the kitchen, she banged the pail on the floor, rinsed the clinging suds from the bottom of the tub and prepared to fill it up with clear cold water for rinsing and blueing. Fortunately she did not have to go down the steps for that. The cistern pump was on the back porch, so it only meant going a few steps for clean water, but the opening and shutting of the door chilled the room, and after the steam of the washing suds, gave Grace a decided feeling of discomfort.

She shivered as she plunged her hands in the icy water, but glancing at the clock decided she hadn't time to wait to heat water to take the chill off. They must be rinsed and got on the line at once, or dinner would be late. Either that or leave them until afternoon, which she had no mind to do.

"It seems as though everyone and everything conspired to make women's work as hard as possible," she murmured moodily with herself. "I'd like to see any man work with things as unhandy as I have them. I know I've walked two miles this morning, just carrying and emptying water. I'll bet the man that built this house spent six months planning to make it as inconvenient as possible. Certainly no woman would have had her kitchen located so she'd have to go down eight steps to get to the ground."

"It's not so bad except on washing days," she added, shaking out a sheet and depositing it with its mates in the basket. "But after you have broken your back rubbing a tub or two of dirty clothes, to have to walk up and down those steps emptying water is more than flash and blood can bear."

She pulled on heavy mackintosh and cap as she spoke, donned white fleece lined mittens, and lifting the basket with a groan and a scowl for her aching back sallied forth to hang the white clothes on the line. An icy wind that froze the clothes as she hung them, and flapped them rudely about her face effectually kept her mind from thoughts of the steps to climb and gave it a turn in another direction.

"I'd like to see John hang these things out in freezing weather," she jerked out, between frantic grabs at wildly flying sheets and table linen. "He'd hang them out about once and then string them around the living-room the rest of the time. Any time a man would put up with what a woman goes through," an indignant snort as a pillow slip sailed away across the yard cut forth further ruminating on John and his ilk and fastened her

mind firmly on the business in hand. It was time to start dinner when she got back in, and after blowing vainly on her numb fingers and swinging her arms briskly about, she hurried through the usual wash-day noon meal. Part of the clothes had to go over until afternoon, for meals on time was a fetish in the Ludlow family.

"Town women have it so much easier," she mused as, after dinner she finished up the job of rinsing the clothes which were left. "No water to carry nor tubs to empty. All they do when they're through washing is to pull a plug out of the bottom of the tub and let the water run away. It was just fun for Mrs. Smith to wash there in Jackson. If I just had tubs like hers, now, I wouldn't mind washing a bit."

All the time she was hanging the clothes around the kitchen range, she refused to go out in the cold again, her mind dwelt on the stationary tubs which had graced Mrs. Smith's basement. Made of slate, and standing at just the right height on four solid legs, they were always ready, quick to fill and nothing at all to empty and clean.

"Why couldn't I have some right here in the kitchen?" Grace said audibly, as solitary people have a fashion of doing. "They could stand right over there in the corner out of the way, and we could put a hinged cover over them and make an extra table. Of course, I haven't the running water to fill them, but John or the hired man could do that before they go out, and then if I didn't have to carry all the water out after washing all morning it would take off half the work. John could surely connect them up with a pipe to carry the water off, and when we do get water in they'd be here all ready. I'm going to write Mrs. Smith anyway and find out how much they'd cost."

The next morning's mail carried a letter to Mrs. Smith, and after Grace had given up looking for the answer one came. There was a page or so of the usual apologies for delay, and after skimming through it Grace learned that the tubs had been in the house when the Smith's moved in, so that lady had to go down town and hunt about before she could find out the cost. At last she had found a plumber who would sell two tubs and do the inside plumbing for \$15. As the Ludlows lived where he could not set the tubs up for them, he would deduct the cost of setting them up from the price of the tubs. They would probably cost around \$13.

"If that's all they cost they're mine," Grace exulted. "If I carry water up and down those steps much longer I'll pay a doctor \$25, and I'd rather pay half that for convenience and keep well. I suppose John will growl about hard times, but if he can have a sulky plow I don't see why he shouldn't buy me these tubs. They'll be used 52 weeks out of the year, which is certainly more use than his machinery ever gets."

Contrary to expectations John did not growl. He came in at three o'clock wreathed in smiles and flourishing a check for \$100.

"Lansing bit at last," he crowed. "He's taken the colt at my price, just as I was ready to throw off \$10."

"Throw off \$3.00 more, then," Grace said promptly, "and give me the \$13 for some stationary washtubs."

"What's the answer?" demanded John. "I never saw one. What does it do?"

"They stand quietly in the corner when not in use," Grace explained, "and are connected with the outside world by a good drain. You and Bill fill them wash day mornings for me, and when I'm through washing I pull out a plug and the dirty suds carries itself outside and down the drain. I've carried out 3,000,000 hogsheds of water since I've lived here, to say nothing of what I've carried in, and now I'm through."

"If it's as bad as that I guess you get the tubs," John agreed. "We ought to do something to celebrate our victory over that old skinflint."

And lest he change his mind, Grace sat down that moment and ordered the tubs.

DEBORAH.

WINTER BUTTER-MAKING IN THE HOME.

BY ELLA E. ROCKWOOD.

Cold weather interferes with the ripening of cream so that unless properly handled it becomes inoculated with the wrong variety of bacteria and develops a bitter taste instead of the pleasant acidity and fine aroma essential for the production of the best quality of butter.

Probably the most satisfactory method of treating winter cream in the quantity handled on the average farm not specially devoted to dairying, is to hold it three or four days before churning, making butter twice a week. This plan adapts itself very conveniently for the housewife. Tuesday and Friday will be found to fit in nicely as churning days in the regular program for work.

Having the cream for the churning we will now proceed to ripen it. Being all in a single vessel, well stirred twice daily, the sweet cream should, on the day preceding the churning, be warmed up to 62 to 64 degrees. By placing the receptacle containing it within a larger one filled with warm water and stirring constantly the temperature will speedily rise. It should be tested with a reliable dairy thermometer and removed when the proper point is reached, then set in some convenient place where the temperature will not drop very much and carefully covered. Next morning the cream should be ready for the churn, pleasantly acid, moderately thick, pouring from a dipper like molasses, and "pitting" the surface as the last drops fall. Both outside and inside of the dipper will be coated thickly with adhering cream. When this condition is reached, combined with the tests given in the previous sentence, those who know are satisfied that the ripening is complete.

With the cream in readiness the next thing is the churn. This should be scalded as usual but not chilled too much. If the cream has dropped below 64 degrees it should be again warmed as it is a useless waste of energy to attempt to churn at too low a temperature in winter. Herds vary in this respect and only experience and an actual test can determine the exact degree for exhaustive churning. As a rule, when the butter comes quickly it means imperfect separation of fat and consequent waste in the buttermilk. Even without a tester one can tell fairly well whether any considerable amount of fat is left in it or not. If it is quite thick with a yellow tinge and a rich creamy taste, the churn has not secured all the butter. It should be a clear bluish white and

rather thin in order to indicate complete separation. A churn only one-third full of cream will generally get more complete results than a fuller one because the concussion is greater.

In washing butter in cold weather the water should be about the same temperature as the buttermilk. This leaves the granules in the waxy stage, easy to press into shape after salting. If too cold they gather in very small particles, like corn meal, on the surface of the water, so fine that they pass through the opening of the churn and collect in large numbers on the sieve. Twice washing is sufficient. Too much water washes out the flavor.

A churning of five or six pounds may be salted in a butter bowl, more than that is best treated in the churn. Streaks are caused by imperfect distribution of salt which the working is supposed to incorporate evenly. Salt heightens the yellow color of butter and the tint is deepest where this is deposited most thickly. Hence the logical remedy for streaked butter is more working.

It is difficult to convince the average home butter-maker that it is not necessary to set butter away until next day before finishing. If this is given a fair trial even the most skeptical woman will be convinced that it is better to finish the job as soon as the salting is done. It is then in the best possible condition for working and right then and there is the time to give it all it requires. Next day it is rigid and must be warmed, and possibly half melted, before it can be handled. The best butter makers today do not re-work the product but do all that is required at the one operation, salting, working and printing or packing as soon as the churning is completed.

BABY WEEK.

1916 is Baby Year. The facts about American babies, the needs of American babies, and America's responsibility to her babies will this year be known as never before, because the first week in March will be Baby Week throughout the country. More than 400 communities representing every state in the union are already laying plans for Baby Week, according to the Children's Bureau of the United States Department of Labor, in order that during those seven days the needs of the babies may be so presented that all the parents in those communities will learn a little better how to care for their babies, and all the citizens will realize that they have a special obligation to safeguard the conditions surrounding babies. The Federal Children's Bureau believes that Baby Week will give more parents a chance to learn the accepted principles of infant care, and will awaken every American to his responsibility for the deaths of the 300,000 babies who, according to the census estimates, die every year before they are twelve months old. Therefore the Children's Bureau has prepared a special bulletin of practical suggestions for Baby Week campaigns, adapted to the varying needs of communities of different types. Copies of this bulletin may be had free of charge from the Children's Bureau at Washington.

CHEESE.

BY N. M. PAIRPOINT.

Cheese is one of the foods that is not yet sufficiently used, either for nutritive dishes or as flavoring.

Its nutritive qualities are very high, its food value being equal to twice its weight of fresh meat or eggs, and three times its weight of fish. As the result of this, cheese dishes should be used instead of meat or eggs, and not made an important part of the same meal.

Cheese is the casein or curd, of milk, solidified, pressed, and allowed to dry, and it contains a very large part of the solids, fats, and mineral matter, found in whole milk.

Sometimes skim-milk is used in its

manufacture, but usually it is from whole cow's milk, that is considered specially valuable for that purpose, and the milk must be in good condition if the cheese is to be satisfactory.

There are a large number of kinds but they can be generally divided into three classes, hard, soft, and those specially flavored.

The ordinary American product is a hard cheese, and that made for the home trade is milder flavored than that made to be exported. The soft cheese is well represented by the Neufchatel, a very soft cream cheese, that was first made in this country in Orange county, New York state. The cream cheese that is put up in square packages, and is often called Philadelphia cheese, usually contains more of the fats of the milk than the Neufchatel. New York state has been the home of cheese making for many years, and it is still the most important industry of some towns and cities.

Among the hard cheeses of the different nations are the Stilton and Cheshire cheese of the English; the Edam of the Dutch; Gorgonzola of the Italians; and Port-du-Salut of the French. These all vary in flavor and hardness, but are of the same type as the regular American cheese, and are now all made in this country, as well as being imported.

Among the soft cheese of the Neufchatel type, are the Camembert, the D'Isigny, and the Roquefort, which is semi-soft cheese. The Limburger is a soft cheese, and with the Brie, and the Camembert are among those specially flavored by selected fermentations.

There is a very hard Italian cheese, called the Parmesan, that has a granular quality. This can be purchased in a grated form, and is particularly useful for flavoring for soups and salads and to use with macaroni and rice.

MICHIGAN'S HAPPY BABIES.

German Measles.

German measles is a common disease of childhood, but almost never seen except in cases of epidemics. It is mild, almost never fatal and seldom, indeed, serious. The chief characteristic of the disease is a fever accompanied by a rash. There are once in a while cases accompanied by sore throat or perhaps by the catarrhal symptoms which occur with measles, but often the rash is the first and only symptom of the disease.

The rash usually begins on the face and spreads to the whole body, though it sometimes appears first on the back and chest. It is usually fully developed in 24 hours, and sometimes lasts only that long, though there have been cases where the rash stayed out for four days. The spots are a pale-red color, varying in size from a pin head to a pea and on the face running together in blotches like true measles. There is usually but little rise in temperature, 100 or 101 degrees, and the temperature goes down as the rash disappears. Occasionally the skin comes off in fine scales over the body, legs and arms, but this does not always occur.

As the disease is contagious, the patient should always be isolated during its course. No age is exempt, and the fact that a person has previously had scarlet fever or measles will not protect him from German measles. The same person will not have two attacks, however.

The epidemic usually occurs in winter or spring, and not infrequently follows an epidemic of measles. It is often hard to diagnose, as it is sometimes confounded with scarlet fever or measles. It has, however, none of the dangers which accompany these diseases, and is never followed by serious complications. DEBORAH.

Keep the dust cloth in a closed can with some absorbent cotton soaked with coal oil in the bottom. The cloth will absorb enough oil to enable it to take up the dust.—X. Y. Z.

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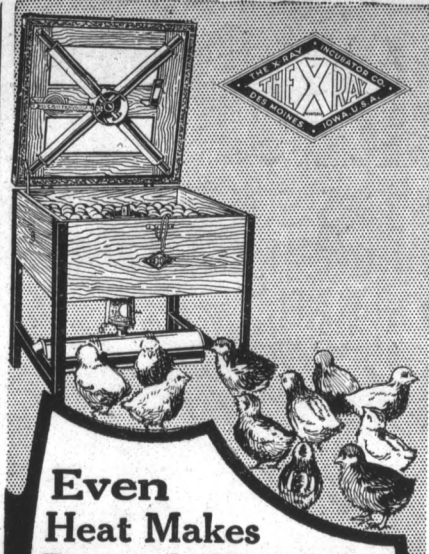
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WE PAY \$80 A MONTH SALARY
and furnish rig and all expenses to introduce our guaranteed poultry and stock powders. **BIGLER COMPANY**, X 682, SPRINGFIELD, ILLINOIS

Raising Geese for Profit

THE production of geese for market purposes has become a most important industry in Rhode Island, and has proved a most profitable farm occupation, due to the heavy demands for geese in recent years. The geese farm industry stands today midway between the chicken and turkey business as to importance.

