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Reasons For and Benefits of Tile Drains.

THERE is very little land naturally so dry as not to be susceptible of improvement by artificial drainage, for land is never in a perfect condition in that respect unless all the rain that falls on it can soak down to the minimum depth required for healthy development of the roots of cultivated crops, and then find vent either through a naturally porous soil or by artificial channels.

Probably no better illustration can be given of the effects of water on growing plants than what we see in the case of plants growing in pots; every pot is provided with a hole in the bottom to allow the water to drain out when the soil becomes saturated and with the exception of water or bog plants, this drainage is necessary. If we see plants whose foliage turns yellow or drops off or which fail to grow and whose whole appearance is unthrifty we are almost sure to find the trouble to be at the roots and not unfrequently we find the drainage clogged and the roots inactive. Turning the plant out of the pot, placing some bits of broken crockery at the bottom, then some coarse material, the plant is returned to its place and filled in with fresh soil and in a few days it starts into a new growth and shows that it can grow if the conditions are suitable; without healthy roots there can be no healthy growth. A supply of water is necessary for the roots to take from the soil what they need, but the water must pass off and not remain stagnant, or disease and death will follow. The case is exactly the same with plants growing in the fields where there is an excess of moisture below the surface.

Drainage is a good and permanent investment, and when completed will return to the farmer a high rate of interest on the money invested. The farmers generally, may be slower in seeing the results than the business man of the city who is readiest to perceive improvements and take advantage of them. He may consider slowly and deliberately and in some instances cling to old customs and hesitate to adopt new methods, but when he is convinced of the value of a good thing he should not be, and is by no means, slow in taking hold of it. It may be true that some things have united to make him more cautious in expenditure for improvements and led him to think he had better continue as best he can in the old ruts of the past, trusting to luck and possibly good weather for a limited measure of success. But why take a risk when success can be made certain and the cost of improvements be made manifold. When the farmer can surely double his crops without increasing, but rather lessening, the cost of cultivation and when he can make one field give the results of two, why should he hesitate? Your fellow farmers say this can be done and they who have made the experiments

give their experience in their own conversations, each in his own language, but all reaching the same conclusions. One says fields that five or six years ago averaged 25 bushels of grain now run up to 50 or 60 once they are tilled. Another says that as a result of tiling one-sixth of an increase in the production of grain is a very low estimate. Still another says that the crop is doubled, while the expense of working is much lower. Another says: "I have had a long and varied experience with tile drainage on my farm, and claim that when the work is well done I have realized 25 per cent on my investment in the increased yield of a single crop."

The matter of cost need scarcely be considered if it is true, as asserted, that the increase of crops will pay the expense of tiling in even five years. But it is agreed by many that two or three years is the longest time necessary, while often the increase in the first year's crop pays the cost of under-draining many a

to 15 bushels of corn per acre changed into fields yielding from 60 to 75 bushels per acre and the price of land advanced from \$25 to \$50 then \$75 per acre and the same lands are now selling from \$125 to \$200 per acre. And the tile factories are running to their fullest capacity to meet the increased demand for their products, despite the fact that millions of dollars have already been spent in tiling. I doubt whether there can be found among the progressive farmers any who, after a faithful trial, are ready to declare their work of tiling even a partial failure, or who would not say that tiling, with good roads, is the very best investment they have made.

It is manifest that a wet soil can never be pulverized. Plowing clayed, or even loamy soil when wet, tends rather to press it together and render it less previous to air and water. The effect of tiling is to admit air to the surface soil and to draw out of it all the water that will run out, so that in early spring or

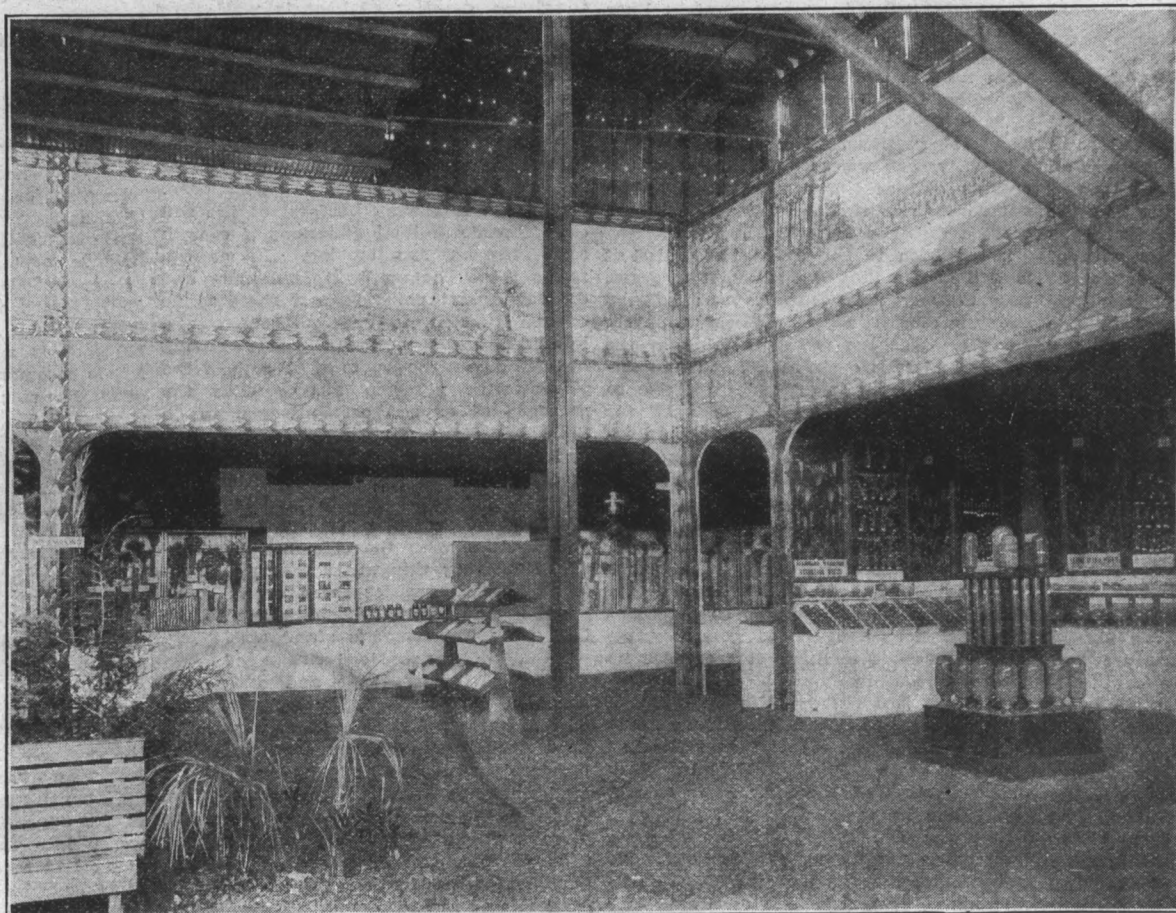
tion to plow. Usually such tracts are uneven, some spots being lower than others and the water settles in the lower places. In such places the farmer drives his team knee deep in the softened mud and finds a stream of water following in the furrow, or he rises upon a knoll baked hard by the sun, and one-half of the surface, when finished, is shining with plastered mud and ready to dry into the consistency of bricks while the other is already in hard, dry lumps, like paving stones, and about as easily pulverized. This is hard work for both teams and men; hard in the plowing and hard in the whole process of cultivation. The same field, well tilled, is friable and porous and uniform in texture and may be well plowed and readily pulverized if taken in hand at any reasonable season.

In this connection attempts have been made to estimate the saving in horses and men by tiling and it is thought that it was a reasonable calculation to fix it at one in four, or 25 per cent, or we may say that it will take four horses to do the work that three horses can do on the same land when tilled.

Drainage promotes absorption of fertilizing substance from the air and supplies air to the roots. Plants, if they do not breathe like animals, require for their life almost the same constant supply of air. All plants die in soils and water destitute of oxygen. Absence of air acts exactly in the same manner as the excess of carbonic acid. Stagnant water on a marshy soil excludes air but a removal of the water warms a wet soil and facilitates aeration. Among the advantages of thorough tiling is the circulation of air through the soil.

One vital effect of an excess of water in the soil is that it produces a corresponding diminution of the amount of air beneath the surface, which air is of the greatest possible consequence in the nutrition of plants. In fact, if air were entirely excluded germination could not take place and seed sown would either decay or lie dormant.

The condition promoted in the soil through tiling affects its temperature. Pot grown plants may still further serve to show the bad effect of a surplus of water in the soil. All plant growers are very careful in cold weather about watering their plants at night, knowing by experience that evaporation will too greatly reduce the temperature and thus check and stunt the plants. The case is the same in effect over large areas where the water is held in the soil below the surface. The temperature is kept many degrees below what it would be if good drainage existed. Vegetation commences later in the spring, arrives at maturity later, and is coarser in texture in such soils. The market gardener, the fruit grower, the farmer, can not afford to raise crops on any but well drained land. The excess of water in



Michigan Educational Exhibit at the Recent National Corn Exposition, at Columbia, South Carolina.

farm. For these reasons the tiling of late autumn it may be worked with the plow as advantageously as undrained land in mid-summer. Tiling lengthens the season for labor and vegetation. When a wet winter is succeeded, as is often the case, by a torrid summer without the ceremony of an intervening spring, farmers have need of all their energy to get their seeds seasonably in the ground. The earth is saturated with water and the land designed for cultivation frequently can not be plowed until late in the spring and all the processes of fitting the soil for planting are necessarily hurried and imperfect. We know, too, that in such ground the surface becomes hard and bakes quickly, so that it can not be worked properly. This is not the case with tilled lands. It is difficult to find one day in the year when a wet piece of land is in a suitable condi-

the soil keeps down its temperature in various ways, and the sun has not the power to warm such soils for several reasons, among which are: first, the soil is rendered cold by evaporation; second, heat will not pass downward in water, so that it can never warm the soil, except as it is conducted downward by some other medium than water itself; third, heat being distributed in water only by circulation, anything which obstructs circulation prevents the passage of heat. Water, when in the soil in quantity, in passing into the state of vapor, rapidly carries off the heat which the soil has taken from the sun's rays. It also carries off heat by radiation when present in excess and in a stagnant state.

The Disposal of Soil Water.

Now the average rainfall is 32.18 inches each year, and this water will be disposed of in three ways: first, used up by growing plants; second, flowing away either over the surface or by ditches; third, by evaporation. When we speak of so many inches of rainfall we seem to be dealing with small quantities of water, but the gross amount is large. One inch of rainfall means 112 tons of water per acre, and the annual rainfall is 3,600 tons per acre per year. The rainfall for six months, from April to September, is 19½ inches. Suppose an acre planted in corn produces 20 tons, and assuming that it will evaporate from its leaves and stems 36 times its own weight of water, about 6½ inches of rainfall will be used by the growing crop, leaving 13 inches to be disposed of in six months by the flowage and evaporation which will take place from any moist soil. Thus six inches of the semi-annual rainfall is made way with and the remaining seven inches would flow away by drains if such were provided. In their absence this mass of water can be disposed of only through an increase in the natural evaporation. Evaporation is a powerful cooling process. To evaporate one pound of water will consume an amount of heat sufficient to raise the temperature of five pounds of water from freezing to boiling heat. Thus by evaporating such a mass of water the temperature of the soil is lowered to a surprising degree, with a corresponding handicap for vegetable life.

Soil Water vs. Soil Temperature.

If we attempt to make good this loss of heat caused by the unnecessary evaporation and to restore the normal temperature of such soil it would require all the heat produced by burning 65 tons of coal for every acre. No wonder that the farmer calls such soil cold. Any means by which we draw off this water without evaporating it will be a large addition to the available temperature of the soil during the growing season. Every tile that discharges five tons of water a day for six months saves an amount of heat equivalent to 75 tons of coal; it is thus that soil over-charged with water is kept at a lower temperature than a similar soil well drained. When rain water sinks freely into the ground to a depth of several feet and then finds ready exit by drainage, it carries down with it the heat which it has acquired from the atmosphere and sun-heated surface, and imparts it to the soil. This has been determined by numerous observations. The importance of the result can not be well overrated for the temperature and other conditions of atmosphere called climate are beyond human control; this power of raising the temperature of all wet, and consequently cold, soils, becomes tantamount in some of its results; to a power of improving the climate, there being good ground for stating that in numerous cases grain crops have ripened from 10 to 14 days sooner than they would have done had not the land on which they grew been tiled.

Tiling Prevents Drought.

This proposition is somewhat startling at first view. How can tiling land make it more moist? One would as soon think of watering land to make it dry. A drought is the enemy we all dread. Somebody has a plan for producing rain with explosives in the air. A great objection to this is that they can not limit their showers to a particular place and all the public may never be ready for a shower on the same day.

If we can really protect land from drought by undermining it, everybody may begin at once without offence to his neighbor. If a handful of rich soil of almost any kind be taken up after a rain we can squeeze it hard enough with the hands to bring out drops of water. If a larger quantity of the same soil was taken up, after it had become so dry that not a drop of water could be pressed out by the hand, and subjected to the

pressure of machinery we would force from it more water. Any boy who has watched the process of making cider by the old-fashioned process, has seen the pomace after it had once been pressed apparently dry and cut down, and the screw applied anew, give out quantities of juice. The facts illustrate first, how much water may be held in the soil by attraction. They show again that more water may be held by a pulverized soil than a compact one. This increased capacity to retain moisture by attraction is the greatest security against drought. After more rain falls than the ground can readily absorb the excess settles into the drains and flows away, leaving the soil in a suitable condition for the roots of the growing plants. But in a dry time the air upon the surface is heated by the sun's rays which are absorbed by the top layer of soil. This heated air expands and rises, just as warm air rises from the heated stove.

Physical Effects of Drainage.

Another important effect of drainage is that air passing through the soil oxidizes a portion of the plant food in it, both mineral and organic, thus increasing the fertility of the soil. Also, it often destroys poisonous substances in the soil like the pro-salts of iron which the access of air changes into innocuous peroxide. Particularly is this true of all clayey soils. There are occasionally stiff clay soils which are, in their natural state, impervious to water, or nearly so, and these are the very soils which, without drainage, are practically worthless. It would at first view seem that such soils could not, from their constitution, be susceptible of drainage, and were it not for a provision of nature which seems especially to aid our labors, such lands must be given over as hopeless. But all soils, and clay in particular, expand when wet and contract when dry. When these drains are laid in clay the soil next to the tile is deprived of its moisture and, of course, rendered dryer than the rest. This causes it to crack and the cracks are found by observation to commence at the drain and extend further and further in almost straight lines into the subsoil forming minor drains or feeders, all leading to the tile. These main fissures have numerous small ones diverging from them so that the whole mass is divided and subdivided into the smallest portions. The main fissures gradually enlarge as the dryness increases and at the same time lengthen out so that in time they may be traced quite a distance from the drains.

In addition to the evils enumerated it is well known that wet lands, if in grass, produce only the coarser varieties and many sub-aquatic plants of no value for pasture. Herbage is late coming in the spring and fails early in the fall and animals grazing on it are unduly liable to disease. When such land is used for cultivation, operations are easily interrupted by the rain and the compactness and the toughness of the soil renders labor more arduous than is necessary on dry lands and with all the usual precautions the best seedtime is often missed; and this proves the prelude to a scanty harvest. Even the deep breaking of the subsoil and the deep tillage so beneficial in other circumstances is generally injurious on such land, as it increases its power of retaining water.

It would seem from the remarks of those who till the earth that there never was a season just right; that rains had been sent down so plentifully and at such wrong seasons of the year as to always blight our harvest. Our potatoes, corn and beans are rotted by the summer showers or cut off by the drought. No man admits that he lacked skill to cultivate his crops and seldom does a farmer attribute his failure to the poverty of his soil. He has planted and cultivated in such a way that in a favorable season he would have reaped a fair reward for his toil, but as has been claimed, the season has been too wet or too dry. Still, with full faith that farming will pay in the long run, our friend resolves to plant again the same lands in the same manner, hoping for the future better luck that seldom comes.

Too much cold water is at the bottom of most of these complaints of unpropitious seasons as well as at the bottom of the soils, and the evils can only be removed or greatly lessened by thorough tiling. Moderate rains then cease to arrest such work and deep tillage aids the drainage and is in every way beneficial, helping to make earlier seedtime and fuller harvests.

Suggestions.

1. Have the work laid out and planned

by an experienced man and keep the plats for future use.

2. The tile should have sufficient outlet.
3. The tile should be deep enough to drain the lowest places.
4. The bottom of the drain should be to a true grade.
5. Every tile should be perfect in form and burned hard enough to have a clear metallic ring.
6. Be sure the tile is large enough.
7. See that the tile join neatly when laid.

Mason Co.

O. N. TYNDALL.

THE THEORY AND PRACTICE OF LAND DRAINAGE.

The above was the topic of a series of lectures delivered at the Round-Up Institute by Prof. J. A. Jeffery, of M. A. C. In the first of these he said in part:

To get rid of excess water upon agricultural land is desirable, first because the evaporation of water requires heat that should go to warm up the soil and prepare it for receiving plants. The laboratories show us that it requires about five times the amount of heat to warm water that it does to warm dry soil. It requires this large amount of heat merely to increase the temperature of the water; but where it is necessary to get rid of this surplus water by evaporation instead of through drains demands a vastly greater amount of heat. To evaporate a single gram of water requires over 500 times the heat that is needed to raise the temperature of water one degree and over 2,500 times the amount demanded to raise the temperature of the soil one degree. It will therefore be understood by every informed mind that drainage assists in warming up the fields in the springtime and thereby enables the plants to get an early start. During the first warm spring days when plenty of moisture is present on the land, 30 tons of water is evaporated on an acre every 24 hours, and later when most of the water is gone, about 10 tons will be evaporated on a single acre. So here an enormous quantity of heat is used that would go to heat the soil if the water was gotten rid of by drainage.

Another point to be considered, said Prof. Jeffery, is the supply of air in the soil. Oxygen is necessary for the germination of seeds, which is readily proven by excluding it from the presence of the seeds when they will not germinate. Again, the nitrifying bacteria of the soil cannot perform their functions if oxygen and nitrogen are lacking. In certain forms these bacteria will feed upon and destroy actual plant food if there is no oxygen present to supply their wants. Furthermore, leguminous plants having nodules upon the roots that supply the plants with nitrogen also require the presence of oxygen and nitrogen to do their important part in land renovation and improvement. Now, when the soil is charged with a surplus of water it is impossible for the air to percolate into the soil and feed the seeds and bacteria and nodules with the elements mentioned. Removing this water through a system of drains enables these wants to be supplied and a great benefit done to the land from the farmer's standpoint.

What Lands Need Drainage?

After reviewing these and other reasons for tile drainage, Prof. Jeffery stated and answered the question, what lands need drainage? We are coming to appreciate that a much greater area of our land would be benefited by drainage than was thought a few years ago. There are places which appear to be perfectly drained because of natural conditions, and yet demonstration proves it to be profitable to install some system of drainage. Often on the side of hills there will be spots where the water will not leach away and frequently farms that have a gentle slope that naturally would look to be properly drained remain cold and wet. Then, too, there are spongy basins at the foot of slopes which require the same treatment. These places, together with the large area of level lands over our state would be greatly improved by the use of tile drains.

The Kind of Tile to Use.

The kind of tile to use is not only an important question, but one concerning which much inquiry is now being made. The Professor exhibited a tile which had recently been excavated from the college grounds and which is known to have been in the ground at least 30 years. It was stated that many inquiries came to the department with regard to the utility of cement tile. The speaker stated that he had believed these tile to be all

right when properly made. He has, however, found it necessary to make one exception. In muck soils where there is a large quantity of organic matter there appears to be danger of cement tile giving way on the lower side after a short time. It was his impression, however, that in other soils these tile could be safely used, especially when made with plenty of cement. The clay tile will usually crumble where it is placed in a shallow ditch and is reached by frost. This is due to the absorption of water by the walls which, in freezing, expand and destroy the tile.

The questions is frequently asked, "how the water gets into the tile?" In all except cement tile, water enters almost wholly at the joints. In the case of cement it has been calculated by Prof. Jeffery that fully 1,500 tons of water would pass through the walls of cement tile on an acre of land in the course of a day when the drains are constructed four rods apart. In other words, cement tile absorbs water through the walls very readily, while other tile secure the water almost entirely through the joints.

The Size of Tile to Use.

Prof. Jeffery next stated that one could determine with fair accuracy the size of tile to use, knowing the area to be drained and the grade to which the tile are laid. A three-inch tile will under ordinarily favorable circumstances carry the water from five acres; a four-inch tile from 12 acres, a five-inch tile from 20 acres; a six-inch tile from 40 acres and a seven-inch tile from 60 acres. Under no conditions would the speaker use less than three-inch tile, this being the size employed for laterals. It is a rule generally followed by tile drain experts that where the grade is increased one inch the area that a certain sized tile will satisfactorily drain is increased about one-third.

A number of systems of laying out drains were illustrated on the blackboard, the point being made that no universal plan can be adopted, every farm being a problem unto itself. The course of drains must be adapted to local conditions to give permanent and effective results. Another point was that two branches should not enter a main line from opposite sides at the same point, the laterals should rather be alternated with respect to the place where they join the main line of tile.

The Question of Fall.

In a majority of instances the quantity of fall becomes an important factor in the construction of drains. Where the land is level it is sometimes difficult to secure sufficient fall to make the drain do its work well without exercising extreme care. A three-inch fall to every 100 feet is a liberal grade; a two-inch fall is common; and one inch is also frequently used; while drains have been successful that were given only one-half inch fall per 100 feet. It must be observed, however, in this regard that the less the fall the greater the care required in grading and laying the tile, and the larger the tile needed, as indicated in a former paragraph.

It is frequently expedient to change the grade of the tile in their course from the headwaters to the outlet and certain things must be taken account of in such a plan. There can be no objection to changing the grade from a small to a large one, as such a change will enable the tile near the outlet to take care of the water delivered by the tile above. But where the opposite plan is attempted a difficulty may arise. With a heavy fall to the upper tile they will naturally rush water into those below and the latter, being laid to a smaller grade, will check the flow, which reduces the power of the liquid to hold foreign material in suspension and is likely to cause silt to be deposited in the tile. Hence, should it be necessary to construct drains after the manner just mentioned, provision should be made for installing a silt well where the grade changes from the high to the low one. This silt well will collect the deposit, from which it may be removed at intervals.

This closed the first lecture on the "Theory and Practice of Land Drainage." In the short discussion following it was emphasized that cement tile should be made rather rich in cement, the proportion of one part cement to four parts sand was considered about proper. One party testified that he had cement tile that had now been in the ground seven years and appeared to be working very well. Another suggested that if, after the tile have set, they be buried in damp sand for several weeks, the quality of the tile will be greatly improved.

TESTING THE SEED CORN.

The month of March is the time to test the seed corn that was selected with so much care last fall, and, having been dried before exposure to freezing temperatures, was preserved through winter under the best conditions of aeration and humidity.

Testing the seed corn is a very necessary operation, because it is the only process by which all the bad ears and those of weak germination can be eliminated. Poor germination is sure to cause a poor stand of corn, and a poor stand always means a poor crop. On the other hand, a large yield means that every square rod of land is producing its required number of corn plants, in a good vigorous condition, having a uniform start in life, and bidding fair to give maximum yields.

Good vigorous seed produces much stronger plants than seed of weak germination. This, then, is another decided advantage gained by testing seed corn. The vigorous seed will make a good growth under more unfavorable conditions of climate and soil than will seed corn with even a suggestion of weakness and may, therefore, be planted earlier, when the soil is somewhat colder and a very desirable addition be made thus to

cluding the medium kernels, and Pile No. 3, including the wide kernels. The planter can then be set for each class of kernels as they are planted and, if carefully done, the planter should drop the required number of kernels in over 90 per cent of the hills. This does away with the work of thinning down to the required number of stalks, which is an expensive job. In the care of carefully tested seed it is generally unnecessary to plant more than the required number of kernels. Carefully tested and carefully planted seed is absolutely necessary in securing maximum yields of corn.

Mich. Ag. Col.

C. L. COFFEEN.

THE PRICE OF FARM LAND.

Will good productive farm land ever reach its limit in price? There ought to be a maximum standard of value. In other words, the farmer who makes a purchase of a farm should not pay more for the soil than an amount on which it will pay a fair dividend, figuring out all expenses and cost of production, including five per cent interest on purchase price and allowing a good wage for the owner who devotes his time and labor to its management. It is safe to say that there are not many farms in the state of Michigan, or any other state, that are

and less expense. But the point is just how to bring this about.

I recently received a letter from a farmer in Illinois telling of the great land boom in the northwestern part of the state where we formerly resided. One year ago three of those farmers came out here to look for land and I showed them around some in this locality. They also went to Kent county and investigated, but returned to their native state. I am told that they have all purchased farms there, paying \$165 to \$185 per acre. I well know the properties which they have purchased and am satisfied there is no living man who can make much more than the actual expenses each year in farming the land in a general way. To start with, the interest alone is \$9.05 per acre. The land is not as well improved as is the case with most farms here in Michigan. In fact, the farm buildings in the whole state will not compare with those of Michigan. The land, it is true, is fairly productive, but nowhere near what it once was.

I am informed that there are farms in the county where we lived that have been recently sold for \$300 per acre. Think of it, and then tell me how a farmer can make the interest (\$15.00 per acre), let alone other expenses, yet land is still on the rise at the rate of \$15 to \$20 per acre annually. It seems that all a farmer has to do in Illinois is to name a price—it is some like dropping a well-baited hook in a school of "bullheads"—he is sure of a bite. I know of many farms there that have changed hands of late for \$200 and over which are not worth as much as farms here in Michigan that can be bought for one-half the price.

All the trouble with this land is, it has not the proper color. If it could be colored black or dark it would double the price, yet not be worth a dollar more, or as much. Illinois farmers are disposing of their high-priced land and many go to Ohio and other states, where the land pleases their eye, yet they can not produce much, if any, better crops than we can on our best lands here.

I had 55 acres of corn this season which was planted on land which has not been seeded for about seven years. This corn yielded a good crop and would make at least 45 to 50 bushels of shelled corn per acre. The fodder and corn will fatten 37 head of 1,200-lb. steers and has also kept two cows and 33 ewes and also fed 100 ewes two months, which were well fattened, aside from 35 head of shoats, which will reach 200 lbs. by the time the cattle are finished.

It is safe to say many of their high-priced farms in northern Illinois did no better than this. In fact, I am told that the corn would not yield, on an average, 50 bushels per acre in the county where we lived, yet they claim to have an immense crop. They are marketing their corn now for 42 cents per bushel of 56 lbs. shelled corn. At 50 bushels per acre this would figure \$21. This looks good, but figuring all expenses out it leaves the farmer a mighty small dividend on his high-priced land. Some seasons we get no crop at all. What is going to help pay expenses then? All the farms in northern Illinois lost their winter wheat crop the same as did many in Michigan. All these "little deals" help to fill the farmer's pockets (?) and make the business more encouraging and interesting. If some of the city people who are crying "high cost of living", and censuring the farmers could know the true conditions, they would change their minds, especially if they would come out on the farms and hobble over the clods for a few years at least.

Washtenaw Co. B. F. WASHBURNE.

AMOUNT OF FALL FOR TILE DRAIN.

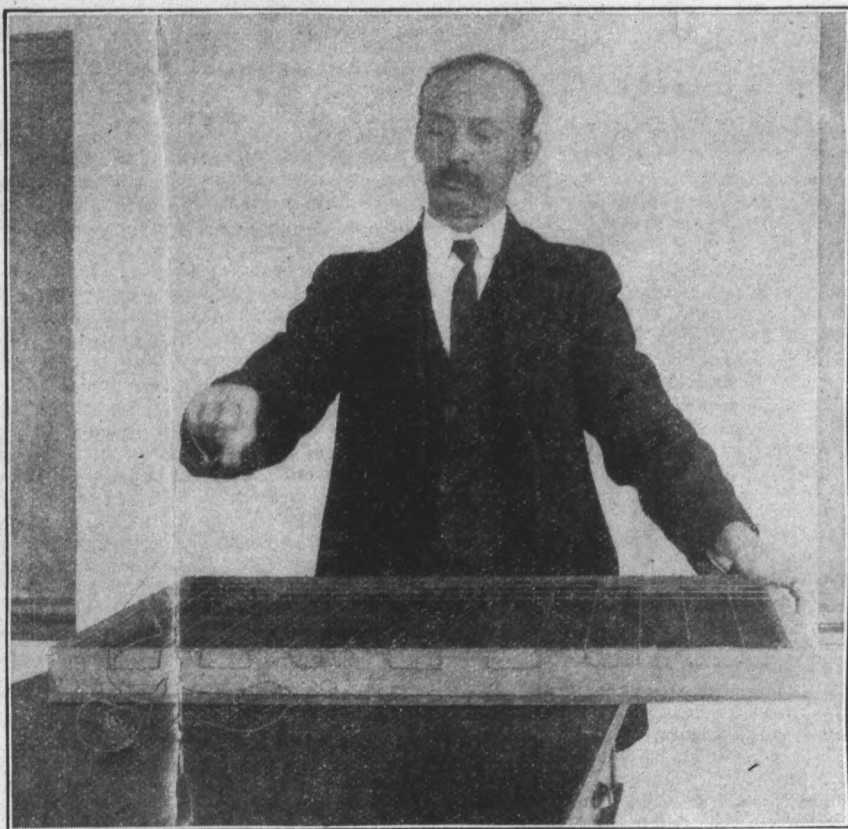
I am interested in tile draining and wrote to Washington about two years ago for what information I could get. In the pamphlet I received it said if tile were laid right, one-inch fall to the 100 feet would be good. Now Colon C. Lillie says in your last issue it ought to be two inches to 100 feet. I am getting a little confused.

Huron Co.

G. S.

I certainly would rather have two inches to the 100 feet than one inch, but if you can't get only one inch it will do if you do very careful work. Where you only have one inch fall to 100 feet of ditch the ditch ought to be very carefully surveyed out, and you ought to lay the tile to a grade line. Two inches to the 100 feet is not very much, but, of course, water will run even with one inch if the tile are carefully laid. I would, however, prefer to have more than two inches fall to the 100 feet if I could get it.

COLON C. LILLIE.



Dividing the Testing Box Into Squares, for Testing Kernels from Each Ear.

the length of the growing season. If the spring remains damp and cold and the soil does not warm up to the point where nitrates are being formed, an application of 50 to 125 pounds of nitrate of soda, mixed with sand, per acre, will give the young plants a start, develop reach in the roots and get them into condition to make the best use of the soil nitrates as soon as the soil warms sufficiently to allow them to become available for the use of the plants.

The above is an illustration of a very good germination box, dimensions 30x30x3 inches inside measurement. The box is filled about two-thirds full of sand. Tacks or small nails are driven around the sides two and one-half inches apart and twine is strung on these tacks in such a manner as to divide the surface of the sand into two and one-half inch squares. The above illustration shows Mr. Potts in the act of stringing one of these boxes.

This work is best done in the early spring when the farmers have more time for this work than later and, as a matter of fact, it would be difficult to find a more profitable employment in any of the farm activities throughout the entire year.

Considerable judgment is required in deciding what ears shall be thrown out. The most efficient work requires that the root be carefully observed as well as the leaves and any ear showing a weakness in root development should be discarded. In general, if the root development is weak, the leaf development will also be weak. Just at this time a considerable amount of labor can be saved by separating the tested corn into three divisions or piles as follows: Pile No. 1, including the narrow kernels. Pile No. 2, in-

cluding the medium kernels, and Pile No. 3, including the wide kernels. The planter can then be set for each class of kernels as they are planted and, if carefully done, the planter should drop the required number of kernels in over 90 per cent of the hills. This does away with the work of thinning down to the required number of stalks, which is an expensive job. In the care of carefully tested seed it is generally unnecessary to plant more than the required number of kernels. Carefully tested and carefully planted seed is absolutely necessary in securing maximum yields of corn.

The actual expense each year for land that costs \$100 per acre, for interest, taxes, repairs, insurance, fertilizer, farm implements and incidental expenses, with a decent compensation for the landlord and wife for time and labor, will amount to around \$12 per acre. This amount must be figured out of the gross receipts of the farm. Now, in view of this expense where is the farmer's dividend coming from, especially when he hires a few men at the wages we have to pay them to work on the farm today, with board and horse kept, which in all foots up to around \$50 per month?

In the first place, there is only about one farm in every hundred that is producing much over one-half to two-thirds what it should, or what it did years ago when land was selling for \$30 to \$50 per acre. "Good farm hands" could be hired those days for \$15 to \$20 per month—men who were not afraid of work and never thought of keeping trotting horses and feeding a bushel of the farmer's grain per day.

We frequently hear it said that farmers are getting rich. You will see great headlines in the press telling how many "millions" are going down into the farmers' pockets. It may go there, it is true, only to be paid out the following day for a hundred and one expenses. Possibly much of this could be saved by more careful figuring and in greater produc-

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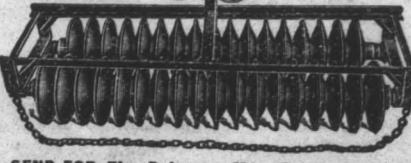
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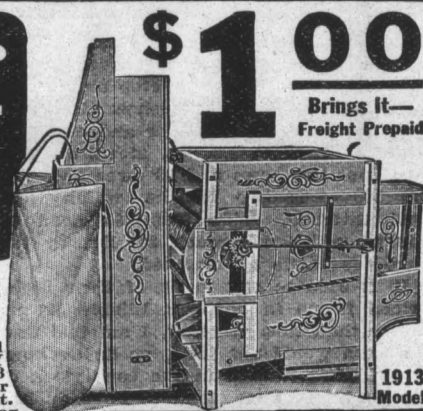
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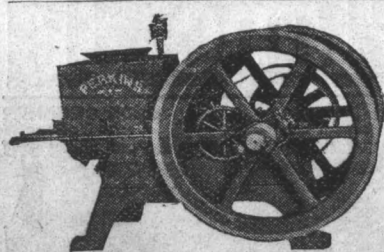
Last year I added a Corn-Sorting Attachment, which grades corn so that a round or edge drop planter drops the right number of grains in 98 out of every 100 hills (in repeated tests at State Agricultural Colleges). Same planters, loaded with ungraded corn, make only 65 out of 100 perfect hills. In two months I shipped to Iowa farmers alone 4,000 machines with Corn-Sorting Attachments. Try my Special Corn-Sorting Attachment. It will increase your corn crop amazingly!

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54 KINDS AND SIZES



FARM NOTES.

Sowing Clover with a Drill.

I have a field of about four acres of rye, sown last fall. I sowed timothy seed with the rye last fall. Now I would like to sow some clover seed this spring and would like to know if it would hurt the rye if I use my grain drill. It is a fertilizer drill and I would like to sow some fertilizer with clover seed. How much fertilizer should I use to the acre?

Huron Co.

SUBSCRIBER.

The rye will not be damaged by sowing clover seed with a drill, provided it is sown crosswise of the drill rows. In fact, many farmers prefer to sow their clover seed with a drill, particularly where a disc drill is available. Where the seed is sown with a hoe drill and it sprouts and just gets nicely up before a rain occurs it is sometimes covered by a hard rain and the young plants are killed before they get well started. This does not occur where sown with a disc drill, however.

A small amount of fertilizer sown with the clover seed might aid in getting the young seedling started in the spring, but as a general proposition it is a better practice to sow the fertilizer with the grain in the fall. If sown with the clover seed in the spring it would not be advisable to sow a very large amount as it would benefit the clover only while it was getting well started in the spring. Limiting factors in getting a stand of clover are more likely to be an acid condition of the soil, or the effects of a drouth due to the poor mechanical condition of the soil than the lack of sufficient plant food to support the clover.

Sweet Clover as a Forage Crop.

I have read considerable of late as to the value of sweet clover, but have noticed nothing along this line in the Michigan Farmer. Would like to ask whether you or any of your readers know it to be valuable.

Oakland Co.

R. D. T.

Several articles have been published in the Michigan Farmer relating to the use of sweet clover as a forage crop and soil improver. However, as it is becoming better demonstrated each year that alfalfa can be successfully grown practically anywhere that sweet clover can be, alfalfa has been recommended instead of sweet clover. Sweet clover is a biennial. The plant comes up and makes a good growth the first year after the seed is sown and does not seed until the second year. Afterward the plant dies, while the alfalfa is a perennial and lives for an indefinite number of years. Besides, it is a more valuable plant, will produce a larger amount of forage which is better relished by all kinds of live stock and is just as valuable a soil improver.

Seeding Alfalfa with Oats.

I have a six-acre field that has grown corn the past two years which I would like to seed to alfalfa this coming spring. Could I sow oats at rate of 1 bu. per acre, and would it be advisable to sow lime or fertilizer and, if so, what formula should I use and how much per acre? This is a fairly productive piece of ground, consisting of clay, sand and black loam well drained. How much alfalfa should I sow per acre and should it be sown directly after sowing the oats?

Clinton Co.