Geese are probably the hardiest of all domestic fowls, requiring less attention than cows or hens, and little or no outlay for buildings. The old geese do well in all weathers with nothing in the way of shelter but a shed to run under, and usually they disdain this. They do best on wet or marshy land, where hens and turkeys would die. They are, however, very different from other fowls, and unless their nature is understood and their requirements met they are the least profitable of all feathered stock. The desirability of extending a knowledge of the best methods of geese raising as well as making experiments that will throw more light on the subject, is evident.

Good Crosses.

The Embden-White China breed are the easiest to pick, are white when dressed, and, though small, are plump and present an attractive market appearance. The Embden-African are also easy to pick and are large and plump. The White China, though the weakest and smallest of all varieties, when mated with Embden ganders, produce vigorous, quick-maturing goslings, which are plump and solid when dressed. The Embden-Toulouse is regarded as the most satisfactory cross for large geese for the Christmas and New Year's trade. Pure African and Embden crosses grow best early in the season and should be marketed early. Pure-bred China, African-Toulouse, and African-Brown China should be dressed before fall, in order that they may be easy to pick. White plumaged Embden and White crosses may be picked easily and later than other breeds.

Old geese lay a greater number of larger eggs and are more reliable than young geese. Nevertheless, if geese be purchased it often saves time to buy young geese rather than to attempt to secure any number of old ones. Young ganders are better for breeding than young geese. Young geese do not lay as many fertile eggs or produce as many goslings the first breeding season as they do the second. If geese are often changed from one place to another they are apt to not breed well, and the other conditions being equal they breed better the third season they are in a locality than the second season.

Getting Good Results in Breeding.

In order to insure the best results, geese for breeding should be obtained as early in the fall as possible, not later than October. They thus have an opportunity to become acquainted with their new surroundings before the breeding season. Breeding geese should have considerable exercise and be kept moderately thin in flesh, all through the winter by light feeding and a free range or facilities for swimming. The best ganders for breeding purposes are African and Brown China. The Toulouse geese lay well, but often fail to sit. The Embden geese lay fewer eggs, but make better mothers. Brown and White China breeds are prolific layers. Geese are great grazers, and too much grain is not good for them. To insure fertile eggs they should have an abundance of green food and have access to a pond or other body of water. If this is not possible, a tub of water set level with the surface of the ground may be substituted.

Very early laying is not desirable, since the goslings do not thrive unless they have an abundance of grass. For the first two or three days they should be given nothing except grass and wa-

ter. Later a light feed of scalded cracked corn should be given in addition three times a day. The goslings are liable to be overcome by the heat, and should always have some place of retreat where they may escape the sun's rays.

New York.

EARL W. GAGE.

COMMON DISEASES OF THE DIGESTIVE TRACT.

Crop bound is generally caused by the lower opening into the gullet becoming clogged by straw, hay, grass, feathers or coarse foreign substances. Sometimes it is caused by paralysis of the muscles controlling the crop. Perhaps one of the most important causes is indigestion. Do not over-feed. Make the hens exercise, and fed plenty of coarse, sharp grit. If the compaction is due to paralysis and an over supply of grain, a cure can generally be brought about by giving the bird a tablespoonful of castor oil, then massaging the crop and working part of the contents back out through the mouth. If the compaction is due to clogging of the opening into the lower part of the gullet, or the crop is very much distended by a large amount of coarse, dry material, it usually is necessary to make an inch incision into the crop, and then remove the obstruction at the opening into the gullet. Wash out the crop, and with common or silk thread sew up the crop, and then the skin. Feed soft feed the first few days. This disease is not contagious.

Crop Inflammation.

Inflammation of the Crop: Quite frequently fowls are noticed walking about in a droopy and listless way, with a rather distended crop. Upon catching the bird, and feeling the crop it is noticed that the contents are very soft. A massaging of the crop quite frequently causes a sour mucous to run out of the bird's mouth. This is due to a sour crop brought about by inflammation of the glands which line the walls of the crop and secrete saliva. Generally the crop is partly filled with a liquid or gas. This, being mixed with the feed, gives the contents a soft feeling.

It is generally caused by eating spoiled or poisonous foods. Quite often it is caused by over-eating of very fibrous feeds, like ground oats and other coarse mill products. Or it may be caused by eating anything which disagrees with the bird.

Remove the cause. Feed more regularly. When changing from one ration to another do it very gradually. Make the bird exercise and make sure that all feed is wholesome and sweet. Feed not heated, decayed or rotten feeds. Feed nothing you would hesitate to eat (as far as purity goes), and increase the feeding of charcoal and grit.

Treatment for Inflammation of Crop.

To cure the affected individual, give a tablespoonful of castor oil and massage the crop, then holding the bird with head down and mouth open, gently and gradually work the contents out by way of the mouth. Next give the bird two or three tablespoonfuls of warm water, massage the crop and then work this back out again by way of the mouth. Then give another tablespoonful of castor oil. Don't feed for 24 hours, and then feed sparingly of easily digested and wholesome feeds. Give plenty of charcoal.

This disease is quite frequent in small chicks, in which it may be the result of any of the above causes, or chilling, over-heating or over-eating.

Compaction of the Glandular Stomach. This is quite often found in small chicks, the stomach being literally packed with fine hair and coarse dry grass. Sift all beef scrap to remove these hairs, and keep chicks away from the coarse dry grass. Feed plenty of green feed, and the tendency

to eat too much of coarse, dry grass will be lessened. Give a half teaspoonful of castor oil. Provide plenty of charcoal and grit.

Texas. F. W. KAZMEIER.

EARLY CHICKS FOR WINTER LAYERS.

Records show that the first year of a pullet's laying is the period when she returns the greatest per cent of profit upon her keep. From this it is easy to see that the poultryman who succeeds in bringing his pullets to the laying stage as early in life as possible is the one who will get the best results. Early chicks and the proper care in bringing them up are things necessary to secure this.

An incubator is very useful in this sort of work, as the first chicks should be hatched out not later than February 15 and it is not usual to have many broody hens at that season of the year. Some object to such early chicks, claiming that they are too hard to rear in the extremely cold weather of that season but, if proper quarters are provided, we think that better results are obtained than from the ones hatched during the changeable weather of the later months. Chicks that are hatched after the first of May can never be developed into early layers.

Early chicks and good quarters are not all that is necessary to secure early laying pullets, however. A properly balanced ration with a systematic plan of feeding are other requirements. Begin the feeding with a nourishing ration that will promote development of frame and growth rather than the putting on of fat. Where the chicks are made over-fat the time of their reaching maturity is likely to be greatly delayed.

If the pullets have been properly fed and cared for by the time that they are seven months of age some of them should begin laying and within a few weeks the flock should be producing enough eggs to pay their daily keep. By this time their rations should have undergone a radical change. Previously a ration that aimed at development of the body was given but that is no longer necessary and we should now be giving food that is rich in the elements necessary for egg production.

By using the proper system it is possible to have the pullets laying well early in the fall while summer conditions are yet present to some extent. This early start will have a great deal to do with the results secured during the winter months. We have in mind a flock of 16 pullets that during the months of December and January laid 600 eggs that sold at an average price of 25 cents per dozen. It probably cost no more than five cents per dozen to produce these eggs and the profit was certainly great enough to satisfy the most greedy. This is surely proof that work with pullets that insures their development into winter layers is profitable. The work must be begun, however, during the early months of the year.

Ohio. SHERLEY CONNELL.

PRACTICAL POULTRY HINTS.

Do not speak of your poultry flock as "Thoroughbred," as you doubtless mean "Pure-bred." Thoroughbred refers to the breed of well developed horses commonly known by that name and the term is incorrectly used in describing a breed of poultry. Thoroughbred is a breed name, the same as Plymouth Rock, Holstein, Toulouse, etc.

A menu of oat meal in the morning and corn meal mush at night would soon put a working man in the hospital. Even the best of food must be spiced up by variety and it takes a remarkable appetite to cling to one or two articles of food for any length of time. How about the hen in winter? The weight of the winter egg basket is largely determined by the variety of

food furnished the hen. She is unable to select her own ration in winter and one or two kinds of grain do not take the place of her summer ration on the range.

Plenty of straw or dry leaves must be available for the scratching shed or laying house during the winter. The hen must exercise and scratching is her only form of gymnastics. Make her scratch. The hen that sits on the roost all day seldom sits on the nest.

Keep the hoppers well filled with grit, oyster shells, and charcoal. On cold windy days the birds frequently receive set-backs which make them non-producers until spring. Avoid this trouble by keeping the laying-house well supplied with the hen's necessities of life.

Crowding on the perches is a frequent cause of over-heating and this is followed by a sudden chill when leaving the roosts on a cold winter morning. Some breeders drive spikes in the roosts about six inches apart and this compels every bird to occupy the right amount of space and no more.

A chicken crook is a handy implement in the poultry yard. You can make one from a stiff piece of wire bent into a crook at the end with a pair of pliers. When examining a bird for lice in the day time or catching birds for examination by other breeders the crook will save considerable disturbance caused by chasing and grabbing among the birds. One quick lunge at the bird with the crook and you have it securely caught by the leg without any injury.

Cull the flock thoroughly. One poor sickly looking hen may pull through the winter and lay just enough eggs next spring to enable you to hatch out six or eight birds lacking in vitality. These birds will never thrive and may be the means of transmitting disease to healthy members of the flock. You can possibly afford to keep culls if you are expecting to get out of the business in less than a year and stay out. Otherwise you must cull, and do it right.

Ingham Co. R. G. KIRBY.

DUST BATH MATERIAL.

Do you think the lime dust from a limestone road, mixed with some fine road dust, would make a good dust bath for the chickens to bathe themselves, or would the lime in some way hurt the hens? I have a cock which appears to be all right and eats well, but his comb is not of a nice rich red. It is more of a wine color. What do you think is the matter with him. I want to use him in my breeding pen this year if possible.

Branch Co. W. B.

The limestone dust bath will be all right for dust-box use. It cannot have any bad effects as the lime is not in the caustic or burned lime form, which might have some evil effects. When mixed with some good road dust this material should make a very good dust box material. Your rooster may have a slight attack of liver trouble or if diarrhea is also present the trouble may be a slight attack of enteritis. The male birds are more inclined to sit around when confined in winter than the hens and not standing confinement as well they become more susceptible to disease. It is quite essential to the health of the flock that it is made to work for its living in the winter time. This can best be done by feeding all the grains in deep litter. Are you sure that the cocks comb has never been frosted? This may be the cause of the discoloration. If the bird appears to be in full vigor it will be all right to use him for breeding purposes, but if there are any indications of lack in this way it would be best to use some other bird.

It is a good plan to have plenty of fine loam in a dry place to be used for filling the dust baths during the winter.

Although salt will sometimes kill fowls and chicks if placed where they can get at it, a little salt in the mash is an advantage.



H. H. Johnson



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there's 20 years of Johnson "knowhow" plus the experience of about 650,000 satisfied owners. Hundreds of thousands of more owners than any other. Makes big hatches easy in cold est weather.

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For only \$10 you can get these two prize winning machines, delivered, freight paid east of the Rockies. You take no risk—money back if not satisfied. You can order direct from this ad. Ask the publisher about us.

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heat, double walls, double glass doors, copper tanks and boilers, self-regulating. Nursery under egg tray. Made of finest, select, clear CALIFORNIA REDWOOD, not pine, paper or other flimsy material. Incubator finished in natural color—not painted to cover up cheap, shoddy material. Incubator and Brooder shipped complete with thermometers, egg tester, lamps, everything but the oil. This is the best outfit you can buy. If you don't find it satisfactory after 30 days' trial, send it back. Don't buy until you get our new 1916 catalog, fully describing this prize winning outfit. WRITE FOR IT TODAY. You can't make a mistake in buying a Wisconsin. On the market 15 years.

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Ironclad

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Why take chances with untried machines when for only \$10 we guarantee to deliver safely, all freight charges paid (East of Rockies) BOTH of these big prize winning machines fully equipped, set up ready for use! Why not own an Ironclad—the incubator that has for two years in succession won in the greatest hatching contests ever held. In the last contest conducted by Missouri Valley farmer and Nebraska Farm Journal, 2000 machines were entered, including practically every make, style and price. With 140 egg Ironclad—the same machine we offer with Brooder, freight paid, for only \$10, Mrs. C. F. Merrick, Lockney, Texas, hatched 148 chicks from 148 eggs in the last contest.

30 DAYS' FREE TRIAL Money back if not satisfied.

Both for \$10 Freight Paid East of Rockies

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IRONCLAD INCUBATOR COMPANY, Box 117 RACINE, WIS.

WRITE Your Name on a Postal

and get our 1916 Incubator Book FREE and postpaid. Shows why Prairie State Incubators "hatch most chicks that live." Contains chapter on Poultry Diseases, also one on hatching and rearing. PRAIRIE STATE INCUBATOR CO. 123 Main Street, Homer City, Pa.