C. F. S.

It is impossible for anyone to state with authority just how one should proceed to get just the best results with alfalfa. What might be the best plan one season would perhaps not be the best the next. As a general proposition, however, those who have tried sowing alfalfa with a light seeding of oats, say one bushel per acre, have had perhaps as good success as those who have used other methods of seeding. Probably just as good results could be secured by the use of a light nurse crop of oats as in any way if one would give close attention to weather conditions and in case a drouth should occur at any time when the oats are drawing heavily upon the land for moisture cut the oats for hay, thus giving the alfalfa a good opportunity to survive the dry weather. In case weather conditions are favorable the oats may be allowed to mature and harvest for grain. This plan has a good many advantages and is probably as good a one as could be recommended.

Inoculating for Red Clover.

I have a piece of rye, sown last fall, that I wish to seed to red clover this spring and desire to inoculate with M. A. C. culture. The drainage is poor and I cannot get on the ground very early with a team and disc drill. Can you advise how I may get this seed in without endangering the germs of the inoculation, considering my not being able to get on the ground in early spring with a team?

Calhoun Co.

A. E. W.

Inasmuch as it is essential to cover the inoculated seed sufficiently to protect the bacteria from the deleterious effects of sunlight, we can advise no bet-

ter way than to wait until the seed can be sown with a disc drill if inoculation is to be practiced. There is great doubt in the writer's mind, however, whether inoculation would be a success upon this poorly drained ground. It is quite as essential that the soil should be in a condition to be a fit home for the bacteria peculiar to clover as that it should be present in the soil, and where this is not the case inoculation will not remedy the difficulty. A poorly drained soil is somewhat likely to be in an acid condition and if this were true, thorough inoculation with pure culture would not be likely to prove successful. It might be better to sow alsike clover upon this wet ground than common red clover, as it will endure more moist conditions than red clover. Then it would be advisable to make a litmus paper test of the soil in the early spring, and if it is found to be acid, wait until it can be drained or the acidity corrected by the application of lime before inoculating.

Sowing Alfalfa on Mustard Infested Ground.

Please advise me how to get rid of wild mustard. The farm I now own has been rented for 12 years and one field is badly seeded to wild mustard; in fact, it nearly ruined the oats sown on this field last year. I thought it would be a good plan to plant this field to some hoe crop, say corn, and after the corn is off this fall plow the ground about five inches deep and drag it once over; about May 1 plow again about seven inches deep, thoroughly fitting the ground and sowing to alfalfa, and when the alfalfa is about a foot high, clip it, and again about Sept. 15. In the above I mean to sow the alfalfa without a nurse crop.

Hillsdale Co.

M. G. B.

This plan, as outlined in the above inquiry, would seem to be an excellent one for ridding the field of mustard and getting the valuable forage crop established. There is no question that when the alfalfa once becomes established the mustard will be crowded out, as it will not stand the frequent cuttings and cannot compete with a vigorous growing plant like alfalfa, after the alfalfa is once established. But unless the mustard is very thoroughly subdued before the alfalfa is sown it would be difficult to get a stand of alfalfa on mustard infested land. It might be necessary to cultivate this field thoroughly for one to two months and sow the alfalfa in midsummer, as in this way the mustard could be well subdued, that is, such of it as is left in the ground after growing a hoed crop like corn and given the subsequent treatment proposed.

With regard to clipping the alfalfa when same is about one foot high, a word of caution might be advisable. It is never best to clip alfalfa except at such times as the new growth has started out at the crowns, as to clip it at any other time weakens the vitality of the plant and is very apt to injure the new seeding.

The result of this trial would be interesting, and if successful we trust that it may be reported through the Michigan Farmer.

Eradicating Plantain.

I would like to ask how to clean a field of just common plantain. Some years ago I let a neighbor haul in some clover seed to hull while I was hulling mine. Then I scattered the chaff over the field and planted to corn, oats, wheat and grass in rotation. By that time I had plantain as thick as it could stand. The last time I broke up this field I planted to corn. The next year I took half the field and planted it to beans, then wheat and grass. By that time the plantain was just as thick as ever and spreading. Now I want to plow this field again this spring. I never pasture the fields that I farm. Would it help this field to pasture it, or could I smother plantain by sowing clear timothy real heavy?

Isabella Co.

M. K.

It may be impossible to thoroughly eradicate this plantain without summer following the field. If the field is planted to a cultivated crop, such as corn, however, and none of the plantain allowed to seed, it might be disced up and seeded to a spring crop the following year, or the second year, if two cultivated crops are grown in succession, with a better prospect of subduing the weed than would be the case if the ground were plowed for a grain crop. The only way to subdue weeds of this kind is to simply prevent them from making any growth above ground and the best method to accomplish this will, of course, depend upon local conditions.

The farmers in the vicinity of Kingsley, Grand Traverse county, have organized for the purpose of erecting a co-operative warehouse for the storing and shipping of farm produce, particularly potatoes.

PURE CULTURE FOR INOCULATING LEGUMES.

Can you tell me what this "Nitragin" is that is being advertised and sold for inoculating alfalfa and legume crops? Is it any better than the pure culture we get from the Agricultural College at Lansing? I have used this pure culture but not with as good results as some claim with the Nitragin.

Hillsdale Co.

G. B. W.

While the writer has never used this brand of "pure culture" for the inoculation of legumes, it is undoubtedly very similar in character to that sent out by the Bacteriological Department of the College for experimental work. It is but recently that commercial firms have gone into the manufacture and distribution of pure cultures for inoculating purposes. One of the reasons for the experimental work done at the colleges and experiment stations in this direction was the education of the farming public as to the value and limitations of pure cultures for the inoculation of leguminous plants. These are simply cultures of the bacteria peculiar to the several plants and essential to their best success, which are grown in artificial mediums and applied to the seed before sowing in order that the bacteria may be right at hand when the plants start.

In sending out these cultures the colleges and experiment stations do not make any extravagant claims for them, since it is a generally recognized fact that unless the soil conditions are such as to make a suitable home for the growth of the nitrogen fixing bacteria, the pure cultures will not bring about a successful inoculation. That is to say, if the soil is in an acid condition there may be an entire failure of inoculation where either a pure culture or the soil from some other field which has previously grown the legume is used. The writer's experience corroborates this statement in a most striking manner. A small field of three acres was sown to alfalfa after a thorough preparation of the seed bed and both pure culture applied to the seed and the soil from a successful alfalfa field applied to the seed bed and harrowed in. Inoculation was secured on only a very small portion of the field, however. The next year lime was applied to this field and alfalfa was again sown, with the result that perfect inoculation was secured, thus showing that the first failure was due to the condition of the soil rather than to the inefficiency of the inoculating medium or pure culture.

Unquestionably these pure cultures have a valuable place in the promotion of successful stands of leguminous crops which have not been previously grown upon the same soil. But their limitations as well as their advantages should be understood in order to attain the greatest satisfaction in their use. The work of experiment stations and colleges in sending out these cultures is simply preliminary to their introduction and the object is educational with a view of informing farmers of the state and country with regard to their value and limitations, and this purely educational work will doubtless be discontinued at such time as the commercial houses are prepared to satisfy the demands for these cultures at a reasonable cost.

WHAT SHARE IS PROPER FOR RENTING A FARM?

I wish to rent my farm of 200 acres and furnish everything complete and keep everything in repair. Wish to keep at least 12 cows on the place and furnish all seed. Said renter to have a share in all increase of stock while his contract is in force. The renter to pay all threshing bills, fill the silo, and do all the work. What share ought he to receive, providing I furnish feed for stock?

Muskegon Co.

A. S.

The renting of a farm is a matter of mutual agreement between two parties. No definite rule can be given because the bargain has to be made and it will differ materially with the party. Of course, there are some general rules which have been considered to be fair in the renting of a farm. First, where the renter does all the work and pays all expenses and the owner furnishes nothing, the rule is that the renter gets two-thirds of the crop and the owner one-third. On the other hand, if the owner furnishes half, half of the live stock, if he furnishes half of the feed, that is, if the live stock are fed on the undivided feed produced on the farm, he may or may not pay half of the taxes; that is a matter of mutual agreement, but something along this general line, then each will furnish half and each would receive half of the returns of the farm. The general exception to this rule is that the renter furnish the horses or

the power necessary to do the labor on the farm and also furnish the tools because it is conceded that a man ought to work his own horses rather than somebody else's, that a man ought to use his own tools rather than those of someone else, because he is more liable to take proper care of them than if he worked somebody else's horses.

SOY BEANS IN MICHIGAN.

About ten years ago I was requested to write an article on soy beans for your paper, which I did. Some time later Mr. Lillie stated in one of his letters that he "might grow cucumbers again but he had grown soy beans once and that was enough," or words to that effect.

Judge of my astonishment on reading his article in the Michigan Farmer for January 4. Verily, "the world do move."

Mr. Lillie says they have been grown to a considerable extent in Indiana, Ohio, New York and Illinois. Remarkable! It may interest the readers of this paper to know that Japanese and Manchurian soys were grown 12 miles from West Branch, Ogemaw county, Michigan, and Early Black (Buckshot) and Ogemaw soys originated on the same farm, before any of the experiment stations of the states mentioned had made their first trials.

It may interest Mr. Lillie to know that soys were grown and matured in Cheboygan county many years ago; that several varieties have matured near Saskatoon, Sask.; that a soap company and a linseed oil company, located 100 and 225 miles further north than his farm, are growing soys for oil; that for 15 years the bulk of the soy beans (excepting Southern Mammoth) sold by the seed trade of the United States was grown in Michigan, and that I have the invoices, growing contracts and bills of lading to prove it.

You can pick up a score of leading American seed catalogues today, whose 1913 seed was grown in this state last season. And why not?

Central Manchuria in 1911 shipped more than a million and a half tons of soys, and its climate is far more rigorous than anything ever experienced south of the Straits of Mackinaw.

I have grown more than 100 varieties of soys and I never saw one that would not stand more heat and cold, more wet and drouth than Indian corn.

While I do not mean to say that soys are specially adapted to light, dry soils, I do mean to say that the most successful growers of the crop in this state, have been and are now, on such soils.

The soy has been grown in Manchuria for more than 2000 years.

The bean cake, which Japan needed as a fertilizer, and which under Chinese rule she had received in trade, for many centuries, was one of the prime causes of the Russo-Japanese war, because the acquisition of Port Arthur and Dalmay by Russia threw the trade into her hands.

A year ago I was in a county in southern Michigan where many soys are grown. I went into two large hardware stores and found both of them selling soy paint oil, made from Manchurian soys in Germany.

Regarding the price of soy beans for seed. That depends largely on the variety and where it was grown.

One can get Michigan-grown seed of some kinds for much less than \$3 per bushel, bags free.

For other sorts you will have to pay much more than \$3 for Northern seed.

Probably the highest priced sorts are Medium Early Green, Ito San and Haberlandt, with Peking nearly as high. The Medium Early Green was introduced by Prof. Brooks, of Amherst, about 1895; Ito San by myself in 1900.

Both varieties, in spite of the large crop of 1912, are higher in price now than at any time since their introduction. This may not signify that these are the best varieties under all conditions, but they are more generally known than any others.

I have had to refuse orders for thousands of bushels of these varieties this season, as well as for some Haberlandt and Peking, the most popular of the newer introductions.

Ebony and Hollybrook have been offered in abundance at very moderate prices, in fact, Ebony is almost low enough for feeding.

To those who contemplate growing soys this year I want to say, don't buy southern grown seed at any price.

To those in northern Michigan, (north of Saginaw county), I would say do not plant Hollybrook, Haberlandt or Peking. Ogemaw Co.

E. E. EVANS.

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Because the nitrogen in the soil or that in barnyard manure is largely in an organic form, not readily available until the organic material carrying the nitrogen decomposes or rots. This rotting or disintegrating process is carried on by bacteria or very minute forms of life which thrive in the soil. Nitrogen freeing bacteria begin work very weakly after the soil has warmed up beyond 40 degrees Fahrenheit. One can readily see, therefore, that any large supply of available nitrogen for the young plant will be delayed until late in the Spring if no quick-acting fertilizer is used, and as a consequence the crop often stands still, especially so in a late and backward season.

The nitrogen in our fertilizers is largely water soluble and becomes available as plant food for the development and growth of the young plants immediately upon coming in contact with the moisture in the soil. That is the reason why a fertilized crop will grow faster, better and stronger and will reach maturity from ten days to two weeks earlier than if no fertilizer were used.

The quality of the fertilizer determines to a great extent the quality and quantity of the crop.

The farmer cannot learn too much about available plant food. Write us and we will tell you how to fertilize properly and economically. We want agents for unoccupied territory.

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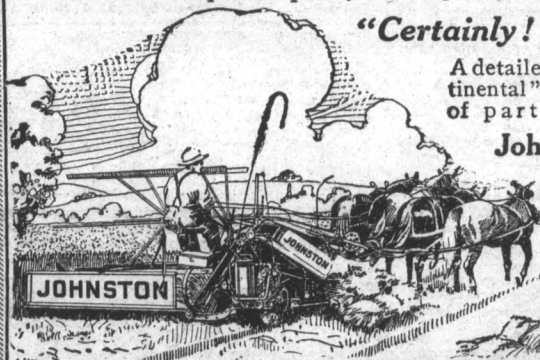
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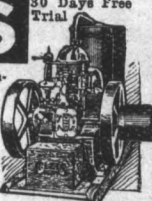
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POWER ON THE FARM.

This theme proved of very general interest to those attendant at the first session of the recent Round-Up Institute, and was made specially so by the capable manner in which it was handled by Prof. H. H. Musselman, of the Department of Farm Mechanics of the Michigan Agricultural College. The theme was opened by the statement that power cannot be applied as effectively on the farm as it can in our many manufacturing plants. This is largely because it must be applied at so many places, under unusual conditions and in varying quantities, all of which increase the difficulty of high efficiency.

Power, as applied to use on the farm, may be classified in a number of ways. First, it may be classified under power that replaces the labor of man, or that increases the capacity of man to do work. Pumping water or running a washing machine would be examples of the first, while grinding feed, sawing wood and plowing would illustrate the latter. Secondly, the classification may be made according to location, when it is divided into the power used about the buildings and that used out in the field. A third classification is made in accordance with the application of power, whether it is applied in accordance with the application of power, from a stationary source, or whether it is to be applied in a movable form where traction power is necessary. These classifications suggest to the average mind some of the difficulties encountered when attempting to secure economic service from motive machines.

A number of sources of power are available to the farmer. The important ones are hand labor, animal labor, wind, steam, water, gasoline and electricity.

Hand vs. Mechanical Power.

Prof. Musselman believes that the hand power employed on the ordinary farm should be reduced, that some form of mechanical power should be substituted for at least a portion of the hand power. At one place in particular this should be done. That is in pumping water. Equipment to do this work is not expensive and saves so much human energy that could as well be employed at other tasks that no farm of any size should be without such a convenience. The kind of power to use for this and other services about the house and buildings is something of a problem in some instances. Steam is scarcely ever considered now-a-days for this purpose, while wind and gasoline are probably the most available forms. The windmill is an economic source of power, but cannot be depended upon to give the needed service, so that it becomes necessary to construct a reservoir to hold a quantity of water that will tide over periods when there is no wind. The gasoline engine is dependable and can be run at any time and in this regard is superior to all other power, with the possible exception of electricity where that is available. The same argument holds good with regard to power for operating the washing machine, churn, cream separator, etc.

The Size of the Farm Engine.

Just how large an engine to secure in order to get the most economic results is a matter that requires study. Where only pumping is to be done, or work that demands the smallest unit of power, a one and one-half horse power gasoline engine will do good service. For the average farm home greater satisfaction would likely be secured from an engine rated from three to five horse power. This engine can be centrally located and used for many purposes. Another class of engine includes that rated from six to ten horse power and finds a place on many of the larger farms, especially where wood is to be sawed, feed ground and work of that character performed. Inquiry seems to make plain that practically no field is open for a portable engine on the farm with a rating between 10 and 20 horse power. The original investment and upkeep expense are too large for the work to be done. It was the speaker's conclusion from the information he had and observations made that three to five horse power is usually the most serviceable for such an engine has sufficient power for doing the many tasks about the farm buildings and still be worked more nearly its limit than a larger engine would be, and it has been proven that the more nearly one can work the engine up to its full load the more economic it is in the use of gasoline.

The Farm Tractor.

The next phase of the question discussed was the part the gasoline tractor

will probably play in future Michigan agriculture. The steam engine has failed to become a competitor of the horse and mule as a motive power upon the farm, and it has not been fully established as yet that the gasoline tractor will supplant the horse to any large degree. In fact upon those farms where only one or two teams are required to do the work the probabilities are that gasoline will not replace the horse, unless a different type of engine than those now known is developed and this for the following reasons: The gasoline tractor has a certain amount of power that it can yield. About 50 per cent of this must be used for moving its own weight. Now a horse can naturally pull one-tenth of its own weight but when necessary it can double and even treble the amount of the load it can move. This reserve power enables the horse to get out of difficult places, and since the gasoline tractor must be employed where such conditions are likely to occur at any moment it cannot be loaded to its limit because a reserve power is always necessary. Another advantage in the use of horses is that in case four horses are demanded for the work they may be used all in one team, or two teams, or the four horses may be used singly, whereas with a gasoline tractor the power must be applied altogether. Hence, for the small farmer the only way in which the gasoline tractor will become of general interest is through co-operation with neighbors or by employing the services of the engine from one who buys to do custom work. The conclusion reached by Prof. Musselman was that a gasoline tractor must be at least a 20 or 25 horse power before it becomes an economic source of power upon the farm. At that size and above it has been quite thoroughly demonstrated that the implement will increase man's capacity to do work.

The last part of this address was occupied in a consideration of the comparative cost of gasoline and kerosene as engine fuels. He referred to the test made in the plowing contest at Winnipeg, in the years 1911 and 1912. In the year 1911 in a number of tests the average for gasoline showed that 1.45 horse power hours were secured from a pound of fuel, while for kerosene 1.23 horse power hours were secured from a pound of fuel. In the year 1912 the horse power for gasoline was 1.5 for a pound and for kerosene 1.15 horse power hours for each pound. From these comparisons it appears that at present prices the kerosene would be a more economic fuel than the gasoline.

FERTILIZER ON CORN.

One of my neighbors used some fertilizer on part of corn field and it seemed to help it wonderfully at first, then all of a sudden it stopped growing and it seemed as if it did not do as well in the end as on an adjoining strip which had not been fertilized. Would like to know the cause of this.

Shiawassee Co. J. D. W.
Nothing is said about how the fertilizer was applied or how much was applied, and I think this would make a great difference and might explain the results obtained. If only a small quantity was put in the hill and then a severe drought came in the middle of the summer, this application in the hill would encourage the roots to remain close to the hill to get their food, consequently when the drought came they would not be out in the soil where they ought to be and would be more affected. On the other hand, if the fertilizer had been applied in larger quantities and broadcasted the roots would have gone out into the soil after their food and would have been better protected against the drought which followed. This would be my judgment of it. COLON C. LILLIE.

AMOUNT OF MOISTURE IN CORN.

Some interesting tests, showing the per cent of moisture in corn, were made at a western Ohio corn show held the middle of February. An ear of corn that was three years old and had been kept all that time in dry places, showed a moisture content of 10 per cent. Another ear that had been picked for seed and stored on a rack in a corn crib, where it had a circulation of air on all sides with splendid chances for drying out, showed 20 per cent of moisture. The results of the tests were somewhat surprising to those attending the show.

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Dairy.

CONDUCTED BY COLON C. LILLIE.

DUAL-PURPOSE VS. DAIRY COWS.

I would like advice about buying pure-bred cattle. Which, in your opinion, would be the best breed to buy, a dual-purpose breed, or one of strictly dairy type? Am on a farm of 100 acres, have a silo and some pasture.

Washtenaw Co. L. E. S.
If you want to go into the dairy business and get the most butter or milk out of the feed which you produce on your farm, my advice would be to get strictly pure-bred dairy animals, or else high grades. On the other hand, if you are going to make dairying a secondary issue and want to fatten most of the calves or grow them into steers and make beef of them, then perhaps the dual-purpose breed would be more profitable. Personally, I should prefer a dairy breed, and think that you could get better results for the money invested.

MODEL COW STALL VS. SWING STANCHION.

In a recent paper Mr. Lillie gave plans for a model cow stall. As I want to repair my barn and put in cement floors, I wish to ask if he would advise me to put in the model stall, or the swing stanchion like those in the dairy barn on the State Fair grounds.

Antrim Co. A. A. L.
There is no use in my saying very much about the comparative value of the model cow stall and the swing stanchion. This is a kind of question that people won't agree on, anyway. One man will have a swing stanchion and another will have some other kind of stall.

One has to use his own taste and judgment in selecting. Personally, I like the model cow stall, taking everything into consideration, but I don't think the one seen at the State Fair was a good example of the model cow stall. If I remember correctly, it wasn't built according to the directions given in the last issue of The Farmer. I didn't like the arrangement for the manger. One fine thing about the model cow stall is that it has a hay manger separate from the grain and ensilage manger. You don't have to wait until your cows get through eating their ensilage and grain before you feed them the hay. One can put the hay in, feed them the ensilage and grain, and go about his business, even go to bed, and everything will be all right.

I have no objection to a swing stanchion, although it always seemed to me as if the cows were more confined than they ought to be. Personally, I like a model cow stall and if anything should happen that I would want to build another barn I am quite positive that I would put in model stalls again, but I wouldn't have them like those at the State Fair. I don't like that pattern.

THE BEST SILO.

We live in a locality where the silo is a new thing. What, in your opinion, would be the best silo to build? We were told by wood silo agents that the acid from the ensilage would eat the cement from the inside, also that they would freeze much quicker than a wood silo.

Cass Co. R. C. W.
All of the silos on the market today, so far as I know, are good ones. The modern stave silo is a splendid structure, is well built and durable, and will last a life-time if properly put up. So, also, are the modern cement block silos, or the modern solid grout silo, or the vitrified tile silo, in fact, any of these structures, if properly made, will keep the silage in splendid condition. The cement silos are practically indestructible. They will not burn up and they will last indefinitely.

When the man who represents the patent stave silo tells you that the cement on the inside of the cement silo will be corroded or softened by the acid which is formed in the green corn turning to ensilage, admit this. It will after a time. But, on the other hand, this same acid will act upon the staves in his stave silo after a time and make the wood porous. It will be a long while before it affects this wood to any great extent, and so it is a long while before it affects a good rich coat of cement to any great extent. The first plastered silo that I built was plastered on the inside and remained good with occasional whitewashing with pure cement white-

wash, for something like 18 years. Then the bottom part of it got a little porous and we plastered over this again, and now it is good for 18 years more, so that the action of the acid upon good cement mortar on the inside of the silo is of very little moment. It doesn't harm it very much. It can be easily repaired. So far as freezing is concerned, the cement silo, if it is solid wall, or solid block, or a solid cement stave, it may freeze a little bit more than a wooden silo, but not enough so that it would make any particular difference. If you want to keep the silo from freezing in real cold weather have a little oil stove and burn that in the silo, which will prevent it from freezing and at a very minimum cost. You will only have to do this the coldest nights.

You ask what is the best silo, and I frankly say that I don't know which is the best silo. They are all good, it is largely a matter of personal choice.

CREAM WILL NOT CHURN.

I have a cow that has been fresh about two months. She gets all the corn fodder and mixed hay she will eat, also corn in the stalk for grain. She gives a good flow of milk, yielding a good cream, but I can't get any butter from the cream. I churned two days on one churning without getting butter. Would say this cow is kept in the barn most of the time.

Shiawassee Co. C. L.
Of course, once in a while we find a cow that does not put any butter-fat into her milk but this is indeed very rare. Probably the only reason this butter will not come is that you do not ripen or sour the cream, or because you try to churn it too cold. Set the cream away from time to time and keep it until you get a churning. Then put it where it is warm. Set it in a tub of warm water to warm it up to 70 degrees, then keep it at that temperature for 24 hours. Then cool it down to 60 degrees and churn. I think you will have no trouble in having the butter come.

The cow really ought to have some bran, or gluten feed, or pea meal, or something of that sort—some food rich in protein to mix with the unhusked corn. She hasn't protein enough in her ration to get best results.

THE MAN WITH ONE COW.

Nothing is gained by ignoring facts, and it is a fact that a cow kept under the conditions existing in a small place cannot be depended upon to give milk as pure as that obtained from modern certified milk plants. In these latter the most scrupulous care is exercised to have everything not only clean but sterilized and germ-proof. Even the milkers wear antiseptic suits of white duck and close fitting caps, so that the dust that may settle in their hair will not contaminate the milk. New York state allows a dairyman to call his output certified, provided there are less than ten thousand germs in a cubic centimetre (a quarter of a teaspoonful). Under the worst dairy conditions of dust and filth, the number of germs may be a hundred million in the same quantity of milk. If you keep a cow your milk production will fall somewhere between these two extreme limits.

The question is, since we cannot possibly compete with the certified milk producers, shall we keep a cow?

The answer is yes, if you are in the position to do so, because, while the certified milk is purer than that which you will obtain, the chances are that you will obtain purer milk than you are now getting, as the quantity of this certified milk is limited.

If we eliminate the cost of labor in keeping a cow, there is a real economy in it because she will produce from 12 to 20 quarts of milk a day, or sufficient to supply five or six families. The surplus which you will not need for yourself will either find a ready market in your neighborhood, or can be churned into butter. A good Jersey or Guernsey cow should supply an ordinary family with all the milk and butter they need. Of course, it is much simpler to go to the grocery store for a bottle of milk and a print of butter than to carry out all the operations incident to the care of a cow.

Even on a comparatively small place it is possible to keep a family cow because in the absence of pasturage one can practice intensive dairying and raise fodder crops. It is estimated by this method one can keep five times as many head of cattle on the same acreage as on ordinary pasturage.

A cow is at her best usually when she is seven years old. After she is 12 it is doubtful if she pays for her keep. In

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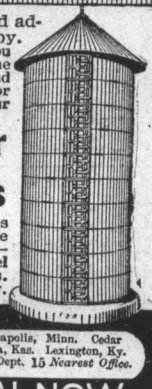
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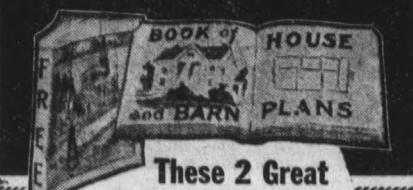
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buying a cow select one in which Jersey or Guernsey blood prevails. Do not buy a nondescript or a mongrel, and do not buy a cow with horns. A polled cow is the only safe kind where there are children.

No one should keep a cow unless some member of the family knows how to milk. In these days when it is so difficult to secure good servants, it is extremely risky to depend entirely on the whims of the gardener or stable man to care for the cow. If he should leave suddenly the whole family would be thrown into a panic, unless someone knew how to milk. It is perhaps too well known to be worth mentioning that a cow must be milked regularly night and morning, no matter what other work is left undone.

New York.

T. A. TEFFT.

THERE ARE NO STATE REQUIREMENTS FOR DAIRY BARN.

What are state requirements for an up-to-date dairy barn? My barn is 54x26 ft., and I have planned to raise it on a 7-ft. wall. On one side of a 12-ft. ground driveway I wish to keep horses, and on the other side I wish to keep cows. I will sheet up both sides of the driveway. Would there be any objection to the stock being thus situated where one desires to sell milk or cream?

Washtenaw Co.

A. W. E.

The state has never presumed to prescribe any requirements for dairy barns or in fact for any other kind of barn. The state has passed a law preventing the adulteration of milk but has never passed a law governing the conditions under which sanitary milk must be produced. Several incorporated cities, however, of the state have passed ordinances designed to control and preserve the purity of the milk product sold in the various cities. None of these ordinances so far as I know, state how the barn shall be built or anything of the sort. They simply insist that the milk must be clean and wholesome when it is sold in the city. It is well known that milk must be produced under as clean conditions as practicable and then it must be cooled as low as practicable before being shipped to the city. Under these conditions milk is usually a wholesome food. But no state law or city ordinance attempts to tell the farmer how he shall have his barns built or constructed unless it is decidedly unsanitary. When the milk inspector from the city inspects the dairies where the milk goes to supply the inhabitants of that city and he finds decidedly unsanitary conditions then he has a right to prescribe what must be done. For instance, suppose a man had a common dirt floor and the cows stood in filth in the stable. He could say that those conditions were unsanitary and that clean milk could not be produced under those conditions, and could say to the farmer that unless he put in a cement floor that he would not permit the sale of his milk in the city, or something of that sort, and while probably his milk was not kept in a stable for any considerable length of time it might be considered unsanitary conditions or improper conditions under which to keep milk. If the stable is kept clean as an ordinary stable can be kept conveniently, and the milk removed from the stable, there would be no question at all as to how the stable was constructed or what it was constructed of. Again, a city inspector might say that milk should not be kept in the same stable with horses, and yet if the horse stable was kept clean, the horses kept on one side of the barn and the cows on the other, and conditions were clean, he would probably have no objection to this, providing the milk was removed from the stable as soon as possible so that it would not absorb the odor, either from the cow stable or the horse stable. Consequently you would have a right to remodel your stable in any way that you thought best as long as you made it sanitary, and built it so that it could be kept reasonably clean as a stable. No city milk ordinance contemplates forcing a farmer to do things that are absolutely impracticable. What they want is to have him produce sanitary and wholesome milk.

If you have your stalls run crosswise of the barn and have a 12-foot driveway I would not think it would be necessary to board this driveway up. Simply have a passageway between the cow stalls and the horse stalls so that you can drive through and clean out the barn by loading the manure from both the horses and cattle directly onto the manure spreader or manure trucks. This would be a splendid way of keeping the stables in good sanitary condition with the least

possible expense and no inspector could object to it, providing the stable was kept fairly clean and the milk was removed as soon after milking as possible so that it would not absorb the odor of the stable.

HAY NECESSARY WITH SHREDDED FODDER.—SEPARATED MILK FOR CREAMERY.

How many tons of mixed hay will 21 grade Jersey cows, one bull and six yearlings require from March 15 to May 10, to be fed with silage and shredded corn fodder and gluten feed? Will it pay to buy a separator and separate my milk rather than send the whole milk to the creamery?

Jackson Co.

S. C. B.

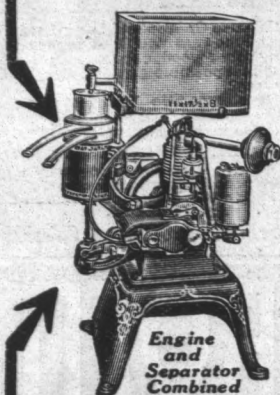
No one can tell anything about how much hay it will be necessary to feed, because one can feed very sparingly of the hay and very liberally of the shredded corn fodder and thus reduce the amount of hay absolutely necessary, and he can make a fairly good ration also if he feeds a little heavier of the gluten feed and corn silage. As a matter of fact, he could get along entirely without the hay, although it is better to have the hay in the ration. If one had no shredded corn fodder the cows probably ought to have about 15 lbs. of clover hay per day for the most economical ration, but with the shredded corn fodder they could get along easily with 10 lbs. per day. If you fed 10 lbs. per day it will take about two and one-half tons to feed the cattle for the time specified, but this could be reduced in amount, provided you had plenty of shredded corn fodder that you wanted to dispose of and had to buy the hay. It might be policy under these circumstances to reduce the amount and use a little more gluten feed to make a balanced ration.

There are quite a number of things to take into consideration as to whether one had better buy a separator and deliver cream at the creamery instead of whole milk. The skim-milk is certainly better if it is separated on the farm and fed warm to calves and pigs, and it is much more convenient. And again, it doesn't cost as much to deliver the cream as it would the whole milk, because the amount is reduced very materially. Again, with proper care the cream would not need to be delivered every day. Every other day will do if pains are taken to cool the cream and stir it when it is cooling so as to relieve it from the animal heat and animal odor, and then if it is kept cool it can be delivered every other day and still be in very good condition. Now these things must be taken into consideration. If you have to deliver your own milk and have to go every morning with a limited amount of it, of course it makes it very expensive. On the other hand, if you separate it at home you would only have to go every other day. But if your milk is hauled by a paid hauler that comes by your house, it would not make so much difference. However, then, of course, you would have to pay for hauling the skim-milk to the creamery and back again, and besides that the skim-milk would be cold when it came back from the creamery and would have to be warmed before it was fed to calves and would be better if the chill was taken off before it was fed to pigs, especially young pigs.

Another matter to be considered is the distance to the creamery and the condition of the roads. Whatever expense is incurred in the delivery of the product at the station must under almost all circumstances be borne by the producer, and if that expense is increased by carrying skim-milk to the station and returning to the farm, that much would be retained by separating on the farm, less, of course, the added expense of separation over the other method of handling.

Numerous prosecutions are expected to follow the recent seizures of more than a quarter of a million pounds of butter in Chicago warehouses by revenue agents, unlawful adulteration being charged by the federal authorities. It is alleged that the butter contains more than 16 per cent water. Last December, when the inquiry began, more than 25,000,000 lbs. of butter were stored in Chicago storage houses, being about half of the actual supply in cold storage in the United States, but since the beginning of the investigation about 20,000,000 pounds have been shipped away from Chicago. Federal officials declare that this is a prime factor in the high cost of living and rigorous inspection will be made of all butter that enters the warehouses. Manufacturers of butter in Illinois, Ohio, Wisconsin, Iowa, Minnesota and Nebraska involved may be prosecuted for the alleged adulterations. The penalty for violations of the revenue laws regarding the sale of butter is a fine of \$5,000 and a tax of 10 cents for each pound adulterated.

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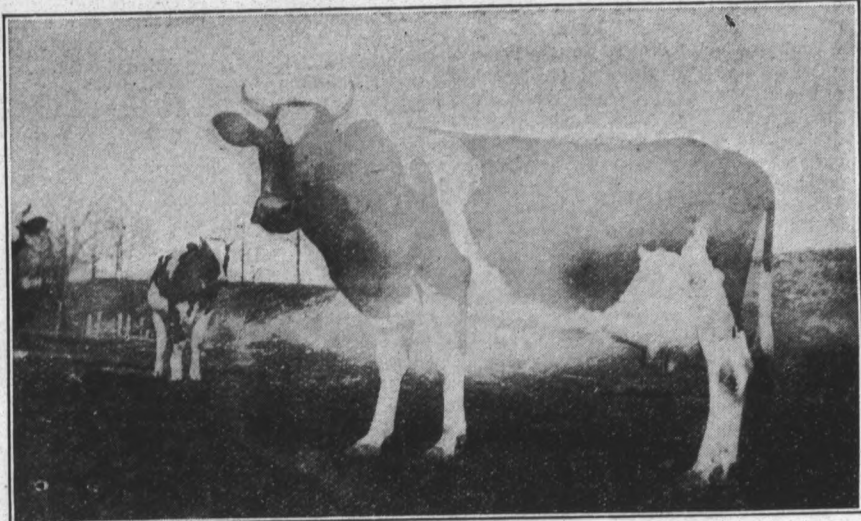


We admit it was no easy matter to put the Saginaw at the top. The greater part of seven years passed before Dairymen and Stockmen came to know the Saginaw as the one best Silo. During those seven years, we popularized the All-Steel Door Frame; and we designed the now-famous Inner Anchor; then the Saginaw Base Anchor; and the Angle Steel Rib, which marks final perfection in Silo building. In those seven years we've grown from one small Silo plant to five huge, modern Silo Factories. Our sales in a single day have totaled 587 Silos. The Saginaw stands strong and immovable as a big City skyscraper. No storm can twist it or tilt it or shift it on its foundation. And every pound of Silage that goes into a Saginaw comes out bright and clean. That's why leading farmers choose it. Write! We've ever had. Send for it and you'll see why experienced Dairymen and Stockmen everywhere are putting up Saginaws. Postal sent now brings handsomely Book 42, by return mail. The McClure Company (formerly Farmers Handy Wagon Company) Saginaw, Mich. Des Moines, Ia. Minnesota Transfer, Minn. Ft. Worth, Tex. Cairo, Ill.

DAIRY FARMING.

The Man.

In this world are found too many men who are unfitted to the work they are doing—some, of course, are at their tasks out of necessity and others by accident or choice, but they all are inefficient and working at a disadvantage by reason of being unsuited to their occupation. The dairy business has suffered like all other occupations in this regard. Men who lack the ability to produce money-saving crops, to provide the right kind of dairy barn equipment, to secure a good herd, to breed and feed his animals well, and to dispose of the product after it has been produced, men who lack that quality to make the dairy cows feel at ease when he is about, these men are certain to make a failure of the dairy business. If, after a personal examination one concludes that there may be qualities that will disqualify him from putting not only time but attention of mind and heart into dairying, it would seem the course of wisdom to consider another occupation.



Persistent Breeding toward a high Dairy Type raises the standard of the grade cows and occasionally produces an animal of rare performance.

Of all the elements that combine to make a person fit for a duty, a longing to do that particular thing is of most importance. A sincere desire to be engaged in a certain business generally reveals the line in which the person will succeed, for if he has an affection for the work he will inform himself of the requirements and get in a position to supply them. It is then that he will secure books, and journals and bulletins to learn of the experiences of others and with a longing for the business he will ever study to learn causes and determine effects. As applied to the dairy business a love for the dairy cow should, and naturally would, lead a person to gain much knowledge of her and the environment in which she will succeed best.

Now one of the important personal qualifications that can be acquired to a large degree by the person who wants to follow dairying, is business ability. Dairy farming is a business. Without business principles it cannot be made a success. If Mr. A. has made a greater success out of any kind of business than Mr. B., one is warranted in saying that A. had greater executive ability, that he understood business principles and applied them more successfully. It isn't always the best educated man that makes the greatest success out of dairy farming—far from it. The college professor may make a signal failure of it and yet know all about the subject. Why? Because he may lack this business or executive ability. He must not ignore that. It is the man back of enterprise that makes that enterprise a business success, and it is just as true of dairy farming as any other kind of business in the world. The business of growing crops upon our farms and marketing those crops through the dairy cows as dairy products, is one of the most profitable branches of agriculture in this country today. Taking everything into consideration, there is no phase of agriculture where there is a greater chance for real profit, than where a man grows crops on his farm for his cows, makes butter, or sells cream, feeds the skim-milk to calves and pigs, retains all the fertility possible upon his own farm, and thus markets his crops through his cows. But this requires business sagacity.

Sentiment is another quality necessary to make a success of dairying. The dairy cow has got to like her keeper. It may not be absolutely needful to like the cow, but one has got to fool her in some way and make her like him or she won't give you the best results. As Gov-

ernor Hoard says, one must have a little sentiment in handling either a dairy cow or a woman. If he hasn't got it he will make a failure with both. I want to tell you just a little experience. A number of years ago I had an old soldier as herdsman—"Old Jake," we called him. Most people would say he was a simple-minded fellow, but we know that he was one of nature's own noblemen. He liked cows and he made them comfortable. He would not think of going to bed at night until he looked them all over to see that they were comfortable. He had it on his mind; not for the money he got, but because he liked the cows. I never had my herd do so well as then. There came a time when "Jake" got a pension and he thought his rheumatism was worse than ever and he had to leave. He was gone about a year, and then he came back, not to see me or the family, but he had stood it as long as he could to be away from those cows. It was summer time when he came back, and the first thing he wanted to see was the cows. I went down the lane with

him and there on the creek flats was the herd feeding. I could go down ordinarily and they would keep on feeding. But when they saw "Jake" coming along with his peculiar hitch, they stopped and looked, and then they started. When the queen of the herd came up he put his arms around her neck and tears rolled down his cheeks. You want a little bit of that sentiment to make a success with the dairy herd.

A PERSISTENT MILKER.—SWEET OR SOUR SWILL FOR HOGS.

I have a Jersey cow due to freshen April 15. She is a very persistent milker and shows no signs of drying up. Would it not be better for her and the calf if I should dry her up? And if so, how is the best way to do it? This cow is the best one I own and I want to do what is best for her and the calf. And is there any difference in feeding sweet or sour swill to pregnant sows as long as they get proper grain? The sows seem to prefer sweet milk and swill.

Oceana Co. H. J. P.
As your cow is due to freshen April 15, and is still giving milk it will be impossible to dry her off as she should be. If she shows no sign of drying up now you can scarcely get her dry in time so that it would do any good anyway, and, therefore, I would advise milking her. I would give her a good liberal ration of feed, more than what milk she gives would seem to warrant because she is not only giving milk but she is also taking care of the embryo calf. If you don't feed her well your calf is liable not to be vigorous when it comes. It may not, anyway. Cows ought to have from four to six weeks vacation but sometimes we get such persistent milkers that they do not dry off and it seems to be impossible to force them to do so. In such cases it is advisable to continue milking them. Of course, the last few days before the cows freshen the milk would not be fit for food but could be fed to pigs.

Feeding experiments would seem to indicate that it makes but little difference whether pigs are fed sweet milk or sour milk. An experiment made at the Wisconsin Experiment Station would seem to say that the pigs did a little better on sour milk than they did on sweet but as it is some bother to sour the milk in cold weather I don't think that there is difference enough so that you need to pay any attention to the condition of the product. At the Vermont station results showed the sweet and sour milk to be about equal for gains, but the pigs fed sour milk seemed to relish their diet more.



June Milkings all the year round

Most anybody can make a dairy pay in spring-time, but it takes science to make it equally profitable in the drought of August and the zero weather of mid-winter. We know what we are talking about because we used to be cattle men ourselves. And we found out how to make June forage last all year and how to get June milkings in mid-winter. That's why we went into the Silo business. The

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Live Stock.

WEIGHT VS. MEASUREMENT OF CATTLE.

I would like to have you inform me if there is any way to determine the weight of cattle by measure. T. P. C. Genesee Co.

We know of no system of accurately estimating the weight of animals by measurements. An expert buyer learns to accurately measure the weight of cattle with his eye, but the variation in type is so great that it would be impossible to reduce any system of measurement to terms of weight which would even approximate accuracy.

PROPOSED AMENDMENT TO THE MICHIGAN STALLION LAW.

At the recent meeting of the Michigan Horse Breeders' Association at M. A. C., the proposed amendment to the stallion law was read. In the old stallion law, the wording was such that it let scrub stallions go "scott free" while grades and thoroughbreds had to pay a license fee of two dollars for the privilege of standing.

Clearly this was not the intent of the law. The law was made to crowd out the scrub sire for it is a recognized fact by breeders that the general class of horses will not be improved until the use of the scrub stallion is abolished.

The gist of the proposed amendment is that mongrels cannot obtain a license to stand unless they have been standing in a certain community for five years and the owner can get the letters of ten reputable freeholders and owners of colts sired by said stallion, stating that the stallion has been used in the community for five years. Also, the bills issued by the owners of all stallions shall bear the names "Pure Bred," "Grade," "Mongrel," on "Non-standard bred," whichever the case may be, and such names shall be posted up on the barns where the stallion stands. The license fee was made five dollars instead of two as in the old law, and this license is subject to renewal upon payment of two dollars a year.

MANAGEMENT OF EARLY LAMBS.

It is a common occurrence among early lambing ewes to find individuals deficient in milk flow when the offspring is dropped. The cause of this trouble can generally be traced to improper feeding of the ewes during the pregnant period. What remedy can be applied at the critical moment is one of the puzzling problems confronting the flock owner. Cow's milk should never be fed a newly-born lamb as it is too difficult to digest and deficient in nourishment. The best plan is to draw a little milk from another ewe that has recently lambed, and feed it to the lamb whose mother can not produce the necessary supply. Continue the practice until the mother is able to provide for her own offspring. Ewes giving trouble of this nature can be assisted by rubbing the udder. This friction will stimulate the muscles of the milk glands and if there is any available material for milk production it will come down. Proper feeding also should be immediately begun.

More early lambs are lost every season from becoming chilled than perhaps from all other causes combined. Chilling may be produced from two causes. First, exposure to low temperature, and second, lack of nourishment. There are several good methods of treating chilled lambs. If the trouble is caused from lack of nourishment food should be immediately supplied if the patient is not too far gone. When a lamb is chilled from over-exposure there is but one reliable remedy, and that is the warm water treatment. Put the lamb into a large pail and hold his head up above the rim. Then fill the pail with hot water at a temperature one can nicely hold his hand in. As soon as the water cools remove and repeat the treatment. Continue until the lamb shows life and a little desire to get out. Then remove the patient and wipe dry with flannel cloths. Keep the lamb in a warm room until thoroughly dry, then return him to his mother. I have found it a good plan to sew a flannel blanket about the lamb for protection against repeated attack and

leave it on for a day or two. When properly applied and done in time, this treatment of chilled lambs will generally prove a success.

To achieve a reasonable degree of success in handling early lambs the flock owner must pay strict attention to business. During the lambing period every precaution must be exercised to avert mortality. As a rule, more difficulty is encountered in caring for early lambs than those that come later on pasture. Sudden changes of feed should be avoided, both with the ewes and young lambs. If the ewes can not get to pasture they should be supplied with some form of succulent food or the milk flow will become insufficient for the lambs and they will fail to make satisfactory growth. The ewes should be heavily grained with milk producing or proteinaceous feeds. Clover hay and alfalfa are excellent roughages for ewes suckling lambs during the confined months. To secure the best results in handling early lambs the ewes should be gotten onto their regular ration some time before lambing time and then gradually given heavier feeding as conditions demand.

Shiawassee Co. LEO C. REYNOLDS.

FEEDING YOUNG PIGS.

The proper food for young pigs is undoubtedly that which they can obtain from their mother. Should this supply be insufficient, it is better to feed the sow in such a way as to increase the flow of milk rather than to tempt the youngsters to eat for themselves. I hold to the belief that the cheapest and best way to use separated milk is to feed it in small quantities to the suckling sows, as it will supply just those feeding properties which the sow requires at the time. The sow can digest the milk much better than can the little pigs, which get all the benefit from the milk fed to the sow, and in an easily digested and natural form.

Little pigs suffer from indigestion if given solid food before they are three to four weeks old, when they have arrived at that age a few whole white peas, kernels of oats or wheat may be given, if available, small proportion of milk added to the grains and water slops.

The piglings will not be able to digest a great quantity of separated milk, owing to the fat being extracted. The addition of a little linsed oil will render the separated milk more digestible, or as much molasses as will render the slops sweet.

The question as to the age at which pigs can be fed solid grains or feeds is answered above. So is the question as to the best way to assist the sow when her supply of milk is insufficient for her piglings. If anyone successfully reared a litter of 16 pigs, as I have heard, without the assistance of the sow, he should be competent to advise as to the system of wet nursing pigs. Many different plans have been tried. Probably the best and least expensive is the use of cow's milk, to which a little sugar or molasses is added. The principal points in feeding being very frequent meals in early life, attention to the temperature of the food, and perfect cleanliness of the feeding bottle, troughs, etc., used in the operation.

When all these precautions are taken, it is doubtful if ordinary pigs at ordinary market prices will give a profitable return for hand-rearing.

Canada. W. R. GILBERT.

We have raised young pigs "by hand" with entire success and believe that, while this expedient should be avoided if possible, if necessary to the saving of the pigs it will prove profitable under present market conditions.—Ed.

BOOK NOTICE.

"Modern Silage Methods," the ninth edition, revised to date, published by the Silver Mfg Co., Salem, Ohio, is a 264-page book in paper binding covering every phase of building and filling silos, giving the reader up-to-date information on how to feed silage for milk and beef production, also for sheep, poultry and other live stock. The book includes feeding tables, which alone are worth more than the price of the book, which is only 10c, a sum really below the cost of its production.

MARCH PIGS.

Of the more than fifty millions of pigs farrowed on the farms in this country each year, there is a larger percentage of losses at farrowing time during the month of March, than during any other month in the year. January and February are colder months, but there are but a few who are so presumptuous as to venture to intentionally plan for pigs to come during those months in this cold climate. In the southern states the weather is too wet and cold, and the conveniences in the shape of buildings are too meagre to make it advisable to plan for pigs during midwinter.

The month of March is the month of heavy losses in small pigs for three reasons: It is a month of changeable weather, and not generally much sunshine, an essential for giving young pigs a good start in the journey of life. In the second place, a good many are anxious to get early pigs and are ready to take the chances because they seem to think the reward of getting early pigs started to meet the early market in the fall, is enticing enough to take the risks. In the third place, there are but a few who know how to make the necessary preparations for pigs in cold weather, and are willing to take the pains to meet the necessities.

March is a month characterized by not only sudden changes in temperature—sometimes there seems to be a promise of fine weather—but there are other conditions that come too suddenly for us to be prepared for them. Often when there is not a cold, disagreeable storm on hand, there is the poisonous east wind that seems to discourage if not destroy young lambs and young pigs. Notwith-

it is the season now upon us, and the losses likely to be met with in March are not alone the result of "bad luck," but come as a sequel to a lack of proper precaution and bad management. It is the season of the year when newspaper men set their type to "break the news" to the general public, and arouse them to the "solemn fact" that farmers have met with serious pig losses during the early farrowing season this year, and there is sure to be a shortage in the annual "hog crop" next fall, and consequently high prices must prevail.

Oakland Co.

N. A. CLAPP.

FEEDERS' PROBLEMS.

What to Sow with Rape for Sheep Pasture.

What is best to sow with rape in the spring for sheep pasture? Something that will make pasture all summer? Ingham Co. A. H. J.

While a variety of feeds is better for sheep than rape alone, it is a difficult proposition to sow anything with rape which will serve this purpose. Some farmers sow millet with rape and while this makes a fairly good combination it is not so good as though sheep could be given access to a grass pasture while on the rape, either all or part of the time, or be given the run of the two fields.

Charcoal and Ashes for Hogs.

I have some pigs which have acted peculiar for some time. They appear to crave for metals, especially galvanized iron and zinc and to nurse each other. The pigs are six months old and over. Mich. W. W.

It is not safe for one to prescribe for hogs unless he has made a personal examination, and then it is better to consult a veterinarian who makes a specialty of this sort of business. However, at



21-yr.-old Brood Mare and some of her Colts. Property of J. A. Barnum, Branch Co.

standing the fact that farmers have more time to devote to caring for pigs during March than later in the season, conditions of weather at farrowing time are unfavorable in several ways which make it very difficult to save a large percentage of the pigs farrowed. Even if the pigs are saved at farrowing time the battle is not won. Confinement in pens and the accumulation of filth are the factors one has to contend against, and fate too often decrees that the little pigs, though they are almost as precious now as diamonds, are to succumb to some of the many diseases to which they are heir, before they are old enough and large enough to be put out in the open to breathe the pure air so necessary to insure life, and come in contact with mother earth to insure healthy strength and vigor.

It is safe to assert that in all that portion of country above 40 degrees north latitude, it is not safe to venture very much with pigs being farrowed during the month of March. Seasons have changed since 50 years ago. Cold weather comes later in the season, we have what we call later falls, and winter lingers longer in the lap of spring. From the standpoint of economy it is too often a risky venture to undertake to have a large percentage of the pigs to be raised on the farm farrowed in March. It costs as much to winter the sows that lose a large percentage of pigs in March as it does to winter those that bring a tenfold increase in April.

While there may be a few who have "good luck," as they call it, with pigs in cold weather, there are thousands who meet with severe losses. It is only the trained herdsman who has the necessary equipment to control and make the conditions ideal to save pigs in cold weather, that can make it a paying venture to plan for an increase in the swine herd during the treacherous weather we usually have in March.

I offer these hints at this time because

long range I would say that the pigs were affected with a mild attack of indigestion, and I would suggest that you give them charcoal or hardwood ashes, or concentrated lye. If you use concentrated lye use it at the rate of about one-half pound of concentrated lye to a barrel of slop. If you give them hardwood ashes, if they do not eat them readily I would put some of the ashes right into the slop. This will correct any acidity in the stomach and I think it will relieve the trouble.

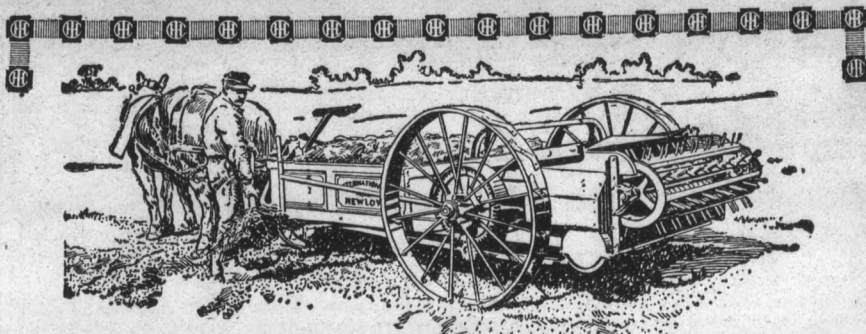
Producing Veal on Skim-Milk and Grain.

Will you please tell me if you think I can make a good veal calf out of separator milk and oil meal? Some claim they can. If it could be done wouldn't it be cheaper than giving the calf whole milk, especially as we have more skim-milk than we have use for? Please tell me what you think about it and how much oil meal to feed?

Van Buren Co.

C. M.

I think it would be practically impossible to produce veal in the same length of time with skim-milk and grain as it would on whole milk, because whole milk is the natural food of the calf. However, if you want to keep the calves until two or three months old, or probably a little longer, you can get them in good condition so that they will sell well for veal. You want to feed, however, instead of oil meal, ground flaxseed if you can possibly get it with the skim-milk. Commence with a small amount and gradually increase until you are giving the calf about all that it will eat. Now, besides this get the calf to eating oats and corn meal just as soon as possible. Be careful about overfeeding but gradually increase the skim-milk and ground flaxseed until the calf has all it wants, providing it does not produce the scours. You will have to watch this. Some people produce veal calves in this way of fairly good quality. They will have to be a little bit older. I am inclined to think the veal will be produced cheaper than on whole milk but it will hardly be as good quality. COLON C. LILLIE.



An Unsolicited Testimonial

A CLEAR-EYED young Iowa farmer stepped up to a manure spreader demonstrator at the 1912 Chicago Live Stock Show and, pointing to one of the spreaders in the exhibit said:

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This unsolicited recommendation from a man who had used an I H C spreader, and therefore knew what it would do, carried weight with his hearers. They might have doubted whether an I H C manure spreader would spread soft coal, but there was no doubt in their minds that an I H C spreader had spread manure to this man's entire satisfaction. This is a typical case showing what users think about

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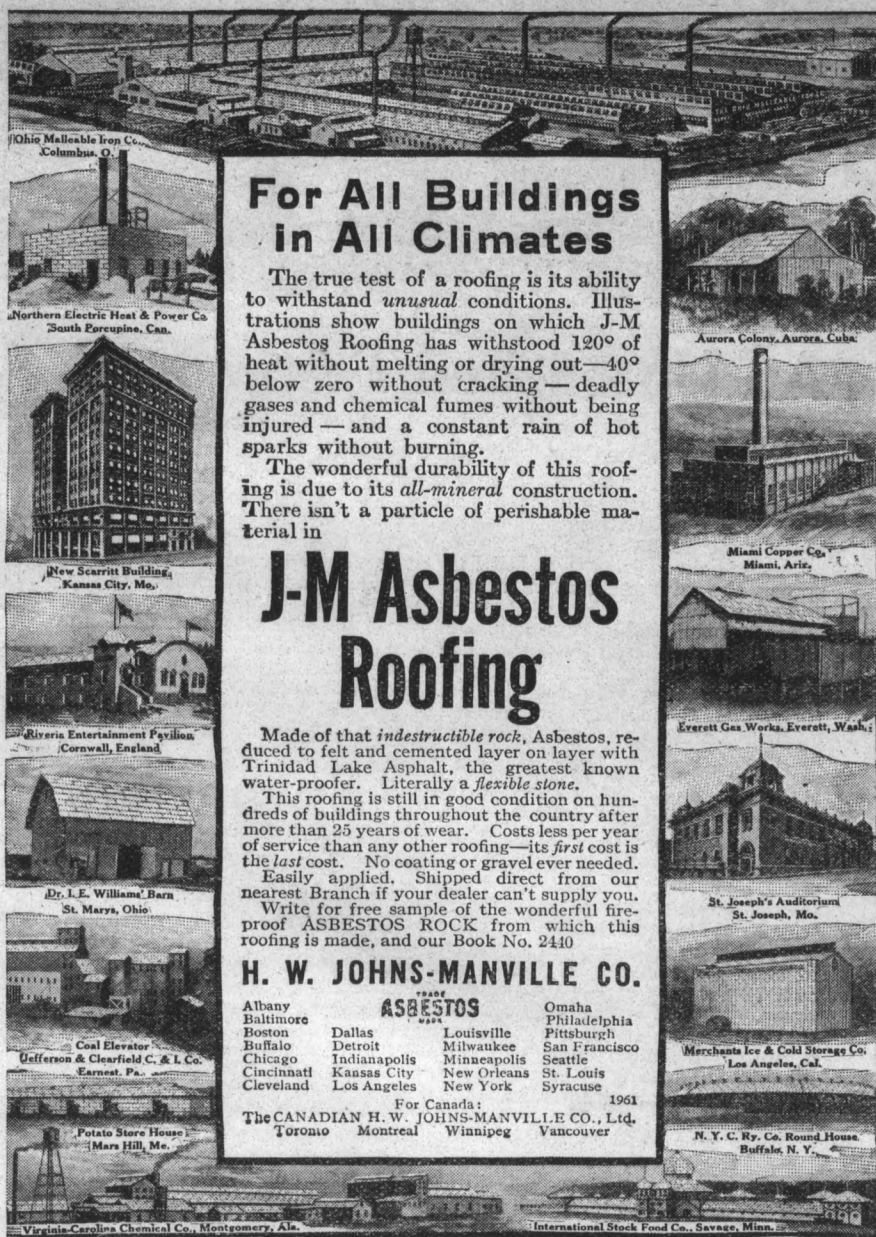
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Why Chicks Die In The Shell.

Dying in the shell is a very common trouble and one which causes many failures. There had not been any attempt to discover why chicks die in the shell until hatching with incubators became popular, although the trouble prevailed long before the incubator was thought of. There were only a few dead chicks under each hen, at the most, and nothing was thought of it, but when the incubator came into the field, making it possible to hatch chicks by the hundreds, the cause of this trouble came up for discussion. My ideas on the matter have been formed from my own experience and observation.

Whether a larger number of chicks die in the shell where eggs are hatched in incubators than under hens is doubtful. However, it is very plain to me that two chicks dead in the shell under each of 10 or 12 hens will not attract much attention, while a score or more in one incubator will cause very much alarm. It is simply that by having all the eggs together, as in the incubator, one realizes more fully how many there are. With hens it's only one or two here and there.

As to the cause of the trouble it may be said that, perhaps, in not two cases in 20 will the conditions under which eggs are incubated, or the conditions surrounding the eggs before incubation begins, be the same, hence there must necessarily be various causes. It is therefore difficult to give definite instructions that will apply in all cases. A few chicks dying in the shell should cause no alarm. It cannot be prevented, and it is an impossibility to hatch every egg. A few chicks failing to come out of the shell is no indication of faulty incubation, nor does it necessarily mean a weakness, in the breeding stock. However, when a large number die in the shell it is time to look about for the trouble.

The incubator is not as often at fault as many are inclined to think. If the machine is a good one, of standard make, the trouble is more likely with the operator or with the eggs. A poor operator will not get a good hatch from the best machine ever made. If the trouble is neither with the machine nor the operator, then it lies farther back. Carefully note the conditions surrounding the eggs after they were laid and before being placed in the incubator. Eggs too long exposed to a chilling atmosphere, or kept in too high temperature, or kept too long after being laid and not turned daily, will show an unusually large number of chicks dead in the shell.

Eggs to hatch well in an incubator should be as fresh as possible. The nearer all are of the same age the better, and the same applies to size and color. Eggs two or even three weeks old have been known to hatch remarkably well, but those not over a week or ten days old are much more to be relied upon. While accumulating they should be kept in a temperature of 50 degrees and should be turned daily, or at least every other day. If they have been on a long journey, and perhaps roughly handled, a larger per cent of dead chicks than usual should be expected.

None of these things being the cause, however, go still farther back and look into the condition of the breeding stock. It may appear healthy enough but not producing strongly fertilized eggs. There may be a lack of vigor on the part of the male, or a spirit of uncongeniality between the male and some of the females. The food ration may be lacking in some much-needed element—green or animal food—or the food may be simply dumped out to the flock and the fowls are therefore not taking sufficient exercise to keep themselves in vigorous breeding condition. The breeders may be immature, may be poorly fed, or may be overfat.

Look over all these conditions carefully. In fact, do not overlook anything that has to do with the strength and vitality of the chicks, either directly or indirectly. Remember that securing a high percentage of live chicks depends as much upon strongly fertilized eggs, laid by healthy, vigorous fowls, as upon proper incubation. The more frequent causes of chicks dying in the shell where the incubator or operator is at fault are irregular temperature, neglect in turning eggs, improper ventilation or, more frequently, insufficient ventilation caused by operating the machine in a poorly ventilated room. The directions accompanying an incubator are generally to be relied upon, and if these are followed carefully no greater losses should be experienced from chicks dying in the shell where eggs are incubated by artificial than by natural means, due allowance being made for the experience of the operator.

A. E. VANDERVOORT.

GETTING FULL VALUE FROM POULTRY MANURE.

In published estimates of the average annual income from a single hen a credit of 50 cents is allowed for the fertilizer item. By carefully gathering and storing this by-product of the poultry flock results show that it is not an exaggerated valuation, but a wasteful manner of handling may considerably reduce this figure. As the majority of flocks are kept roosting over the accumulations of droppings which exhale pungent ammonia, valuable to agriculture but unsanitary when mingled with the atmosphere that supplies respiration, there is not only a constant loss of material but the breeding place for vermin thus afforded renders the care of poultry costly, irksome and discouraging.

An altogether satisfactory way of storing hen manure is to build for it a shack of old boards, secure from the elements, outside of but convenient to the quarters, and lay in a pile of sand or earth with which to spread a coating over each deposit of manure. This seals up the ammonia and makes a properly diluted compost. Every day the droppings from the roosts and scatterings from the floors should be cleaned up and stored. To make it a daily task is not burdensome and is amply recompensed not only by a sense of cleanliness enjoyable to the fowls and their keeper but a rich fertilizer is preserved in the best possible condition. In the growing season of course the droppings are applied immediately to the soil.

On a plot of ground intended for leafy products, such as lettuce, spinach, cabbage and the like, also for all sorts of vines, an application of this compost, well harrowed in, just before planting gives surprising results in quickness and luxuriance of growth, conditions essential to crispness and flavor.

At this stage it is no longer a sin but rather a virtue to introduce hardwood ashes with their content of lime to set free the elements of growth and sweeten acid conditions, and their supplementary constituents of potash and phosphoric acid to balance the vegetable ration. In nowise, however, should these two fertilizers be brought within the bounds of affinity until awaiting vegetation is present to feed upon their resultant dissolution. After all the reiterations of this warning appearing in poultry literature, there are multitudes of flock owners still ignorant of, or indifferent to, the waste accruing from composting ashes and animal voidings, and who, under the mistaken notion of cleansing the roosting quarters and destroying lice, proceed day after day to sandwich these mutual destroyers.

Oceana Co.

M. A. HOYT.

SOURCES OF HONEY IN MICHIGAN.

(Continued from last week.)

Fruit Blossoms.—In my locality these always come during the dandelion flow and constitute a very valuable adjunct to it. Fruit-blossom honey is a very mild, pleasant tasting honey, not quite so light in color as the clover. Its principal value is as a help at the critical time when honey is getting scarce in the hive and much of it is being used for brood rearing.

Clovers.—The several varieties of clover are the most important of all the honey plants. They were pretty thoroughly discussed in a series of articles appearing in these columns last year, so it seems unnecessary to deal with them further here.

Basswood, or American Linden.—Next to clover this has been one of the most important of Michigan honey plants, but the country has become so depleted of this valuable tree that it is very seldom we get enough honey from that source to become of any account. When secured in its purity it is whiter than clover and has a minty flavor very pleasant to the taste. The tree usually comes into blossom about the tenth of July and in Michigan the flow is usually of only three to five days' duration. G. M. Doolittle tells us that in his home state (New York), the flow usually lasts two to four weeks. This is probably owing to the three weeks and is as sure as the clover

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Silver, Golden and white Wyandottes, a fine lot of young stock. New circular January 1st. Browning's Wyandotte Farm, R. 30, Portland, Mich.

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mountains. The trees in the valleys blossom first and then gradually come into bloom up the mountain side, giving a continuous flow for a considerable time. As high as 66 lbs. from a single colony, has been reported from this wonderful producer of honey. As the tree is a very rapid grower, bee-keepers would be well repaid for adorning their roadsides with a row of shade trees of this variety. In five or six years the trees would begin to blossom. Even outside of the bee industry there would be good money in raising basswood trees, as 15 to 20 years is all the time necessary to bring them to a marketable age, and the lumber is growing more valuable every year. Young trees can usually be procured from the woods and brush lots, and such trees will do better than those secured from nurseries.

Willow Herb (*Epilobium Augustifolium*).—This is a great honey plant—al-



Blossom of Willow Herb, a Species of Fireweed Yielding Water-white Honey.

most equal to basswood where plentiful. It is a fireweed and is usually at its best the second year after a fire. The honey secured from it is very light colored and of rather insipid taste.

Currant (*Ribes rubrum*).—Gooseberries also are included in this genus. These blossom early but are not usually plentiful enough to make them very important.

Raspberry.—Honey from the raspberry has, in the last eight or ten years, come into great prominence as one of the finest flavored honeys produced. The bulk of the raspberry honey produced comes from northern Michigan. As the forests are lumbered off, raspberries take possession, and bee-keepers who have apiaries in these locations reap a rich harvest. This flow comes at about the same time as the clover flow. As the bees can work on these blossoms immediately after a rain storm there is seldom any

of white honey and, coming as they do after the clover flow is over, are quite valuable to the bee-keeper where cucumbers are raised extensively.

Heartsease (*Polygonum persicaria*).—Grows mostly in low damp ground and is not as a rule very plentiful in this state. The honey is of very fair quality, and as it blossoms from August until killed by frost it is very valuable to the lucky bee-keeper who has it in his locality. No large yields have been reported from this plant in Michigan, probably because of its scarcity, but in some of the western states it is nothing uncommon for bee-keepers to secure an average of 200 lbs. to the colony from this source alone. One man reports 450 lbs. from each of two colonies in one season from this source and an average for the whole year of 250 lbs. per colony.

Mecosta Co. L. C. WHEELER.
(Concluded next week.)

FEEDING BEES IN SPRING—SECURING NEW QUEENS.

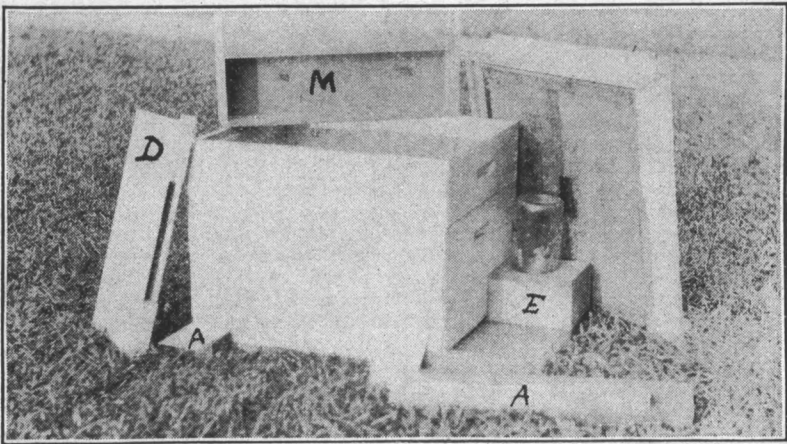
In Farmer of Feb. 1, N. F. Gute speaks of feeding bees in spring. Does he feed outside or above the brood chamber? He also mentions method of dividing swarms to increase them. If he does not wish to change the queen the old hive would build queen cells and raise their queen, would they not?

Lapeer Co. E. S. M.

The best method of feeding bees in spring is by means of one of the entrance feeders which can be purchased from any of the supply dealers. The Alexander is made of two-by-four stuff, with deep saw kerfs in the flat side, extending nearly through. The cutter-head is so set as to allow a thin portion of the wood to be left so as to give the bees a foothold to prevent drowning. The wood is saturated with linseed oil to prevent checking and cracking. The hive is slid forward on the bottom board and the feeder put in place, crosswise of hive. It is made long enough to extend three inches beyond the edge of a ten-frame hive. A wooden block closes the exposed end. This feeder can be used on an eight-frame hive by putting cover block lengthwise. To feed, lift block and pour in the syrup.

The Doolittle entrance feeder is a box-like arrangement with opening at the top to allow a fruit can, with perforated cover, to fit in, top downward. This is pushed before the entrance, closing it in every way except to bees coming directly into the feeder from the hive. Bees suck the syrup from the can through the holes in can top, which are about the size of pin holes. Either of these feeders are good ones, as only bees from hives fed have a chance to get at the syrup, thus completely doing away with robbers. The hive is not opened and thus danger of chilling the bees is avoided.

Old colonies will build their own cells and raise their own queen, if strong in bees. Many good bee-keepers keep no queen that is more than two years old,



A Variety of Bee Feeders.—A. The Alexander; D. Division board Feeder; E. Doolittle entrance feeder; M. The Miller.

time lost by them when gathering from it. Rain will wash all the honey out of clover and basswood blossoms, causing a stoppage in the nectar flow from clover of perhaps half a day to a full day. The basswood flow will often be ruined for the season by a single shower of rain.

Honey Locust (*Gleditsia triacanthus*).—An abundant producer of honey but usually too scarce to make much impression on the flow. I believe the honey is of very good quality.

Horsemint (*Monarda fistulosa*).—In places where this is plentiful it produces an abundance of finely flavored honey.

Cucumber (*Cucumis sativus*).—Cucumber blossoms produce a good quality

as vigorous laying young queens are much more profitable. The bee-keeper should take a hand in getting rid of a poor queen, as bees are slow in superseding a queen mother. This may be accomplished by putting the old queen in a top story, or super, putting a queen-excluding zinc between. Bees will then build queen cells. When a new queen has been hatched, mated and has begun laying the old queen may be killed by the bee-keeper, or the queen excluder may be removed and the young queen will do the deed. A quicker method is that of using a queen cell, nearly ready to hatch, obtained from some other hive, or by the introduction of a virgin or laying queen. Shiawassee Co. N. F. GUTE.

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DETROIT, MARCH 8, 1913.

CURRENT COMMENT.

Always Sign Your Name. Occasionally letters are received making complaint that questions previously submitted to the Michigan Farmer have not been answered. Generally this is due to the neglect of the inquirer to give his full name and address. Where publicity is not desired the name will not be published, but for obvious reasons we cannot reply to inquiries where the inquirer does not give his name and address. Where inquiries are received from a large number of correspondents some rule has to be observed with regard to answering them, and it is only reasonable that the correspondent give his name and address as evidence that he is a subscriber to the Michigan Farmer, and as such is entitled to such service as we may be able to give him. To avoid disappointment in receiving a prompt reply to all inquiries the subscriber seeking advice should therefore give his full name and post office address.

The Township Highway Problem. With the approach of the date for the annual township meeting the question of an appropriation for local highway improvement should be given careful consideration by the electors. In the evolution of our highway system no fixed policy has as yet been developed in most townships of the state. The question of the manner of improving and maintaining the highway has rather been the subject of experiment. In some townships the progressive spirit has prevailed and a section of permanent road built through local appropriation, and often with the result that the increase in taxes has brought about a reversion of sentiment upon this question and further progress along this line has been indefinitely delayed.

We believe, however, that if in the making of experiments in highway improvement, the matter of proper highway maintenance could be more carefully studied in the average township and the voters of the township become better informed upon the possibilities of improved highways through proper maintenance at small cost, a definite plan would be evolved which would be permanently pursued in many townships of the state.

Reference has been made in these columns many times to the efficiency of the King drag for highway maintenance, particularly on clay roads, and it has also been demonstrated that even on sandy roads much benefit is derived from the use of the King drag at just the proper time. In fact, the thoroughness of the work, and the timeliness with which it is carried on throughout the season are the essential factors to its success.

If one man in each of the four road districts, into which the average township is divided under the present law,

were kept constantly at work upon the highways, using the King drag when the weather is suitable, the grader to turn-pike the road suitably when conditions do not favor the use of the King drag, the drawing of gravel to fill holes in the road where needed, etc., very desirable results could be secured in many townships and the roads could be maintained in better condition at less expense than they now are. This is a matter worthy of the consideration of the farmers in every township prior to the township meeting when plans can be made for this kind of work.

The State Round-Up Farmers' Institute. The Round-Up Farmers' Institute, which was held at the Agricultural College at East Lansing last week, was a very successful meeting from every point of view. The program was a very interesting one, well calculated to interest both the farmers and students present. The topics discussed were of a timely nature and were handled by men who are authorities in their several lines. The attendance was very good throughout the session, the large assembly hall in the new agricultural building being filled to its capacity at practically every meeting, while on Thursday a separate session was held for the discussion of horticultural topics and a separate section was conducted for the women on Wednesday and Thursday.

Owing to the extended and varied character of the program it has been impracticable to attempt a consecutive report, for which reason this important meeting will be handled as it was last year. Several of the more important subjects treated are made the subject of special articles in this issue and others will follow in like manner in succeeding issues, to the end that Michigan Farmer readers may get the benefit of the lectures upon the more important of the topics presented in a more thorough manner than would be possible by attempting a comprehensive report of this important institute meeting in a single issue.

Every reader should carefully review the reports of the lecturers upon the subjects presented in this issue and should watch for those which will follow as in this way they may receive some measure of the benefit which would have accrued to them had it been possible for them to have attended this important institute meeting.

Cold Storage Legislation. At every legislative session the cold storage question comes up for its share of proposed legislation. From recent reports the present legislative session in Michigan is to be no exception to this general rule, it being reported that a bill is to be introduced and pushed providing for limiting the time during which food products may be kept in cold storage to six weeks. As is usual with such legislation, this proposed measure is advocated as a remedy for the high cost of living. A careful study of the proposition, however, should convince any fair-minded man that a bill of this kind given general application would be an injustice both to producer and consumer.