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and Almanac for 1916 has 200 pages with many colored plates of fowls true to life. It tells all about chickens, their prices, their care, diseases and remedies. All about incubators, their prices and their operation. All about poultry houses and how to build them. It's an encyclopedia of chickendom. You need it. Only 15c. C. C. SHOEMAKER, Box 911 Freeport, Ill.

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Mention Michigan Farmer when writing to advertisers

Markets.

GRAINS AND SEEDS.

January 25, 1916.

Wheat.—Export buying by private concerns and government agents, carried prices to higher levels last week. Attempts of European countries to purchase supplies outside of the United States has evidently failed, and now that their agents are active here, the bulls find it possible to keep values up and advance them. The visible supply of wheat in bond, together decreased nearly two and one-half million bushels, and despite the fact that primary receipts aggregated nearly two and a half million bushels, or over a million bushels more than for the corresponding period a year ago. Weather conditions also threaten the growing crop, fields over a greater part of the country being exposed. One year ago No. 2 wheat was quoted locally at \$1.45% per bushel. Last week's Detroit prices were:

	No. 2	No. 1	May.
Wednesday	1.30½	1.25½	1.35½
Thursday	1.30½	1.25½	1.35
Friday	1.33	1.28	1.37½
Saturday	1.33½	1.28½	1.38
Monday	1.33½	1.28½	1.38
Tuesday	1.35½	1.30½	1.40

Chicago.—May wheat \$1.36; July \$1.26½.

Corn.—Economy in feeding and good supplies at primary elevators have forced a slight decline in corn values. The bulk of farmers' holdings is just becoming available for marketing, and fairly liberal deliveries are being made. The visible supply shows an increase of 1,125,000 bushels. Eastern interest in the deal is easy. One year ago No. 3 corn was quoted at 74½c per bushel. Detroit's last week's quotations were:

	No. 3	No. 3
	Mixed.	Yellow.
Wednesday	75	76½
Thursday	74½	76
Friday	74½	76
Saturday	74½	76
Monday	74	75½
Tuesday	74½	76

Chicago.—May corn 79c; July 79.2c.

Oats.—Export sales of oats have given the trade support and helped to advance prices. Stocks are decreasing. Domestic demand is active and general. One year ago standard oats were quoted at 56c per bushel. Last week's local quotations were:

	No. 3	No. 3
	Standard.	White.
Wednesday	53	51½
Thursday	53½	52
Friday	53½	52
Saturday	54	52½
Monday	54	52½
Tuesday	54½	53

Chicago.—May oats 53.4c; July 49.6c.

Rye.—Higher at \$1 per bushel for cash No. 2. Demand good.

Beans.—Steady with offerings light and demand strong. Immediate, prompt and February shipment quoted at Detroit at \$3.70 per bushel. At Chicago market continues to advance with pea beans, hand-picked Michigan stock quoted at \$4.15@4.25; prime do \$3.85@3.95; red kidneys \$4.90@5.25.

Barley.—At Milwaukee barley advanced to 73@80c, and at Chicago to 67@80c per bushel.

Clover Seed.—Higher at \$12 for prime spot; March \$11.90; prime al-sike \$10.25.

Timothy Seed.—Steady at \$3.80 for prime spot.

Field Peas.—At Chicago the market is slow at \$2.35@2.60 per bushel, with sacks included.

FLOUR AND FEEDS.

Flour.—Jobbing lots in one-eighth paper sacks are selling on the Detroit market per 196 lbs., as follows: Best patent \$6.80; seconds \$6.50; straight \$6; spring patent \$7.10; rye flour \$5.90.

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 \$18@18.50 per ton; standard timothy \$17@17.50; light mixed \$17@17.50; No. 1 mixed \$14@15; No. 2 mixed \$10@12; No. 1 clover \$10@12.

Chicago.—Easier. Choice timothy \$18@18.50; No. 1 do \$15.50@16.50; No. 2 do \$13.50@14.50.

Straw.—Wheat and oat straw \$6.50@7; rye straw \$7.50@8 per ton.

DAIRY AND POULTRY PRODUCTS.

Butter.—The market remains firm and prices are unchanged. Extra creamery 31c; firsts 29c; dairy 21c; packing stock 19c.

Chicago.—There is just enough business to keep supplies from accumulating. The market is quotable steady at last week's prices. Extra creamery 30½c; extra firsts 28@29c; firsts 25@27c; extra dairies 30c; packing stock 19@19½c.

Elgin.—Trade has been quiet. Fancy goods are scarce but the demand for medium grades which have accumulated is increasing. Price remains unchanged, the quotation being 31c.

Eggs.—Mild weather brought increased supplies and consequently lower prices. Current receipts are quoted at 27c; candled firsts 28c.

Chicago.—Increased receipts caused a drop of about 5c in prices. Mild weather is cause of decline. Refrigerator stock is freely offered but in little demand. Firsts 27c; ordinary firsts 26c; miscellaneous lots, cases included 24@27c; refrigerator stock 15@18c, depending on quality.

Poultry.—The market is firm and offerings are not large. No change in prices except turkeys, which are 1c higher. Turkeys 16@17c; spring turkeys 21@22c; fowls 10@16½c, according to quality; spring chickens 15@16½c; ducks 17@18c; geese 16@16½c.

Chicago.—Little change in the market. Turkeys received are of poor quality. Stagg young chickens will be discriminated against hereafter. Turkeys, young and old 12@18c; fowls 12@15c; springs 14½c; ducks 17c; geese 10@13½c.

FRUITS AND VEGETABLES.

Apples.—There is no change, the market being quiet. Greenings at \$2.50@3.50; Spys \$3.50@4; Baldwins \$2.50@3.50; Steel Red \$4.50@5. At Chicago business is fair and supply is good. Prices are slightly higher for some varieties. No. 1 Greenings \$2.50@2.75 per bbl; Jonathans, No. 1, \$3@3.50; Baldwins \$2.75@3.25; Wageners \$2.25@2.75; Spys \$2@3.75.

Potatoes.—Are firm and in good demand. Prices are 5c higher. Carlots on track, white \$1.05@1.15; red \$1.05@1.10 per bushel. At Chicago the demand was slower than usual as buyers are seeking lower prices on account of mild weather. Prices are about 5c lower. Fancy Michigan Rurals sold for \$1@1.05 per bushel. Other prices range from 90c@1.05. At Greenville the farmers are being paid \$5@88c per bushel.

WOOL AND HIDES.

Wool.—Outlook is bright for those having supplies. Manufacturers are obliged to purchase material at prices set by the sellers. Sales at Boston last week amounted to seven million pounds. Shipping conditions in the southern hemisphere and an embargo on New Zealand wools are making stronger markets in this country. Territories are most in demand, although fleeces are receiving considerable inquiry.

Hides.—No. 1 cured 16½c; No. 1 green 14c; No. 1 cured bulls 13c; No. 1 green bulls 10c; No. 1 cured calf 21c; No. 1 green calf 20c; No. 1 horsehides \$4.50; No. 2 horsehides \$3.50; sheepskins, as to amount of wool, 50c@2.

GRAND RAPIDS.

Two Kent county growers sold five cars of apples January 21 at prices materially lower—about half it is stated—than the figures they were held at last fall. There has been no general break however, in the apple market, though the situation is not very encouraging at present for growers with stock in storage. An easier feeling is reported in potatoes, with the going market price around \$5@90c. New white pea beans are quoted at \$3.40; red kidneys at \$4.40 to farmers. Poultry is higher, with the quotations for fowls at 14@16c live weight. Hay is bringing \$14@17 on the city market. Grain prices are as follows: Wheat, No. 2 red, \$1.23; rye 85c; oats 42c; buckwheat 70@80c; corn 72c.

DETROIT EASTERN MARKET.

Supplies were more plentiful Tuesday morning, which resulted in slower sales, especially for apples; the price range was 75c@1.40 per bushel. Potatoes 75c for inferior to \$1.25 for a fair grade; cabbage 70@75c; parsnips 65c; onions \$1.10@1.25; carrots 65@70c; eggs 38@40c; pork \$10 per cwt; chickens 16c per lb live; loose hay moving slowly with prices around \$20 per ton.

LIVE STOCK MARKETS.

Buffalo.

January 24, 1916.

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

Receipts of stock here today: Cattle 175 cars; hogs 115 d. d.; sheep and lambs 45 d. d.; calves 900 head.

With 175 cars of cattle on our market here today trade was in a demoralized condition and the bulk of the cattle sold 25c lower, and in some cases as much as 35c lower. They had 25,000 cattle in Chicago today and Swift used that as a hammer on our market here, and in fact they were the only big packers that were in the market; so you can see it was impossible to get any action on shipping cattle when we only had one man to bid on them. We look for a fair run of cattle next week and a very slow market.

Receipts of hogs were somewhat lighter than expected and with good demand all grades sold 15@20c higher than Saturday's close. All good grades around \$7.80; pigs and lights \$7.25@7.50; roughs generally \$6.75; stags \$5@5.50. Everything sold at the close and market looks quite good for the balance of the week.

The sheep and lamb market was active today and prices 25c higher than the close of last week. All sold and we look for lower prices balance of the week.

We quote: Lambs \$11.50@11.60; cull to fair \$8@11.25; yearlings \$8.50@10.50; bucks \$4.50@6.25; handy ewes \$7.75@8; heavy do \$7.25@7.75; wethers \$8@8.50; cull sheep \$4.50@6; veals, good to choice \$12@12.25; common to fair \$8@11; heavy \$6@9.

Chicago.

January 24, 1916.

Cattle, Hogs, Sheep.
Receipts today..23,000 70,000 18,000
Same day 1915..17,154 48,354 15,095
Last week.....59,562 282,029 88,851
Same wk 1915..42,354 197,934 61,956

Shipments of cattle here last week were: Cattle 11,714; hogs 53,106, and sheep 17,451, comparing with 10,612 cattle, 52,255 hogs and 17,248 sheep a week earlier, and 10,354 cattle, 39,863 hogs and 3,862 sheep a year ago. Hogs received here averaged 194 lbs.

Cattle open steady to a dime lower today, while hogs are a little higher, selling at \$7.05@7.70. Sheep and lambs open with bids a little lower.

Cattle were in active demand early this week. Steers received during the week went chiefly at a range of \$7.50@9, with the best class of heavy steers purchased at \$9@9.85, but only two or three sales were made above \$9.65. Cattle that classed as good sold at \$8.50 and over, while medium grade cattle brought \$7.75@8.45, warmed-up steers \$7@7.70 and stalk-fed steers \$5.60@6.95. There were no prime yearlings, and the best of these steers offered went at \$9.25@9.50. Butchering cows and heifers had an outlet at \$4.80@5.50, the best cows selling at \$7@7.50, while cutters went at \$4.15@4.75, canners at \$3@4.10 and bulls at \$4.75@7.10. Calves were good sellers on the basis of \$4.50@11 per 100 lbs. for coarse heavy to prime light vealers, with shippers buying the better class of heavy calves at \$7.50@9. While cold weather made the sale of beef throughout the country much larger, it is still obvious that any return to fairly large cattle receipts continuously cannot fail to cause a weakening of prices, prime cattle excepted. It was very largely last week a case of too many \$7@7.75 cattle, eastern buying orders falling off as the week advanced, leaving more offered than could be disposed of promptly. Sales of the \$8@9 class were animated most of the time, and above the \$9 line strength was manifested constantly, as few steers of this class were offered. The market closed Saturday in bad shape, the week's receipts being the largest since early in December.

Hogs were boomed last week to the highest prices recorded since last October on lively local and shipping buying, the liberal receipts being readily taken. Even on Monday there was a large advance in prices, notwithstanding the run of 69,395 hogs, and later in the week prime hogs brought \$7.75, followed by a subsequent sharp decline in values. The shipping outlet was large at times, and exerted a marked influence on prices for such grades of heavy and light hogs as eastern packers are in the habit of buying in the Chicago market. Premiums were paid for choice heavy shipping barrows. Recent receipts averaged 104 lbs., comparing with 191 lbs. a week earlier, 225 lbs. a year ago and 217 lbs. two years ago. Hogs sold much higher than in recent years, 1914 excepted. After a drop to \$7.50 for best hogs, there was a sharp advance Saturday on small receipts caused by the floods, and sales were made of the best lots at \$7.50@7.65, with rumors of \$7.67½ and \$7.70 being paid. Sales ranged all the way down to \$6.85@7 for ordinary light hogs, pigs fetching \$5@6.70. Light shipping hogs brought \$7.27½@7.35 and the best heavy shipping hogs \$7.50@7.65. A week earlier hogs brought \$6.45@7.30.

Lambs, yearlings, wethers and ewes continued to shoot upward last week, with further new high records for mid-winter, advances in prices being extremely large. It was again a case of

large buying orders, with nowhere near enough to go around, Monday receipts of only 24,791 head being followed by meager supplies. Fed western lambs comprised most of the daily offerings, nearly all of them prime in quality. Advances amounted to 10@25c for good lambs, 35@50c for yearlings and wethers and 40@65c for good ewes. Lambs sold at \$8@11.15, yearlings at \$8.25@9.80, wethers at \$7.25@8.35, ewes at \$4.75@8.25 and bucks at \$5.50@6.50.

Horses were in the usual supply and demand last week at unchanged prices with the principal trading in army horses. The poorer horses sold around \$60@100 and the choicer class of drafters on the basis of \$240@285, with wagoners at \$150@200. Light weight drafters were salable at \$200@235.