Unquestionably the development of the cold storage business has been of great benefit to the producer of perishable products. Particularly is this true of butter and eggs, which are produced more abundantly in the flush season than during the balance of the year. In fact, before the advent of cold storage both butter and eggs sold very cheaply during the season of greatest production, while during the season of scant production these products which were really fit for table consumption, sold at such an extravagantly high price that ordinary people were unable to use them. But with the development of the cold storage business these products sold a little higher during the season of flush production, due to the demand for storage purposes and products of table quality have sold cheaper during the season of scant production, so that on the whole, while the producer has been benefited to a marked degree the consumer has not suffered an injustice when the average price for the season is taken into consideration.

With other products the same thing is true to a lesser degree, such as fruits and perishable vegetables. In fact, in every case where such legislation is proposed it will be found that the object in view is to restrict the storage of meat products for an indefinite period of time, either of beef or, as is the case with the legislation contemplated as above noted, fish and sometimes poultry. But in the attempt to regulate the matter of storing

meat products for future consumption those who are pushing this kind of legislation should remember that they would do a great injustice in applying the same rule to other perishable products, such as those above enumerated. This is a subject of grave economic importance and one which will bear close study from many standpoints.

Milk Inspection. The situation with regard to milk inspection in Detroit will be of interest to all dairymen as well as city consumers of milk, since the situation in Detroit is typical of that in many other centers for marketing milk. During recent years the city board of health has taken the matter of milk inspection in hand and has not only inspected the supply as it came into the city, but by way of insuring a better quality of milk within the city has been sending inspectors into the country to score the dairy barns and herds of producers who ship milk to the Detroit market or who sell the milk to local dealers at country loading points.

It was charged by producers in many sections contiguous to Detroit that oftentimes these inspections were unfair and were made by incompetent men, and as a measure of mutual protection local organizations of dairymen in different sections of contiguous territory sprang up. Something like a year ago a general organization was consummated and after a time this was reorganized and made to include practically all of the local organizations. This organization is known as the Mutual Dairymen's Association of Detroit. It numbers something over 800 members and represents between nine and ten thousand dairy cows, the milk from which contributes to the Detroit milk supply. The association is really an affiliation of the 42 local producers' associations scattered throughout the country which contributes to the Detroit city milk supply.

As would be natural, there has been some friction between this organization, the local board of health and the milk dealers of the city of Detroit, and all sides of this three-cornered combination have not as yet been satisfied with the manner in which the problem involved has been worked out. As a consequence the Mutual Dairymen's Association is now seeking state legislation to control in a measure the matter of city milk inspection. According to information furnished by the secretary of the Dairymen's Association, this proposed legislation, which is embodied in House Bill No. 290, introduced by Representative Downing, of Wayne county, contains the following provisions which are considered important by the members of the Dairymen's Association:

First in importance among these provisions is the matter of the qualification of the inspectors, the proposed requirements being either an experience of two years on a dairy farm as working manager or two years' instruction in the dairy department of the agricultural division at M. A. C., or any agricultural college of similar standing. The provisions of the bill, so far as supplanting the present inspectors by those who come up to these qualifications, are that one shall be put on within 90 days after the law goes into effect and one each six months thereafter until the full corps of inspectors are so qualified.

Another provision incorporated in this bill is to make it obligatory upon the board of health to grant a reinspection of premises of any milk producer who has been eliminated because of the score of his dairy plant within 30 days after he files an affidavit that such alterations or improvements as would meet the requirements have been completed. At present it appears that if a man is once prohibited from shipping his milk because of the score of his premises, he cannot get his premises re-inspected until the next annual inspection, which is considered a hardship.

Another grievance of the dairymen is the rule of the Detroit Board of Health prohibiting the shipment of milk from a fresh cow for ten days after she has freshened. It is claimed that in other states where this matter is governed by law, a period of only four to five days is required to elapse after a cow freshens before the milk can be shipped, which to experienced dairymen would seem to be a more reasonable requirement. There are a number of other minor provisions relating to the matter of inspection and the ground upon which the milk may be excluded from the city supply, which space will not permit to be here enumerated.

It is said upon good authority that the board of health is preparing to make a strenuous fight against the enactment of this proposed legislation. As a matter of fact, to one who has observed this contention from the outside, it would appear that there are just grounds for dissatisfaction among the dairymen. There seems to be plenty of evidence of incompetence on the part of some of the inspectors at least, although it is stated upon reasonably good authority that the board of health has sought to make an improvement in this direction. Also, there is no doubt that those who have this matter in charge in the city health department are less able to give competent inspection than would be a class of inspectors coming up to the qualifications advocated by the dairymen.

On the other hand, there is every reason why the city milk supply should be maintained at the highest possible point of quality. There is undoubtedly need for more "horse sense" on the part of the city authorities and for more toleration and consideration on the part of at least a portion of the milk producers.

The discussion which will arise over this proposed legislation should at least give the public a clear idea of the situation as it is, and the enactment of a well considered measure of this kind might promote the public welfare to a desirable degree. The hearings upon this proposition will be carefully followed as they progress.

The School Book Question. As usual during legislative sessions, the question of school book legislation is engaging considerable attention at Lansing. There are, as usual, two general opinions prevailing with regard to needed changes in the school book law. One favors the enactment of a law providing for free text books in the public schools. This has the approval of the Michigan State Teachers' Association and the Michigan Association of School Boards and City Superintendents. The arguments advanced in favor of it are that it makes the school absolutely free to the pupils, preventing loss of time and reducing the cost of school books to the minimum. Michigan experience has favored this plan in cities where it has been tried out and the objections to the plan are answered in a fairly satisfactory manner by those who favor it.

The other idea favors a state uniformity in text books, which idea appears to be at present, as it has been in the past, somewhat in the minority. Upon the ground that the idea of uniformity is a good one, if there are no serious objections to it, some of the objections advanced by those opposing state-wide uniformity of text books might here be noted. Perhaps the strongest of these claims is that unsatisfactory text books might be secured and that progress would be handicapped by such a movement. Another potent reason is that the expense of introducing uniformity would be very considerable and that the benefit would accrue more largely to those who move from place to place than to the more substantial citizens of the state who remain in one locality.

As this is a matter of interest to every citizen of the state, the outcome of the present legislative consideration of the proposition will be watched with interest by all.

Congress Enacts "Dry" Measure. For the second time in the history of the country, Congress last week passed a bill over the President's veto. The bill so passed is known as the Webb bill and prohibits shipment of intoxicating liquors into "dry" states. This bill had previously been passed by both houses of Congress and submitted to the President, who vetoed it for strictly legal reasons, it being his opinion that the bill was unconstitutional in that it virtually delegated to the states the control of interstate traffic in liquor, when that control was vested by the constitution solely in Congress.

As above noted, this is only the second time in the history of our country that Congress has passed a law over the veto of the President. The first instance of the kind was when the Rainy River Dam bill was passed over President Roosevelt's disapproval. In this case, however, there was a very decided vote in both houses, based upon the sentiment that the act would make effective the prohibition laws of the "dry" states which are now largely inoperative because intoxicants are shipped to private individuals within the states.

(Continued on page 315).

Magazine Section

LITERATURE
POETRY
HISTORY and
INFORMATION

MICHIGAN FARMER
AND **LIVE STOCK**
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The FARM BOY
and GIRL
SCIENTIFIC and
MECHANICAL

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

STAUNCH OLD FORT MARION

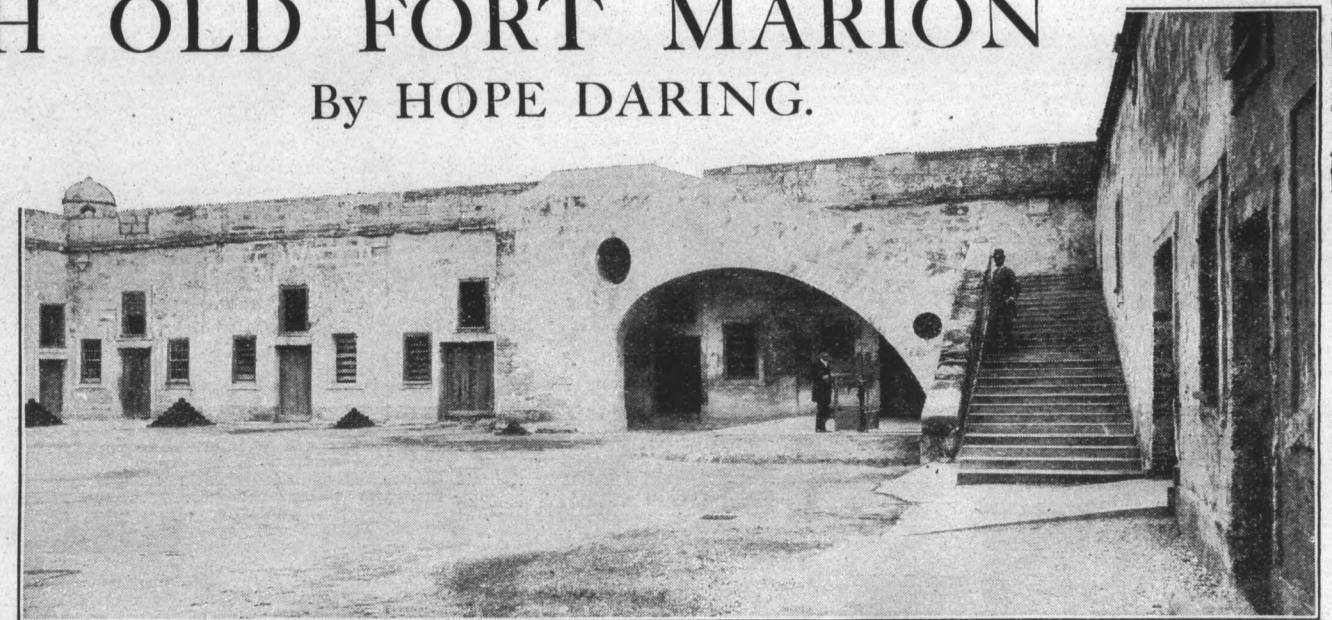
By HOPE DARING.

IT stands within the city limits of St. Augustine, the "Ancient City." This present structure was completed 156 years ago. Few changes have been made since its completion, although, after the fort came into possession of the United States government, several times a large sum of money has been expended in repairs. Fortunately these have been repairs, not innovations.

A writer has said of the early days, "For 200 years the fort was St. Augustine, and St. Augustine was Florida." When the Spaniards settled in Florida—the New World that had lured them across the sea with promises of gold and of eternal youth—their first thought had to be of protection. In 1565 Menendez built, near the present site of Fort Marion, an octagon-shaped fort of logs, chinked with earth. The palisades were palmetto trunks driven into the ground. This was named Fort San Juan de Pinos.

A hundred years brought little change to that seaside colony. In 1647 St. Augustine contained "300 householders or heads of families, while the convent of St. Francis had 50 brothers in residence." About 1690 the present fort building was begun. A famous French engineer, Marechal de Vauban, furnished the plans. The building dragged—although it was, only a few years before it was occupied, it was not completed until 1756. It is said that a king of Spain said, when recognizing its cost, "The fort's walls must be of gold."

Instead of gold the fort's walls are built of coquina. This curious shell formation is a mixture of sand and shell fragments of great variety. Ages ago these were washed up on the shores of Anastasia Island, just across the inlet from the fort. By the action of the waves and the dissolving of the lime substance of the shells, this came to be a cemented mass. It quarries easily and hardens on being exposed to the sun and air. Vast quarries of this substance line much of the shore of the island, and it was decided to use it for building the fort. It was cut into blocks six feet long, four to five feet wide, and two to five feet thick. These were conveyed across the inlet or harbor, now known as Matanzas River, to the spot where the fort was to stand. Convicts were brought from Spain and Mexico to work upon the walls. Indian captives were also compelled to



Spacious Inner Court of the Old Fortress as it Appears Today.

toil at the heavy tasks. Coquina is a Spanish word signifying shellfish.

When completed the fort was a massive structure, "equipped with curtains, bastions, moat, barbican, and glacis." It was named San Marco. With its reservations it covered 22 acres. The inner court, from which the casemates opened, was a little more than 100 feet square, and the wall was high enough so that some of the casemates were divided into upper and lower apartments. The water side of the fort was protected by a water battery, and on the other three sides was a high hill of earth—the glacis. This was in turn surrounded by the moat. The barbican, a small fortification, was directly in front of the fort's entrance, and was connected with it by a drawbridge. The roof of the casemates was flat and formed the wide terreplein or rampart, and this was protected by a high parapet. At each of the four corners of this immense wall was a bastion or lookout tower, the one on the northeast corner being higher than the others. These bastions were named by the Spaniards, St. Peter, St. John, St. James, and St. Paul.

There were stormy days for San Marco. In 1702, when it was in an uncompleted state, it was unsuccessfully besieged for three months, by English

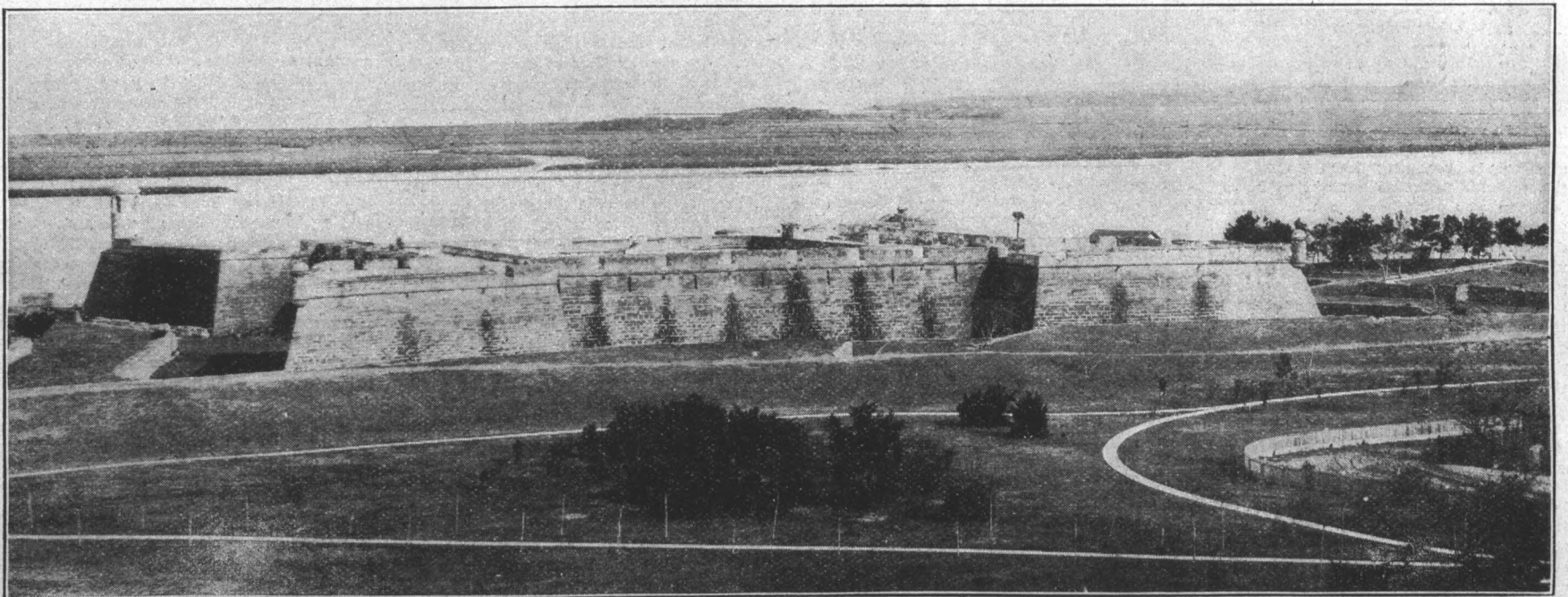
troops. Twenty-five years later Colonel Palmer, of South Carolina, "laid waste the entire country," but could not force the fort to surrender. In 1740 Governor Oglethorpe, of Georgia, invested St. Augustine, and the inhabitants took refuge behind the coquina walls of the fort. Oglethorpe erected batteries on Anastasia Island, but his cannon balls did little harm to the fortification. In 1762 Spain ceded Florida to Great Britain, in exchange for Cuba which had fallen into the hands of the latter country. The English occupancy lasted for 20 years, and it was a time of great material prosperity for all the colony. Florida was ceded back to Spain soon after the close of the Revolutionary War and remained a Spanish colony until 1820, when it became a part of the United States.

On the twelfth of July of that year the stars and stripes were raised over the St. Augustine fort. It was re-christened, being called Fort Marion, in honor of the Revolutionary hero, General Francis Marion. From 1835 to 1842 Fort Marion was a busy place, as it was the base of operations against the savages in the fearful Seminole War which cost the government \$20,000,000 and the lives of hundreds of brave men. The Seminole chief, Osceola, was a prisoner there for a time. In 1861 Fort Marion was seized

by the Confederates, but it was re-taken by the Federal troops the next year and remained in possession of the government during the remainder of the war. At different times it was used as a prison for captive Indians brought there from the west. At one time, 1886, 77 Apache Indians were confined there. Not long after their removal, the troops were withdrawn, but during the Spanish-American War the fort was again used as a prison, for deserters and unruly soldiers of the United States army.

The quaint little city of St. Augustine is yearly visited by thousands of tourists, and no one goes away without inspecting the old fort. It well repays a careful study. Some of my most pleasant recollections are of the views from the bastions and of the hours spent on the rampart, pacing back and forth, gazing at the gray-green line of the island that divides the ocean's deep blue from the pale blue of the inlet, or reading and dreaming in a sunny niche of the walls. Let me see if I can bring Fort Marion of today before your eyes.

The walk up from the little town is charming. One can walk upon the wide cement coping of the sea wall or follow the street that closely skirts the harbor's shore. It is an ascent to the fort—really the slope of the old glacis. On the east



Old Fort Marion, at St. Augustine, Fla., the Construction of whose walls was begun nearly a Century before the American Revolution.

is a group of low, scraggly cedars, wind-whipped and leaning inland as if shrinking from the force of a gale. A seat placed under the trees makes an ideal resting place, or one can sit on the low coquina wall. Passing over the moat on a bridge, each side protected by a railing, one stands directly in front of the low, wide doorway or sally-port. Above this, a little defaced by time, is a shield bearing the arms of Spain and a Spanish inscription which, translated, reads, "Don Ferdinand VI, being King of Spain, and the Field Marshall Don Alonzo Fernando Heredia being Governor and Captain-General of this place, San Augustin of Florida, and its province, this fort was finished in the year 1756. The works were directed by the Captain-Engineer Don Pedro de Brozas of Garay."

The doorway leads to a long and wide entrance hall where there is a registry in which visitors are asked to write their names. On the left is a big, dungeon-like apartment, once the guards' room, but now used as the office of the custodian in charge. At the right is the old cook room, the mammoth corner fireplace at which meals were prepared still unchanged. This hall opens into the large inner court, and, as before said, about this court are ranged the casemates which once were used as barracks, messroom, storerooms, and dungeons. Directly opposite the opening of the hall into the court is the old chapel. The doorway into this was once beautifully adorned, but time has wrought its insidious work upon it; little is left save the niches for the holy-water fonts. The altar was at the extreme end. One of the most picturesque features of the court is the massive staircase that leads up to the rampart. However, this is modern, as the ascent was originally an inclined plane for artillery.

No modern visit to Fort Marion would be complete without an inspection of the "dungeons." To them the old sergeant who acts as the building's custodian must lead the way, as the doors of the various casemates opening from the court are kept locked. A request that you may see the dungeons is invariably met with the statement that the air within is too bad for anyone to enter that day. There is just one way to purify that air, and that is one to which the tourist has become accustomed—the giving of a tip. Not a large one is required, but, once given or, better still, promised, the air clears as by magic. The old man lights a small lantern, unlocks a door at the northeast corner of the court and leads you through two rooms and a passage to a low aperture through which you pass by stooping nearly to the ground. This gives access to a vault 20 feet by 12 and eight feet high. The arched roof is of solid masonry. The custodian places his back against the wall, sets the lantern at his feet, and repeats, apparently by rote, a story to the effect that the Americans had had possession of Fort Marion 18 years before they knew of the dungeons. They were discovered by the masonry above the middle chamber caving in when a heavy gun was being moved over the terreplein above. Investigation brought to light the inner chamber, the entrance to which was sealed up. Within that—and here the old man's voice grows sepulchral—were two skeletons, one that of a woman. They had been chained to the wall. The dungeon also contained a rack and other instruments of torture used at the time of the Spanish Inquisition. As you listen, in the dim, wavering light, you feel—well on the occasion of my own visit a sweet-faced school-girl, who was one of the party, voiced the sentiments of the rest of us when she cried, grasping her father's arm, "O, papa! Do let us get out of here!"

When you emerge into the court, the sunshine and the salt-scented air are doubly sweet. You give a sigh to the memory of the unknown dead, and then you may do as I did—go to your room and read from a reliable guidebook of the city that the "so-called dungeon was designed for a powder magazine or bomb-proof," and that "it was in this room that the instruments of torture and the human bones are said to have been found, from which legends and tales of cruelty have been evolved, but which are unsupported by any reliable data."

There is a charm about the place. It is not of war and bloodshed that you think as you stand in one of the watch-towers and look afar over the sea and land. You dream of the day when the quaint old Spanish vessels rounded the north end of Anastasia Island and came into the harbor. Officers, dark-robed priests, soldiers, brave pioneers, all rush-

ed down to the rude wharf to receive the news from far-away Spain, the beloved fatherland. You walk on the slanting roof of the water battery, if you are

"level-headed," and dream your dreams of the past, that far-off romantic day when "the fort was St. Augustine, and St. Augustine was Florida."

BRAMBLE HILL

By ROBERT CARLTON BROWN.

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As he alighted from the elevated at Oak Park Avenue and walked cross-town to the big white corner house of the Parkers he recalled the only other time he had been there. Almost two years before, that had been. He hadn't progressed much in the meantime in actual deeds, but he felt light-hearted, confident and hopeful.

At the door of the Parkers' house he was met by the same housekeeper, whose face he remembered from the time before. "Is Miss Wattles in?" he asked.

"Miss Walters, you mean?" queried the landlady.

"No, Miss Wattles, Jerusha Wattles," repeated Sid.

"There's nobody of that name here. There was a Miss Walters, but she left for New York last night."

"With Mrs. Parker's mother?" hazarded Sid.

"Yes."

"Well, that's she!" he cried. "It must be she. Isn't her first name Jerusha?"

"No. It's Elizabeth. Elizabeth Walters!"

"Doodle's girl!" cried Sid. "You don't mean to say Mrs. Parker's mother's name is Mrs. Raimer?"

"She is, sir; that's her name," answered the housekeeper, ogling Sid curiously.

"Well, what do you know about that!" cried Sid, a wave of astonishment welling through him. It was the first time he had ever considered the remote possibility that Jerusha and Elizabeth were the same. A second later he demanded excitedly of the wary housekeeper, "Is Mrs. Parker in?"

"No, she won't be home till Thursday, she's out of town."

Sid was afire with curiosity. He hurled questions at the old housekeeper, who seemed to grow more suspicious of him and was very chary with her answers. As he grew more excited and asked more intimate questions about Jerusha, in an effort to identify her with Elizabeth Walters, the old housekeeper gradually closed the door. At length, when it was open only a crack she cried out, "Anybody'd think you were the census taker." With that she slammed the door and Sid found himself, flushed with possible discovery, tingling with curiosity, standing alone on the doorstep.

He was tempted to ring again. He must be certain of one thing at once. But he caught the housekeeper eying him out of a side window and feared she would call the police. As he stopped to reflect he realized that his questions must have seemed impertinent and strange to her.

So he dashed down the steps and rushed to the elevated station. His first impulse was to follow Aunt Raimer and Elizabeth Walters to New York and see for himself. Then he realized the folly of that and dashed into a telegraph station to send the following message to Doodle:

Fitzdun Raimer,
Fifth Avenue,
New York City.

Have made a great discovery. Has Aunt Raimer's companion, E. W., a little mole on her forehead, near her right eyebrow? Wire answer immediately to Auditorium Annex.

Sideral.

Chapter XVII.—Wires that Crossed.

Fitzdun Raimer in love! Well, it looked that way. He stayed home from Newport that summer, chewing his moustache and waiting for news from his aunt about Jerusha, fearing that if he left the Clendenning something would happen to the weekly letter from Aunt Raimer. Jerusha had forbidden him to follow them to Chicago. She had also said he must write to her, that it was best for him to forget this foolish infatuation of his, that she was sure he didn't really love her and that it was only his desire to think he was doing something in earnest that had suggested the romance.

But Doodle didn't agree. He was sure of his love for Elizabeth Walters, as he knew Jerusha. Her breezy westernness had attracted him. He wanted to go to

Chicago and look her up. But it wouldn't do any good. Both Aunt Raimer and Jerusha were in league against him. They told him he ought to go to work. He admitted it, but did not consider the thing seriously. Then along in May came the news from Aunt that Elizabeth Walters had gone to visit some of her relatives and wouldn't be back, possibly not at all, at least not until winter.

Doodle was in despair. He stayed in town and sat around waiting for letters from Aunt Raimer. If he could only find where Elizabeth Walters was visiting he swore he'd leave town in a minute and follow her. At least, he'd break their agreement and write her a letter. But, no, she'd be disappointed in him, she wouldn't like it, so he changed his mind.

Sideral wrote him about the railroad business and Doodle was greatly surprised to find him so absorbed in real work.

Part of Sid's letter read:

"You know, my picking up spirits on this railroad deal is all on account of Jerusha Wattles, the girl I told you about. She's a wonder. She thought up the idea and, with the help of Jimmie and a disgruntled grade contractor, we put the thing through. Doodle, don't stay at home and worry about that Elizabeth Walters of yours, come down and meet a real girl. She's a western girl and a peach. You wouldn't know her now if you'd ever seen her before she went away, she's been traveling, you know, and you never say such a change in a girl."

Your questions about Susan Dunlap are impertinent. How are we getting along? Darn it, old man, can't you have a little pity? Here you are whining about not being able to see that protegee of Aunt Raimer's and spending your worthless existence in worry about whether she likes you or not, while you never give a thought to my case here. You ask me coldly, calmly, casually, how Susan and I are getting along; you say, 'forget the railroad and marry the girl.' Confound it, Doodle, don't you see that I'm trying to put this railroad business through so I can redeem my standing with Susan's father and get to see her once in a while. Of course, it isn't so hard now that Jerusha is home. She's a wonder. But her father's broken his leg helping to build the dam and she's naturally worried to pieces and hasn't any time for me.

Jim seems very much interested in her and I hope it comes to something, for she's a fine girl and I'd like to sort of keep her in the family, you know.

Will let you know how I come out in holding off the railroad. It was a great idea! You ought to see Jerusha once and just compare her economic ideas with that Miss Walters of yours and her champagne economy that so surprised Aunt Raimer.

Jimmie's going home as soon as the railroad thing is decided. You'll probably see him after he gets home and he'll tell you all the details. Wish I could come back with Jimmie. If things don't pan out as I want them to maybe I will.

The letter didn't serve to cheer Doodle much. He grew desperate in the course of a few days and ran down to Newport for a fortnight. But he couldn't find any fun there. The girls were insipid and he felt bored continually. Finally he rushed back to New York. There he met Jimmie quite unexpectedly. Jim had been home a week and told Doodle of the failure of the dam, also of Watts' death, (of which Sid had informed Jim by wire), and how business had kept him from going back to the funeral.

They had a great old talk. Jimmie was full of his infatuation with Jerusha; he bubbled over like a boy in his enthusiasm. In answer to Doodle's drawn questions Jim described Jerusha to him so minutely that even Doodle's dreamy, wool-gathering wits began to quiver and palpitate with the thought of the similarity between Jerusha Wattles and Elizabeth Walters.

But it hadn't yet occurred to him that they might be one and the same. He could imagine Elizabeth Walters in the same scenes which Jim described; he could see her gyping over a bonfire and rising to the emergency of a broken bone; she seemed strangely like Jerusha Wattles.

His conversation with Jimmie that afternoon was mostly about Sid and the railroad, but the parts Doodle remembered best were the descriptions of Jerusha. He lingered over them afterward and compared them with pictures of his own of Elizabeth Walters, and the contemplative mood induced by Jim's remarks

caused Doodle to start out by himself on what proved to be a very eventful walk, that afternoon, after they had parted.

Jim repeated the situation in regard to the railroad so often that even Doodle had a clear conception of it. He had so much to say about Watts that finally Doodle came to know that Jerusha's father had been an amiable old gentleman, a perfectly fine old gentleman. But none of that interested him in the same way that Jim's eternal harking back to Jerusha did. Jim assured Doodle that he thought the new railroad would get into trouble with the old one and that Sid's chances were not all gone. In case any opportunity did come he was going back to Turtle Creek and help. Doodle smiled to himself at this and wondered if it were entirely on account of Jim's zeal in the railroad struggle.

In summing up the situation Jim said, "You see, the railroad lost nearly a month on account of that day. They'll never settle the impending scrap with the old road and get through by October first. They'll come to Sid on their knees yet. I'll bet on that. That fight isn't over by a good deal. I'm glad old Sid is staying out there."

"Say that again. 'You're glad Sid's staying out there?'" smiled Doodle.

"Why, sure. I don't want to see him lose."

"But what if he wins this Jerusha Wattles in the meantime? You say he's with her all the time. That looks suspicious. Sid was never much of a hand with the ladies, like Rollo here; but I wouldn't be any too happy, if I were you, about leaving Sid alone out there, the only real man in a little town like Turtle Creek."

"Oh, rats! Sideral and Jerusha! Why, they're like brother and sister."

"Well, so were Adam and Eve before they got married, I presume," replied Doodle.

"You can set your mind at rest on that score. Sid's doing all this work on the railroad just so he can get his stand-in back with Susan Dunlap. He's not fickle. He wouldn't switch."

"Maybe he thinks so. But you never can tell. Being around with any girl every day for a week or so kind of goes to a man's head if he likes her. You see, Sid's been with this Jerusha Wattles right along and he hasn't so much as said 'Howdy' to Susan Dunlap in six months. I think Sid's just in love with the idea of Susan, the only girl he ever allowed himself to think sentimentally about. Probably every time he looks at any girl and thinks how pretty she is he has a pang in his heart as he catches some note of similarity to Susan. I tell you if I were interested one way or another in this Jerusha Wattles I'd be pretty scared at this minute, and I'd be right in Turtle Creek myself, defending my own against Sid."

"You wouldn't have said that if you'd seen him building the dam," answered Jim. He paused and continued, "By the way, how's that girl who travels with your aunt? The one you raved about for a year."

"Nothing doing," replied Doodle, serious in a moment. "My inherent idiosyncrasy seems to have the opposite effect to Sid's, at least on one lady I know of. She resembles your Jerusha Wattles very closely, too."

"Well, if she's like Jerusha you wouldn't have the fat chance of a mouse in a rat trap. She's not looking for a little boy to lead by the hand. She wants a man, a Hercules, one of these fellows that look as though they could pay the rent." Jimmie drew himself up to his full height, swelled out his chest like an acrobat and bragged unblushingly. "One wants a perfect man, a man who can work and sweat, a man of spirit, of fire! In a word—my humble self."

"Gee, but you hate yourself, don't you?" smiled Doodle. "Well, I'm glad we're not both in love with the same girl. I never wanted to compete with Paris, still, if I did, I can easily imagine Paris green with jealousy."

"Help," groaned Jim. He paused a moment in acknowledgement of the pun and then finished abruptly. "But don't let Sid and his stand-in with Jerusha worry you."

"Oh, suit yourself," Doodle shrugged his shoulders, "but I'm glad neither you nor Sid ever saw Elizabeth Walters. Not that I'm exactly afraid, but accidents have happened, you know. She might marry one of you on an election bet."

They had sauntered down Fifth Avenue as far as the delta formed by Broadway and Fifth Avenue, where the Flatiron building stands. There Jim shook hands

(Continued on page 308).

Walking 4,000 Miles a Year.

By Edgar White.

HOW many men are there in these United States who can tell the exact distance they have walked since January 1, 1912? What class of men use their legs most?

Sam Griffith, a farmer and saw-mill man of Macon county, Missouri, became curious about such matters last year. January 1, 1912, he connected a pedometer with his right leg and it has been



Sam Griffith, who, seemingly, would rather walk than ride.

on active duty ever since. From the date given, up to the hour of retiring the night of December 31, 1912, his recorder—which looks like a Waterbury watch—registered 4,103.6 miles. In other words, that is the distance he walked in the year 1912. He had an invitation to Christmas dinner from a farmer friend, which added 14½ miles for that day. Sam sent his wife and children over in the carriage, but walked so as to exercise the pedometer.

Mr. Griffith carefully tested the length of his steps and found them to be 27 inches. Then he set his walking indicator so as to register 27 inches every time he stepped, so his record is accurate enough for all scientific purposes.

As a baby Mr. Griffith was quite a toddler. Sometimes the whole family would have to turn out and hunt him up when he had wandered from home. Then he went five miles to school on foot, and often as far to meeting. It got to be a sort of mania with him. No railroad company could live on his business. When he wanted to come down from Elmer to attend court at Macon he would cut across fields some 25 miles and save six bits in railroad fare. The people of Elmer would meet at the village store of a night and guess how many miles Sam would walk in a month. Of course, nobody would hit the bulls-eye for sure, and so they clubbed together in December of 1911 and bought him a silver-plated, ball-bearing, double-action pedometer and hung it on the town Christmas tree. Sam was as tickled as if the stork had fetched him a new baby. He got himself measured for a new set of trousers to hang the thing on, and put it in commission at daybreak of the glad New Year.

"It doesn't matter which way you travel, up or down or sideways, it keeps count," said Mr. Griffith while in town some time ago. "Once last summer I fell off a hay barn, and it ticked along just the same, registering some 20 steps on the way down. Fortunately I lit on a hay pile, and there it rung off."

"Recently I was down at Popular Bluffs for a couple of weeks, and wore out a brand-new pair of shoes climbing over scenery. Every day I covered from 15 to 20 miles on foot, because since I've had this thing keeping tab on me I wanted to see what I could do. Seems like its always whispering, soon as daylight breaks: 'Come, Sam, get busy; time's running.' Funny how it grows on one. When you're wearing a pedometer you don't stop a wagon and ask for a

lift along the road, but foot it. Suppose the children of Israel had been supplied with these things? Wouldn't their records have made people stare?

"Ever since I was a wee bit of a chap I liked to walk. Used to sprint to the village with my big brothers before I was seven—that was six miles and back. Never thought of getting tired. When I grew up it was just the same. If I wanted to go anywhere my two legs was all the horse I wanted."

"My longest day's walk? It was 41½ miles from daybreak until dark, in July. I wanted to see some parties about lumber. First I went west of Elmer and down through the Ethel neighborhood. I hadn't started to make a record, but every place I went to find my men they were just a little farther on, I was told. So I crossed the Chariton river and walked over to Callao, over on the Burlington, and back up by Dodd and then home. When I looked at my little round-faced partner that night he seemed to say: 'You're taking a mean advantage of me, Sam, just because I'm little and can't help myself.'"

"Soon after that, however, it took a good day's rest. It rained pitchforks and blowed like a typhoon all day, so that I only walked two miles. That was the lowest record for any one day in the year."

"When we're busy at the saw-mill the record runs highest. The biggest month was October, when the pedometer registered 541½ miles. The saw-mill is a mile and a half from the house and I'd go back and forth pretty often. The first month I only covered 290 miles. You understand, I'm not walking merely to string out the pedometer's record; it's just keeping track of what I do as I go about my business in the normal way. My habit is, and always has been, to walk where most men would ride. Instead of taking the train at Elmer to come to Macon by way of Bucklin or La Plata, where you have to change cars, I cut across and walk the 12 miles through to Atlanta and take the train direct into town. As far as time goes I beat those fellows who ride all the way, because I don't have to wait at the junction. I'd rather walk than ride under those circumstances."

Since he's attached a pedometer to him Mr. Griffith has been keeping a daily log, showing not only how far he has walked, but a description of the roads and weather, and the condition of crops. He believes he could soon get in condition to make a very satisfactory "hike" across the country.

"I've studied Weston's methods pretty

closely," said Mr. Griffith, "and I have noticed that he is a successful walker because he carries out two or three simple rules. He is a temperate man, never eats or drinks too much, and has regular hours for walking and for sleeping. Then he places one foot after the other naturally, not turning his toes out, and doesn't swing his arms. A good walker must concentrate all his power on what he is doing, and if he indulges in any false or useless motions he will not get very far."

The pedometer man started out to cover 4,000 miles during the year. He exceeded that by over 100 miles.

Waynesville, Pennsylvania, was Mr. Griffith's birthplace, and 1874 the year he happened in. He has lived in Missouri 23 years.

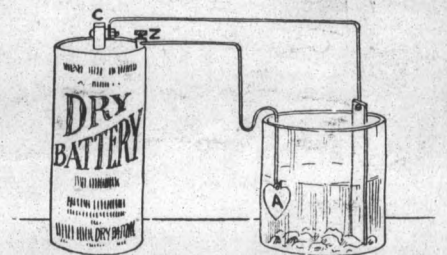
HOW ELECTROPLATING IS DONE.

BY I. H. WALBRIDGE.