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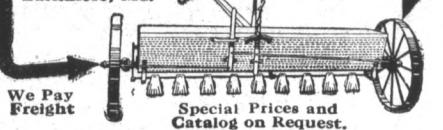
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The first edition is sent to those who have not expressed a desire for the latest markets. The late market edition will be sent on request at any time.

DETROIT LIVE STOCK MARKET.

Thursday's Market.
January 20, 1916.
Cattle.

Receipts 2042. The run in all departments at the local stock yards was considerably below that of a week ago and everything was yarded and sold much earlier than usual, the only stragglers being late trains off the Pere Marquette.

In the cattle division the trade was active and prices averaged full steady with last week on all grades, nearly everything going to the local butchers. Farmers after stockers and feeders were scarce, although some good light stuff could have been picked up at prices that would pay for feeding.

The milch cow trade was dull, especially so on those of the common order, which are selling at \$35.50.

Prices paid averaged as follows: Best heavy steers \$7.25@7.60; best handy weight butcher steers \$6.50@7; mixed steers and heifers \$6@6.50; handy light butchers \$5@5.75; light butchers \$4.75@5.25; best cows \$5.50@6; butcher cows \$4.50@5.25; common cows \$3.50@4; canners \$2.75@3.25; best heavy bulls \$5.50@5.75; bologna bulls \$5@5.25; stock bulls \$4.50@5; feeders \$6@7; stockers \$5@6; milkers and springers \$4@80.

Roe Com. Co. sold Hammond, S. & Co. 6 cows av 875 at \$3.60; to Bresnahan 6 heifers av 591 at \$4.75; to Thompson Bros. 4 steers av 802 at \$6, 12 do av 876 at \$6.60, 2 cows av 1090 at \$5.50, 2 do av 900 at \$4.25, 2 steers av 875 at \$6.25, 1 cow wgh 920 at \$4.25; to Kamman B. Co. 1 steer wgh 1090 at \$6; to Thompson Bros. 4 do av 817 at \$6.75, 3 do av 1073 at \$7.10, 1 bull wgh 1320 at \$5.75, 2 cows av 1010 at \$4.50.

Haley & M. sold Golden 1 cow wgh 760 at \$4.25, 6 butchers av 850 at \$5.25; to Thompson Bros. 1 steer wgh 1200 at \$7.60, 2 do av 920 at \$6.85; to Steinberg 3 butchers av 503 at \$5.25; to Kamman B. Co. 4 do av 1002 at \$6.50, 2 steers av 1010 at \$6.60; to Breitenbeck 13 cows av 1060 at \$5; to Mason B. Co. 14 butchers av 684 at \$5.55, 4 bulls av 1192 at \$5.40; to Hoffend 4 butchers av 692 at \$5; to Kamman B. Co. 4 steers av 950 at \$6.65; to Bray 1 cow wgh 1060 at \$3.80; to Newton B. Co. 2 do av 1170 at \$5.25, 6 do av 861 at \$3.75, 9 do av 882 at \$5.75, 1 bull wgh 1910 at \$6; to Remmick 1 do wgh 1150 at \$5.50, 8 steers av 1154 at \$7.10, 2 cows av 1088 at \$5; to Breitenbeck 2 cows av 1110 at \$5.60, 10 steers av 857 at \$6.50; to Klepler 2 cows av 1112 at \$5.

Veal Calves.

Receipts 653. The veal calf trade was dull and averaged about 50c lower than that of a week ago. A few extra fancy brought \$11.50 but the bulk of sales was at \$10@11 for the good grades and \$7@9.50 for medium and heavy grades.

Sandel, S., B. & G. sold Kull 9 av 140 at \$10.50, 1 wgh 120 at \$10.50, 1 wgh 130 at \$8; to Sullivan P. Co. 3 av 165 at \$11; to Burnstine 2 av 105 at \$8, 1 wgh 170 at \$10.50, 5 av 165 at \$8.50, 3 av 175 at \$9.50; to Nagle P. Co. 5 av 140 at \$11, 3 av 125 at \$9, 5 av 140 at \$11, 2 av 175 at \$11, 5 av 140 at \$11.

Sheep and Lambs.

Receipts 4,800. The sheep and lamb trade was active and a few heads of choice lambs were 10@15c higher than last week, but the general market was about steady as follows: Best lambs \$10.50; fair lambs \$9.50@10; light to common lambs \$8@9; yearlings \$8.50@9; fair to good sheep \$6@6.75; culls and common \$4@5.

Bishop, B. & H. sold Thompson Bros. 23 lambs av 65 at \$9.25, 22 do av 85 at \$9.50; to Parker, W. & Co. 203 do av 75 at \$10.50, 11 do av 47 at \$9; to Hammond, S. & Co. 7 yearlings av 100 at \$6.90; to Swift & Co. 209 lambs av 82 at \$10.60; to Sullivan P. Co. 14 sheep av 110 at \$6.50, 8 do av 100 at \$5.50; to Thompson Bros. 127 lambs av 65 at \$9.75; to Barlage 7 sheep av 90 at \$5.50; to Swift & Co. 182 lambs av 65 at \$9.35, 29 do av 55 at \$9.25, 23 do av 55 at \$9, 38 do av 70 at \$9.50; to Nagle P. Co. 231 do av 70 at \$10.25, 60 do av 75 at \$10.50, 216 do av 70 at \$10.25, 27 do av 75 at \$9.50, 172 do av 75 at \$10.25, 116 do av 85 at \$10.50, 52 do av 70 at \$10.50; to Sullivan P. Co. 87 do av 65 at \$9.50.

Roe Com. Co. sold Thompson Bros. 11 sheep av 125 at \$5.50, 14 lambs av 92 at \$10; to Barlage 7 lambs av 65 at \$9.50.

Sandel, S., B. & G. sold Thompson Bros. 5 sheep av 110 at \$6.25, 7 lambs av 60 at \$10.

Hogs.

Receipts 12,032. The hog trade opened dull and 10@15c lower than on Wednesday. Pigs sold around \$6.75; yorkers and heavy at \$7.25@7.40.

Friday's Market.

January 21, 1916.

Cattle.

Receipts this week 2402; last week 2791. Canners and bulls are steady; common milkers not wanted; all other grades 25c lower than the opening this week. Best heavy steers \$7@7.50; best handy weight butcher steers \$6.25@7; mixed steers and heifers \$6@6.50; handy light butchers \$5.50@6; light butchers \$5@5.50; best cows \$5.50@6; butcher cows \$4.50@5; common cows \$4@4.50; canners \$3@3.85; best heavy bulls \$6; bologna bulls \$5.25@5.75; stock bulls \$4.50@5; feeders \$6@7; stockers \$5@6.50; milkers and springers \$35@75.

Veal Calves.

Receipts this week 975; last week 884; market steady. Best \$11; others \$7@10.50.

Sheep and Lambs.

Receipts this week 6,690; last week 6,587; market steady. Best lambs \$10.50@10.75; fair do \$10@10.25; light to common lambs \$8@9; yearlings \$9.50; fair to good sheep \$6.75@7.25; culls and common \$4.50@5.

Hogs.

Receipts this week 16,912; last week 18,661. Market steady. Pigs \$6@6.75; yorkers and heavy \$7.20@7.30.

LIVE STOCK NEWS.

All descriptions of cattle offered on the Chicago market have been working their way gradually upward for several weeks, subject to the inevitable reactions from time to time, the undertone having become much stronger since the weather changed and became decidedly wintry. A limited demand exists for strictly prime corn-fed beefs carrying plenty of weight, but these are in such meager supply that sellers have been obtaining frequent advances, with good prospects that \$10 per 100 lbs. will be paid before long, provided any are offered.

As for prime yearlings, seldom are any offered on the market, so that prices are usually merely nominal, despite a good demand most of the time. However, the big call these times runs strongly on medium-priced cattle that can be converted into beef that does not cost the average family too much money. Within a short time comparatively low-price lots of cattle have sold for \$1 per 100 lbs. more than at the previous low time, and the great deficiency in the country's cattle supply may be expected to bring forth higher prices in the future. During the first 11 months of 1915 shipments from all points of stockers and feeders to feeding districts ran rather more than 15 per cent ahead of the corresponding period of 1914, but the lack of good feeding corn and its advance in the northern portions of the corn belt states caused such a general early marketing that the present supply in feeding districts is unusually low, according to reliable accounts. Country shippers of cattle of the stocker and feeder types should stop shipping such cattle to the Chicago stock yards, as there is no outlet there to feeding districts, and sellers have to depend on killers, who pay much lower prices than would be paid by cattle feeders. Such cattle should be sent to markets where there is a feeder outlet, such as the Missouri river markets. In the St. Paul market of late buyers have been paying from \$5.50@6.50 per 100 lbs. for feeders weighing from 650 to 950 lbs., while good feeding cows brought \$4.50@5 for lots weighing around 900 lbs., such cattle being shipped to the Dakotas, Minnesota, Iowa and Illinois.

The Chicago hog market has undergone a remarkable improvement in recent weeks that has raised prices for all descriptions to generally unexpectedly high levels, and it is expected that further advances will take place. In short, the requirements of local packers and eastern shippers have been extremely liberal, while of late yard speculators have taken a conspicuous hand, making large purchases of the better class. Prices were the highest paid since last October, with the bulk of the hogs selling at a range of 30c per 100 lbs. and the best light weights going about 20c below prices paid for the best heavy weights. This condition of things is due to the great predominance of light hogs, the average weight of the receipts being much below that of recent years. The hogs coming to market are steadily increasing in weight, however, and further gains in this direction are generally expected. Late receipts have been averaging heavier in weight than at any previous period since October. All things considered, it seems to be advisable for stockmen owning thrifty youngsters to hold them until they become well matured and superior in quality. The packers need large numbers for converting into cured meats, and never in the past was the general consumption of fresh pork products anywhere near so large as now.

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No. line wires	Height in feet	No. stays per rod	No. 9 top and bottom and No. 12 filler.	Weight per rod	Price per rod F. O. B. Port Huron, Mich.	Price per rod F. O. B. Minneapolis, Minn.
7-26-16	3	3 1/2	3 1/2	4 1/2 lbs.	\$0.15	\$0.16
7-26-30	3	3 1/2	3 1/2	5 1/2 lbs.	.18	.19
8-34-16	3	3 1/2	3 1/2	5 1/2 lbs.	.18	.20
8-34-30	3	3 1/2	3 1/2	6 1/2 lbs.	.22	.24
8-45-16	4	5	5 1/2	6 1/2 lbs.	.19	.21
9-42-16	3	3 1/2	3 1/2	6 1/2 lbs.	.21	.23
9-42-30	3	3 1/2	3 1/2	8 lbs.	.26	.28
10-50-16	3	3 1/2	3 1/2	7 1/2 lbs.	.24	.26

HEAVY STOCK FENCES

All No. 9 Wire	Weight per rod	Price per rod F. O. B. Port Huron, Mich.	Price per rod F. O. B. Minneapolis, Minn.
9-48-12	12 lbs.	\$0.36	\$0.39
10-50-12	13 1/2 lbs.	.40	.43
10-50-16	14 1/2 lbs.	.44	.47

POULTRY FENCE

18-50-24	1 1/2, 1 3/4, 1 1/2, 1 3/4, 1 1/2, 1 3/4, 1 1/2, 1 3/4	12 lbs.	.39	.42
Staples Galvanized, 1 1/2 inch, per bag of 25 lbs.			.85	.90
Brace Wire, No. 9, Soft, per coil 25 lbs.			.80	.85
Stretcher, all iron, double draw			7.50	7.75
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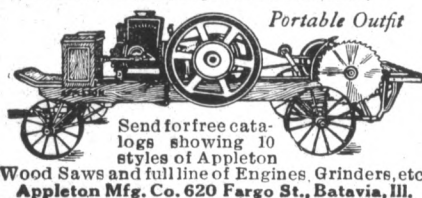
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1. One or more meetings each month. (A "meeting" is defined as one opened and closed in ritualistic form).
2. Owning or renting a hall or having other fixed place of meeting.
3. A program at every meeting unless degree work prevents.
4. An average attendance of 25 per cent of membership.
5. Reports to State and Pomona Granges made during the first month after a quarter has closed.

Optional Requirements.

1. Opening and closing without using manuals.
2. Degree work memorized by officers or special team.
3. At least 15 per cent of membership members of Pomonas.
4. Observance of days set aside by State Grange.
5. Promptness in opening and closing.
6. Co-operative trade through Grange contracts to amount of \$500 or over each year.
7. An orchestra, band, chorus, quartette or Juvenile Grange.
8. Observance of parliamentary practice in conducting meetings.
9. Degree work in all four degrees at least twice each year.
10. Leading in some effort for community betterment.
11. Presenting two public programs of dramatic or other literary form during the year.
12. The presentation of one public healthy program.

NEWAYGO COUNTY POMONA.

Newaygo County Pomona met with Ashland Center Grange December 29-30. Never has there been such an attendance since the early days in the history of the Grange in Newaygo county, when contests were at their height. Ashland Grange is composed largely of young people and is next to the largest Grange in the county.

Seventy-five sat down to the first table where a delicious chicken dinner was served and 75 at the second, with about a dozen left for the third.