Last winter someone told the boys and girls of The Farmer how to make an electric alarm bell. That article, and others that have appeared, have no doubt aroused the young folks' interest in electricity and it has occurred to me that a description of the process of electroplating would be received with pleasure,

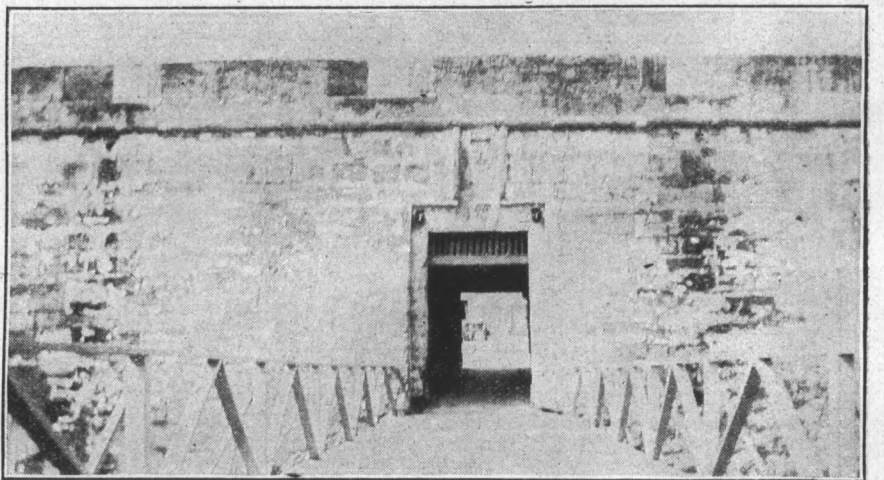
ding crystals until some remain undissolved at the bottom, then add four or five drops of the hydrochloric acid. Care should be used in handling the acid.

Connect the apparatus as shown in the accompanying illustration, the copper strip being placed in the solution. Any metal trinket (represented by A in the cut) which has been cleaned can be coated with copper by hanging it in the



solution, but it should be turned frequently in order to secure an even plating on all sides. When the article is completely covered it should be removed, rinsed and polished.

(In this experiment an ordinary coin of any denomination is frequently used. After the coin has been well coated and its value as money apparently destroyed, a reversal of the current, performed by



Doorway or Sally-port. (See "Staunch Old Fort Marion.")

since the experiment necessary to a thorough understanding of the process is very simple.

You will need a dry battery to furnish current for the work. Also procure ten cents' worth of copper sulphate, five cents' worth of hydrochloric acid and a piece of copper, about two inches wide and six inches long, which can be bought for about five cents.

Fill a glass jar, about four inches high and two or three inches in diameter, about half full of water. To this add some of the copper sulphate crystals; stir the mixture for several minutes, ad-

transposing the wires at Z and C, will remove the copper from the coin and return it to the copper strip.—Eds.)

LITTLE FARM FABLES.

BY AUNT QUILLIA.

Orpie and Mac.

White Orpington was the joy of her keeper and the pride of the pens. MacGregor—or Mac as he was usually called—was a Scotch collie who lived at the same farmstead.

Although a pure-bred shepherd, he, like some other dogs of his race, manifested an unaccountable interest in all young and tender things. And so when Orpie was put into a wooden cage and bundled off to the fair, Mac felt that he, too, must go.

Orpie, with her white feathers and the little red comb that was just beginning to appear, was fair to look upon. Nevertheless she was a most disagreeable chick. Scarcely had she left the shell before she began her complaints and telling what she would prefer. "Mother is always giving me angle worms," she would say, "but there are others that I like much better. I wish she would take me to the corn field oftener." Or, "Our pens and poultry houses are all very well, but I would like more up-to-date ones better." Indeed, no hour of the day passed but that Orpie had some unfavorable comparison to make, invariably closing her comments with some personal preference.

On her return from the fair she was even more critical and dissatisfied than ever. Mac's spirit was tried within him, yet he manifested no displeasure until, at last, he said one day, "Orpie, I have something to tell you. At the fair, you know, I was not confined to one spot like yourself. As I trotted about the grounds I fell in with a family group who interested me much. It consisted of father, mother and two children. Seemingly they were in good circumstances, all well groomed and well fed. Most of all, the little girl interested me, reminding me so much of you. Her gown was soft and white, her shoes fine and pretty and her ribbons immaculate. Best of all, as I trotted by her side, I noted, as dogs will, that she had a clean, wholesome smell, showing that her body, as well as her

Market Day—By Alice Annette Larkin.

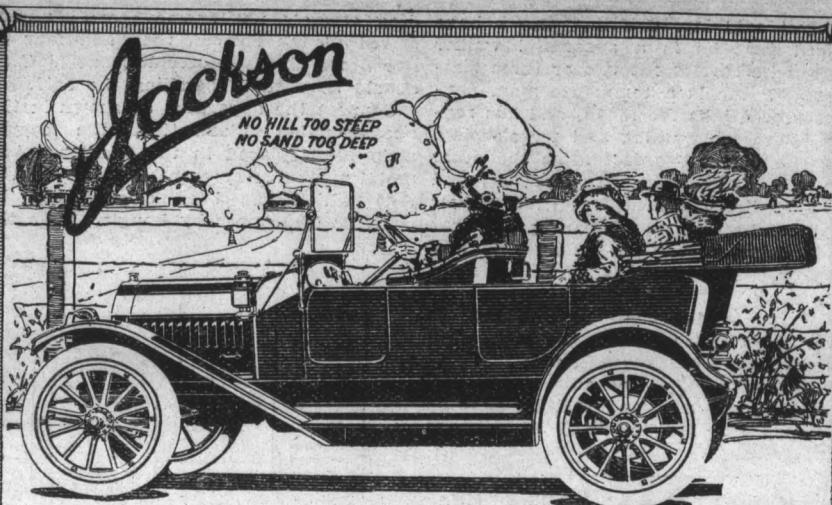


When father goes to town, sometimes,
With loads of things to sell,
And says he'll leave one horse at home—
Which one he doesn't tell—
We always hurry with our work,
For then we like to play
That we are farmers, too, ourselves,
And this is market day.

We know it's Jim he'll leave at home,
And he's our favorite horse;
For when we're ready for our fun,
He's ready, too, of course.
It makes no difference where he is,
Near by, or far away,
He's just as glad as we ourselves
When we have market day.

So out we hurry to the barn;
There's Mae and Dick and Ted,
And Katherine and Ruth and Anne,
And even Baby Ned.
Ted wears his grandpa's stovepipe hat;
He always likes to play
That he's the biggest man of all,
When we have market day.

There's room enough for all to ride,
But someone holds the horse
And tells him where we want to go
To sell our goods, of course.
Sometimes we carry corn or beans,
Or pumpkins all the way;
There's fun for every one of us
When we have market day.



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"Majestic"—\$1975

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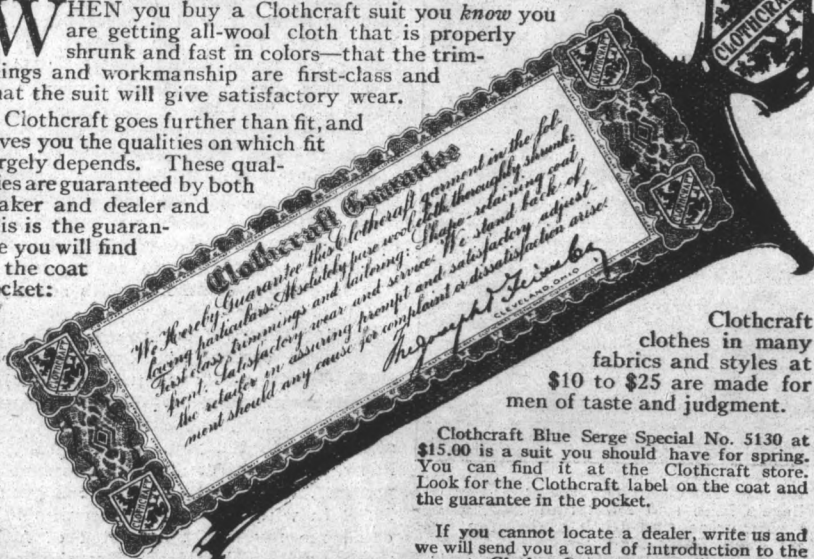
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clothing, was well cared for. And yet, though fair of face, she had a most unhappy countenance as though little footsteps of discontent had left thereon their tell-tale traces.

"In the horticultural department it was, 'Oh, papa, what lovely grapes! I am sure I would like them better than ours'; or, 'Just look at those apples, papa! Why can't we have that kind?' In the Art Hall it was, 'O, mama! I am so tired of our pictures. I would like these so much better.' On passing the merchants' samples it was, 'Oh, oh! What lovely ribbons! I never have liked these. Do, mama, get me a box.'"

"At last her father, who had been silent for a long time, said: 'Annabel, I know how you can have just all that you like.'"

"Delighted at the prospect she sprang to her father's side. Taking his hand she exclaimed, 'Dear, good old daddy, tell me, tell me at once!' Looking down into the eager face her father dryly said: 'Like what you have and you can have what you like.'"

SMILE PROVOKERS.

"Pa, what is a bigot?"

"A bigot, my son, is a person who doesn't think as I do, and sticks to it."

"He always says the right thing at the right time, doesn't he?"

"More than that, he always keeps still at the right time."

Police Commissioner—If you were ordered to disperse a mob, what would you do?

Applicant—Pass around the hat, sir. Police Commissioner—That'll do. You're engaged.

Lawyer—You don't like the jury?

Defendant—I do not. No. 1 is my tailor, No. 3 is my grocer, No. 5 is my milk and egg dealer and No. 7 is my wife's first husband! What chance have I got?

STOCKING THE FIELDS WITH GAME BIRDS.

BY ISAAC MOTES.

In thickly settled sections of the country the re-stocking of farms with partridges, or bobwhites, late in the winter is a wise move, and it is often a real necessity in states where the open season for quail is long, or where much hunting is done on a farm by friends of the farmer or by his sons. The more quail on a farm the better crops will a farmer raise, as a rule, for there is hardly a green thing grown in field or garden that is molested by them, while they eat millions of grass seeds, potato bugs and other small insects and worms. And, as farming becomes more scientific and intensive, as the proportion of forest land grows less, and as the cultivation of crops becomes cleaner, allowing no weeds and grass to go to seed, the birds find greater difficulty in getting enough to eat in winter in northern sections where snow remains on the ground for months at a time. As there is often no protected places on these small, well-kept farms where the birds can roost at night during the cold, snowy weather they sometimes freeze to death. They are, in some respects, almost as domestic as chickens and do not change feeding grounds to hunt better ones, but spend their lives within a few hundred yards of the places where they were hatched.

The best time to do this re-stocking is in late winter or very early spring, say during the first part of March. The birds can be secured from commission firms in cities and towns who handle game, chickens, etc., or from retail markets, or they may be secured from farmers, or from friends and acquaintances living in the same county, where the birds are plentiful enough to spare a few dozen pairs.

It is comparatively easy to catch partridges alive in traps, pens or nets. Hunters who understand the nature and habits of the birds can take a common barrel net with wide wings, and by using judgment in placing the net and caution in driving the birds into it, whole droves may be secured. This driving can best be done by men on horseback. It may be possible to secure the birds from someone within a few miles of your farm whose place is well stocked with them. Being domestic birds with restricted haunts, one farm may have none, while another a mile away may be swarming with them. A dozen pairs, or even a less number, secured from some neighbor



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will re-stock a place in one season, and they will spend their lives within five or six hundred yards of your house and seldom leave your fields, even though they are shot at every winter and many of the flocks considerably reduced in numbers.

In liberating the birds they should be taken into a body of timber if there is one on the place, or into the orchard, or a field or pasture containing some cover where they can alight and hide before flying too far—some meadow or large woodlot containing tall grass or broom sedge. They should be liberated a pair at a time; the male first and the female a few seconds after. Toss them into the air several yards in the direction in which you want them to fly. The female will be almost sure to fly in the direction taken by the male, twenty-five or thirty feet behind it, and they will be pretty sure to alight close together. In five or ten minutes they will whistle themselves together, and stay together all spring and summer. After liberating a pair you should wait twenty-five or thirty minutes, or longer, before releasing another, and each succeeding pair should be tossed in a different direction, or from different places on the farm, but convenient to hiding places.

It is an easy matter to tell the male and female apart, for although about the same size, and the same color on back and wings, the male has an almost white spot on its throat, immediately under its head, about the size of a man's thumb nail, while in the female this spot is a very pale yellow. Quail differ somewhat in color according to the character of the country in which they live. In country containing a good deal of prairie, or cultivated fields, they are a straw color and do not show so plainly the small white specks upon back and wings, while in deep brown woods both male and female are a deeper brown, and the white specks are more noticeable, but this small spot on the throat always distinguishes the male from the female.

Where farms are small it will be best for several farmers living harmoniously near each other to join in such an enterprise, buying two or three dozen pairs of birds to liberate in their neighborhood.

In order to keep a farm stocked with quail in cold climates it is necessary that they have a protected place to roost, and that a little grain be scattered in the fields during protracted snows, especially if the fields have had a clean cultivation and no grass and weeds were allowed to go to seed. A gallon or two of wheat, scattered in the fields upon the snow, or under the broom sedge where the birds roost, might save a hundred quail on a large farm, and this number would mean a thousand young ones the following spring.

The best roosting place for quail is among high grass or broom straw. A small corner of a pasture, or meadow, or orchard, grown up in this broom sedge will afford a snug roosting place for dozens of droves, and if the straw is thick and tall, and the birds get plenty of heating food, there is no danger of their freezing in the coldest climate, for they roost very close together, squatted on the ground in little circles under the straw, where the heat from their bodies soon melts the snow under them and the ground becomes dry. A drove of twenty-five or thirty will snuggle down in a little circle not more than fourteen or fifteen inches across. These roosting places are good places in which to scatter the wheat, for the birds begin feeding early in the morning.

A good deal of attention is being given in some states and sections, and by people owning fine estates and large farms, to stocking their communities with Chinese or Mongolian pheasants, different kinds of grouse and other large game birds, often at quite an expense, but if your farm is well stocked with quail you can very well do without these larger, more expensive birds, many of which may die before becoming acclimated. The quail will do better and multiply faster without these larger game birds, for it is believed that the Mongolian pheasant fights the quail, driving the hens off their nests and perhaps eating the eggs, or at least preventing their being hatched.

A GRAIN OF WISDOM.

BY ALONZO RICE.

The bread of repentance we oftentimes eat
Is made (if we only would own to the truth,
Although it may sound like a foolish conceit)
From the wild oats we sowed in our youth!

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By R. E. Olds, Designer

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It has taken a lifetime to develop an engine like the one in Reo the Fifth. And even my rivals concede it to be one of the great engines of the world.

My catalog states all the details about it. I won't bother with them here. But the fame of this engine is based on four things:

- Its unusual power—
- Its enduring silence—
- Its remarkable endurance—
- Its ease of adjustment.

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We avoid trouble for you by putting each engine to five radical tests in our factory.

Each is run for 10 hours with outside power, then another 10 hours with its own power. Then we take it apart and inspect it.

Then it is made to run a blower, and tested at various speeds. Then it runs an absorption dynamometer, as a measure of its power. Then, in the finished car, we give it the hardest sort of road test.

These tests require 48 hours. But thousands of these engines, run for years and years, are still in prime condition.

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- The gears are tested to stand

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We use 190 drop forgings.

We use 15 roller bearings.

The tires are 34x4.

Each body gets 17 coats.

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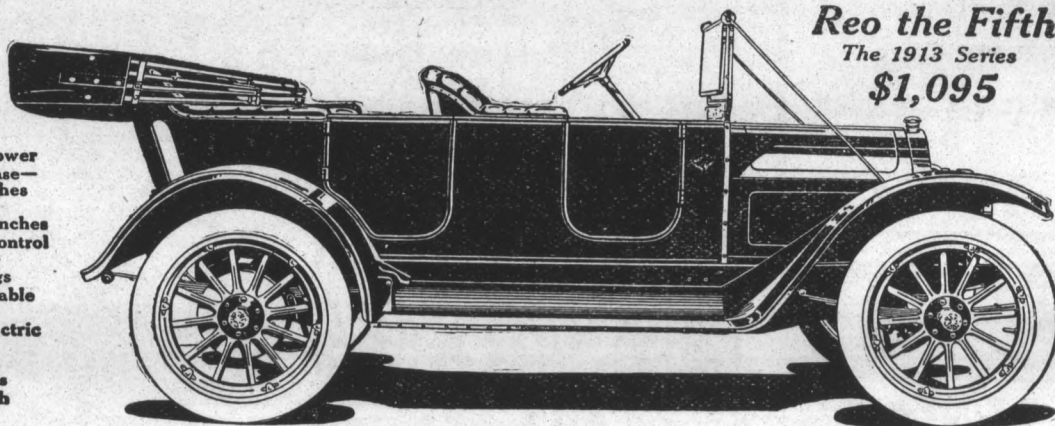
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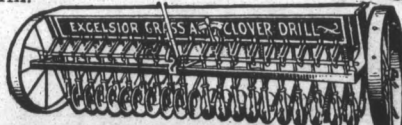
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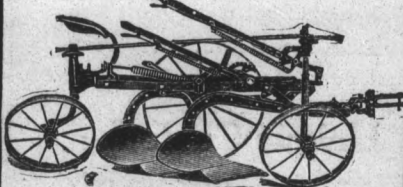
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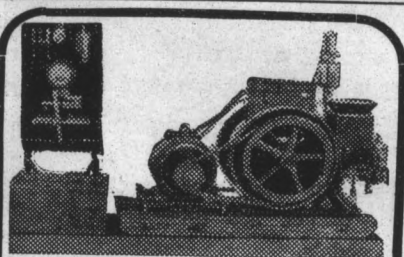
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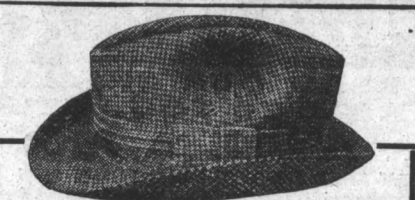
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BRAMBLE HILL.

(Continued from page 304).

with Doodle and went into the skyscraper to report to his father the progress on his Yonkers work.

Doodle found himself standing alone in front of the cigar store at the apex of the delta, with all New York gliding past in autos on the left and the rest of it rumbling and jolting by in street cars on the right. It is a parting of the ways, that delta which cleaves the stream of traffic atwain. On the one hand the staid and respectable rich who are aristocratic enough to consider down-town Fifth Avenue as good as uptown Fifth Avenue, but Broadway—never. On the other side jolt by those who have no interest in passing the grim stone piles, boarded up in winter while their owners are south, and nailed shut all summer while their occasional inhabitants are abroad. There is little to be seen in the residential part of Fifth Avenue at any time of the year, and, of course, in July there wasn't even a dog to be seen. In fact, the procession consisted only of sight-seers, tourists, strangers, joy-riders, decrepit demimondes and tenement inspectors.

There being nothing of interest here, Fitzdun Raimer peered over the social fence into Madison Square Park, from which Fifth Avenue turns away in disdain as she approaches. The Madison Square Park season was at its height. Benches swarmed with wisps from the human hay-stack. The park seemed like one great tree; the benches were branches and the humans swarming blackbirds.

Into this maelstrom of life Fitzdun Raimer sauntered slowly. It was very interesting to study dissipation, disease, squalor and drunkenness at first hand.

Glancing up at the Metropolitan Needle he found that it was already half-past four. With much time on his hands before dinner, he dropped down on a bench beside a gentleman who looked like a peevish Hamlet and continually caressed an uncomfortable crop of hair on his sunken face, something between a five-days' growth and a rabbi's beard. He was also thin, painfully thin.

Fitzdun didn't mind the mingled odor of stale tobacco and whiskey. He was tired and wanted to sit down and think over all Jimmie had had to say. Madison Square Park was public ground, where business men sometimes strolled and sat at noon hour. Still, he felt like an interloper, as though he had no business there.

A slovenly youth of mongrel origin, with tattered shirt and shoes stubbed out at the toes and scuffed to the natural color of the leather, swooped down upon Fitzdun as a juicy morsel tossed to him by Fate, placed an impetuous, seeking, grimy hand on Doodle's knee, attracted his attention by staring into his eyes with an eager, yearning, hungry look, and demanded: "Shoes shined, sir?"

Doodle glanced down idly at his shoes; his man had done quite well with them that morning, as usual. There was no need to have the polish spoiled to satisfy an urchin's urge in the way of work. So he inserted two fingers into an outside change pocket and dropped a quarter in the boy's palm.

"Never mind shining the shoes," he said. "I've given you that quarter on the express condition that you shine your own. Look to the beam in thine own eye before thou goest about offering to pick motes out of other people's."

The bootblack stared till Doodle felt he ought to reach out his palm and hold it handy for fear the eyes of the urchin should pop out. Finally he replied in a gasp: "I didn't offer to take no cinder out yer eye; I only ast to shine your shoes."

Doodle was about to reply when the shabby genteel gent sitting next him reached out an expressive hand; his flexible fingers described a parabola and a few festoons in the atmosphere and, when Doodle's attention had been distracted from the bootblack, he wriggled his mouth and spluttered: "Do not mind Smuck; he is long on shortcomings. Do not be hypnotized by his great big globby eyes into giving him more money. Save it, sir, for more worthy investment which I shall shortly suggest to you. Yet I note with pleasure," he pronounced the word deliciously, in a quite Frenchy manner, "with pleasssssoor," he repeated crisply, "that you have given him money. Live and let live! It shows, sir, that you are no economiser," he gave a little laugh, clenched his fists like Scrooge and wriggled his eye-brows in delight over the turn he had given the word. "I am pleased to note, also," he went on lightly, running his long, interpretative fingers in a softly Svengalian manner in

the direction of the tree tops, "that you read Shakespeare."

His nervous hands ceased gesticulating and dropped motionless in his lap. By that sign, as much as by the fact that his loose-lipped mouth flapped shut, Doodle knew that he had finished speaking.

"Thank you for your commendations on my mental, moral and social qualifications, and I'm obliged for your warning against this young person, Smuck," replied Doodle very gravely, turning to the fellow beside him with an odd twist to his smile of greeting and holding his hand on his money pocket. "But how did you gather that I read Shakespeare?"

The hands went up in a delightful deprecating gesture and a long finger was thoughtfully impressed on the gentleman's temple.

"Ah," he said, beating a gentle measure with his other hand in time with his raggy flow of words, "I heard thee theeing and thouing the young rascal flattered by the fitting name of Smuck. That shows thy acquaintance with the master?"

"So you read Shakespeare, too?" exclaimed Doodle.

"Oh, yes. I have played Hamlet."

"Indeed! Then you're an actor?"

"Yes."

"Are you engaged at present?"

"I had a very handsome engagement yesterday."

"What was it?"

"I 'walked on' with a moving picture film company," replied the gentleman with the mangy hair, shrugging his eyebrows and giving his fingers a significant flirt.

"Then you have a great future behind you," replied Doodle, remaining grave with an effort. "I infer you lost the engagement?"

"Exactly. I have lost many engagements, all because of lady fair. Shall I tell you about it?"

Doodle having come to the park to consider carefully the question of lady fair himself fell an easy victim to the suggestion. "What do you charge for the monologue?"

"Whatever your kind and generous heart dictates will be a seemly amount," replied the down-at-the-heels-and-pockets actor, making a very significant wriggle with his knotty forefinger as though describing in the atmosphere a squat dollar sign.

"You're broke then?"

"Unusually broke. That's my middle name—John Unusual Harp, sir."

"A musical cognomen," remarked Doodle. He paused. "If you're broke I suppose you're hungry, too."

"Oh, yes, indeed," agreed the moving picture film actor; "I looked in the mirror this morning to see if I had eaten and found that I hadn't."

"Well, here's the dollar; produce the story about the lady fair," replied Doodle, slipping a bill into his companion's hand.

"It feels as cool as a thousand," remarked the ragged gentleman. "I shall have this framed and hung over the first bar I come to. You've seen those souvenirs of mine often, I dare say."

"Often," agreed Doodle, watching the fellow pat the bill as though it were a pet cat, rubbing it caressingly between his forefinger and thumb, stained like a schoolboy's in walnut time, but with cigarettes.

The actor cleared his throat with a rasping scrape and drew himself up impressively, folding his arms, unfolding them, and sweeping them out with the fascinating gesture of a street window demonstrator.

"I will now dull the razor—" he began.

"You will now what? I thought you were going to begin telling me about your enlistment in the service of the lady fair?" put in Doodle.

"Oh, I beg pardon. I began accidentally with a line from an old play I used to act in. I mean, if you will kindly step down this way, gentlemen, away from the door, I will next offer the gem of the sale, a— Oh, I beg pardon," he stopped again, consciously, and allowed his long arms to slip slowly to his lap as he wriggled about uneasily.

"Just a moment," he said, reaching into his lapel pocket and oringing out a handkerchief that was part silk, though which part it would have been hard to say. He wadded it up with the care of an old maid, turned sidewise and slipped the bunched handkerchief carefully along his pronounced backbone until it reached the irritating top rail of the park bench, which grazed him at that point. "Are you as thin as all that?" Doodle

tried not to smile, but he grinned in spite of himself.

"I am so thin I can't shave because my nose always nicks the razor." He sank back and continued, "You have doubtless heard in your extensive reading, sir, of Louis the Quince?"

"Oh, yes, brother of Oscar the Apricot?" ventured Doodle.

"Oh, no. Nix on that kid stuff. This was a French king, fifteenth of the long line of Louises. You know, Louis the Quince, they named bureaus and settees and finger bowls after him?"

Doodle nodded that he understood and the actor continued, his hands trying to out-talk his tongue, "Well, I was playing the part of Louis the Quince one night in my early youth. It was a revival of an old English play. There was a girl in the cast who had the part of 'soft voice off stage.' She was as timid and sweet a little flower as ever ran away from a mean step-mother and went on the stage. The manager was a rotten man. You couldn't tell her that, though. She believed in him, though he did manage to get her into his debt. That night I'm telling you about, he came into the flies about ten-thirty. We were playing a small town, sir, and I was just warming up to the big scene where I, as king, hurled defiance into the teeth of the Emperor of Germany, when I saw, out of the corner of my eye, the manager come in, and I knew in a minute he'd been out with Bacchus. He put his arm around the girl and stood left, in the wings." The actor paused and shrugged his shoulders. Taking a long breath, he went on abruptly, "Well, that's about all. He forgot himself, and I heard what he said. I was right in the midst of my big scene, but I cut my part, gave the last lines—rushed off into the wings and knocked him down. When the manager picked himself up he hauled his revolver and shot at me. The curtain was rung down and there was the devil to pay behind. They were all after me, but I got clear of the door with the girl. We didn't go back for our trunks. I got her into a straight company and six weeks later we were married." He stopped again and looked with hollow, searching eyes at his long fingers, absently twining and untwining them. "Six months later she died," his eyes glowed dry and his fingers were motionless for a moment. "She caught the cold that night I ran away with her."

A long silence ensued. Finally Doodle moved about uneasily and exclaimed, "Wheww, that was tough."

"Oh, that was a long time ago." He clapped his hands together and sat up straight, his eyes glistening and the handkerchief wadded at his back dropping to the ground. "You wanted my story. You paid for it. There it is!" he swung his long arms in a care-free motion and started to rise.

"Wait a minute," cried Doodle. "Haven't you been able to get back in the show business since then?"

"I haven't tried hard. It took the heart out of me. I prefer to me a stroller, one of God's own wanderers—a scatterling," he answered with a far-away look. "I have enlisted in the service of lady fair; I've walked across Japan and the Eastern Archipelago, I've been searching in the highways and the byways for courtesy."

"And have you found any? Sit down. I like to hear you talk," said Doodle, slipping another dollar into the nomad's palm. "You're like a modern Don Quixote."

"Only a Sancho, only a Sancho," he corrected. "But I have found some courtesy. Yes, I have found much, but only in bits here and there. A month ago I stopped at a little, humble cottage in Illinois. I was weary and athirst; I asked for food and was received with overwhelming courtesy. A lady fair, and a gentle old man greeted me and bade me enter with great courtesy. I was treated as one of them. A rare flower she was, a ripe berry, sun-ripened, and yet when I mentioned New York she had been there, lived right here on Fifth Avenue and came through it all unspoiled. Still simple and courteous. Still a plain, unaffected little country lass."

"What town was that?" asked Doodle, struck by the resemblance of the description to Jim's account of Jerusha Wattle.

"Turtle Creek. I think the name was. I remember reading in a scrap of newspaper which wrapped a beautiful sandwich something about a railroad mix-up they had there. I think—"

(Continued next week).

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This month we touch the two million mark, and it's only one year later.

It took 12 years to bring motor car owners to use a million of these tires.

It took only one year for those million tires to sell a million others.

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A million tires, within 12 months, sold a million others. That breaks all the records of Tiredom.

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You who still use other tires must infer that these men are wrong.

But these are days of odometers. Men are keeping track of tire mileage.

Mileage figures only sold those million tires—the mileage figures on the previous million tires.

And Goodyear sales, because of

those figures, are seven times larger than two years ago.

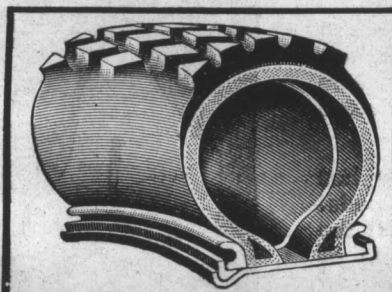
Find Them Out

For your own sake, test No-Rim-Cut tires. They save the average user almost half one's tire bills.

Think how that cuts tire bills. Think how it saves annoyance.

These tires now outsell every other tire in the world. Find out why they do it.

Write for the Goodyear Tire Book—14th-year edition. It tells all known ways to economize on tires.



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With or Without Non-Skid Treads

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Get your money's worth Demand COLUMBIAS

Cost no More; Last Longer

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Manufacturers of honest Columbia Batteries.
Factories in U. S. and Canada
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Woman and Her Needs

At Home and Elsewhere

What is Behind the Anti-Suffrage Movement.

THE suffragists of Michigan put up a good fight in the last election and lost by a narrow margin. For awhile neither defeat nor victory was certain, and there was much charging and countercharging of fraud and irregularity. Finally defeat was announced and there were paeans of rejoicing from the enemy's camp, and grim silence from the suffragists who, nothing daunted by defeat, went on with the warfare, plans for which had been discussed while the outcome was undecided.

Aside from those who were actively engaged in the fight against suffrage there were few who were not sorry that the women lost. From those who took no part on either side came expressions of sympathy. For the majority of people believe in the justice of woman suffrage. It is not because they do not think suffrage right that they are not actively engaged in the battle to secure it. It is simply that they do not believe it will accomplish the great things the suffragists hope. At any rate there were many expressions of regret and much predicting that when the question was again submitted to the people of Michigan the cause would be won.

But new forces were silently at work, beneath the surface. While the suffragists were resting in their tents, pending the outcome, and quietly discussing working plans provided it became necessary to fight again, the army on the other side was laying out a campaign. Almost simultaneously with the announcement that suffrage lost there sprang up in Detroit, Flint and other cities of Michigan, Anti-Suffrage societies headed by the women of wealth and leisure of the cities. In Detroit it was announced that a cultured and highly educated eastern college woman would address all those interested in the anti-suffrage movement at a meeting in the Pontchartrain. The names of the women behind the movement read like a page from the society blue-book. Rather, like the list of patronesses at the most exclusive society ball of the season, since anyone with a quarter can get her name in the blue-book. Those who attended the meeting said it reminded them of a symposium on dress, where each woman tried to outdo the other. Grande dames in diamonds, and debutantes in expensive gowns filled the front seats, while the plainly dressed suffragists who had come to get the arguments on the other side, or to try to confound the speaker, according to their temperaments, were sprinkled through the crowd. The much advertised lady addressed her audience and the Anti-Suffrage movement was launched.

To those who are familiar with the real below-the-surface facts the situation is like this. The suffragists are made up of the toilers and women who think. On the anti's side are lined up a few women with money and social position who do not want to vote. With a few notable exceptions none of them have ever been accused of thinking about anything except receptions, patriotic societies and clothes. Their names heretofore have been seen principally in the papers as guests or hostesses at exclusive functions. A few are charitably inclined, but seldom do they mother any movement in aid of the poorer classes except in a dilettante sort of way. Just what force was powerful enough to get them together and actually set them to doing something has been a cause of much wonderment among those who are always looking for the fire when they see smoke.

The alleged cause has not been long hidden, however. In fact, it never was actually hidden, for from the first there were those who blamed the liquor interests. Before the question was settled it was declared that if suffrage lost, the liquor dealers would be responsible. So there were those who said at once that the liquor dealers really originated the

anti movement in Michigan. At first only the suffragists made the charge, but the rumors have been circulated so persistently, and there is so much circumstantial evidence that everyone who thinks now feels sure that back of the exclusive society anti's is the strong hand of the manufacturers of strong drink. No one for a moment accuses these women of being the accomplices of the liquor men. But practically everyone thinks they are the unwitting tools of the saloonmen. The liquor dealers do not want suffrage for fear of the temperance vote. They will leave no stone unturned to prevent it, and a club of leading society women is a good thing with which to dazzle the eyes of that large body of people who are influenced entirely by what people whom they conscientiously ape are doing.

The story of the anti's club, as told by the suffragists, is like this. Outside parties, liberally paid by the liquor dealers of the country, are being sent to every doubtful state to organize the anti's. They go to the large cities, acquaint themselves with the situation, find out just what women are conservative enough to be against any movement which threatens to take them out of their rut. They then work on the woman's disgust for politics and wardheelers, paint pictures of her being forced to go to the polls and cast her vote, and lead the women to organize the clubs. Of course, it is not done so baldly as this would in-

dicade. The whole thing is so adroitly managed that the society women think they are doing it themselves, and fail to recognize the fact that they are being manipulated. To some this may sound impossible, but there are so many women and men, too, who never think for themselves, that it is perfectly easy for anyone who does to use them for anything.

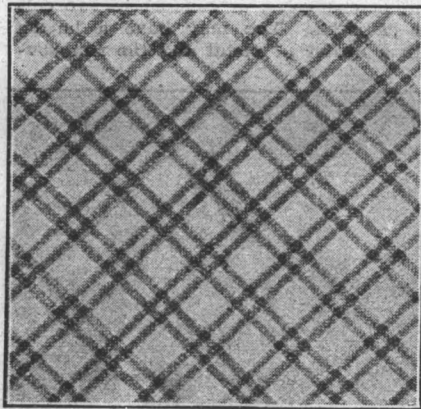
And this is what not only suffragists but men conversant with the situation declare has been done in Detroit. The women who are ostensibly back of the movement are only shields behind which the liquor dealers of the country work. Of course, the liquor men deny the charge with hands raised to Heaven and challenge the suffragists to come ahead with their proof. It is hardly likely that the suffragists can do this, for it is one of those situations which everyone is positive exists, but which has been so carefully built up that it would be impossible to bring positive proofs. The thief has made a clever get-away, but if the case could be proved by circumstantial evidence there is enough lying around loose to convict the criminal in any court.

If the suffragists are right in their contention it is the most favoring gale that ever blew their way. Once let it be known that the liquor men are against suffrage every decent minded man and woman will immediately line up on the other side. No matter what we think about suffrage we are all pretty much of one opinion about liquor. Besides, we Americans always love a fair fight in the open and have no sympathy for the cause which fights the working woman behind the skirts of her more fortunate sister.

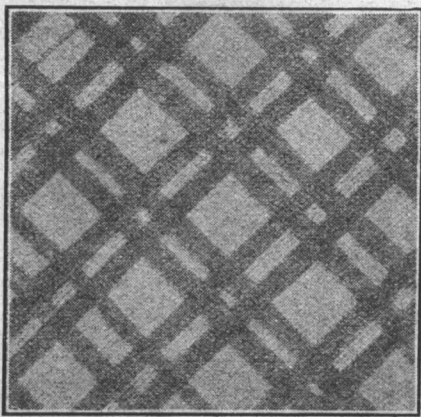
DEBORAH.

What's What in Spring Patterns.

IS it possible that the fashion makers really grow cleverer each spring and evolve daintier fabrics for the consideration of women? Or is it that we have grown so tired of winter garb that the spring garments seem to us each year the prettiest we have ever known?



Two Samples of Gingham.



Whichever the cause, certain it is that the fads and fancies of this year of grace seem more fetching than any in the memory of mere woman.

Alluring in color, satisfying in texture, pleasing in line are the offerings in summer garments. From the bright cherry, which was so high in favor during the winter, to the delicate blues every wom-

an loves, the colors run in every shade that pleases the eye.

Prettiest among the wash goods are the poplins, and because of their soft, silky qualities they promise to be among the most popular of the many fabrics. They come in all colors, tan, sundry shades of blue and pink, cream, what you will, and although they shimmer with much the effect of the silk-and-wool poplins they are easily tubbed. These sell at 25 cents the yard, while the silk and wool poplins are \$1.50 and up.