When Grange was called to order for the afternoon program nearly 400 people were in the hall. One of the noticeable things were the children present. These children had a part in the afternoon exercises and they certainly delighted the hearts of all present. The principal subject for the afternoon discussion was "National Preparedness," Bro. R. M. Hall opening the subject. He was not in favor of it, and said we should nourish a christian spirit. Oscar Blood, a Civil War veteran, believed in being ready. He believed in paying out more money to maintain a good standing army and less for good roads. Another believed,

not in force of arms, but in justice, peace and mercy.

Bro. J. H. Edwards gave the speech of the afternoon. He said he was not in favor of the jingo talk of the newspapers. It was one of the greatest curses that ever struck this country, and goes hand in hand with the liquor traffic. We can mine every harbor in ten days. We have ample time to get ready, and in 30 days we can drill an army of 100,000 men. He would build up a citizenship that would demand the respect of the nations. The poor suffer most in time of war. If we pick up a war every family will have a vacant chair. Mr. Edwards is in favor of a conscription law, fixing the law so that no substitutes can be bought, thus making it necessary for the president himself to go if called.

Miss Laura Carr read a good paper on "Community Service for Women." She believed in women doing all in their power to promote the welfare of their own neighborhoods. Miss Carter said every neighborhood should have a leader—one that would be willing to go ahead and start something for the good of the neighborhood.

Mary Robertson said the Grange was the greatest factor in community service. She told of the get-together spirit of the big meeting and was in favor of contests in canning clubs to bring the young people to the Grange.

Miss Carrie L. Carter, Commissioner of Schools, gave a fine talk on "Factors for a Good School." She told what a problem it was to care for so many school children physically, and gave plans for ideal schools and grounds.

Mr. H. B. Blandford, County Agent, related his experience in the county achievements of Newaygo county the past year. The result is that banner potatoes and beans are being shipped out by the carload at high prices.

On Wednesday evening a business meeting was held, five candidates were instructed in the fifth degree and officers were elected.—Mary Robertson.

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. Hamline, Alma; W. K. Crafts, Grass Lake; Edward Burke, St. Johns; Mrs. C. J. Reed, Spring Arbor; Mrs. R. E. Moore.
Address all communications relative to the organization of new Clubs to Mrs. J. S. Brown, Howell, Mich.

Associational Motto:

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

Associational Sentiment:

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

CLUB DISCUSSIONS.

Ray Farmers' Club met at the hall on Thursday, January 13, for their annual oyster dinner. Despite the inclement weather about 65 members were present. After a sumptuous dinner the meeting was called to order by President J. A. Priest. Song by Club, invocation by Mr. J. P. Gilmour, followed by a short business meeting. The program which was necessarily short, was then taken up. A fine report of the state convention at Lansing was given by our delegates, Mr. and Mrs. H. E. Curtis, after which the Club adjourned to meet with Mr. and Mrs. C. J. Hartway in February.—Mrs. J. A. Jewell, Cor. Sec.

Two Interesting Papers.—The January meeting of the Ingham County Farmers' Club was held at the M. E. Church with Messrs. Searl, Root, Clinton and Densmore and their wives as hosts and hostesses. President Ives called the meeting to order and with Mrs. Watts at the organ all joined in singing the "Sweet Bye-and-Bye." Mrs. Tanswell read a letter from Clarence J. Reed, president of the Jackson County Farmers' Club, inviting our Club to attend a meeting to be held at the court house in Jackson, February 9. R. J. Robb explained that this organi-

zation was composed of members of the various Clubs in the county, held two meetings in the year, one in February and one in August. The invitation was accepted. The first paper of the afternoon was "Grinners and Growlers," by Mrs. W. H. Taylor, who treated the subject as one who smiles, and the grouch, and in looking over papers she found many, many items about the smile, but only one upon the grouch, which she gave in full. A good definition of a smile is a certified check for happiness that can be cashed anywhere. A smile is worth a million dollars and does not cost a cent. The secret of a long life is never losing your temper. In the discussion Mrs. Shafer said smiles grease the wheels of everyday life, and told of meeting a person one day in spring, when the sun shone bright and beautiful overhead, but muddy underfoot. He referred to the mud, she spoke of the sunshine, when he replied, I am not going that way today. Mrs. Bowden gave a history of the royal families of Europe, telling how they were all related by ties of blood. The next paper was by Mrs. Ives, who said in part that the elements seemed to go in threes, earth, air, and water; root, stem and leaf; father, mother, child; so she would take "Barns, Barnacles, Brass Tacks." She described the modern barn, arranged for convenience, drainage and sanitation, mentioned all the tools necessary for farm work and a building necessary to cover them. A good hog house, for the hog, was the mortgage lifter. A hen house, for the hen keeps the larder well filled. With all this expense, how much was used for kitchen efficiency? One-tenth would add many conveniences. Club then adjourned to meet the second Saturday in February with Mr. and Mrs. W. S. Root on South street. The program committee is busy at work and it is expected the year-books will be ready for distribution at the next meeting.—Mrs. Tanswell, Cor. Sec.

The Riley Farmers' Club met with Mr. and Mrs. P. J. Staub, January 13, at 10:30 a. m. The meeting was called to order by President Frank Faiver. Following opening exercises the Club voted to join the State Association of Farmers' Clubs. Mr. Burke, of Greenbush gave a short talk on the benefits derived by joining the State Association. Following dinner the Club was called to order at 1:30 p. m. Songs, "Old Black Joe," and "Massa in the Cold Ground." It was voted to add the name of Olive to our Club, henceforth to be known as the Riley-Olive Farmers' Club. Members then drew for the next meeting. The February meeting going to Mr. and Mrs. Thompson. Dr. Gohn, of St. Johns, gave a talk on hog cholera, saying he wished every farmer in Clinton county to join him in doing all in their power to prevent the disease from spreading in Clinton county. An address on, and thorough discussion of, hog cholera and how to prevent it, was given by State Veterinary George Dunphy, in which he said the only way is for the farmers to pull together and clean up, and to co-operate among themselves and with our county agent. A talk on what a farmer can do, by Mr. Burk, was much appreciated. Two new members were added to the roll. The program afforded several good musical and literary numbers. An extension school from the extension department of M. A. C. will be held at the South Riley Grange Hall from January 24 to 27, with a large attendance enrolled and a profitable time expected.—Ella Blizzard, Cor. Sec.

Have Oyster Supper.—Gun Plains Clover Leaf Farmers' Club met at the home of Mr. and Mrs. Oscar Howe on Tuesday evening, January 11. About 70 were present. A bounteous oyster supper was served, followed by the meeting. The program was good. Several fine musical selections were rendered. The chief amusement of the evening was a "fish pond" where old and young participated. A discussion was given in regard to getting speakers on agriculture from the M. A. C., and it was decided not to have them this year.—Mrs. Fred Myers, Cor. Sec.

Membership Increasing.—The West Otisco Farmers' Club held their January meeting at the home of Mr. and Mrs. Russell Slayton, January 6, and passed a very pleasant day. About 45 people helped to dispose of the bountiful dinner provided for the occasion. Several of the 38 members of the Club were unable to attend on account of sickness, which was much regretted. Two new members were voted in, and four new names were presented to be voted on at the next meeting. A good program was well rendered, and the topic for the day was thoroughly discussed. Our president and his wife who were delegates to the state meeting at Lansing, gave a good report of the meeting which delighted their hearers. The next meeting will be held at the home of Mr. and Mrs. W. B. Travis.—Martha Hall, Cor. Sec.

This announcement is appearing all over this country at the same time. We are determined to sell the lands described herein just as quickly as possible. If you want to own one of these farms then by all means send us the coupon below, together with your first remittance, today without fail. If you will not take our word as a guarantee, and you desire to know more about these lands before reserving a farm, then send coupon for our literature below.

This Company—Our Plans

This Company is a sister corporation of **The Long-Bell Lumber Company** of this city, which holds first rank among America's largest lumber producers. You may investigate this company thru your bank, Dun's or

ers and idlers will find nothing congenial among the men and women who are coming to the Long-Bell Farms with funds to build their homes and plant their crops, and who know what success is. We have 200,000 acres of land to sell, beside that now being offered for sale, and we want to make the first 100,000 acres we sell quickly dispose of the remaining portion of our holdings. With this

benefits derived from transportation, etc., in Beauregard and Vernon Parishes tend to make our land have a value in excess of \$25.00 per acre.

Read carefully the table below, and as you read remember this: If you do not take advantage of reserving a farm now at these prices you have no one to blame but yourself.

TABLE OF PRICES AND TERMS

50c per acre is the Reservation Price, no matter what land is allotted you.

Price Per Acre	Time Limit	Reservation	Down Payment Made After Inspection	Time Interest
\$12.00	Jan. 30 to Feb. 5, 1916,	50c per acre	\$5.00 per acre	3 to 5 yr. 6%
14.00	Feb. 6 to Feb. 15, "	50c per acre	6.00 per acre	3 to 5 yr. 6%
16.00	Feb. 16 to Apr. 1, "	50c per acre	6.00 per acre	3 to 5 yr. 6%
18.00	Apr. 2 to June 20, "	50c per acre	6.00 per acre	3 to 5 yr. 6%
20.00	June 21 to Sep. 15, "	50c per acre	6.00 per acre	3 to 5 yr. 6%
22.00	Sept. 16 to Nov. 1, "	50c per acre	6.00 per acre	3 to 5 yr. 6%
25.00	Nov. 2 to Dec. 31, "	50c per acre	6.00 per acre	3 to 5 yr. 6%

80 acres is the largest farm we will sell to each man at \$12.00 per acre.

You select your own land if our selection does not suit you. You are allowed 90 days in which to make an examination in person or through agent. No sale complete until land is examined and accepted by you or for you in writing. If land allotted you is not satisfactory, all reservation money will be returned to you.

How to Send Reservation

Select, for instance, 80 acres. Send us \$40.00 as reservation. You will be allotted the land for sale at the prices which prevail when your reservation is received. If not satisfactory to you, we will return the \$40.00 to you on demand. That is all you have to do. First come will be first served. The \$12.00 land is the same quality as the \$25.00 land. You can select your own farm if you so desire, after you make your reservation.

Our Guarantee

Send us your reservation and remittance of 50c per acre for each acre you want to reserve, and we will allot you land at the price at which same is being sold at the time your reservation arrives. The only rule we follow is "First come, first served." As mail comes into our office it will be stamped with the day, the hour and the minute, and it will be opened in this manner.

The first reservations receive the lowest price land, the \$12.00 land is the same quality as the \$25.00 land, and those that follow, follow in this order. We will notify you immediately after allotment the price at which you bought. If this is not satisfactory to you, we will return every cent you have paid.

Long-Bell Farm Land Corporation

By R. A. LONG, Chairman the Board of Directors

Bradstreet's, or in any way you so desire. The fact that its name is connected with this project should be sufficient for you to investigate carefully the opportunity it offers.

We want the men and women who buy our lands to know that everything we say we will do we actually will do. We want a man to buy an acre of land who does not believe he is capable of developing his farm as a good farm should be developed. We want men and women who understand how good is the climate and soil and who know how to make the climate and soil return to them the income that is worthy of their effort. Dream-

end in view we have decided to sell our land upon the following lines:

The Plan

In a table given above you will see exactly what land we have to sell and the prices at which we are selling it. There is no difference between the highest priced land we offer and the lowest priced, except a price difference.

Raw, uncleared, unimproved land throughout the South is frequently sold by similar organizations to our own at \$25.00 per acre. We believe the natural advantages and the

All you have to do is to determine the number of acres that you want to reserve. Then remit us 50¢ per acre, together with the reservation coupon below. As these coupons come into our office they will be allotted land at the prices then prevailing. For instance, if you get your reservation to us the first one, you will receive land upon a basis of \$12.00 per acre. When time limit has expired we will select you a farm at \$14.00 per acre, and allotments will be made in this manner. The 50¢ per acre reservation applies for any size farm of 40 to 80 acres each.

As soon as we have allotted this land to you we will send you a purchase contract and a receipt for the money you have remitted to us, and we will tell you exactly the price at which your land was bought. If this price is not agreeable to you we will return to you every cent you have paid. There are no "ifs," or "ands," about this statement. The question of price is made for the purpose of quickly disposing of our land and placing settlers upon it, in order that we may settle up this community as fast as possible.

After you receive our purchase contract you will be given ninety days in which to investigate your land, without any further payments. When you have seen your land if it is not entirely to your satisfaction you may select a tract entirely to your own liking, or failing to do this, we will refund every cent you have paid us. This is the way we intend to do business.

We do not want you to buy an acre of this land, nor to reserve a tract, unless you can see your way clear not only to keep up your payments to this Company, but to make the kind of improvements that are necessary in any new farming section.

Our Free Book

No matter whether you send us a reservation or not be sure and send us the coupon below for our free book entitled "Where Soil and Climate Are Never Idle." In this book you will find every phase of Long-Bell Farms entirely covered. We will show you by the eye of the camera the very country you will view when you go down to investigate your land. We will give you facts and figures with respect to this section of Louisiana. We will tell you of the work done by the manager of the Long-Bell Demonstration Farm, which comprises 612 acres. You will see pictures of oranges, oats, corn, cotton, vegetables, figs and grapes grown on the very same farm.