Ratine, which was good last year, has come in with four-fold strength. Added to the plain colors which were worn last year, there are many striped effects, and in these the striped tans are high in favor. There are plain tans, Saxe blue, Copenhagen blue, light blue, dark blue, and even lavender. Twin sister to the ratine is sponge, which looks so much like it that only the shopkeeper can tell the difference. Both cloths make up prettily with the Bulgarian silks. These silks, by-the-way, the guileless clerk will tell you are hard to get because the war in the Balkans has shut down all the silk mills over there. If you begin talking to him about the antiques made in New Jersey and Grand Rapids, however, he will admit that the silks which savor of tapestry, are really made in our own mills and are hard to get simply because they are in such demand. In the ready-to-wear ratine gowns, Bulgarian silk girdles and Robespierre collars, and buttons covered in silk are much in evidence. Silk crepe ratine comes at 25 cents a yard. This, as its name shows, is a crepe effect striped with silk.

Marquises and voiles are again good, in spite of much talk last year against them and in favor of more closely woven cloths. If these two favorites of women are to go it is very evident they will die hard. Both come in silk thread effects, and in all colors. The marquise sells at 35 and 40 cents the yard, and for the woman who wants a diaphanous gown, nothing is prettier.

French ramies are new and good. These are a coarse weave, something like voile, and come in plain colors. Linen color ramie is one of the leaders, but it can be obtained in other tones.

CLEAR HEADED

Head Bookkeeper Must Be Reliable.

The chief bookkeeper in a large business house in one of our great Western cities speaks of the harm coffee did for him. (Tea is just as injurious because it contains caffeine, the same drug found in coffee).

"My wife and I drank our first cup of Postum a little over two years ago and we have used it ever since, to the entire exclusion of tea and coffee. It happened in this way:

"About three and a half years ago I had an attack of pneumonia, which left a memento in the shape of dyspepsia, or rather, to speak more correctly, neuralgia of the stomach. My 'cup of cheer' had always been coffee or tea, but I became convinced, after a time, that they aggravated my stomach trouble. I happened to mention the matter to my grocer one day and he suggested that I give Postum a trial.

"Next day it came, but the cook made the mistake of not boiling it sufficiently, and we did not like it much. This was, however, soon remedied, and now we like it so much that we will never change back. Postum, being a food beverage instead of a drug, has been the means of banishing my stomach trouble, I verily believe, for I am a well man today and have used no medicine.

"My work as chief bookkeeper in our Co.'s branch house here is of a very confining nature. During my coffee-drinking days I was subject to nervousness and 'the blues.' These have left me since I began using Postum, and I can conscientiously recommend it to those whose work confines them to long hours of severe mental exertion." Name given by Postum Co., Battle Creek, Mich.

"There's a reason," and it is explained in the little book, "The Road to Wellville," in pkgs.

Ever read the above letter? A new one appears from time to time. They are genuine, true, and full of human interest.



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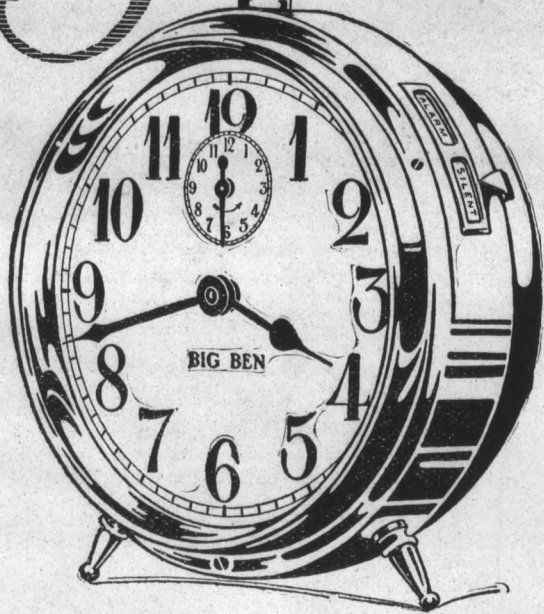
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(2)

Big Ben



Big Ben—Two Good Alarms in One

Take your choice in Big Ben. He rings either way you wish—five straight minutes or every other half minute for all of ten minutes unless you switch him off. He's two alarms in one.

If you're a light sleeper, turn on the half minute taps before you go to bed. If you sleep heavily, set the five minute call. You can slumber then without the get-up worry on your mind.

When morning comes, and it's announced by Big Ben's jolly bell, you can't help getting up at once, for Big Ben never fails to get you wide awake.

Big Ben is really three good clocks in one, two excellent alarms and a fine time-keeper to keep in any room and tell time all day by.

If you have got to get up bright and early, if you have to get your help in the field on time, ask for Big Ben at your jeweler's and try him for a week. You'll never want to be without him afterwards.

Big Ben stands seven inches tall. He is triple nickel-plated and wears an inner vest of steel that insures him for life. His big, bold figures and hands are easy to read in the dim morning light. His large, comfortable keys almost wind themselves. He rings five minutes steadily or ten intermittently. If he is oiled every other year, there is no telling how long he will last.

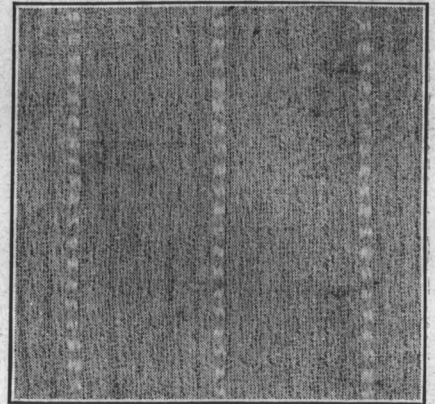
He's sold by 18,000 watchmakers. His price is \$2.50 anywhere in the States, \$3 anywhere in Canada. If you can't find him at your jeweler's, a money order mailed to Westclox, La Salle, Illinois, will send him anywhere you say express prepaid.

French corduroys will be popular in the winter goods. These are much like pique, but the stripes are wider and give the effect of real corduroy. They sell at 50 cents the yard, while the pique, which will be much worn for separate white skirts, suits and dresses, may be bought for 25 cents.

Ginghams, like the poor, we have ever with us. They are washable, durable and likeable for a general utility dress. Small checks and plain colors are being pushed for favor this spring, though the larger plaids and stripes are also shown. She who is wise shrinks her gingham before making it, as this cotton is the worst of any to shrink after washing. As usual, the dress gingham runs in value from a shilling the yard to 35 cents, depending partly on quality and partly on the store where they are bought.

For kimono a pretty conceit is shown, plisse. The body of this resembles our

ered, or with the center cloth and the rim metal. You may have covered buttons in the shape of a sphere or a hem-



Silk Crepe Ratine.

isphere and of any size from the size of a pea to an inch or two in diameter.

Among the "freaks" there are buttons in size and color like a cherry. Cherry red is such a favorite color in fabrics it must follow that we would have cherry buttons, too. Then there are smaller red buttons with a black top which remind one of currants, and small red buttons without the touch of black. It takes some stretch of the imagination to conceive a garment decked with these gay buttons, but probably some dressmaker will be found brave enough to consider them smart.

HOW TO COOL A PIE QUICKLY.

To cool a pie quickly when it is baked late and needed for dinner, buy a 15 cent wire sieve shaped like a pan. Place it in the pan and set the pie in it. Pour

Novelty Ratine.

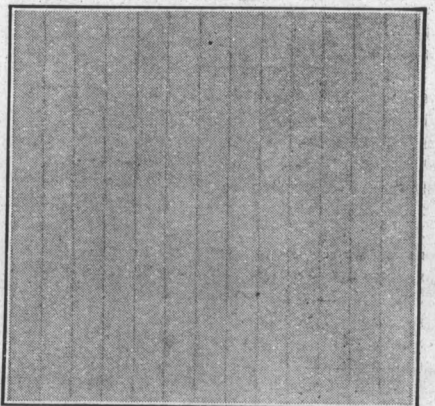
old friend the seersucker, and over the cloth are fans and floral effects in every conceivable color, most noticeable being cherry and blue.

BUTTONS ARE POPULAR.

Buttons will play a prominent part in trimming the frocks of the season of 1913, if the button manufacturers have their way. Not in the memory of this particular woman has there been such an array of these ornaments shown.

Glass buttons, of course, are much in evidence. There are small brilliants shaped like cut diamonds; round glass buttons the size of a quarter; glass buttons in light blue, dark blue and purple, amber, green, pink, and lavender, in fact, any color you ask, for trimming dainty waists. Brass buttons are shown from the size of a dime to a size even larger than a silver dollar.

The covered buttons are in many styles. You may have a flat button covered in one color, or covered in two colors of cloth. You may have a button with a center of metal and the rim cov-



French Corduroy.

cold water in the pan till it comes up around the pie tin. When the water becomes warm the sieve can be readily lifted out and the water changed for cold.—Mrs. M. N.

Great Majestic Malleable and Charcoal Iron Range

Don't Buy Any Range Sight Unseen

If you were buying a horse, you wouldn't want any printed description—you would want to look him over mighty carefully so as to know you were getting your money's worth. So, before deciding upon any range the wise woman will go to the local dealer and examine the **Great Majestic Range** closely—it will stand the test of comparison point for point, with any range ever made. When you have made this comparison—your choice will be the range with a reputation.

The Majestic Outwears Three Ordinary Ranges

It is the only range made of malleable iron and charcoal iron. Charcoal iron won't rust like steel—malleable iron can't break. Outwears 3 ordinary ranges.

Perfect Baker—Saves Half Your Fuel

The **Majestic** is put together with rivets—joints and seams remain air tight forever. Body lined with pure asbestos board—you can see it. Takes but half the fuel—assures perfect baking.

All Copper Reservoir—Against Fire Box

The reservoir is all copper and heats through copper pocket, pressed from one piece, setting against fire box. Holds 15 gallons of water. Just turn lever and reservoir and frame are instantly moved away from the fire.

Greatest Improvement Ever Put in a Range

—increasing strength and wear of a **Great Majestic** more than 800 per cent at a point where other ranges are weakest—many other exclusive features. Ask to see it.

For sale by dealers in nearly every county in 40 states. Any **Majestic** dealer can furnish any size or style **Majestic Range** with or without legs. Write for our booklet, "Range Comparison."

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a Reputation
It Should Be
In Your Kitchen



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Pretty Kimono Patterns Are Shown in Many Shades.

HOME QUERIES.

Household Editor:—How do you make croutons?—Cook.

Cut the bread in slices about a half-inch thick, remove the crust, cut in cubes, shake in melted butter in a frying pan until they are browned all over, or spread with butter, and brown in the oven.

Household Editor:—Would you whip a child for obstinacy?—Anxious Mother.

If I wanted to make him incurable. Whipping an obstinate child usually only makes him more sullen and resentful. I have a friend who cured her six-year-old boy of obstinacy by telling him he was sick and that he must stay in bed until he got well again. She explained that when children were perfectly well they were always good and obliging, and that if they became naughty and disagreeable it was a sure sign they were sick and must be doctored. A day in bed with nothing to eat but toast and gruel soon "cured" the small boy of his sickness.

Household Editor:—How do you glaze bread?—Baker.

A good way is with cornstarch. Use a tablespoonful, even, of cornstarch to a pint of boiling water. When the bread is almost done pull out of the oven long enough to rub on the cornstarch with a brush, then return and finish baking.

Household Editor:—How long should steak be cooked?—Mary M.

A steak an inch thick should be cooked four minutes if liked rare, and ten if desired well-done. If an inch and a half thick cook eight minutes for rare and 15 for well-done.

Household Editor:—How do you use boracic acid?—M. B.

Dissolve a teaspoonful in one cup, a half pint, of hot water, and bathe the afflicted part. Boracic acid solution makes a good wash for a sore mouth. It is also good for an eye wash.

Household Editor:—What vegetables can be safely given a three-year-old child?—Mrs. B.

Potato, fresh peas, asparagus, spinach, celery and lettuce. It is seldom that a child this age will eat any of the coarse-fibred vegetables, as turnips, carrots, etc., and this is a pretty good sign that the stomach is not ready for them.

Household Editor:—Would you recommend oat meal water for three-months-old baby?—Mother.

That depends altogether upon the baby. While one baby might digest it easily another would die on it. Oatmeal is loosening, so if the infant's bowels are already loose I would not give it. The theory in feeding babies is not to give starch at all until the seventh month, when the salivary glands begin to work, and oatmeal is a starch. However, many babies thrive on starch much earlier than seven months, setting at nought the theory. Rice water and barley water are either one easier of digestion for the average baby than oatmeal water. To make either, boil one tablespoonful of the grain in a pint of water two hours, adding boiling water as it cooks away so that there is one pint when the time is up. Then strain and add one tablespoonful to the entire day's feeding, or a teaspoonful to a bottle two or three times during the day. If the baby digests this all right you will know by the condition of the bowels next day. In case it is digested add a little more of the water the second day until the child is taking all it can safely digest.

Household Editor:—Why can't I say "I knowed it"?—Jack.

Because "know" is an irregular verb and the past tense is "knew." You should say "I knew it" and "I have known it."

Household Editor:—Why do some recipes say to beat the whites and yolks of eggs separately and others to beat them together?—M. K.

Eggs are used for two purposes, one to make a cake lighter and the other to thicken the mixtures in which they are used. When they are added to give lightness, we beat the parts separately; when to make the mixture thicker, as puddings, etc., it is better to beat them together.

Household Editor:—What does "roux" mean?—Cook.

It is a French term for the cooked butter and flour we use to thicken sauces.

Household Editor:—"The Magazine Corner," by Pearl White McCowan, Jan. 4 issue, appealed to me. Will you or the lady who wrote the article please give me information about the hooks? Are they to be made or bought? And how are they fastened on the wall?—E. C.

The hooks described in the article were, or rather are, for I use them myself, of the variety known as hanging paper, or letter files, and are often seen in business offices. They are made of either wire or with an iron back and wire hook,

and are so constructed as to hang upon nails driven into the wall. They can be purchased at almost any bazaar or ten cent store, at various prices, according to material and durability. Price usually ranges from two to ten cents each.—P. W. McC.

HOW TO COOK OUR HOME-DRIED FRUITS.

BY MARY MASON WRIGHT.

Our home-dried fruits are not only nutritious and healthful but economical as well, and most country housewives have a good supply on hand which comes in nice toward spring when other things are not so plentiful.

All dried fruits should be well-washed before being cooked, for no matter how carefully they have been dried, they will not be entirely free from dust or dirt; then they should be soaked in water from 12 to 24 hours, the time depending on the kind of fruit, and whether they are very dry or wrinkled. All fresh fruit is largely composed of water, and most of this has evaporated in the drying process, therefore it is necessary that as much water be again absorbed as was lost to make it anyways like fresh fruit. These dried fruits should be boiled in the water in which they have soaked, and should be cooked very slowly, or they will break down and become soft and mushy before done sufficiently; they will also lose part of their flavor by rapid cooking. A pinch of salt added to most dried fruit will improve its flavor. Sweeten the fruit just before removing it from the fire.

Dried sour cherries make an excellent substitute for the commercial dried currants, and can be used with success in almost everything in which they have been used. They are especially nice when used in suet puddings or in fruit cakes, or mince pies. In most cases it will be best to run them through a food chopper, or at least chop them up.

Sour and sweet dried fruits are excellent combined; they can either be stewed together or stewed separately and then combined, the latter is the more desirable way when the fruits do not cook in the same length of time. Raisins are fine combined with dried apples. Use about a cupful of seeded or seedless raisins to each pint of fruit. Dried apples are nice stewed with slices of lemon, or spiced with cinnamon. Dried peaches and apricots make a good combination, also pears and prunellos, dried plums and prunes. In combining a sour fruit like plums with prunes, use about one-third of the former, and two-thirds of the latter. There is an art in "blending" different kinds of fruit, as there is in "blending" coffee or tea, and the best way is to try different ways in combining the fruits until you get the most satisfactory flavor.

Most of the dried fruits can be used in making pies, puddings and such like. Peaches make nice filling for shortcakes, and if the preserve closet begins to get low in spring excellent preserves and marmalades can be made with the dried fruits. Soak the fruit for at least 24 hours, then simmer very slowly, adding about three-fourths of a pound of sugar to each pound of fruit, unless the fruit is very tart, then a little more sugar can be used. Boil the fruit until thick, and then turn into jars. Following are the recipes of two fruit cakes made with dried fruits that are delicious as well as economical:

Dried Apple Fruit Cake.—Soak one cupful of dried apples over night in cold water enough to swell them, chop them in the morning, and then add one cupful of molasses and cook slowly until almost soft, then add a cup of seeded raisins, and stew awhile longer. Set aside to cool, and when cool, add one-third cup of butter, one well-beaten egg, one-third teaspoonful of soda, and one cupful of flour. Beat up and bake in a moderate oven. A teaspoonful of cinnamon will add to the cake for many. This can be doubled if a larger cake is desired.

Spice Fruit Cake.—Take two cupfuls of light-brown sugar, and three-fourths cupful of butter, cream together, add one cupful sour cream, two eggs, one-half cupful chopped seeded raisins, one-half cupful of chopped dried cherries, one-half cupful stewed dried apples, one teaspoonful of cinnamon, and one-half teaspoonful each of allspice and cloves, or nutmeg, and one teaspoonful soda. Add enough flour to make a good cake batter, and bake in a moderate oven. The dried sour cherries nicely take the place of currants, and the dried apples the place of citron.

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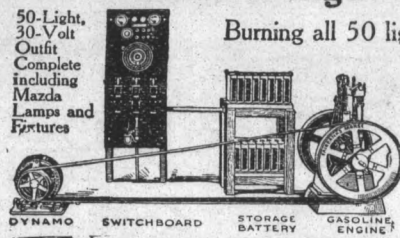
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Would you be willing to work hard for a few years to have it?

You have read of the splendid apple crops of the Pecos Valley of New Mexico and Texas. You have seen reports of the large profits. You know the results that can be secured by intelligent effort. You know these things, but have you ever sat down to analyze the advantages offered by the Pecos Valley?

Do you realize that most of the apples used in Texas come from this valley? Do you know that there are 4,000,000 people in Texas, all apple-hungry and willing to pay well for good fruit? Do you know that the Pecos has the nearest apple orchards?

Do you know that the Pecos Valley has a particularly favorable climate and soil for apple-growing? It is the nearest apple-growing country, and other apple sections are practically shut out of Texas by the long hauls and expense of transportation.

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Do you know that splendid land, ready for the plow, with water developed, can be bought for \$75 an acre and up, on long time, with low interest?

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not using the little foresight, energy and hard work that will ultimately make you the possessor of an irrigated apple orchard in the Pecos Valley and all the prosperity that means?

You will find there now—good schools, good roads and many thriving little cities more enterprising and better consumers than larger communities in older sections. You'll get a hearty welcome and won't be lonesome, because orchard homes make close neighbors and the resulting social activity due to common interests.

Write for Pecos Valley folder—it's free—and get the whole story.

C. L. Seagraves, General Colonization Agent,
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Monroe, Michigan.

THE PROPER CARE OF CLOTHES.

BY SUSAN M. KANE.

Perfect fitting clothes, correctly tailored of substantial materials, give undeniable satisfaction. That this peculiar pleasure and pride that comes from wearing clothes of a distinguishing quality may be continued during the vogue of the article or garment, it must be kept in the best possible condition. This care of clothes requires money for the professional cleaner or time and skill of someone at home. The suggestions in this article, if followed, will make it easy to dispense with much of the professional's service.

The chief requisites for the proper care of a wardrobe are a well padded ironing board, sleeve board, medium-weight pointed iron, a stiff nail brush, whisk broom, some talcum powder, flour, ammonia, alcohol, chloroform, butter, olive oil or lard, gasoline, a bottle of bluing, time and patience. A formidable list, but reliable.

A few general rules apply to pressing. Brush the garment to be freshened, thoroughly, inside and out. Remove all stains and spots before touching with the iron. Dampen only a little of the garment at a time, using a sponge or whisk broom dipped in water, lay a clean newspaper over dampened place and press with hot iron. Press every garment on the wrong side first, if possible. Then follow the same method on the right side. The results are fine creases, color brought out, finish restored, no lint and no ruined towels.

A dependable cleaning solution for any woolen fabric, and especially good for coat collars, sleeves, and all soiled edges is, one ounce each of ammonia, alcohol, and shaved castile soap, mixed well and put into a quart of water. Apply freely with nail brush and rinse carefully in clear water.

Sometimes you may clean a spot from your clothing with gasoline and find a ring left around the part cleaned. To remove this steam it over a teakettle until the ring disappears.

The aim, always, in removing spots from clothing, whether dresses, gloves, ribbons, or hats, is to get the article cleaned without destroying the color or finish of the fabric. These are most often destroyed by hard rubbing. Olive oil and lard are great mollifiers. Moisten creases on ribbons, collars, ties, and if you are cleaning gloves, every part of them with pure lard. Sponge away, very gently, all dirt loosened by the lard, with bits of soft muslin dipped in gasoline, then rinse thoroughly in a good quantity of it. Gloves and unattached ribbons and collars should be rinsed by shaking them in a fruit jar partly filled with gasoline.

A grease spot may be removed by thoroughly rubbing in talcum powder on both sides of the goods. Let it stand a few hours, brush off and rub in another lot if needed.

Pitch and gum are most difficult to remove from clothing. Spread a thick cloth over it, then the fabric to be cleaned, gummed side up. As the gum softens, press out as much as possible with a blunt knife. Then take a piece of soft woolen cloth and hold tightly over the spot. Never rub it. Keep the iron warm, not hot.

Get out the soiled white or gray felt hat. Take a stiff nail brush, a cup of flour, and a quart of gasoline. Go out of doors and give it a good scrubbing. If you don't mind a little extravagance in gasoline rinse it in a fresh quantity, and you will make a better job. Hang on the line, when dry brush out the flour. Put on a fresh band or turn the old one.

Fresh paint may be removed by rubbing a clean portion of the same garment over the stain. Old paint stains should be thoroughly covered with butter or olive oil, and then rubbed well with turpentine to remove paint from cotton fabrics. Ink, if sponged immediately with cold water will leave no stain, even if spilled on white goods.

Many a blue serge suit is cast aside because it has become shiny. Try this remedy for it. Make a solution of water and common bluing—two tablespoonfuls of bluing to one cup of water, and apply with a soft cloth. Press in the usual way and the shine will vanish until time to press again.

It is a temptation, as well as an expensive luxury to send party dresses and other soiled pieces of delicate fabrics to the dry cleaner. The work may be successfully done at home. Make a paste of equal parts of gasoline and flour.

Spread this paste on the garment with a knife, let it stand three or four hours and then brush thoroughly. After it is well aired, let it lie loosely in a cloth wrung from water. In a couple of hours it will have absorbed enough moisture to make it press nicely. Press on the wrong side with a moderately hot iron.

Trousers pressed in the following way will look as if just from the hands of the leading tailor.

After brushing, turn them inside out. Lay one leg on the ironing board at a time, with front and back crease in the center of the leg; this will bring the seams at the sides. Dampen, lay a newspaper over the entire leg and press until the pants are dry. This removes all bag in knee. After pressing both legs on the inside, turn them right side out and lay each leg on the board separately, folded to crease. Dampen each crease, cover with newspaper, and press with hot iron.

There are those who will be able to get the best results from these suggestions because they are impressed when told to do a certain thing. There are others who have been brought up on the word "don't," and for them it may be well to add: Don't put a hot iron on any part of a woolen or silken garment without having a paper over it; don't rub any kind of a stain hard; don't hurry any part of the process of cleaning; don't waste, nor yet be stingy in the use of gasoline; don't use gasoline near a fire.

THE HOWELL SANATORIUM.

The Howell Tuberculosis Sanatorium is located on a farm three miles from Howell. It is on a high hill, and one can look off in every direction to a distance of 20 to 25 miles. The air is bracing and the place inspiring to the patient who is striving in every possible way to regain his health. Those who are receiving treatment at the sanatorium are very enthusiastic in their praise of the institution. The sanatorium is heartily supported by the State Anti-tuberculosis Association in every way possible, and that association urges all who are afflicted with this disease to make early application to Howell.

The capacity of the sanatorium is limited and is nearly all taken at the present time, thus making quick application advisable. The cost to the patient or the county sending him, is \$7.00 per week, including board, room and medical care. Incipient or early cases are preferred and this class of patients is most likely to be cured.

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Our large Fashion Book—containing 92 pages illustrating over 700 of the season's latest styles, and devoting several pages to embroidery designs, will be sent to any address on receipt of 10 cents.



No. 6867—Men's lounging or bath robe, 34 to 46 breast.

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The above patterns will be mailed to any address by the Fashion Department of the Michigan Farmer on receipt of 10 cents for each.

Grease tinware before using it, set it in the oven and let it get hot. It will never rust. It is very useful with tin covers as they rust, so quickly with steam. Grease with lard.—Mrs. T. S. C.

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We prepay freight to any freight station east of the Mississippi River, or south to Tennessee. You cannot afford to buy a machine until you have sent for our handsome illustrated free catalog, printed in colors.

THE MICHIGAN FARMER, Detroit, Michigan.

(Continued from page 302).

This proposition will be of interest to members of farmers' organizations of Michigan, notably the Farmers' Clubs, who have repeatedly passed resolutions favoring the enactment of such a law by Congress. There is probably no doubt that the constitutionality of the law will be made an issue by the interests involved, but the passage of same is a distinct victory for the temperance element of the country.

The farmers' institutes, as conducted in Michigan have accomplished a vast amount of good to the agriculture of the state. Through this medium many farmers have been inspired to the adoption of better methods of conducting their farms, and there is no doubt that the investment has been a very profitable one for the state. Also, our Michigan institutes have been so well managed that greater benefits have been secured at less cost than has been the case in very many other states, if not in any other state in the nation. But the very impetus that this form of instruction has given to the agriculture of the state has caused it, in a measure at least, to outgrow the institute as at present conducted, until it seems probable that the time has come when the institute as we know it should gradually give place to something of still higher educational value.

In this connection an experiment which is being tried by Professor French, of the Department of Agricultural Education at M. A. C., seems to promise well. This is nothing less than a week school, (so-called for the want of a better name), for farmers, something like the short courses conducted at the college. These schools have mostly been held in the villages where agricultural courses are given in the high schools, for the reason that the interest in the proposition is greater at those points. Two good men are sent to take charge of the school, who first give lectures on the special lines of agriculture in which the farmers of the community are most largely interested. Then the farmers attending are asked to describe the methods which they follow and in the discussions which follow many facts of interest are brought out. This gives the experts who are conducting the school the information needed to make it of the greatest possible benefit to those attending. It is stated upon good authority that the interest in these farmers' schools has been very keen in all of the eighteen communities in which they have been conducted this winter. In at least one instance the interest developed has been so great that the work will be continued by a Monday night meeting of the school throughout the winter.

It would appear that in schools of this character will be found the logical development from our present day farmers' institutes, in which there is too little opportunity for the expression and interchange of opinions by and between the farmers attending. The mixing of scientific principles and practical experience which can be secured at such "schools" cannot but prove of value to all who attend them.

HAPPENINGS OF THE WEEK.

National.

On Friday last the Senate passed a naval bill carrying an appropriation of \$150,000,000, which is \$14,000,000 more than was allowed in the bill as passed by the House.

A legislative committee of the Michigan law-making body has been appointed for, and Monday began work on, the investigation of the methods of business of the Pere Marquette railroad.

The city of Cleveland, Ohio, is the first in the country to make a complete appraisal of its property, and the work shows that the municipality has outside of streets and street improvements, over \$40,000,000 invested in realty and buildings.

Public officials are taking a most liberal attitude toward the remedy for tuberculosis discovered by Dr. Friedmann, of Germany, who is now in New York City, the plan being to distribute the vaccine through government control should experiments in the government laboratories prove the remedy to be what it has been claimed. Already members of the public health bureau have counselled with Dr. Friedmann and he has consented to arrangements making the above plan easy of accomplishment.

Omaha, Neb., was the scene of a horrible fire last Saturday morning. The Dewey hotel, which was housing 75 guests at the time, burned, and while it is not known how many lost their lives the number will be above a score. The fire followed a gas explosion which was due, it is believed, to a leaky pipe. So intense was the heat that the firemen could not get the fire under control in less than three hours. The exact loss of

life will not be known until all the debris has been cleared away.

The business men of Jackson, Mich., have launched a movement designed to have the state prison removed from its present location because of the unpleasant notoriety which it has brought upon the municipality.

Rev. Dr. Horner, for 20 years past a leading Methodist Episcopal clergyman of the Detroit conference, died at his home at Farmington last Friday night, of pneumonia. He was 75 years old, having been born at Pittsburg in 1838.

Congress passed the Webb bill, which provides for the prohibition of shipments of liquor into "dry" states, over President Taft's veto.

This is an exciting week at Washington, on account of the inauguration of Woodrow Wilson, of New Jersey, as the twenty-eighth president of the United States. Saturday, Sunday and Monday trains were coming into the great union depot every five minutes loaded with people enroute to the capital city to view the ceremonies connected with the installation of the new executive. The city is decorated as for a gala day, the churches and public places overflowing with visitors, and everywhere there is bustle because of the thousands of outsiders in town. Governor Ferris and party left Detroit Sunday to represent Michigan in the functions incident to the inauguration.

While formal announcement of the cabinet of the Wilson administration had not been officially made before going to press, the following is understood to be the list: Secretary of state, W. J. Bryan, of Nebraska; secretary of the treasury, Wm. G. McAdoo, of New York; attorney-general, James C. McReynolds, of Tennessee; secretary of war, Lindley M. Garrison, of New Jersey; secretary of navy, Josephus Daniels, of North Carolina; postmaster-general, Albert S. Burleson, of Texas; secretary of commerce, Wm. C. Redfield, of New York; secretary of the interior, Franklin K. Lane, of California; secretary of agriculture, David F. Houston, of Missouri; secretary of labor, William B. Wilson, of Pennsylvania.

Four persons were burned to death and one burned fatally in a rooming-house fire at Mayburg, Pa., Monday morning. By leaping from a second-story window 45 others safely made their escape from the flames.

E. W. Gerbracht, former head of the Williamsburg sugar refinery, goes to prison at Mineola, L. I., to serve a 30-day sentence for defrauding the government out of sugar duties.

The failure of the Washington police to protect a parade of several thousand suffragists on Pennsylvania avenue Monday, resulted in the line of march being broken by drunken rowdies, and the women treated shamefully, 300 of whom are reported to have fainted.

By reason of Congress refusing to act in the matter of appointments by ex-President Taft, President Wilson will have 1,400 public positions to fill. A civil suit has been filed in the district court of New York to dissolve the coal tar interests, the charge being made by the government under the Sherman anti-trust law.

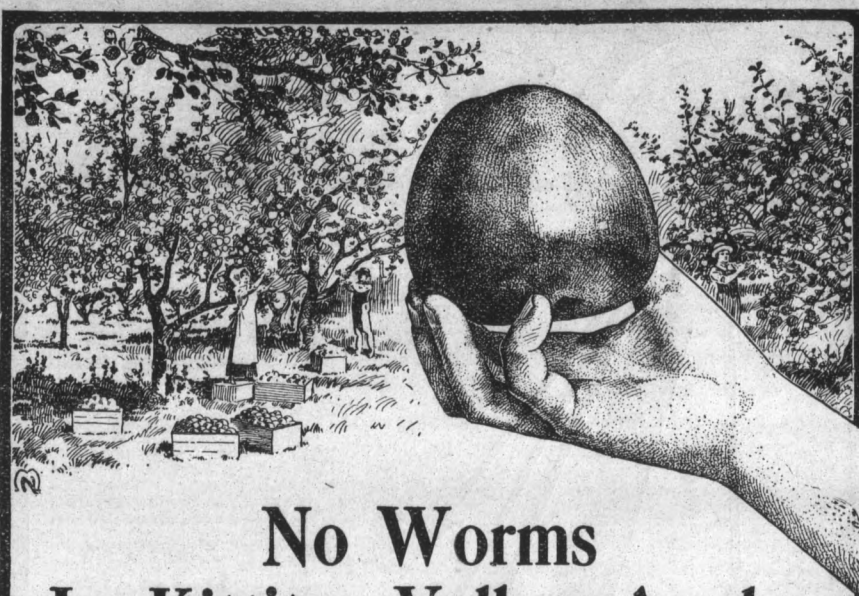
Money order postoffices will install a collect on delivery plan in connection with parcel post, commencing the first of July next. Instructions have already been issued and are in possession of the above class of postoffices. The following rules are given: The fee for collection on a package will be 10 cents in parcel post stamps. Packages will be insured at their actual stated value up to \$50. Sender will receive a receipt showing the office, date of mailing, the number of the parcel and the amount to be collected. Only money order postoffices will receive packages for C. O. D. service and they can only be forwarded to a money order office. The C. O. D. tag attached to the package must show the amount due the sender, the money order fee necessary to make the remittance and the total amount to be collected.

Foreign.

After the recent stirring events in Mexico, political affairs now seem to be clearing up, with the provisional government ruling the country by an iron hand. It was reported late last week that 11 rebel leaders and 2,500 troops have yielded to General Huerta and taken oath to support the new regime. It is officially reported that during the fighting in Mexico City 4,000 persons were killed and 11,000 wounded. The government also reports that Emilio Madero, a brother of the deposed and assassinated president, was killed in Northern Mexico while leading a command of rebels. Alfonso and Gabriel Madero, the surviving brothers of Francisco, are counselling together in Texas as to the future movements of the family. The widow and immediate members of the family of the late executive have arrived in Cuba. An invitation has been forwarded to Porfirio Diaz, former dictator of the republic who is now in Egypt, to return to Mexico, and a detachment of cadets is being sent abroad to escort the General back to the land from which he was deposed by the Maderists, should he decide to return.

No particular change is noted in the war situation in Turkey. Sir Edward Grey, of England, has called the ambassadors of the powers together to consider Turkey's application for mediation. The allies are firm in their demand for the terms originally asked for—the surrender of Adrianople, Scutari and Janina and the payment of an indemnity. In the Janina district where active fighting has been in progress during the week the Greeks claim small successes.

The Japanese town of Numadzu to the south of Tokio, was destroyed by fire Monday. Two thousand homes and the government buildings were burned and a number of fatalities resulted. The property loss is estimated at \$2,500,000.



No Worms In Kittitas Valley Apples

Kittitas Valley, Washington is free from fruit pests. Here grow the finest apples in the world, excelling in size, color, flavor and keeping quality.

Good apples can be bought at a reasonable price. After the fifth year a regular income of \$500 an acre can be counted on and there's big money in vegetables and small fruits while you're waiting.

The enterprising orchardist who gets into this wonderful country now while it is new will never regret his move. Good orchard land is plentiful—the climate is temperate and healthful—winters mild—summers cool.

A new irrigation ditch, known as the Hi Line Canal, carrying water for 75,000 acres of high-class fruit and truck gardening land, is now under construction.

The heart of Kittitas Valley is traversed America's newest transcontinental line—the

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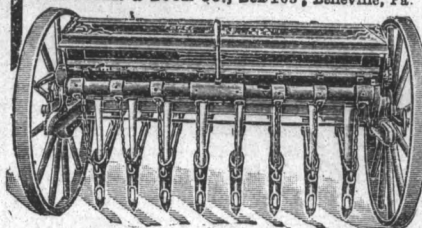
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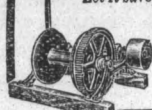
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Horticulture.

INSECTS OF THE FRUIT GARDEN.

Current Worm or Current Sawfly.

This destructive insect is the larva of a small fly which appears in large numbers in the early part of summer. The fly itself is a little larger than the common house fly and is of a yellowish appearance. It arrives about the time the first leaves come out on the currant bushes and lays its small white eggs on the under side of the leaf, usually on the midrib or larger veins. These eggs hatch in a week or ten days into small light green worms which immediately attack the leaves. Since the eggs are laid on the lower leaves the larvae attack these first and gradually work their way upwards. For this reason their presence is usually not noticed until the bush is nearly stripped. As the larvae grow larger they change to a dark green color, and when full grown, are covered with black spots. Usually there are two or three broods a year but in the northern part of Michigan there is seldom more than one.

Remedies.—This insect is very easily controlled by applications of any arsenical spray, such as arsenate of lead, or Paris green. These poisons will do all right for the first application but as the second brood may come when the fruit is about ready to pick they are not de-

stroy all the young larva and eggs and thus lessens the number of insects the next year.

Raspberry Sawfly or Slug.

This is a black, four-winged fly that may be seen among the bushes in May or early June. It lays its eggs within the leaf usually near the veins. These eggs hatch into whitish looking larva which later become dark green and covered with soft spines. When full grown they are about one-half inch long.

Remedy.—Spray with some arsenite, such as arsenate of lead, or Paris green or with hellebore. Use the same strength as was given for the currant worm.

The White Grub of the Strawberry.

This is the worst insect pest of the strawberry. It is the larva of the large, dark-brown June bug that may often be seen in numbers flying around electric lights in the month of June. There are two types of these beetles, the second form being of a silvery white color. This form is not so common as the dark-brown type. In both cases it is the larva that work havoc in the strawberry patch. They eat off the roots of the plant so that an apparently healthy plant will wilt and then dry up. It is usually more destructive in the older beds, but newly set beds are sometimes badly infested.

Remedy.—Since the insect works beneath the surface of the ground the remedies are preventive rather than cura-



Views of Well, Trenches and Celery Field of an Indiana Irrigation System.

sireable to use at that time. For the second brood white hellebore is usually used at the rate of one-half ounce to a gallon of water or it can be used as a powder and dusted on. In our own practice we spray the currant bushes at the same time and with the same material that we use on the apple trees, namely, Bordeaux mixture and arsenate of lead.

The Currant Borer.

The adult form of this insect is a blue wasp-like moth which usually appears in the early summer and lays its eggs near the tips of the young currant shoots. These hatch into small white grubs which burrow down into the center of the shoots. It eats out the pith and forms a tunnel which may be seen when the shoots are cut off. Since infested shoots have a weak and sickly appearance they can be easily distinguished. They should be cut off and burned.

San Jose Scale.

This insect is very partial to currants, but as currant bushes can easily be sprayed, it can be kept in check by applications of lime and sulphur solution. Since the strong solution is the one used it must be applied in the early spring before the leaves come out.

The Raspberry Cane Borer.

This insect is a small slender black beetle about one-half inch in length. It will be first noticed in June when the tips of some of the young raspberry shoots will be found in a wilted condition. This is caused by two or more rows of punctures between which the beetle lays its eggs. As the puncture extends around the stem the supply of water is cut off and the shoot wilts. These eggs hatch into small larvae which burrow down through the center of the stalk. By fall the insect has reached the roots where it passes the winter.

Remedy.—Cut off the wilted shoots three or four inches below the punctures and burn. The canes that wilt and die during the latter part of summer should also be cut out and burned. This de-

stroys all the young larva and eggs and thus lessens the number of insects the next year.

Strawberry Leaf Roller.

The adult form of this insect is a small brown moth which appears in the early spring and lays its eggs upon the leaves of the strawberry plant. In a few days these hatch into greenish brown larva which are about one-half inch long when full grown. When mature they spin webs which make the leaves roll up. They then eat out the soft tissue of the leaf and the remainder turns a reddish brown, giving the plants a burned appearance.

Remedy.—Spray the leaves with Paris green during August at which time the second brood appears. Cutting and burning the foliage is also a good remedy. This should be done immediately after the fruiting season.

Emmett Co.

G. W. LINDSLEY.

USES ARTESIAN WELL FOR IRRIGATING CELERY LAND.

The accompanying picture shows one of the uses to which an Indiana farmer put an artesian well, or rather one of the wells he discovered on his land, for he had three of them. The picture illustrates that he irrigated a celery garden and other crops during dry weather.

The little picture in the foreground shows one of the wells and gives an idea of the volume of the flow, and at each side are shown ditches through which the water is kept flowing out upon the celery ground as long as desired.

The water from the top of the tube was conducted to various parts of the field by means of short sections of galvanized corrugated pipe which are easily extended by slipping one into another. Each of the three wells on the place cost about \$60 each, which included the cost of drilling and tubing. One of the

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wells was used entirely for washing vegetables and was enclosed inside of a wash house with concrete basins.

In Berrien county, Michigan, in the vicinity of Paw Paw lake and Water-vliet, the farmers have found valuable wells, the water of which, besides furnishing all household and stock watering needs, is used for other purposes. Not all of the wells have artesian flows, but some of them send up a never ceasing supply. The water is cool in summer, and in winter it is of a proper temperature for stock watering.

Illinois. J. L. GRAFF.

ON PRUNING THE FRUIT TREES.

Pruning so as to maintain a balance between fruit production and wood growth is of vital importance. If the soil is very fertile or especially rich in nitrogen, the wood producing functions tend to crowd out the fruit producing functions; or if the soil is poor, fruit production is encouraged at the expense of wood production, and the vitality of the tree is affected. This may result in premature death.

Prune regularly and lightly every year when growth is dormant, at any time between the fall of the year and the bursting of the buds, although this work is usually best done in the early spring just before the sap rises. When pruning bearing trees, cut out all the dead wood, and if the top branches are thickly interlaced and form a dense mass through which the sun cannot penetrate, thin out carefully. When pruning a tree set out last spring, thin out all the weak shoots, leaving several of the strongest, which must be headed back about a third.

Too severe pruning frequently gives a setback to an old tree. The younger the tree the better it will stand being severely pruned. If the soil is very rich and the water supply good, the trees will stand a more severe pruning than if the conditions are otherwise.

New York. T. A. TEFFT.

TREES FOR LOW SANDY LAND.

I have a piece of bottom land of a sandy nature, which floods everything. I would like to plant this to nut trees if I could get some good commercial nut that will thrive in such a location. Will chestnuts grow on low land? Will catalpa trees do well on low land and which is the best variety for this climate?

Van Buren Co. B. A.

Low fertile land which is apt to be flooded for some time during the spring and fall could advantageously be planted to Carolina Poplar, or White Cedar, and if the floods were not too severe, Black Walnut might be used to advantage. For such location, however, I would prefer the Carolina Poplar as it is one of the fastest growing of our native trees, having been known to make 15 inches growth in diameter in 17 years. The American Chestnut requires a well-drained upland gravelly loam and has done well throughout the southern section of this state. Where nuts are desired, a large number of trees should be planted as the sexes are separate. Catalpa speciosa will do well in this state on low rich land if not subject to winter killing, but will make only a slight growth on high dry sandy uplands.

Mich. Ag. Col. J. FRED BAKER.

CIRCASSIAN WALNUT AND ITS SUBSTITUTES.

The United States is probably the largest consumer of Circassian walnut, one of the world's best known and most expensive cabinet woods.

The high cost of Circassian walnut is due to the scarcity of the beautifully figured variety demanded for furniture and interior finish, for the tree itself is more widely distributed than almost any other of commercial importance. The demand for the best wood, however, has always outrun the supply. Even in the eighteenth century, when wars in Europe were frequent, so much Circassian walnut was used for gunstocks that the supply was seriously depleted. Early in the nineteenth century the wood of 12,000 trees was used for this purpose alone. Single trees, containing choice burls or fine bird's-eye figures have sold for more than \$3,000.

The tree is native to the eastern slopes of the Caucasus and ranges eastward to the foothills of the Himalaya mountains, from which it extends southward to northern India and the mountains of upper Burma. It has been widely planted in Europe and the United States, in this country under the name of English wal-

nut. The wood grown here, however, has not the qualities demanded by the cabinet and furniture maker. Much of the Circassian walnut now used comes from the Black Sea and from other parts of Asia.

According to a circular just issued by the forest service the demand for Circassian walnut has resulted in the substitution of other woods. Our own red gum is often sold as Circassian walnut, and butternut is also similar in general appearance to the less highly figured grades. Many good African, Asian, and South American woods resemble Circassian walnut, though none possesses the magnificent figure, delicate tones, and velvety texture of the latter. The circular discusses the supply and uses of Circassian walnut, and those who wish to know how possible substitutes may be distinguished can learn from this circular the distinctive marks which the government's experts have discovered.

USING FILLERS IN APPLE ORCHARD—VARIETIES.

I wish to plant five acres of apple trees and between each row of trees I am going to plant a peach tree. Would this be advisable? What kind of apple trees would you advise? I have plenty of Duchesse. What kind of peaches would you advise?

Kalamazoo Co. Mrs. M. H.

While certain advantages are offered by the use of fillers between permanent apple trees the scheme does not meet with general favor among successful growers. The advantage comes in better occupying the land while the trees are coming to bearing age and in securing an earlier revenue from the plantation than would be the case where the main fruits are waited upon. The disadvantage lies in not being able to give the trees the right kind of treatment where two kinds of fruits are grown upon the same land. In the case submitted it will be found that one or the other of the fruits would be apt to suffer; for to protect against too large development of buds on the peaches in the autumn which would expose them to danger of freezing, the land must not be rich in plant fertility, while with the apple trees a fairly strong soil is required. Then, too, in time of need, moisture and plant food will be competed for by the two crops. The most satisfactory use of fillers is where the same species of fruit is used. This is done by planting early bearing varieties like Wagener as fillers among the permanent trees.

The following are standard varieties of apples: Early Harvest, Red Astrachan, Yellow Transparent, Golden Sweet, Fameuse, Wealthy, Rhode Island Greening, Baldwin, Grimes, Hubbardston, Northern Spy, Wagener, and Yellow Belleflower. Of peaches these may be suggested: Alexander, Fitzgerald, Mountain Rose, Eearly and Late Crawford, Solway and Smock.

CATALOG NOTICES.

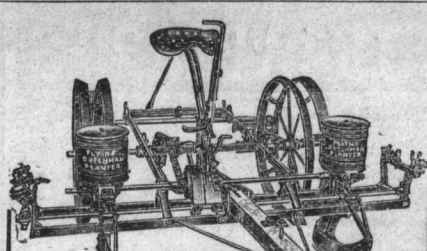
The Lowe Brothers' Company, 499 East Third Street, Dayton, Ohio, makers of "High Standard" Paint and "Mellotone," are sending out some interesting and valuable books on painting and decorating. The booklets are prepared by experts and the principles of good painting and artistic decoration are illustrated in actual colors. They are sent free to all who write for them, mentioning this paper.

Henderson's Garden Guide, published by Peter Henderson & Co., 35-37 Cortlandt St., New York, is a 64-page book containing information on the culture of all kinds of garden crops, including flowers, as well as vegetables. It also contains information on making and maintaining lawns and grass plots, home canning of vegetables for winter use, and has space for a garden record. When writing for this valuable pamphlet mention the Michigan Farmer.

Walter A. Wood Mowing & Reaping Machine Company, of Hoosick Falls, New York, publish a handsomely illustrated catalog of 64 pages, illustrating and describing in detail their line of harvesting machines, including binders, mowers, hay rakes, tedders, disc and floating harrows, cultivators, manure spreaders, gas engines, etc. Write for a copy, mentioning the Michigan Farmer.

The Storrs & Harrison Co., Painesville Nurseries, Painesville, Ohio, publish a spring catalog for 1913 illustrating and describing a full line of garden and flower seeds and ornamental plants as well as fruit and ornamental trees, shrubs, vines, etc. This catalog contains 170 pages and is profusely illustrated with half-tone engravings reproduced from nature. Write for this catalog, mentioning the Michigan Farmer.

The Seed Annual for 1913, published by D. M. Ferry & Co., Seedsmen, Detroit, Mich., is a 100-page book profusely illustrated with half-tone cuts and colored plates listing a full line of farm, garden and flower seeds carried by this well-known firm. Mention this paper when writing for the booklet.



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costs you but forty cents an acre to plant the seed. You will spend a lot of time and labor, fitting your fields for corn, why not plant a seed that has won the Michigan State Championship Prize, and be rewarded for your labor with a big yield of this beautiful Early Yellow Dent Corn?

Price \$3 per bushel, f. o. b. Vicksburg, Michigan.

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OATS—Swedish Select, Siberian and Big 4. Also

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OATS—Reg. Swedish Select and Imp. American. Two

best yielders. Also SEED CORN, Seed Potatoes, Clover, Timothy and GARDEN SEEDS. Samples and catalogue free. THEO. BURT & SON, Melrose, Ohio.

AN EARLY GARDEN.

In the latitude of Albany, N. Y., to have early potatoes or early cabbages by the middle of June is to exceed by almost a month, the exploits of the average gardener. In the early part of September, we sow our cabbage seed, Jersey Wakefield, in a well prepared seed bed. October 15 they will be of suitable size to transplant to a cold frame where they are wintered over. Just as soon as the frost is out of the ground in the spring, they are set in the garden. We often have quite severe freezing after they are set out, but being frost-proof, no harm is done them. Well prepared ground and good cultivation, give us good heads anywhere from the middle of June to the first of July.

Early potatoes, Irish Cobbler, are brought from the cellar the first of March. These are placed in shallow boxes and put on the upper shelf in the pantry, where by April they will have thrown out sprouts, from two to three inches long. They are cut, usually, two sprouts to a piece, and carefully planted, being careful that the sprouts are kept uppermost.

They are covered, lightly, and the soil gradually drawn to them as they grow. A little nitrate of soda is all the fertilizer they get, except what is in the soil. Last year we dug the first mess June 12 which was a record breaker for this latitude. Muskmelons, cucumbers and squash are started in cold frames, about the first of May. In this way we gain about two weeks on the season.

Last season we tried staking tomatoes with good success. Strong stakes were driven at each end of the row and wire tightly stretched between them at a height of five feet. The plants were set 18 inches apart and light poles, cut from a thicket, were set in each hill, and fastened to the wire with a short piece of wire, twisted around it. The plants were trimmed to a single shoot and supported by strips, torn from cotton cloth tied around the vine and stake as they grew. We used the cloth because a wire or harsh string would chafe the vine if blown by the wind. Some of the plants reached a height of seven feet and bore large clusters of the finest fruit. We shall never grow them any other way.

New York. B. F. MACK.

THE SPRING VEGETABLE GARDEN.

I wonder how many readers of the Michigan Farmer in the more leisurely hours of the winter days, do any gardening on paper. It is great fun. And, moreover, it is also profitable, because it is a methodical way which guarantees against a hit or miss result. When spring is once here, there are so many other duties to claim one's time, that, unless all has been carefully planned beforehand, the garden things are only too likely to be planted in the quickest and easiest manner. Now this is to the detriment of the various crops, because gardening demands time and thought. Even with every care some of the crops will fail, because so much depends on uncontrollable circumstances.

It is even now plenty late to plan the spring garden and select and order the seed. And to insure a first rate garden one cannot be too careful about the seed. The different improved qualities of the several kinds of vegetables should be studied so that one may choose what best serves the purpose and then the seed should be ordered from a reputable house.

Then it is highly profitable to study the ground to be planted. For instance, some portion of nearly every garden plot is more or less shaded by trees or buildings. In the early spring, when the first part of the garden is planted, the leaves of the trees may not yet be out enough to show how much shade there will be later. But the leaves will come so that ample allowance for shade must be taken into calculation. A majority of vegetables love sunshine and must have a certain portion to grow well. Yet some do not so greatly resent a moderate amount of shade. For instance, in the heat of the summer lettuce may even be improved by growing where the torrid sun may not pour heat upon it throughout the livelong day. But corn, tomatoes, peppers and cabbage, demand direct exposure to the sun, if the crop is to reach a desired fineness of maturity. Therefore, these crops must be planted so that they will not be shaded even by each other. For instance, the tall corn must be planted on the north and not

the south side of the tomato bed or the cucumber patch.

Naturally, the first things planted are lettuce and onions, followed rather closely by peas. Meanwhile, the seeds of the cabbage, peppers and tomatoes have already made considerable growth in the protection of the light and warmth inside the house. It pays far better to raise one's own plants from carefully selected varieties, because the quality and variety, especially of tomatoes, make all the difference in the world in the return for one's time and labor and one cannot always trust the market for young plants. Some grow merely to sell and care nothing for excellence. Then it costs not a bit more time or labor and but a few cents more money to raise first rate vegetables than a scrubby harvest.

Forcing is an excellent way to profit in gardening. Cabbage may be forced so that June will see it fit for the table. The present day improved tomatoes may be so managed that they will yield a bountiful harvest of their most luscious fruit as early as July, or even June. The writer has received as high as 18 cents a pound for tomatoes raised right out of doors, and in Michigan. And, further, what is more delicious than the first picking of the fruits of the season, fresh out of one's own garden?

To attain the best results, as soon as the tiny seedlings can be lifted out without disturbance, by the point of a knife, they should be transferred to rich earth in little thumb crocks and exposed to a good light. This will insure them from growing spindling. And also, when all danger of frost is past and after the plants have been shifted two or three times to larger crocks, with the roots never from the beginning having been disturbed, they can be slipped from the crocks and planted directly in the hills prepared for them. As the plants thus never have any check in growth to overcome, time is saved in their progress toward maturity. Similar treatment of cabbage and peppers will result in like advantage. Beans and other tender vegetables grow best in the season of late May and June when in a single night vegetation seems almost to spring up, full grown.

Washtenaw Co. C. A. BIRD.

PREPARATION FOR EARLY POTATOES.

I started our crop of Early Rose potatoes January 22, and this is the way I did it: Our cellar is divided into two parts, the north one containing the furnace and the south one the vegetables and fruit. I place the potatoes in front of the south windows in flats in which I grow tomato plants later, the seed end up. The sunshine and light make the sprouts grow rapidly and as I turn the potatoes at a different angle they grow large and thick, sometimes being a half-inch in diameter. These do not break off as ordinary sprouts but seem much stronger. If the south cellar is not warm enough, a little later I will put the flats in the furnace room near the windows. By the last of March, or first of April, they will have made a fine growth. If not ready to plant I put a little moist sand in the flats and they will soon have bunches of fine roots which must not be allowed to dry out. Then when the ground is ready I put a handful of good fertilizer, that has a good per cent of potash, in each hill and cover it with earth and on top of this a potato or a part of one, according to the size, with the sprout up, and cover, pushing it into the earth so it will keep up right. This will soon push to the surface and if frost threatens one can cover the sprout with the earth. But this sprout will stand quite a freeze and if nipped will keep on growing. The leaves seem much more hardy than when not given this start. The foliage is darker green and will be thrifty. If for any reason the seed potatoes are not at hand to start in this way I put the flats in the kitchen to start and even a week will be better there than in the cold ground. Of course, by this plan one cannot soak the tubers for scab unless it is done previous to putting in the flats but one can advance the crop on favorable seasons several weeks, thereby getting better prices.

Hillsdale Co. Mrs. E. M. KIES.

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Shallow Men Believe in Luck--Deep Men Believe in Cause and Effect



THE CAUSE—

The Spalding Deep Tilling Machine is built especially for deep and thorough tilling of the soil. It is guaranteed to do the work exactly as represented in our catalog.

We told the editor of the Michigan Farmer that we wanted to advertise the Spalding Deep Tilling Machine to his readers and asked him how we could get the readers to take the most interest in the machine. "Why, that's easy," he said, "Tell them what they want to know. Tell them what the Deep Tiller is doing for other farmers right here in the territory this paper covers. Show them what the machine has accomplished in the way of increased

yields of such crops as our readers grow. If you can show them results worth while, they will sit right down and write to you."

Very well—we will do that. We print here extracts from a number of letters from farmers in this territory who have been using the Spalding Machine, tilling their soil 12 to 16 inches and harvesting the result of their labor in the shape of increased crops and enhanced land values. *What the Deep Tiller has done for these and others it will do for you.*

Tell us which crops you raise and what kind of soil you have and we will give you helpful information from our *Experience File*, including letters from farmers with conditions practically identical with yours.

THE EFFECT—

Detroit, Mich. Nov. 9, 1912.
My observation for the last two years is, that mixing the subsoil with surface soil as done by the Spalding will prevent scab or fungus growth on potatoes.
ARTHUR J. CLARK.

Paulding, O., Oct. 27, 1912.
In regard to deep plowing and shallow plowing, the difference runs from three to six tons (beets) per acre in favor of the deep plowing.
I consider we have made \$15.00 per acre by deep plowing.

D. TUCKER.
Buda, Ill., Sept. 3, 1912.
We went over our farm this morning to view some corn that is now maturing on land that was deep tilled late this spring with the Spalding Deep Tilling Machine.

The field in question but recently came into our possession. It has been previously owned by the Burlington Railroad Company and had been cropped in corn and oats for forty years and had never been plowed more than four inches deep and had never been fertilized in any manner and had never been seeded to grass. We had attempted cropping this prior to deep tilling it, but had utterly failed. We attempted seeding it, but the clover plant would not thrive and we could not get a stand. This field is on a rather steep slope and the soil was badly worn. We believe that you now understand the condition of this field when we say that it was absolutely worn out. Deep Tilling in the spring in this section of Illinois was looked upon as rather a questionable method by everybody, but we have a crop now that shows well for deep tilling. We have placed an estimate of 65 bushels per acre on this land. It will be all that or more.

ILLINOIS GRAVEL COMPANY,
L. H. SCOTT.
Dana, Ind., Jan. 8, 1913.
The land I used the machine on is black prairie soil with a little clay knoll here and there. It was in corn

last year and I plowed under a heavy growth of stalks. I took 35 acres on the south side of the field, and divided it in six plots, as follows:

Plot No. 1.—This consisted of 2½ acres and was plowed with a Sulky plow six inches deep. The yield by weight was 120 bushels of corn, or 48 bushels per acre.

Plot No. 2 consisted of five acres plowed 14 inches deep with the Spalding Deep Tilling Machine. From this plot I got 366.4 bushels of corn, or 73.28 bushels per acre.

Plot No. 3 consisted of 10 acres which was deep tilled 10 to 12 inches deep and yielded 760 bushels, or 76 bushels per acre.

Plot No. 4.—Ten acres was deep tilled 10 inches and yielded 800 bushels, or 80 bushels to the acre.

Plot No. 5 consisted of 2½ acres plowed with Sulky plow seven inches deep. The yield was 145 bushels, or 58 bushels per acre.

Plot No. 6.—Five acres which I deep tilled 10 to 12 inches deep. This plot yielded 390 bushels, or 78 bushels per acre.

To sum this up—I got 690 bushels more corn on the 30 acres that we deep tilled, than I would if I had used shallow plowing, or 23 bushels per acre more in favor of deep tilling.

I am in the seed corn business, so I know what I am talking about when I say 60 per cent of the deep tilled corn was good enough to be used for seed, whereas only 20 per cent of the shallow plowed could be used for this purpose.

J. D. STURM.
Haynes, N. D., Jan. 14, 1913.
Last spring while tilling twenty inches deep for potatoes, a neighbor came down to investigate. Standing astride the furrow (he called it a ditch), he looked down the length of it and shook his head with incredulity. On his way home he met another neighbor and said to him: "Bob's crazy, plumb crazy. He is certainly ruining his field for all time to come." Neighbor No. 2 made haste to come and tell me, but I plowed serenely on.

Last fall I dug from this patch of two acres, 550 bushels of potatoes while neighbor No. 1 is buying potatoes, not having raised any on his four-inch plowing.

BOYD S. BOBB.
Spiceland, Ind., Oct. 15, 1912.
I am well pleased with the machine, although this was not a dry season. I have 20 per cent more corn on the field broken with it.

H. D. GORDON.
Toledo, O., Oct. 31, 1912.
We used two of the deep tilling machines hitched behind an oil pull engine last fall, and plowed forty acres with great success, going down to a depth of 16 inches and laying the soil over in the nicest, finest shape we ever saw; it was simply the finest work that was ever done in our country.

We put this land in sugar beets and at the same time left a test plot of land that was plowed in the usual manner, and the result has been that the land plowed by your machine gave us an increased production of sugar beets of from two to five tons to the acre.

C. H. ALLEN.
Port Huron, Mich. April 23, 1912.
I plowed about twenty acres with my Spalding Deep Tiller last fall to set out to orchard this spring.

Knowing that to prepare land for an orchard properly it must be plowed very deep and following these instructions, I plowed this orchard ground 18 to 20 inches deep and it is very mellow and fine to work now. I think it is the most complete machine on my place.

FRED H. BEACH.
Jackson, Mich., Oct. 30, 1912.
Along the fence on one side of a field was a growth of brush briars, sassafras, poplar and willow.

I used three horses and cut a furrow 10 inches wide and from 14 to 16 inches deep. The first few furrows went first rate and then I began to have difficulty in getting the horses through the tall bushes and trees on account of the trees holding back on the cross

lines. I had to bend the trees over and break them down. I bent them the way the team was going. Some were so large it gave two of us all we wanted to do. After this the horses were not bothered much.

I am not afraid now to tackle any piece of ground with the Spalding that I can drive the horses through.

R. M. ALLEN.
THE HARTMAN STOCK FARM.
Columbus, O., Jan. 18, 1912.

We are so thoroughly satisfied with the work done by the Deep Tilling Machines, that, while we have ten of them on our farm at present, we expect to buy ten or more next spring so that we will be able to do all our plowing with deep tilling machines.

The work done is similar to spading a garden with the common ditch spade, thereby breaking off the furrow slice instead of shearing it off as with a common plow, which trowels the bottom of the furrow as you do a cistern, making it impervious to both water and air, which are the essentials in crop production.

W. T. BETZ, Supt.
Moonmouth, Ill., April 27, 1912.
I plowed 40 acres with a gang plow to the ordinary depth and 30 acres with the Spalding Deep Tilling Machine to a depth of 15 inches, cutting a furrow about 12 inches in width. At this width and depth I consider it of light draft.

This field was put in corn, all tilled and cultivated the same, the only difference being that the ground plowed with the Tiller was much easier to get into condition for seeding, due to the manner in which the machine pulverizes the soil. The yield of corn per acre was as follows: Ground plowed with Gang Plow, ordinary depth, 24 bushels; ground plowed with Spalding Machine, 15 inches, 61 bushels.

I will admit that the above results sound unreasonable, and have had a hard time realizing that it was so, but wish to say that the above results were not gained through guess work, but by actual weight.

F. I. BROWNELL.

For more facts and information in regard to Spalding Deep Tilling Machine Address SPALDING DEPT. 65, GALE MFG. CO., Albion, Mich.

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Herd, consisting of Trojan Ericas, Blackbirds and Prides, only, is headed by Egerton W. the GRAND CHAMPION bull at the State, West Michigan and Bay City Fairs of 1912 and the sire of winners at these Fairs and at the INTERNATIONAL, Chicago, of 1912. WOODCOTE STOCK FARM, Ionia, Mich.

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GUERNSEY BULL CALVES, YORKSHIRE PIGS. Good Stock.

HICKS GUERNSEY FARM, Saginaw, W. S., Mich.

10 Reg. Guernsey Bulls, ready for service. Large Yorkshire hogs, the best yet. Come or write. JOHN EBELS, R. 10, Holland, Mich.

HEREFORD BULLS FOR SALE Also Poland China Hogs. **ALLEN BROS., Paw Paw, Michigan.**

Hereford Bulls For Sale. Also cow and calf by side. H. D. HALL, Martin, Mich.

HATCH HERD HOLSTEINS—Choice sires from ARO dams. Reasonable prices. HATCH HERD, Ypsilanti, Michigan.

CHOICE Bull Calves from A. R. O. dams. Sired by our herd sire whose dam and sire's dam each made over 30 lbs. in 7 days. E. R. CORNELL, Howell, Mich.

A FEW CHOICE Holstein Friesian Bull Calves for Sale. A. R. O. Stock. **GREGORY & BORDEN, Howell, Michigan.**

FOR SALE—HOLSTEIN BULL CALF Born June 5, 1912, sire a son of the King of the Pontiacs from a daughter of Hengerveld De Kol. Dam of calf, an A. R. O. daughter of Sadie Vale Concordia's Paul DeKol, her dam a 20 lb. imported cow. **ED. S. LEWIS, Marshall, Mich.**

Purebred Registered HOLSTEIN CATTLE The Greatest Dairy Breed. Send for FREE Illustrated Booklets. Holstein-Friesian, Assn., Box 164, Brattleboro, Vt.

"Top-Notch" Holsteins. Yearling bulls all sold. Choice bull calves from 1 to 5 mo. old, of fashionable breeding and from dams with official milk and butter records for sale at reasonable prices. **MCPHERSON FARMS CO., Howell, Michigan.**

Service Bulls and Bull Calves

Sired by Johanna Concordia Champion, whose sire's dam and dam's dam average 34.06 lbs. butter in 7 days, average fat 4.67%. Also cows and heifers bred to him. I can offer you bulls at bargain prices. Try me and see, and do it quick. **L. E. CONNELL, Fayette, Ohio.**

Bigelow's Holstein Farms

Breedsville, Mich. Have for sale several fine young bulls out of cows with high official butter and milk records. **Send for circular.**

FAIR LAWN FARM

Offers the following young **Holstein Friesian Bull Prince Sarcastic**—Fine in form and breeding. Beautifully marked. Sure to please you. **REED & KNOWLES, Howell, Mich.**

THIS HOLSTEIN BULL Was sired by best son of PONTIAC BUTTER BOY. His dam gave 90 pounds milk a day, over 600 pounds in 7 days and has official record of 24 pounds butter in 7 days. **PRICE \$100.** **C. D. WOODBURY, Lansing, Michigan.**

HOLSTEINS—Cow 11 yr. old, bred Jan. 11, '13, A. R. O. record 15.74 lbs. butter 5.12% milk in 7 days. Heifer 15 mo. old, bred Aug. 31, '12. Price \$125 each. Bull calves priced to sell. **B. E. Reavey, Akron, Mich.**

Registered Holstein Cow three years old will freshen this month, dark markings, good breeding, nice individual, \$200, delivered. Write for pedigree. **Hobart W. Fay, Mason, Mich.**

BULL CALF—\$50 Choicest breeding—Dam has 25 pound A. R. O. record. **YPSILAND FARMS, Ypsilanti, Mich.**

Six Bull Calves for Sale—Thoroughbred Holsteins, Registered, Ranging from 3 weeks to 10 months. Color, more white than black. DeKol strain. **LOUIS NELLER, Lansing, Michigan.**

A GRANDSON OF PONTIAC KORNDYKE and **PONTIAC ARTIS** from a 19 lb. Dam. \$200. **LONG BEACH FARM, Augusta, (Kalamazoo Co.) Mich. Fred S. Kenfield, Prop.**

Holstein Friesian Cattle—young bulls out of A. R. O. dams and sired by a bull with a 31 lb. dam. **W. B. JONES, Oak Grove, Michigan.**

Jerseys—Bulls ready for service, bred for production. Also cows and heifers. Brookwater Farm, R. F. D. No. 7, Ann Arbor, Mich.

Lillie Farmstead Jerseys (Tuberculin tested. Guaranteed free from Tuberculosis.) Several good bulls and bull calves out of good dairy cows for sale. No females for sale at present. Satisfaction guaranteed. **COLON C. LILLIE, Coopersville, Mich.**

Dairy Shorthorns—Large Cattle—Heavy Milkers. Milk Records of all cows kept. No stock for sale at present. **W. W. KNAPP, R. No. 4, Watervliet, Mich.**

Scotch Shorthorn Bulls and Heifers For Sale. **W. W. KNAPP, Howell, Michigan.**

Dairy Bred Shorthorns—Two yearling heifers for sale. Price \$100 each. Bulls all sold. **J. B. HUMMEL, Mason, Michigan.**

Farm Commerce.

Mr. Dairyman in Account with Mr. Farmer.

AT the end of the year large firms find it advantageous to take an inventory of their stock and balance up the year's business. While the agricultural correspondent's stock-in-trade is represented by more or less intangible assets, yet if he have a high purpose and his conscience is in his work he will look back upon many satisfying incidents which have resulted from his efforts. Successful writers are prompted to a certain extent by the money they are paid for their writing, but their greatest inspiration comes from knowing that their productions have encouraged some fellow farmer who is being held back by adverse surroundings.

During the few years that I have contributed for agricultural papers I have met many interesting people and formed a number of very intimate friendships, but the most gratifying incident was the result of the following letter from a young man who lives within 60 miles of my home:

"Dear Sir:—About three years ago I read your article—Mr. Dairyman in Account with Mr. Farmer. Father and I were impressed by the points you made clear in separating the manufacturing end of the business from the producing end. The more we thought about the whole matter and discussed the problems involved the more determined we became to put some of your ideas into practice. Now, Mr. Kelley, can you plan to be our guest some time in the near future? We want to show you how nicely your scheme has worked out on our farm."

The letter recalled to mind an article in which the writer attempted to show that the average dairy farmer was sort of a "dual-purpose" individual, that is, he was working along two separate and distinct lines, and that too often the losses from one of the lines exceeded the profits from the other; however, it was calculated to convey the idea of subdividing the work of the dairy and the farm so that one man should be the producer and the other the manufacturer. Naturally, then, and not strange is it, I was anxious to visit this farm and see if at least one of my productions had benefited one of my stranger-friends.

Having made arrangements to spend Thanksgiving with some of my relatives who live near the young man's home, I decided to visit the farm. To make the story shorter, and drop the personal part, for which I already owe an apology, I am going to give you the story as it was given to me by the young man and his father. A view of their premises and stock was evidence that it was not overdrawn.

Three years ago the young man had completed his course at a leading agricultural college and was planning to form some sort of an agreement with his father to remain at home and help manage the 174-acre dairy farm.

Said the son, "If we go into business, we must conduct the farm so that it will produce profitable crops and gradually increase in fertility. We must in the first place, grow crops at less cost than they will sell for in the market, and then we must feed them out on the farm so that we shall realize two profits. You have been a good farmer, raised large crops and kept the farm up in good shape, but it seems to me that you have failed to get the full value out of your crops at market time. I have examined your books for the past four years and find that you have lost from four to six hundred dollars per year through feeding out the crops on the farm. In other words, could the crops have been sold directly after harvest they would have paid you that amount more than you have realized through the sale of animal products from the farm."

"Yes, my son," replied the farmer, "I know that I am not exactly up-to-date on all the problems that changing conditions have brought about. I have frequently fed crops to live stock when I knew that I was losing money, but I have figured that the loss was usually made good through the increased crop yields which resulted from the use of the manure left on the farm."

"Right here," said the son, "is where I think we should try and strengthen our

business. You raise good crops and have the knack of planning your field work and getting the most out of your hired men and work teams. I am going to make you what I think is a fair proposition. You raise the field crops and sell them to me at fixed prices, which we both think are just and equitable. I will take charge of the feeding end of the business and endeavor to put it on a money-making basis.

"My idea is to sell some of the stock now on the farm and invest the proceeds in dairy cows and sell milk to the city trade. You, Mr. Farmer, and I, Mr. Dairyman, will enter into an agreement and conduct our producing and manufacturing on the same farm. We will reason and counsel together and work out a system of crop growing and dairying, whereby we can each make some money and still be independent and contented. You raise the feed crops and furnish me with the raw material. I will pay you a fair price for your crops and depend on my skill as a manufacturer for my profits. In this way we shall see whether or not my training at the college has benefited me for a life on the farm.

"I will pay you \$10 per ton for clover

out what the farm produces. I don't want to come home and make a show just because I have been to college, for I know that your years of hard knocks and experience on the farm is worth a lot more than a fellow can get crammed into his head during three years at college juggling with figures and science. I will put my best efforts into the work and feel sure that I can make it a success."

"Well, my boy, that sounds pretty good, but I am afraid it will be rather up-hill business for you to make much money if you buy all the feed for your cows; however, I am going to accept your offer and we will run the farm one year along these lines.

"Go ahead and get things in shape to begin business the first of April. We will take an inventory of the stock today and again at the end of the year's business. I want you to replace the stock you sell with animals equally as valuable. If my feed crops are good and you need more cows I will help you buy them."

After selling the fattening stock and poorer cows the young man purchased 12 more good dairy cows, which gave him a dairy of 28 good cows. He sold his milk (64 gallons a day) for 16 cents a gallon. At the end of the year the new inventory showed that there had been no material change in the value of the stock. Quantity had more than been replaced by quality. The 24 cows, eight steers and hogs were now represented by 28 good dairy cows. Mr. Dairyman and Mr. Farmer's books showed the following results or the year's business:

Mr. Dairyman Expenses.	
Six new cows	\$ 360.00
Cash paid to Mr. Farmer for hay, silage and straw	1,259.00
Rent of pasture, buildings and seven acres of land	275.00
Twenty tons of gluten feed at \$26 per ton	520.00
Eight tons of brewers' grains at \$25 per ton	200.00
Eight tons of wheat bran at \$22 per ton	176.00
Two tons of oil meal at \$34 per ton	68.00
Two tons of cottonseed meal at \$40 per ton	80.00
Medicines and veterinary services	18.00
Regular hand to help with milking at \$15 per month	180.00
Extra man for one week during state fair	14.00
Repairs, horse feeds and incidentals	106.00
Insurance on stock and feeds	14.00
Total expenses for year	\$2,270.00

Mr. Dairyman Income.	
64 gallons of milk a day, 365 days at 16 cents per gallon	\$3,737.60
8 gallons of milk a day, 214 days, at 16 cents per gallon	273.92
19 veal calves	128.00
8 cows sold from herd	360.00
632 hours' team work for Mr. Farmer	221.20
320 bushels of potatoes raised on rented land after soiling	154.00
220 tons of manure at four-fifths value of \$2.50 per ton	440.00
Total income	\$5,314.72
Total expenses	2,270.00

Mr. Dairyman's net income.....\$3,044.72

Mr. Farmer Expenses.	
Regular hired man at \$30 per month	\$ 360.00
Horse feed, grain, etc.	164.00
Day labor and team work	370.00
Taxes, insurance and road work	146.00
Thrashing, silo filling, etc.	92.00
Repairs, fencing material, etc.	127.00
Paid Mr. Dairyman for manure	440.00
Fertilizers, (phosphorus and potash)	126.00
Improvements to dairy stables	406.00

Mr. Farmer's total expenses.....\$2,231.00

Mr. Farmer Income.	
Improvements to dairy stables	\$ 406.00
Cash for hay, silage and wheat straw	1,259.00
Rent of pasture, barns and seven acres of land	275.00
2,400 bushels of potatoes at 60 cents per bushel	1,440.00
300 bushels of wheat at \$1.10 per bushel	330.00
400 bbls. of apples at \$2.00	800.00
200 cwt. of apples at 50 cents	100.00
Poultry, small truck, etc.	184.00

Mr. Farmer's total income.....\$4,794.00

Mr. Farmer's total expenses.....2,231.00

Mr. Farmer's net income.....\$2,563.00

and mixed hay; \$3 per ton for straw; \$2.50 per ton for corn silage, cut and put into the silos. I will pay \$100 cash rental for the 40 acres of pasture land; \$125 for the use of the barns and sheds; \$50 for 10 acres south of the barn which I shall need for soiling crops. You will be sure of fair prices for your roughage crops and by having more time you would, no doubt, find it profitable to add a market crop to your rotation and buy a few tons of fertilizer to supplement the manure. I will remove the manure from the stable to the manure shed and sell it to you for four-fifths of its fertilizing value, as determined by the figures of any leading experiment station.