We will tell you of a country where, upon a few acres, you can earn an easier and a larger living than you are now doing. We will tell you and show you a section of Louisiana where from the standpoint of education, health, comfort and transportation you can enjoy life to your fullest. We will show you how land values are increasing all over Louisiana, and in this section particularly, and we believe that we can convince you with this literature that here is the place for the man who wants to succeed and to locate.

We do not intend to lure you by fancy pictures of any kind, but we are going to talk to you in a man to man fashion about one of the choicest spots that is as yet left untouched by the plow of man. By all means send for our great literature today. Just clip the coupon now and place it in an envelope and send to us.

Suite 410 R. A. Long Building, Kansas City, Mo.

LONG-BELL FARM LAND CORPORATION,
Suite 410 R. A. Long Building,
Kansas City, Missouri

Please reserve me.....acres in your Long-Bell Farms Colony. I enclose \$..... as my reservation remittance. If the land you allot me is not satisfactory to me in price, or for any other reason, you agree to return the amount of money I enclose herewith upon demand by me.

Name.....
Address.....
State.....

Note—If you have not the money in the house, write us a letter or telegraph at our expense and tell us definitely when this money will reach us, and we will make a reservation and hold to your order for ten days.



LONG-BELL FARM LAND CORPORATION,
Suite 410 R. A. Long Building,
Kansas City, Missouri

Please send me your great book entitled "Where Soil and Climate Are Never Idle." I bind myself in no way to buy one of your farms, but I agree to read your book.

Name.....
Address.....
State.....

Note—If you want to know the commercial value of the company standing responsible for this announcement you may refer to any bank, express company or the commercial agencies such as Dun or Bradstreet.

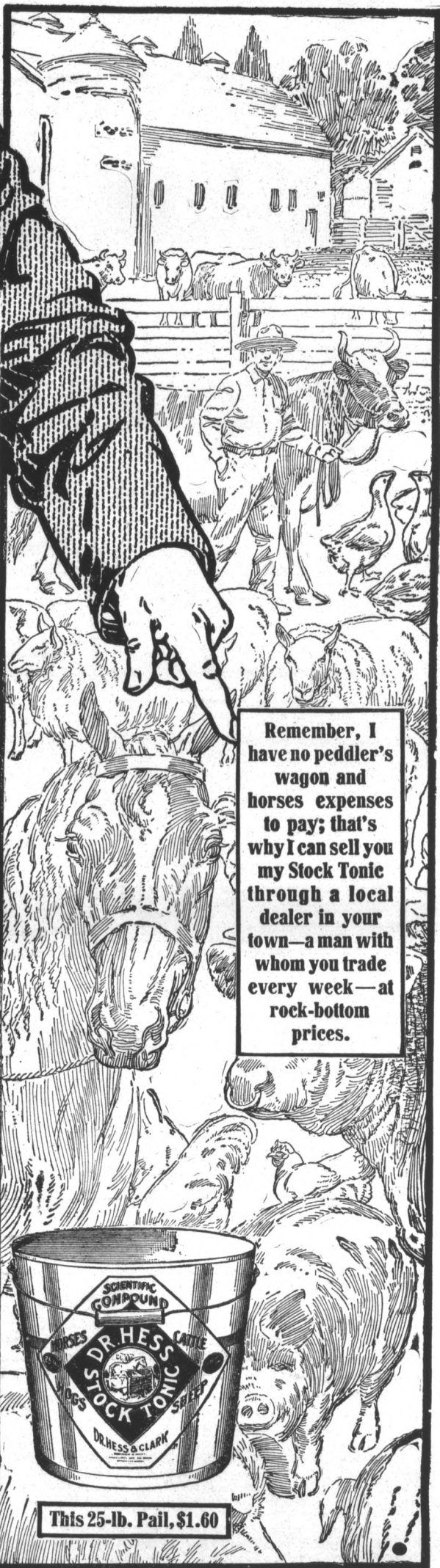


If you have a sick or injured animal write me at once, giving symptoms, and I will send you prescription and letter of advice free of charge. Send 2c stamp for reply.

I'LL PUT YOUR STOCK

in a thriving condition, make the ailing ones healthy and expel the WORMS.

DR. GILBERT HESS
Doctor of Veterinary Science
Doctor of Medicine



Remember, I have no peddler's wagon and horses expenses to pay; that's why I can sell you my Stock Tonic through a local dealer in your town—a man with whom you trade every week—at rock-bottom prices.

This 25-lb. Pail, \$1.60

Why Pay the Peddler Twice My Price?

I urge every farmer to see to it right now that his work horses are put in condition for the hard work of spring and summer, so that when the sun shines your horses will be rid of their old coats, full of stamina and ready for business.

And don't overlook the spring pig crop—the mortgage lifters. Start them off free from disease—free from worms.

Be sure, also, that your milk cows are thoroughly conditioned for the long, heavy milking season, and that those with calf are vigorous and fit.

Remember, your stock have been cooped up for the last few months and have been on dry feed. As corn or oats, hay and fodder do not contain the laxatives and tonics so abundantly supplied in grass, your stock are pretty apt to be out of fix. Some of your animals are liable to be constipated, rough in hair, their legs may have become stocked, or they have dropsical swellings, but the most common disease of all, especially among hogs, is worms—worms.

DR. HESS STOCK TONIC

25-lb. Pail, \$1.60. 100-lb. Sack, \$5.00

Highly Concentrated, as the Small Dose Quantity Proves

Now, as a worm expeller, I will go the limit in guaranteeing my Stock Tonic. To clean out your hogs, put in the swill one tablespoonful of my Tonic to every two hogs twice a day and you'll make short work of the worms. Dr. Hess Stock Tonic is

A Sure Worm Expeller A SPLENDID TONIC

This preparation of mine is 24 years old, farmers everywhere have tested it. I feed it to my own stock, for I know that it contains the necessary ingredients for enriching the blood, improving the digestion and assimilation, keeping the entire animal system clean and well regulated.

Now here is my guarantee to you—a guarantee that my dealer in your town will back up in letter and spirit; it must surely convince you of the undoubted faith I have in this preparation—read it very carefully:

So sure am I that Dr. Hess Stock Tonic will put your animals in a thriving condition, make the ailing ones healthy and expel the worms, that I have authorized my dealer in your town to supply you with enough for your stock, and if it does not do as I claim, return the empty packages and my dealer will refund your money.

And here are my prices—just half what the peddler charges: 25-lb. pail, \$1.60; 100-lb. sack, \$5.00. Smaller packages as low as 50c (except in Canada and the far West and the South). Sold only by dependable dealers who are known for square dealing.

I have a book about Dr. Hess Stock Tonic that you may have for the asking.

DR. HESS & CLARK, Ashland, Ohio

Dr. Hess Poultry Pan-a-ce-a

This is just the time you should be giving your poultry this splendid tonic. It will put them in fine condition, make your hens lay, ensure fertile hatching eggs and strong, vigorous chicks. Very economical—a penny's worth is enough for 30 fowl per day. Sold only by reliable dealers—1½ lbs. 25c; 5 lbs. 60c; 25-lb. pail, \$2.50 (except in Canada and the far West). Guaranteed.

Dr. Hess Instant Louse Killer

Kills lice on poultry and all farm stock. Dust the hens and chicks with it, sprinkle it on the roosts, in the cracks, or, if kept in the dust bath, the hens will distribute it. Also destroys bugs on cucumber, squash and melon vines, cabbage worms, etc., slugs on rose bushes, etc. Comes in handy, sifting-top cans. 1 lb. 25c; 3 lbs. 60c (except in Canada and the far West). I guarantee it.

LIVE STOCK FOR MICHIGAN
WASTE PLACES.

(Continued from page 126).

feed. And out there in the Arizona, New Mexico, Colorado, Nevada, Utah, Montana, Wyoming, waste places it takes, and always will take, from 20 to 80 acres to keep one cow. Do we cry, "God-forsaken?" God forbid? On the contrary that region has been blessed with brave lives and the inflated dollars of those who see nothing in the things near at hand but for whom distance lends enchantment.

Since 1641 when the Jesuits established Michigan's first settlement, did you ever hear of cattle dying in Michigan for lack of food or water? Given access to the food and browse of Michigan's waste places they will suffer less from cold, starvation or thirst than in any of the present waste places of earth. Yes! Take it from the writer. A truth worthy of the most careful consideration and searching investigation. The sandiest sands of Michigan's waste places, with their variety of nutritious grasses and herbs, their shrub and tree browse, their evergreen cosy shelters, their anti-freezing springs and babbling brooks, their crystal rivers and lakes, have more ovine, equine, bovine or porcine sustenance, in winter or summer, on one acre, than those western alkali barrens can rake and scrape from a forty.

Michigan vs. Western Ranges.

The writer sought out the flocks and herds of Montana and Wyoming that go through the winter rustling their own living. Of cattle dependent for their winter livelihood on their own grazing, not a herd was found, though in times past fortunes were amassed on herds self-supported; and as freely melted as the melting snows revealed the havoc of the periodical hard winter. But there are still some very large sheep holdings in those states that graze their own winter keep. If some wintry day these latter flocks could be set down in the brush sheltered, cut-over, waste places of Michigan (reserved from summer grazing for this purpose, as their western barrens are kept), busy bitings and satisfied bleatings, would promptly announce this arrival in nanny heaven.

Coyotes and wovles and mountain lions are a constant menace despite the most efficient shepherds and their faithful dogs. The losses from these causes are never less than ten per cent of the lamb crop; out there in that sheep country par excellence (?) as it appears to those who have only seen it from this country. Their interest rates on borrowed money are nearly twice, out there, the legal rate of Michigan and money is scarcer. Freight rates to Chicago and Missouri river markets are on an average not less than \$160 per car, while the rate from Michigan's range lands will average less than \$40 to Chicago or Buffalo, two of the best markets in America. With Michigan waste places fenced with woven wire, dog-proof, the losses of sheep from carnivorous foes would be nothing. These small pastures will reduce the labor expense more than half, and a little common sense (fence sense) at the time the rams were used would insure from 20 to 40 per cent greater Michigan lamb crops than obtain out west.

Why, then, is every available range in that western desert, fully occupied or overstocked with cattle, sheep and horses, while millions of vastly superior Michigan acres lie neglected and idle, the prey of top-penny tax assessors and squanderers? The answer is obvious to any sane investigator. Michigan men able and capable of making these regions immediately profitable to themselves and a splendid asset of the state, simply have ears that hear not, eyes that see not and understanding that refuses to apprehend, when they face northward and contemplate the beckoning possibilities of their own state.

The most lowly, despised Michigan

jack-pine plain, with its abundant, crystal spring waters, its grazing, browsing and natural timber shelters; set down in any of these western, range barrens lying between the Canadian and Mexican borders, would be a live stock paradise, for a comparison it would be a garden of eden.

Large Holdings Essential.

Those lighter Michigan cut-over lands now lying waste and unused, should all be acquired in large holdings (from a section, up), and fenced into small pastures, (from 40 to 160 acres). Where these pastures lack natural springs, lakes or watercourses, wells which are extremely inexpensive, windmills and tanks, should be provided. Winter pastures should be ungrazed in summer, so that the live stock may harvest their crop during the dormant months. Cattle will graze and browse thriftily in such pastures till near the middle of December and begin again about the middle of March. During such winters as the present one they will get a very considerable part of their thrift making sustenance, between those dates. Sheep and horses will dig, even in the deepest snows, all winter, and thrive in such pastures without other help. Ice, largely made by the pressure of their feet on thawing snow, may seal much of the grass away from the sheep, but between that ice and the sod it will be economically and perfectly preserved, sweeter incomparably, than silage, and the writer believes, more nutritious; against those days in March when the dissolving wind and sun exposes it gradually in the most appetizing form, that is not even surpassed by the delicious new growth of April and May.

Would that some captain of finance might see his way to do something for these Michigan waste places. We have men whom Michigan has made richer than the dreams of Aladdin, whose beginnings were on the farm. Here peace and prosperity can be promoted while dividends add to the joys of public spirit.

* * *

Two-fifths of southern Michigan, i. e., the southern peninsula, lies above a line drawn from the most westerly projection of Saginaw Bay to most westerly promontory at Little Point Au Sable in Lake Michigan. Such a line courses east and west at the middle of Bay, Midland, Isabella, Mecosta, Newaygo and Oceana counties. Below that line is as good land for farm homes as the sun shines on; largely developed. Above that line the lands average just as good but are largely undeveloped. There are lands above that line as good as any that lie below it. And there are lands below that line as poor as any that lie above it. There is comparatively no difference in the climate. The great bodies of water to the north, east and west modify all Michigan temperature. So much so that killing frosts frequently occur as far south as Indianapolis, before the southern peninsula of Michigan is hit. The entire region of southern Michigan from Midland to Mackinac being closer to larger bodies of water, has, if anything a steadier climate, and more healthful, the moderating influences of surrounding waters permitting less fluctuation.

* * *

The job of profitably developing Michigan's waste places is essentially one for capital. It takes too long for mere labor with a pittance of money to change the wilderness into a profitable farm, though thousands upon thousands have done it. After the land is fenced and ranches and the sheep, cattle and horses have profitably disposed of the brush, letting the sun reach the earth through their droppings and making billions of grass blades luxuriate where only bracken and fern grew before. Then let the small farm home come, and welcome. Every forty will be wanted at an attractive price and the farmer will prosper from the start.

* * *

Just One Reading Brought Results

A northern Illinois farmer read just one copy of THE BREEDER'S GAZETTE and sent in the price of a year's subscription. He was not hasty in forming a conclusion. He simply knew what he wanted when he saw it. This is how he explains it:

"I find in your journal articles setting forth the experiences and views of the most successful farmers and stockraisers the country over, and also the names and addresses of the most noted breeders and importers of pedigreed stock."

And why did these things interest him? He states it briefly: "A farmer should never lose opportunity to improve the quality of his stock."

There you have it. It is easy enough to understand why a reading of one issue of THE GAZETTE showed this Illinois farmer that he had found what he was looking for.

There are lots of farmers who do not care for this journal, and we are not trying to make the kind of paper they like, so we are even. We know how to make that kind of paper, but we are a little too proud to do it.

The founder of THE GAZETTE, a man of far and clear vision, would likely haunt the present generation carrying on his work if we should attempt to make such a paper as many farmers seem to like.

It is a lot easier and cheaper to make that kind of farm paper than to publish THE GAZETTE once a week. And if reports be true, there is more money in it.

There ought to be, as it costs a lot less to make them. And until advertisers learn the fallacy of the quantitative theory of circulation, until they learn that the character of a journal's constituency is worth more to them than mere numbers, it is likely that the cheap sheets will make more money than those which work constantly toward high ideals and command a constituency of community leaders, who can ordinarily buy what they want.

Perhaps you missed one point that our Illinois reader raises. He found that this journal contains articles from successful people "the country over." THE GAZETTE is a journal of national survey and circulation. No other farm paper approaches it in these respects. Are you a provincial, interested merely in the things of your own neighborhood, or state or section, or do you desire to touch elbows with your fellows in their farm and stock field the country over?

A year's subscription to THE GAZETTE costs but \$1, and will include a big double Holiday Number, beautifully illustrated.

One copy of a regular issue will cost you nothing if you will ask for it. Write for one today. Address

THE BREEDER'S GAZETTE
Room 1125, 542 South Dearborn St., Chicago, Ill.

PICK THE GRADE YOU WANT—WE CAN SUPPLY IT

Selected Quality Cotton Seed Meal
CRACKED CAKE (NUT AND PEA SIZE) COTTON SEED HULLS
F. W. BRODE & CO., Inc., Memphis, Tenn.
Headquarters for Cotton Seed Products
GOOD FOR

They Need Protein. Feed Balanced Rations. Our Booklet, "Science of Feeding," Free for Distribution.

Raised Without Milk!
Her name is "Daisy" and her owner, W. A. Riddle, of Chapin, Iowa, raised her on Blatchford's Calf Meal, which costs less than half as much as milk.

Blatchford's Calf Meal
A useful preventive of scouring. Calves raised "The Blatchford Way" are heavier, bigger-boned and healthier. Known as the complete milk substitute since the year 1875. Sold by your dealer or direct from the manufacturer.
Blatchford's Pig Meal insures rapid, sturdy growth of young pigs at weaning time. Prevents setback.
See Actual Figures—based on results—that show you how to increase your calf profits. Write today.
Blatchford Calf Meal Factory, Dept. 4381, Waukegan, Illinois

Grinds Corn, Cob, Husks All At One Time
Only feed mill that successfully grinds snap corn at one operation. Also grinds alfalfa, clover, all kinds of grain. Silent running—buhrs self-sharpening and self-shipping. Uses less gas—grinds 1000-3000 bu. one set buhrs. 10 days free trial to convince you that in fine grinding, capacity and light running the Letz is 100% efficient.
LETZ FEED MILL
Self-Sharpening, Silent-Running
Write today—give h. p. of your engine—we'll send you valuable 48-page book "Efficiency and Economy in Feeding Farm Animals."
Letz Manufacturing Co.
210 East Road, Crown Point, Ind.

Ear Tags FOR STOCK
Tag your stock—best and cheapest means of identification for Hogs, Sheep and Cattle. Name, address and number stamped on tags. Catalog and samples free on request.
F. S. Burch & Co., 189 W. Huron St. Chicago

BREEDERS' DIRECTORY.

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Ten Days before date of publication.

CATTLE.

ABERDEEN-ANGUS

HERD ESTABLISHED IN 1900.
TROYAN-ERICAS and BLACKBIRDS only.
Also breeders of Percheron, Hackney and Saddle
Horses.
WOODCOTE STOCK FARM, Ionia, Mich.

ABERDEEN ANGUS

If you are in need of an extra good bull or a few choice
young cows or heifers, we have them for sale. Our
herd is headed by the Grand Champion Black
Monarch 3rd. We invite you to come to our Farm and
see them. They are bred right and priced right. U. L.
Clark, Hunters Creek, Mich. Sidney Smith, Mgr.

Aberdeen Angus Four young bulls also young
cows and heifers. Extra good.
Priced reasonable. Inquire F. J. Wilber, Ohio, Mich.

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

THE VILLAGE FARM,

Grass Lake, Michigan,

GUERNSEY CATTLE.

MILO D. CAMPBELL CHAS. J. ANGEVINE

BEACH FARM
GUERNSEYS

Combine quality and health, the founda-
tion of a perfect herd.

In the sixteen months we have advertised in The
Michigan Farmer, we have sold 17 bulls and 30 females
of our own breeding which we consider very satisfactory
when most breeders are complaining of slow
sales. But good stock is always in demand when offered
at fair prices. It has been impossible to answer all
inquiries but we wish to thank all who have written.

At present we have Registered Bull
Calves only for sale.

CAMPBELL & ANGEVINE, Coldwater, Mich.

GUERNSEYS—REGISTERED BULL CALVES

Containing blood of world champions.
HICKS' GUERNSEY FARM, Saginaw, W. S., Mich.

Guernseys reg. for sale, Watervliet, Mich. May Rose

Seven A. H. cows in herd.
Address J. K. Blatchford, Auditorium Tower, Chicago, Ill.

REGISTERED Young Guernsey Bulls, great grand-
sons of Gov. Chene. Serviceable age nicely marked,
exceptional breeding. Avondale Stock Farm, Wayne, Mich.

Guernsey Bulls of service age and calves from
choice A. H. cows in herd.
T. V. HICKS, Route 1, Battle Creek, Mich.

Guernsey Bull Calves from A. R. dams and whose
dams are running for A. R. One ready
for service. G. A. WIGENT, Watervliet, Mich.

For sale from A. R. dams. 2 heifers bred to
Guernseys freshen in June. 1 2-yr.-old bull and 3 bull
calves. Geo. N. Crawford, Holton, Mich.

For Sale: Registered yearling Guernsey
Bull also Bull Calves. Write
JOHN EBELS, HOLLAND, MICH. R. No. 10.

REGISTERED Guernsey Bulls from A. R. Dams, ready for
service, tuberculin tested, also Registered Bull calves from
A. R. Dams, at Farmers' prices. Byers & Barnes, Coldwater, Mich.

Choice Guernseys For Sale —Bulls.
J. M. WILLIAMS, NORTH ADAMS, MICHIGAN.

Herefords—3 Bull Calves

ALLEN BROS. PAW PAW, MICH

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 1/4 % fat daughter
of Pontiac Aggie Korndyke who has more 30 lb.
daughters than any other living bull. If you do
write for pedigree.

EDWIN S. LEWIS, Marshall, Mich.

The Two Greatest Bulls

KING OF THE PONTIACS

DE KOL 2d's BUTTER BOY 3rd

I have young bulls from cows having high official
records and Granddaughters of above bulls. Stock
extra good. Prices reasonable.

BIGELOW'S HOLSTEIN FARMS,

BREEDSVILLE, MICH.

HATCH HERD

YPSILANTI, MICHIGAN

Registered Holstein-Friesian sires, grandson's of
World's greatest dairy sire, out of choice A. R. O.
dams and King Pontiac Jewel Korndyke. Brother of
K. P. Pontiac Lass 44.15; average record of 50 dams in
his pedigree 31.25 in 7 days; average per cent of fat
three nearest dams 4.37; of his own dam 4.38. Sires in
first three generations already have over 500 A. R. O.
daughters. A few females bred to "King". Prices
reasonable.

DISPERSION SALE

February 10, 1916.

Lilly of the Valley Farm, Ann Arbor, Mich.

15—Pure Bred Holsteins—15

15—High Grade Holsteins—15

7 day A. R. O. records 16 to 23 lbs. Horses, mach-

inery and Pure Bred Durocs. Ask for catalogue.

S. M. CROM

HOLSTEIN Bull Calf: Born Nov. 8th. A nice indi-
vidual, well grown, about evenly marked. His dam
and sire's dam have A. R. O. records that average Butter
7 days 24.83 lbs. Milk 563 lbs. W. B. READER, Howell, Mich.

\$190 Buys Reg. Holstein heifer 8 mos. old and
Reg. Bull 3 mos. old. Not akin. Good
breeding. FERD J. LANGE, Sebawaing, Michigan.

HERD SIRE

Maplecrest Korndyke Hengerveld and Finderne Pontiac Johanna Korndyke

The two great Holstein sires at the head of the herd. Maplecrest Korndyke
Hengerveld's dam and grand dam each made more than 1200-lbs. of butter
in a year, and including the great grand dam each made more than 30-lbs. of
butter in 7 days. His sire has sired three daughters that averaged over 1200-lbs.
of butter in a year.

Finderne Pontiac Johanna Korndyke is the son of the world's champion
cow, Finderne Pride Johanna Rue, who gave 28,403-lbs. of milk and made
1470-lbs. of butter in a year. He was sired by a brother to the 40-lb. 4 yr. old
Mable Segis Korndyke. The dam of the sire is a 30-lb. daughter of Pieterje
Hengerveld Count DeKol. This is believed by many to be one of the most
productive combinations in Holstein breeding.

I take pride in tendering the services of these animals to the breeders of
Michigan who are interested in yearly production. Many people feel it is the
yearly work that makes the greatest profit and our effort is along the lines of
yearly records. These two herd sires represent the highest culmination ever
yet produced for yearly production.

A few high class heifers in calf to Maplecrest Korndyke Hengerveld, and a few bull
calves from dams with records as high as 30-lbs. butter in 7 days, for sale.

D. D. AITKEN, . . . FLINT, MICHIGAN.

Duroc Jersey Boars and Sows

BROOKWATERS' WINNING COMBINATION

Best Blood Lines. Individual Merit. Prices that will make you money.

This is our record, one which we shall maintain. Choice fall and spring pigs and mature stock. Send for
our new circular and state your wants. Write or better come. If you wish one of the best young Jersey bulls
in Michigan we have him for sale.

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

DAIRY TYPE Plus PRODUCTION

Equals Crandall's

Holstein Friesian Cattle

Two very Good young Bulls for sale. Sired by Beauty Walker
Pieterje Prince 2nd. No. 107658. Dam, Hengerveld DeKol's
Best Daughter. Butter 33.62, milk 582.70. Write for Pedigree
if wanting Bull.

Frank R. Crandall & Son, Howell, Mich.

\$50 gets another 2 mo. old Hazel-let grandson of
Maplecrest DeKol Parthena and Pontiac
Maid 30.2 lb. butter 7 days. Dam traces to Pontiac
Korndyke twice Pieterje 2nd twice, DeKol 2nd five
times. M. L. McLaulin, Redford, Mich.

Ypsilanti Farms Registered Holstein young bulls
of choicest breeding at \$50 and
up. Ypsilanti, Michigan.

Holstein Bulls Ready
For Service.

Grandsons of Friend Hengerveld DeKol Butter
Boy and Pontiac Aggie Korndyke. From high
record A. R. O. dams at farmers' prices.

LONG BEACH FARM,
Augusta, Michigan. (Kalamazoo Co.)

Choice Holstein Bull Calves

Ready for service, World's Champion Parentage
HILLCREST FARM - Kalamazoo, Mich.

Special Notice

Registered Holsteins for Sale.

Our present farm being more valuable for real
estate than dairy farming, we are going to move
our herd further out from the city. We have twelve
bull calves which will be sold at prices from \$35 to
\$150 according to breeding—A rare chance to buy
a bull calf at a low price.

Espanore Farm, Lansing, 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
registered Holstein bull calves, the best breeding in
the world, grandsons of Grace Payne 2nd's Homestead,
Pontiac Korndyke, King Payne Segis and Hengerveld
De Kol. The dams of these bulls and calves, have
large advanced registry records. For prices, write
Callam Stock Farm, 204 Bearinger Bldg., Saginaw, Mich.

FOR SALE Registered Holstein Bulls

ready for service, and bull calves, also females.
FREEMAN J. FISHBECK, Howell, Michigan.

Registered Holstein bull 3 months old. Dams record
25 lbs. of butter and 500 lbs. of milk in 7
days. Sire, one of the best in Michigan. Mostly white,
beautiful individual. \$100 delivered, safe arrival
guaranteed. Write for pedigree and photo.
HOBART W. FAY, MASON, MICH.

Reg. Holstein Heifer Calves. Dams' records 17 and 18
lbs. butter. Price delivered \$130 each. Also, 1 yearling bull 23 lb. dam same
price. DEWEY C. PIERSON, Hadley, Michigan.

8 Reg. Holstein heifers, 4 are 8 months old and 4 are 5
months, at \$100 each. Also, 4 young bull calves at
\$30 each. Ernest A. Black, R. 3, Howard City, Mich.

HOLSTEIN Friesian son of G. Champion female Mich.
State Fair A. R. O. 2 yr. 9 days 372.5 milk, 16.143 but-
ter. Hengerveld DeKol breeding. John A. Rinke, R. 1, Warren, Mich.

1110 Farmstead Jersey Cattle. Bull calves from R.
L. of M. Cows, also heifer calves and several bred
heifers for sale. Colon G. Lillie, Coopersville, Mich.

THE WILDWOOD Jersey Herd. Registered Jersey
Cattle of Quality. Herd headed by Majesty's Won-
der 90777, one of the best sons of Royal Majesty. The
daughters of Majesty's Wonder are mated to a son of
Majesty's Oxford King. Herd tuberculin tested. We
have for sale a few choice young bulls for fall service
from high producing cows. Alvin Balden, Capac, Mich.

The All-Around
Jersey

is the farmer's cow. She's his
friend and pride—the beauti-
ful, gentle, ever-paying milk machine that lifts
the mortgage, builds up the fertility of the
farm, and puts the whole business on a sound,
paying, permanent basis. She adapts herself
to all climates and all feeds and does not
need fancy care. She matures early and
lives long. And she's so sleek, clean cut and
handsome, as to be the family pet and
pride. She produces well
and sells well. Learn
about her in our fine, free
book, "About Jersey Cattle."
Write for it now.



THE AMERICAN JERSEY
CATTLE CLUB
346 West 23d St., N.Y. City

MAPLE Lane R. of M. Jersey Herd. Tuberculin tested
by the U. S. Government. For sale bulls, cows,
bull calves and heifer calves. The lowest record of any
mature cow of this strain is 533 lbs. of 8% butter.
IRVIN FOX, Allegan, Michigan.

Jerseys. Bulls ready for service, extra quality sired
by Jacoba's Fairy Emanon, No. 10711, from high
producing dams. SMITH & PARKER, Howell, 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.

HILLSIDE Farm Jerseys, yearling bulls, solid
color, half brothers to ex-world's-record senior 2yr
old and from R. of M. Dams, with records from 400 lbs.
to 800 lbs. C. and O. DEAKE, Ypsilanti, Michigan.

23 Registered Tuberculin tested Jersey Cows for
sale. Also, young females
HERMAN HARMS, Reese, Michigan.

BIDWELL SHORTHORNS



For "Beef and Milk"
Registered bulls,
Scotch-topped roans,
reds and whites for sale.
Farm at N.Y.C. Depot;
also D. T. & I. R.'s.
BIDWELL STOCK FARM
Box B, Tecumseh, Mich.

Shorthorn Cattle of both Sex for Sale
W. W. KNAPP, Howell, Michigan.

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.

Shorthorn and Polled Durhams red roan and
white. C. CARLSON, Le Roy, Michigan.

Milking Strain of Shorthorns. Young bulls \$100 to
\$125 each.
WARNER BROS. Almont, Michigan.

For Sale—3 Bull Calves Sired by a 30 lb. bull. 1 from
a 28.58 lb. dam. Also 2 heifers 8 and 15
months old. Wm. Griffin, R. No. 5, Howell, Mich.

Two Shorthorn Bulls old enough for service. Golden
Wyandotte Cockerels. Collie puppies
S. G. BELCHER, R. No. 5, Hudson, Michigan.

For Sale—One red scotch bull 16 mos. Sire
Uppermill Omega. One white scotch top-
ped, Sire Bright Sultan. W. B. McQuillan, Howell, Mich.

FOR Sale—18 Reg. Short Horn Bulls by Maxwellton
Monarch 2nd, a son of Avondale, from 2 to 13 mos. old
John Schmidt, Reed City, R. No. 5, Michigan.

MILKING SHORTHORNS. Young bulls for sale.
after July 1st
DAVIDSON & HALL, Tecumseh, Michigan

The Bull Advertised in this paper last week is sold
but I have another good, robust young
bull, Ready for Service, sired by a Grandson of
Colantha Johanna Lad. Write, GEO. D. CLARKE,
Owner of Nederland Farms, VASSAR, MICH.

HOGS.

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

Royalton Bred Berkshires—Fine October pigs both
sexes, sired by Royalton
Emperor, registered with papers at fair prices. Write
to D. F. Valentine, Supt., Temperance, Michigan.

Berkshires of best breeding. Special price
on two Spring Boars.
D. W. SMITH, Wixom, Michigan.

TAKEN FROM LIFE
Raise Chester White Hogs
Like This
(CALLED BY SOME O. I. C.'S)
Write for my plan
"How to Make Money From Hogs"

I have started thousands of breeders on the road
to success. I have a very large and fine herd. Ev-
ery one an early developer, ready for market at six
months old. I want to place one hog in each com-
munity to advertise my herd.
G. S. BENJAMIN R. No. 10, Portland, Michigan

SWIGARTDALE BERKSHIRES

Are the kind that win at the Fairs and also produce
the litters as all of our show stock are regular breeders.
They have the size with the bone to carry them and
their breeding is unsurpassed. All the leading families
are represented. We have a few choice Spring Boars
now crowding the 300 lb. mark, for sale, prices from
\$20 up. We are now booking orders for Fall pigs for
January delivery. Can furnish choice Trios not akin,
for \$45 to \$50. We Guarantee Satisfaction.
Swigartdale Farm, Petersburg, Mich.

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 Have a choice lot of gilts. I am breed-
ing for spring farrowing. Write me
your wants. A. A. Pattullo, Deckerville, Mich.

Berkshire Sows bred for spring farrowing
priced according to market.
B. B. REAVEY, Akron, Michigan.

CHESTER WHITES—The long type, prolific kind,
either sex. Write your wants.
Meadow View Stock Farm, R. 5, Holland, Michigan.

Chesters and O. I. C.'s. Sows bred for March
and April farrow.
F. W. Alexander, Vassar, Michigan.

DUROC JERSEYS

Choice Spring boars and fine lot of gilts we are
breeding for Spring farrowing from Michigan
Masterpiece and other noted boars. Prices reason-
able. The Jennings Farm, R. 1, Bailey, Mich.

DUROC JERSEYS—A few choice
spring BOARS
ready to ship. Carey U. Edmonds, Hastings, Mich.

DUROC JERSEY BOARS a choice lot of spring boars.
Fall pigs, pairs and trios
not akin. W. C. TAYLOR, Milan, Michigan.

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

J. W. KEENEY, Erie, Mich. Breeder of Duroc
Swine D. M. & T.
local from Monroe or Toledo, Keeney Stop.

Duroc Jersey Boars of the growthy, heavy boned
type, also a few gilts. Inspection
invited. E. D. HEYDENBERG, Wayland, Mich.

DUROCS of the best of breeding. April farrow.
Either sex. The gilts will be bred for Apr.
farrow. Price \$20.00 to \$25.00 while they last.
H. G. Keesler, R. No. 5, Cassopolis, Mich.

FOR SALE. Duroc yearling Sows and May Gilts
and August Boars.
E. J. Aldrich, R. 1, Tekonsha, Calhoun Co., Mich.

DUROC Jerseys, Yearling Sows & gilts bred for Apr.
farrow to a son of Orion Cherry King the greatest Boar of his
breed. Also fall pigs either sex. F. J. Drott, R. 1, Monroe, Mich.

DUROC Jerseys—A couple of choice gilts bred for
Apr. farrow. Also an extra good spring boar. Send
card for price, etc. E. R. Cornell, Howell, Mich.

Duroc Jerseys for sale—a few choice fall pigs of either
sex. Fancy Buff Rock cockerels. JOHN
McNICOLL, Station A, Route 4, Bay City, Mich.

DUROC Jersey, Mar. gilts bred for April, Sept. pigs
either sex and Holstein bull calves & 4 Registered
Holstein cows. E. H. MORRIS, Monroe, Mich.

Heavy Boned Durocs—A fine bunch of Bred sows
and fall pigs For Sale.
M. A. BRAY, OKEMOS, (Ingham Co.) Mich.

Registered Chester White males and females. Reg.
Holstein male calves, herd bull and cows.
Parham's Pedigree Stock Farm, Bronson, Mich.

DUROC JERSEYS Boars and sows all sold. Some
good fall pigs either sex for
sale. Wm. W. Kennedy, R. 3, Grass Lake, Mich.

HAMPSHIRE SWINE. A few choice March and
April boars. Also two
good yearling boars. Yearling and Spring Gilts sold
open or booked, to be bred for March on April farrows.
Fall pigs single, pairs or trios not akin. Price to sell.
Write me your wants. Floyd Meyers, R. 9, Decatur, Ind.

Registered O. I. C. Swine
Stock For Sale—All Ages
Correspondence Solicited, Visitors Always Welcome

Brightside, Grand Lodge, Mich.

REGISTERED O. I. C. BOARS & GILTS

High class fall pigs at reasonable prices.
J. CARL JEWETT, Mason, Mich.

O. I. C.'s Fine gilt farrow in February, year-
ling, bred, sows, price right.
A. R. GRAHAM, Flint, Michigan.

O. I. C. SWINE Yes, I will pay
express charges
to your express office on August and September pigs
during the month of January. I also have choice gilts
bred for April farrow. A. J. Gorden, R. 2, Dorr, Mich.

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

O. I. C. Serviceable boars, spring gilts and fal
pigs not akin. Write for low prices and
photo. A. V. Hatt, Grass Lake, Mich.

Bred Sow Sale in Feb. 40 Big Stretchy Sows
and Gilts. Write for catalog.
W. J. HAGELSHAW, Augusta, Michigan.

O. I. C.'s 3 July boars. Bred gilts with size
and quality. \$22 to \$30 each.
C. J. THOMPSON, Rockford, Michigan.

Way Brothers Stock Farm. The home of the big
bone O. I. C. Hogs. Stock
for sale. Registered free. J. R. Way, Three Rivers, Mich.

O. I. C. March and April farrow, summer and fall pigs.
I pay express. G. F. ANDREWS, Danaville, Mich.

Breeders' Directory—Continued on page 151.

PLANT, R. No. 7. Traverse City, Michigan.

Why Not Get Both?



You Get This Spreader--It Will Pay for the Auto

Are you one of those who have a certain amount to invest and do not know whether to buy an automobile or a spreader? Get both!

You can do it,—if you get the New Idea Spreader *first*. Your automobile is an expense from the minute you get it—necessary and very desirable perhaps,—but still an expense. On the other hand your New Idea Manure Spreader is a money-maker from the very start. By enriching the soil through proper spreading it brings you enough extra crops to pay for your auto or anything else you may desire.

Your New Idea Spreader *brings* money and your auto *takes* money. That's the difference. The automobile is all right. We haven't a thing to say against it. But we do urge as a matter of farm business sense you get the spreader first. Then you'll be making money while you wait to buy your car. The figures given below prove you make money with a

NEW IDEA

Registered U.S. Pat. Off.

The fertilizing value of the manure from farm animals is surprisingly high. These figures are taken from the estimates of government experts. Taking an 80-acre farm as a basis, you are entitled to the fertility from 4 horses, 15 head of cattle and 40 hogs, which has the following manure value per year:

4 Horses	\$110.96
15 Cattle	439.05
40 Hogs	455.52
	\$1005.53

You are losing at least half of this when you fail to spread properly. This means a loss anyhow \$502.76 per year which you could as well have in your pocket if you used a New Idea.

The patented features on the New Idea enable it to spread manure in exactly the right way, evenly and wide enough to do the work with the fewest number of trips.

Not a Gear to It

No gears to break, freeze or get out of order. The New Idea is operated by strong chains. It's always ready. Our direct axle drive and feed eliminate lost power. Feed operated from one side of axle and spreader mechanism from the other.

The New Idea is low down for easy loading—43 inches high—and is of light draft. It's built like a wagon box, steel reach underneath and strongly braced at all points, especially around the cylinder to prevent cramping of bearings.

The New Idea is guaranteed for one year against breakage from any cause and is unconditionally guaranteed against defective material or workmanship.

"Helping Mother Nature" FREE!

A Book For Practical Farmers

This is not a catalog. It is not a fancy illustrated book for front porch farmers. It is a practical book of facts for the man who actually farms. Gives the results of government experiments in fertilizing. Shows the value of manure and how to apply it to get the biggest crops. This book is worth money to any practical farmer but you can have a copy free if you apply right away. Ask the New Idea dealer, or if there is none near write us for free copy of "Helping Mother Nature" and our catalog.

New Idea Spreader Company

152 First Street

Coldwater, Ohio

The New Idea spreads 7 feet wide, covers 3 corn rows. It spreads beyond the wagon tracks so you don't have to drive over the spread manure. It spreads *evenly*, giving all the land an equal chance. This is important because uneven spreading lessens the value of the manure. When too thick it burns the soil and bare spots receive no fertilization. Five feed changes take care of any soil conditions.

The wide, even spreading is secured by our patented distributor which sends the manure whirling in all directions. Double cylinders insure thorough pulverization and make it impossible to choke the New Idea by overloading. Our endless chain conveyor takes *all* the manure to the cylinders. None left to freeze or rot.

We also build the "NISCO"
—a special low down
type with narrow
front truck.



This is the **FREE BOOK** Write for it or ask the New Idea Dealer