"I figure that by selling some of the less desirable animals I can get together a pretty good bunch of dairy cows and produce 64 to 72 gallons of milk a day for the city trade. It will give me all of my time to devote to my dairy and, by hiring Bert Casey to help with the milking, I think that I can make some money. You will have more time to look after your farm work. We will work for each other's best interests and make definite plans for growing and feeding

Said Mr. Farmer: "At this time last year I thought that Joseph was too full of new-fangled ideas concerning balanced rations, cow testing, dairy sanitation and so forth, but the year's figures are before me and I am compelled to acknowledge that he has made a success where I made a failure. However, I have made more than one thousand dollars more from the farm this year than any year since I have owned it. By planting 20 acres of potatoes I have marketed 2,400 bushels and raised all of the roughage required for the cattle and the feed for my work horses. Well, I am mighty glad that Joseph turned the trick, but I was rather skeptical when he was coaxing me into such an agreement, but I figured that he couldn't lose much if he attended to business. Joseph says he is going to sell ten cans of milk another year and keep more cows. We have reasoned together and I am going to try and raise more feed to sell to him. The more cows he keeps the more manure goes into the shed and the more hay, silage, wheat and potatoes I can raise, but 'what gets my goat' is the fact that the manure costs me four to six hundred

dollars a year, but it is a mighty lot easier to write out my check for that amount payable to Joseph than it was to tramp around the barn and yards waiting on a lot of dirty, lazy, unprofitable scrub stock, just to get a few tons of manure. Joseph was right when he said I was losing from four to six hundred dollars a year through my feeding operations. I tell you it makes a fellow feel like going ten miles out of his way to kick a scrub animal after seeing what the good ones will do when they have good care and scientific feeding. I have been reading up on the manure question and I find that Doctor Thorne, of Ohio, says that the manure made while the cows are fed grain is much more valuable than when they are wintered principally on roughage. Well, one might have known that before, but I always thought that a load of manure was a load of manure; however, I can see differently now. A fellow has to do a lot of thinking and reading nowadays if he keeps up to date on farming questions. Now I can sit by the coal fire and read my papers and study out my next year's business while Joseph and the boy are taking care of the stock."

During the past two years the farm has been managed along the same general lines, but this year Mr. Dairyman has sold his cream to a large hotel near the city and has purchased seven head of Guernsey cattle for foundation stock. Each branch of the business is paying good returns and each party is satisfied and contented. Mr. Farmer has become a potato crank and Mr. Dairyman is a cow crank; they are having a live race to see who can show the better results. Last year Mr. Farmer won out by a hair, owing to the high prices he received for his potatoes. This year's race will likely go to Mr. Dairyman, who is producing 96 gallons of milk a day. Mr. Farmer has succeeded in getting 20 acres of alfalfa started and says that by tapping the sub-soil for potassium and phosphorus and the atmosphere for nitrogen he calculates to follow the pace set by Mr. Dairyman for a number of years to come. A new silo was erected last year and Mr. Farmer says he can fill it from the usual number of acres of corn since he began planting better seed, using more fertilizer and giving it better cultivation.

While all of the figures for the three years were not at hand without prying into the father's and son's private affairs, yet what I have given will serve the purpose of conveying the main point illustrated by the story, that is, dairying and crop growing are two separate and distinct branches of farming, and unless a man studies them separately as well as in their relation to each other, he cannot secure maximum results from his business. They also illustrate some of the possibilities and advantages of a friendly co-operation between fathers and sons (experience and science) on the farm. Many young men who finish colleges would find it profitable for them to blend the scientific training they have received at the college with experience gained by their fathers in putting the old farm on a money-making basis. Many older men who have gotten into a rut need the scientific training and enthusiasm of their sons to assist them in putting their farms on a money-making basis.

New York. W. MILTON KELLY.

THE NOMID SYSTEM—A PLAN FOR DISTRIBUTING FARM PRODUCTS.

(Continued from last week.)

Vegetables—Kinds Wanted.

The list of vegetables used by city families is long. In fact, the city housewife is accustomed to prepare a wider range of eatables than is the country housewife, for the reason that she caters to more delicate appetites, causing her to constantly seek new dishes. Potatoes, onions, beets, carrots, turnips, rutabagas, parsnips, horseradishes, cabbages, etc., are among the vegetable products wanted and sold by the direct method.

How Handled.

There are different ways in which the above products may be forwarded to the consumer, the best one for any particular person depending upon the conditions to be met. If delivered in the vehicle of the producer these vegetables may be carried in baskets, crates, bags, or in bulk; while bags, crates and barrels are useful where shipments are made by common carrier. Practically all the vegetables mentioned are of a character that will keep under ordinary conditions for a considerable time and so

may be shipped in fairly liberal quantities. A shipment made up of several of these vegetables will usually be found more satisfactory and economical—satisfactory because the consumer can use larger quantities of the shipment each day and economical in that the freight and cartage charges will be proportionately less.

Regardless of the way these vegetables are put up, extreme care in the details of preparation and packing must be observed. The products should be well sorted, all small, bruised and inferior looking specimens being removed. They should be packed to prevent injury during transportation. New receptacles are best but these cannot always be provided; however, dirty crates, baskets, boxes or bags should not be tolerated. Securely fasten the sacks, or barrels, or whatever receptacle is used, and mark plainly with the name and address of both the consignee (customer) and the sender.

Time to Deliver.

A few words upon the time for shipping these products may be in order. Because of danger from freezing they cannot always be forwarded in the winter season, although where bagged and kept moving such crops as mentioned will withstand much lower temperatures than the inexperienced may believe; nevertheless, it is a wise plan where prices are satisfactory to make delivery late in the fall and encourage consumers to provide cellar room for keeping a supply that will last well through the winter. Should such a practice become common it would prove a strong factor in improving prices in the fall and keeping them steady during the cold winter months.

How to Keep.

These products keep best in a cellar. Have the cellar well ventilated in order that odors do not escape from the vegetables to the living-rooms, and they will not if proper ventilation is provided. Potatoes especially should be kept in a darkened room since they become green and lose their fine qualities when exposed for a long time to the light. The cooler the room can be held and not freeze, the better the products will keep. Where a furnace is located in the cellar, as is frequently the case, the space in which the vegetables are stored should be partitioned off, preferably with an air-space wall, so the furnace heat will not dry out the vegetables, or nurture rots in them. If the cellar is susceptible to freezing a lighted lantern will raise the temperature a few degrees, also a pail of water placed on the floor will saturate the atmosphere with moisture and aid in keeping down the frost point.

(Continued next week.)

BOOK NOTICES.

"Farmers of Forty Centuries," by F. H. King, D. Sc., formerly Professor of Physics in the University of Wisconsin and Chief of the Division of Soil Management, United States Department of Agriculture, also author of a number of other agricultural works, is a book of 440 pages describing the agricultural practices of the farmers of China, Korea and Japan. This book is profusely illustrated with 250 half-tone engravings illustrating the customs of the people and agricultural practices of these countries in which Prof. King found much that might be profitably emulated by the farmers of the New World. This book is most entertaining as well as instructive reading, showing as it does how the farmers of these ancient countries have maintained and improved the fertility of their soils notwithstanding that they have been constantly cropped for a period of some 4000 years. Published by Mrs. F. H. King, Madison, Wis. Price, \$2.50.

"Crops and Methods for Soil Improvement," by Alva Agee, M.S., formerly Head of the Department of Agricultural Extension, acting Dean and Director of the School of Agriculture and Experiment Station of Pennsylvania State College and now of New Jersey Experiment Station, is a practical work of 246 pages, with illustrations, touching at the essential factors of general farming in a scientific as well as a practical manner. Dr. Agee takes up the essential factors of soil fertility and the problem of its maintenance, following same with a practical discussion of crops and crop rotations and other important factors of successful farming, such as manures and fertilizer, tillage, drainage etc. This is a practical work for the practical farmer. Published by the MacMillan Co., New York. Price, \$1.25 net.

"Beginnings in Animal Husbandry," by Chas. S. Plumb, Professor of Animal Husbandry, College of Agriculture of Ohio State University, is an elementary text book for young people, the first of its kind devoted to this field. It discusses breeds and principles of breeding, feeds and feeding, composition of plants and animals, types and breeds of poultry, eggs and incubation, etc. The book is profusely illustrated, contains 392 pages, 5 1/2 x 7 inches. Price, \$1.25 net. Webb Publishing Co., St. Paul, Minn.



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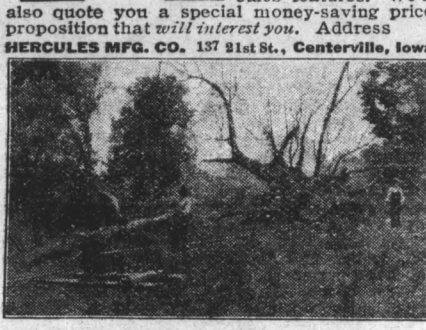
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YOU can clear an acre or more of stumps a day. No stumps can resist the Hercules. Doubles land value—enables you to make \$1200.00 on 40 acres the first year after stumps are out—and \$750.00 in crops every year after. Get the proof. Why not

Write Us Now Book tells all the facts—shows many photos and letters from owners—tells all about the many Hercules features. We'll also quote you a special money-saving price proposition that will interest you. Address HERCULES MFG. CO. 137 21st St., Centerville, Iowa



20 H. P. TRACTOR nearly new, with 4 bot tom plow for sale. Price and terms reasonable. Also seed barley, Odebrucker variety, 90c bu., bags inc. O. L. Emons, Holton, Mich.

Breeders' Directory—Continued.

Registered Guernsey Bull—Four years old, of best breed for sale or exchange. Price moderate, Box 6, Mich. Farmer, Detroit, Mich.

FOR SALE—7 Reg. S. H. Bulls from 8 to 14 months by Victor Ross, sired by International Winners. JOHN SCHMIDT, Reed City, Michigan.

FOR SALE—Magnificent Holstein BULL CALF. Beauty, large, seven-eighths white, by 25-lb butter sire. Dam 14000 lbs. 4% milk annually. Thoroughbred, but not eligible. Only \$20 f. o. b. BOUGEMONT FARMS, DETROIT, MICH.

2 YEARLING SHORTHORN BULLS from good milk-ing dams for sale. W. C. OSIUS, Hillsdale, Michigan.

SHEEP.

Reg. Rambouillet Sheep, Pure Bred Poland China HOGS and FERCHERON HORSES. 2M miles E. Morrice, on G. T. R. R. and M. U. R. J. Q. A. OOOE

SHROPSHIRE & DUROCS KOPE-KON FARM, Kinderhook, Michigan.

"BREED UP YOUR SHEEP" Article sent free to any address. "The Sheep Man of the East." PARSONS, R. No. 1, Grand Ledge, Mich.

AUCTION SALE

On Wednesday, March 12, 1913, At 9 A. M.

REGISTERED OXFORD DOWN SHEEP. All bred to "Adderbury" No. 53734. This is one of the best flocks in Michigan. Young and will be sold in lots of five. Also farm machinery, tools, etc. L. N. OLMSTEAD, Proprietor, Muir, Mich

HOGS.

Durocs & Victorias—A Desirable Bunch of Sows of Either Breed due April and May. M. T. Story, R. R. 48 Lowell, Mich. City Phone 55

BERKSHIRE BOARS May and June farrow, large size, heavy bone. \$18 and \$20 each. GEO. E. LAPHAM, St. Johns, Michigan.

BERKSHIRES—Yearling Sows bred for April & May farrowing. Also a few open gilts. A. A. PATTULLO, Deckerville, Michigan.

BERKSHIRES Choice spring boars and gilts, stock ELMHURST STOCK FARM, Almont, Mich.

Quick Maturing Berkshires—Best breeding; best type. Satisfaction guaranteed or money refunded. O. S. BARTLETT, Pontiac, Mich.

O. I. C. TWO BOARS fit to head any herd. Fall pigs ready to ship. C. J. THOMPSON, Rockford, Michigan.

O. I. C. SWINE Write me for Pigs, pairs and trios, not akin. Have a number of service males of good type. Write me describing your wants. A. J. GORDEN, R. No. 2 Dor, Mich.

O. I. C. Swine, both sexes. Males weighing 100 to 225 lbs. Herd registered in O. I. C. Association. GEO. P. ANDREWS, Danversville, Ingham Co., Mich.

O. I. C. Extra choice bred gilts, service boars and spring pigs, not akin from State Fair winners. Avondale Stock Farm, Wayne, Mich.

O. I. C's—Boar pigs all sold, choice gilts. Place your order for spring pigs with me. Your money's worth or your money back. Fred Nickel, R. L. Monroe, Mich.



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

IONIA GIRL

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

O. I. C. Pigs of September and October farrow for sale cheap. JOHN BERNER & SON, Grand Ledge, Mich.

O. I. C's—All ages, growthy and large. Males ready, 100 to select from. Attractive prices on young stock. H. H. JUMP, Munith, Mich.

O. I. C's—A fine lot of last spring stock for sale, big growthy type, either sex, pairs not akin. Sired by Grand Champion boar, Scott No. 1 Half mile west of depot. OTTO B. SCHULZE, Nashville, Mich.

O. I. C. Choice gilts bred for April farrow. Sired by Just Right No. 3530, Vol 15 O. I. C. Bred to Lengthy. Price \$25.00, Vol 16 O. I. C. A. NEWMAN, Mariette, Michigan

DUROC-JERSEYS—Fall and Spring boars from prize-winning strains. Sows all ages. SPECIAL BARGAIN in summer pigs. Brookwater Farm, R. F. D. No. 7, Ann Arbor, Mich.

Duroc Jerseys—for sale; 20 fine service boars of fancy breeding and individual quality. Prices reasonable. John McNicoll, North Star, Mich.

Reg. Durocs—Bred sows \$20 to \$50, Boars \$20 to \$25. Pigs old enough to wean \$8 to \$12 satisfaction guaranteed. F. B. Cook, R. R. 2, Stanwood, Mich.

DUROC JERSEYS—Nothing For Sale at Present. CAREY U. EDMONDS, Hastings, Michigan.

Duroc Jersey SWINE. Spring and summer pigs for sale, both sexes. I pay express, 25 years experience. J. H. BANGHART, Lansing, Mich.

Butler's Big Bone Poland Chinas. We don't claim to own all the good hogs in the U. S., but we do claim to have bred and sold more big Poland Chinas in the last ten years than any two other breeders in Michigan. If you want a good fall boar write J. C. BUTLER, Portland, Michigan.

POLAND CHINAS—Both Western and Home Bred. Either sex, all ages. Prices right. W. J. HAGELSHAW, Augusta, Mich.

A BIG TYPE POLAND CHINA BOAR—Cheap or will exchange for sows. A few light weight gilts left. ROBERT NEVE, Pierson, Michigan

POLAND CHINAS—Either sex, all ages. Something good at a low price. F. D. LONG, R. No. 8, Grand Rapids, Michigan

P. C. BOARS AND SOWS—large type, sired by Expansion. A. A. WOOD & SON, Saline, Michigan.

P. C. BROOD SOWS—bred for April and May farrow. Big bone, Prolific. Also boars ready for use. Maplewood Stock Farm, Allegan, Mich

POLAND CHINA SOWS—bred Single Comb Black. Minorca cockerels. Satisfaction guaranteed. R. W. MILLS, Saline, Mich.

LARGE TYPE P. C.—Largest in Mich. A few late March gilts weighing 300 lbs. and over. Bred to Big Bermonds, the largest pig in U. S. of age weighed 312 lbs at 10 mo. and 18 days old. Come or write, I can show the goods, free livery. W. E. Livingston, Ionia, Mich.

MULE FOOT HOGS—Fall pigs, service boars and bred sows for sale. Best quality, price right. G. C. KREGLOW Ada Ohio

LARGE YORKSHIRE SWINE—August farrowed gilts \$20 each. No males in stock. Geo. S. McMullen, Clitz, Phone, Grand Ledge Mich.

LARGE Yorkshires—Choice breeding stock, all ages, not akin from State Fair prize-winners. Pedigrees furnished. W. O. COOK, R. 42, Box 22, Ada, Mich

Lillie Farmstead YORKSHIRES A splendid lot of fall pigs at reduced prices, pairs and trios not akin. Young sows and gilts bred for April farrow. Your money back if you are not satisfied. COLON C. LILLIE, Cooperaville, Mich.

Please mention the Michigan Farmer when writing to advertisers.

Markets.

GRAINS AND SEEDS.

March 5, 1913.

Wheat.—This cereal has lost some of its support the past week and prices are now ruling lower than at the close a week ago by about three cents. Perhaps the most important feature of this change is an improvement in the outlook of the crop for this country. At a time when it was possible for considerable damage to be done the wheat producing states receiving a covering of snow which put the dormant plants in excellent shape for this season of the year. Another feature was the estimated amount of grain still in the farmers' hands, the quantity being put by experts at considerably larger figures than had been calculated on by dealers. Unexpected heavy receipts at primary elevators in western states has also added to the weakness; these receipts on Monday were more than double the number of bushels received for the corresponding day a year ago. There is also news that Argentine will have a large surplus to sell and that conditions in India have improved by recent rains. There still exists a good demand from European countries, but buyers there are less anxious because of the improved condition in the supply countries mentioned above. Prices for No. 2 red wheat at Detroit was 99½¢ a year ago. Local quotations are as follows:

	No. 2	White.	May.	July.
Thursday ..	1.09½	1.08½	1.11	96½
Friday	1.09½	1.08½	1.11	96½
Saturday	1.09½	1.08½	1.10½	96½
Monday	1.08½	1.07½	1.09½	95½
Tuesday	1.07½	1.06½	1.08½	94½
Wednesday ..	1.06½	1.05½	1.08	94½

Chicago, (March 4).—No. 2 red wheat, \$1.01@1.06; May, 91½¢; July, 90½¢ per bushel.

New York, (March 4).—No. 2 red, \$1.10½ f. o. b. afloat; May, 97½¢@98½¢ per bu.

Corn.—This cereal has not suffered as yet from the reaction in wheat and prices are holding within a fraction of the high point reached during the past couple of weeks. The colder weather prevailing has improved the demand for the grain for feeding purposes, although the mild winter, taken as a whole, has allowed feeders to get on with considerably less than would be used under more normal weather conditions. Primary receipts at large grain centers were heavy early this week, although the average is below that of a week ago. One year ago No. 3 corn was quoted at 68¢ per bu. on the local market. Detroit quotations are as follows:

	No. 3	Yellow.
Thursday	50½	51½
Friday	50½	51½
Saturday	50½	51½
Monday	50	51
Tuesday	50	51
Wednesday	50	51

Chicago, (March 4).—No. 2 corn, 50¢@50½¢; No. 2 yellow, 50½¢; May, 52½¢; July, 53½¢ per bu.

Oats.—The market in this cereal has remained fairly steady with prices ruling within an exceedingly narrow range. Primary receipts appeared to be slightly below those of last week. On the local market trading is light. One year ago standard oats were quoted at 56¢ per bu. Detroit quotations are as follows:

	Standard.	White.
Thursday	35	34
Friday	35	34
Saturday	34½	33½
Monday	34½	33½
Tuesday	34½	33½
Wednesday	34½	33½

Chicago, (March 4).—No. 2 oats, 32¢; No. 2 white, 34¢@34½¢; May, 34¢; July, 34¢ per bu.

Beans.—There is scarcely any business being done on the local market in this deal and nominal prices are 10¢ lower than a week ago. Immediate, prompt and February shipments are now quoted at \$1.95; May, \$2.05 per bu.

Chicago, (March 4).—Prices here rule about 5¢ lower than a week earlier. Choice offerings find ready sale, while the bulk, which is made up of common and inferior kinds move slowly. Hand-picked pea beans, choice, are now quoted at \$2.20@2.25; prime, \$2.05@2.10; red kidneys, new, \$2.25; do. old, \$1.75@1.85 per bu.

Clover Seed.—An easy tone prevails in the clover seed market with prices showing a further decline of 25¢ during the week, prime spot now being quoted at \$11.25 per bu. On the other hand, prime alsike shows a better demand and has advanced 50¢ over last week's price, the present quotations being \$12.75 per bu.

Toledo, (March 4).—Seed values have been reduced in all departments at this place. Prime spot and March delivery are quoted at \$11.20; April, \$11.10; alsike, prime spot and March, \$12.85.

Timothy Seed.—Transactions are reported at slightly advanced prices, 40 bags being sold on Tuesday at \$1.65 per bu., which is a 5¢ advance over a week ago.

Toledo, (March 4).—Prices higher, cash and March, \$1.62½; April, \$1.67½.

Rye.—No change is noted in the condition of this market, trade being slow and remaining at 62½¢ per bu for No. 2 rye, the price ruling last week.

Chicago, (March 4).—Values have advanced a cent. No. 2 now being quoted at 62¢@63¢ per bu.

Barley.—Chicago, (March 4).—Prices show slight improvement and now rule at 49¢@71¢ per bu., according to grade.

FLOUR AND FEEDS.

Flour.—Jobbing lots in ½ paper sacks are selling on the Detroit market per 196 lbs. as follows: Best patent, \$5.80; second, \$5.40; straight, \$4.90; spring patent, \$5.30; rye flour, \$4.60 per bbl.

Feed.—Detroit jobbing prices in 100-lb. sacks are as follows: Bran, \$24; coarse middlings, \$24; fine middlings, \$29; cracked corn, \$25; coarse corn meal, \$22.50; corn and oat chop, \$21 per ton.

Hay.—The heavy supply prevents the market from recovering and the demand is so slow that values show a further decline in all grades. Carlots on track at Detroit, No. 1 timothy, \$13.50@14; No. 2, \$11@12; light mixed, \$12.50@13; No. 1 mixed, \$11@12 per ton.

Chicago.—Demand fair; better grades lower. Choice timothy, \$16@17 per ton; No. 1, \$14@15; No. 2 and No. 1 mixed, \$12@13; No. 3 and No. 2 mixed, \$6@10; clover, \$6@11; alfalfa, choice, \$17@18; do. No. 1, \$15@16.50 per ton.

New York.—Market steady; standard, \$18.50@19.50 per ton; No. 1, \$20@21; light clover, mixed, \$18.

Straw.—Lower. Car lot prices on wheat and oat straw on Detroit market are \$8@8.50 per ton; rye straw, \$9@10 per ton.

Chicago.—Rye straw lower; other kinds steady. Rye, \$7@7.50; wheat straw, \$6@6.50; oat straw, \$6@7 per ton.

New York.—Rye straw, \$20 per ton.

DAIRY AND PULTRY PRODUCTS.

Butter.—An advance of ¼¢ at Elgin on Monday was followed by similar or greater gains in most of the big markets. Continued cold weather no doubt had an influence and although stocks are not burdensome, and the demand is very good, and the advance is regarded as merely temporary. Locally no change is recorded, jobbing prices ruling as follows: Fancy creamery, 35¢ per lb; firsts, 33½¢; dairy, 22¢; packing stock, 20¢.

Elgin.—Market firm at 35¢.

Chicago.—A steady, even demand for all grades, and weather conditions not favorable to increased production, are given credit for the general advance in this market. The feeling is firm with all kinds ½¢ higher. Quotations are: Extra creamery, 35½¢@36¢; extra firsts, 34½¢@35¢; firsts, 32¢@33¢; seconds, 29¢@30¢; dairy extras, 32¢; firsts, 25¢@26¢; seconds, 22¢; packing, 12¢@21¢ as to quality.

New York.—Steady and higher, both creameries and dairies showing 1¢@1½¢ advance. Creamery extras, 36½¢@37¢; firsts, 34½¢@35¢; seconds 32½¢@34¢; thirds 30¢@32¢; state dairy, best, 34¢@35¢; good to prime, 29¢@33¢; common to fair, 24¢@28¢; packing, 16¢@21¢ as to quality.

Eggs.—Fear of an accumulation of supplies appears to be exerting a strong influence upon egg prices. Offerings are very liberal at all points, with quality such as to lessen expense of grading. The tendency during the past week has been toward lower values, the decline at most points averaging about 1¢. At Detroit current offerings, candled, and cases included, are quoted at 19½¢ per dozen.

Chicago.—The week opened with offerings still heavier than a week ago, resulting in an easy feeling and declining prices. Only choice lots command top quotations. Miscellaneous receipts, cases included, are quoted at 17¢@18¢; do. cases returned, 16½¢@17½¢; ordinary firsts, 16½¢@17½¢; firsts, 18½¢; refrigerators, firsts, 13¢@14¢ per dozen.

New York.—This market is weak following a decline of a full cent since last week. Fresh gathered extras, 22¢@23¢; firsts, 20½¢@21¢; seconds and lower grades, 19¢@20¢; western gathered whites 24¢@27¢ per dozen.

Poultry.—The local market is very firm under extremely light receipts, and the high values of some weeks past continue to rule. Quotations: Live.—Spring chickens, 16¢@16½¢; hens, 16¢@16½¢; No. 2 hens, 12¢@14¢; old roosters, 10¢@12¢; turkeys, 19¢@20¢; geese, 15¢@15½¢; ducks 19¢@20¢ per lb.

Chicago.—Chickens of all kinds are quoted 1¢ higher, due to good local demand. Other poultry steady and unchanged. Quotations on live are: Turkeys, good weight, 15¢; others, 10¢; fowls good, 15¢; spring chickens, 16¢; ducks, large, fat, 17¢; do. thin, ordinary, 15¢@16¢; geese, full feathered, 13¢; do., plucked, 8¢@10¢ per lb.

New York.—Dressed stock quiet with practically no change in values. Fresh killed western chickens, 14¢@15¢; fowls, 15¢@17¢; turkeys, 14¢@24¢ per lb.

Cheese.—Wholesale lots: Michigan flats 15½¢@16¢; New York flats, 18¢@18½¢; brick cream, 17½¢@18¢; limburger, 18¢@19¢.

Veal.—Detroit.—Steady and unchanged. Fancy, 13¢@13½¢; common, 10¢@12¢.

Chicago.—Fair to choice, 80¢@110 lbs., 13¢@14¢; extra fancy stock, 14¢@15¢; fair to good chunky, 12¢@13¢.

FRUITS AND VEGETABLES.

Apples.—Although prices show little change there is slight improvement in the trade because of a good demand due largely to the prevailing low prices. Detroit quotations are: Fancy, per bbl., \$2.50@3.50; ordinary, 75¢@1.50 per bbl.

Chicago.—Arrivals are light and market is showing firmness and increased activity. There are complaints of many varieties not keeping well in cold storage. Quotations ruling from \$2@4 per bbl.

Potatoes.—Prices steady, with the local trade dull and well supplied. Michigan stock in car lots, 43¢@45¢.

Chicago.—With an ample supply of potatoes and a week demand values show another cent reduction the past week. Fancy Michigan stock, 45¢@47¢ per bu; best Wisconsin, 42¢@47¢; Minnesota, 44¢@47¢.

New York.—Potatoes could not maintain the activity of ten days ago and have lapsed into dullness again with

stocks largely increased. Michigan offerings are in comparatively good demand on a basis of 59¢@60¢ delivered.

Cabbage.—The local market is still flooded with offerings and prices remain at the low point occupied this winter, \$1@1.25 per bbl. In New York the finest offerings free from frost are going at \$9@11 per ton. The market at Chicago is without life and Holland is going at \$5.50@6 per ton.

Onions.—Market continues depressed with prices unchanged. Local sales are for 50¢@55¢ per bu for good stock. At Chicago best yellows free from frost are marketed at 75¢ and reds at 60¢ per bu.

MISCELLANEOUS.

Wool.—(Boston).—Manufacturers are taking just enough wool from day to day to supply immediate needs. This policy has had a slightly depressing effect upon the markets, but prices are averaging about steady for Michigan stocks. The foreign trade is strong, prices in England showing upward tendencies. Among the leading domestic quotations are: Michigan fleeces—Fine unwashed, 20¢@21¢; delaine unwashed, 24½¢@25¢; ½-blood unwashed, 27¢@28¢; ¾-blood unwashed, 29¢@30¢.

Provisions.—Mess pork \$20; family pork \$23@24; clear backs, \$21@23; hams, 16½¢@17½¢; briskets, 12¢@13½¢; bacon, 16¢@17½¢; shoulders, 13¢; picnic hams, 12¢@12½¢; pure lard in tierces, 11½¢; kettle rendered lard, 13½¢ per lb.

Honey.—Choice to fancy comb, white 17¢@18¢ per lb; amber, 14¢@16¢; extracted, 9½¢@10¢ per lb.

DETROIT RETAIL PRICES.

Eastern Market.—This market did a restricted amount of business Tuesday, the sellers being fairly well satisfied with the easy sales and prices. The bulk of offerings consisted of apples, potatoes, and cabbage. The market is still receiving offerings of cull apples which are sold around 45¢ per bu. For the better grades values range from 60¢ to \$1 per bu., selected Ben Davis selling around 70¢ and the best Steele Red at \$1. Potatoes are generally held at 55¢ although some inferior offerings were sold Tuesday at 50¢ while a good lot went at 60¢. Cabbage found sale around 25¢ for white and 45¢ for red. Onions, 50¢@55¢; parsnips, 40¢; beets, 30¢; carrots, 30¢ per bu. Rhubarb, 30¢@35¢ per large bunch. Loose hay is \$16@20 per ton.

Grand Rapids.

Jobbers are paying the country trade 26¢ for good dairy butter and only 16¢ for packing stock. They have been paying 19¢ for eggs but reported 18¢ as top notch price Tuesday. The potato market is quiet, drifted roads making delivery impossible. Greenville dealers report 40¢ as best price paid for potatoes. Grain prices paid at the mills are as follows: Wheat, \$1.06; oats, 34¢; corn, 51¢; beans, \$1.60. Live hens are worth 12¢@13¢.

THE LIVE STOCK MARKETS.

Buffalo.

March 3, 1913.

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

Receipts of stock here today as follows: Cattle, 90 cars; hogs, 70 double decks; sheep and lambs, 75 double decks; calves 1000 head.

With 90 cars of cattle on our market here today, and with only 16,000 reported in Chicago, we had an active market from start to finish, and by noon everything was well sold out. All grades of cattle sold fully 15¢@25¢ per cwt., higher than last week.

We quote: Best 1350 to 1500-lb. steers, \$8.50@9; good to prime 1200 to 1300-lb. steers, \$8.25@8.40; good to prime 1100 to 1200-lb. steers, \$7.75@8.15; coarse, plainish 1100 to 1200-lb. steers, \$7.50@7.85; medium butcher steers, 1000 to 1100, \$7.25@7.75; butcher steers, 950 to 1000, \$7@7.50; light butcher steers, \$6.50@7; best fat cows, \$6.50@7.25; butcher cows, \$5.25@6.25; light butcher cows, \$4.50@5.25; cutters, \$4@4.50; trimmers, \$3.50@4; best fat heifers, \$7.50@8; medium butcher heifers, \$6.75@7.25; light do., \$5.75@6.25; stock heifers, \$4.50@5; best feeding steers dehorned, \$6.25@6.75; light common stockers, \$5@5.50; prime export bulls, \$6.75@7; best butcher bulls, \$6.25@6.75; bologna bulls, \$5.50@6; stock bulls, \$4.75@5.50; best milkers and springers, \$6.50@7.50; common to fair kind do., \$4@5.50.

Receipts of hogs today were very light; only 70 double decks on sale. Demand was good from both packers and shippers, and the general market 20¢@25¢ higher than Saturday. All light grades selling at \$9.25; mixed hogs, \$9.15@9.20; some extreme heavies at \$9, and a few up to \$9.10; roughs, \$8@8.25; stags, \$6.50@7. Market closed steady and about everything sold.

The sheep and lamb market was active today, with prices about steady with the close of last week. Most of the choice lambs selling from \$9@9.10. Yearlings from \$7.50@8.25. Look for little better prices the last of the week, with moderate receipts.

We quote: Choice lambs, \$9@9.10; cull to fair do., \$6@8.85; yearling wethers, \$8@8.25; yearling ewes, \$7@7.50; wethers \$6.75@7; handy ewes, \$6.25@6.40; heavy ewes, \$6@6.25; cull sheep, \$3.50@5.25; bucks, \$4@4.75; veals, choice to extra, \$11.50@12; fair to good do., \$8.50@11; heavy calves, \$4.50@6.

Chicago.

March 3, 1913.

Cattle. Hogs. Sheep.
Received today .. 16,000 32,000 20,000
Same day last year.. 18,621 50,809 31,023
Received last week.. 43,663 166,599 82,492
Same week last year.. 46,771 181,932 112,166

Receipts of cattle today are surprisingly small for a Monday, and prices are largely 15¢@25¢ higher for desirable lots, with competition between buyers. Prime

heavy steers sold at \$9.10, \$9.15 and \$9.25 in a few instances, choice steers being scarce, and prime heifers advanced to \$8.25. Hogs shot up about 20¢ on inadequate offerings, with brisk sales at \$8.30@8.70. Hogs received last week averaged 232 lbs., compared with 227 lbs. a month ago, 217 lbs. a year ago, 229 lbs. two years ago and 211 lbs. three years ago. Sheep and lambs were active and advancing, with prime handy-weight lambs bringing \$8.85.

Cattle were slow of sale early last week at lower prices, with a good Monday run for these days of small consumption of beef, but later in the week when it was seen that the aggregate receipts for the entire week were going to be unusually light, there was a good rally in the market. The transactions in beef steers below \$7 were insignificant, with the bulk of the sales at \$7.75@8.65 and fair sales of prime heavy beefs at \$8.70@9. The common to fair class of steers went at \$7@8, medium lots going between \$8 and \$8.40 and a good kind offered at \$8.40 and over, while desirable yearlings sold at \$8@8.75. The striking feature of the market this season is the remarkable advance that has taken place in the cheaper grades of steers, while the small demand for the best beefs has caused them to fall back to near where they sold a year ago. The market is the best ever known for short-fed steers and butcher stock, as well as for cutters and canners, the popular demand in the retail meat markets of the country running on medium and cheap light cuts of beef. Cows and heifers adapted for the butcher trade have been going at \$4.60@8, with cutters selling at \$4.10@4.55, canners at \$3.10@4.05 and bulls at \$4.75@7. The rapid rise in prices for short-fed cattle and the superabundance of cheap feed everywhere impel farmers to make renewed efforts to refill their feed lots, and fair numbers of stockers and feeders are going back to the country, in spite of their unprecedented dearth. Stock steers have been selling at \$6@7.75 and weighty feeders at \$7@8, with limited sales of prime selected feeders at \$8.15@8.25. Stock and feeding heifers were scarce and firm at \$5.25@6.15. Calves had a good outlet on the basis of \$4.50@10.50 per 100 lbs., with light vealers chiefly called for. Milkers and springers had a fair sale at \$45@85 per head.

Hogs have been coming to market much more freely since the advance to figures that enabled farmers to obtain \$8 per 100 lbs. on the farm, and the increased offerings served to bring about several sharp reactions. Thus far owners of hogs in feeding districts have been quick to stop selling after breaks in prices, and there is no reason to think they have changed in this respect, so that the prospects appear to be bright for a much higher market later in the season. The shortage of swine in feeding districts is an undisputed fact, and thus far the packers have been unable to accumulate their customary good stocks of provisions, as the requirements of the fresh meat trade were enormous, while they had to compete with liberal buying by eastern shippers of hogs, as well as with extensive operations by local speculators. Hogs now marketed show up well in quality, and their average weight has increased materially since the first of the present year. Demand centers as strongly as ever in choice light weights, with strong weight pigs selling very high, because of the fresh pork trade. Medium weight hogs sell next best, with extremely heavy hogs going lowest of all. Farmers should hold their healthy hogs until they weigh around 250 lbs., and good breeding sows should not be sold at all. At one time last week prime hogs brought \$8.70, the highest price yet reached, and the week closed with hogs selling at \$8@8.52½, or a trifle lower than a week earlier. Pigs brought \$6.65@8.15.

Sheep and lambs have fluctuated a good deal in values of late, with killers raising strenuous objections to paying the recent outside prices for fat lambs of handy weight, and even sheep and yearlings reacted after reaching materially advanced figures. Even at reduced prices anything choice in the live mutton line looks extremely high when compared with former years, and most offerings are made good and fat before sending to market, so that buyers in search of feeders find it almost impossible to secure stock, even at the fancy prices now prevailing. Buyers of fat stock invariably prefer the medium weights, and heavy lots are discriminated against and go at a big discount. At the close of last week lambs were salable at \$6.50@8.75, yearlings at \$7@7.85, wethers at \$6.40@6.95, ewes at \$4.25@6.40 and bucks at \$4@4.75. Feeding and shearing lambs brought \$7.50@8.50, feeding wethers \$5@5.50 and feeder yearlings \$6@6.50.

Horses are becoming more active, and prices are growing firmer for the better class, with prospects of their going higher by the time the spring trade is at its best, but inferior animals are as slow and weak as ever. The poorest horses go at \$75@100 per head, with drivers salable at \$100@200 and farm chunks in excellent demand at \$140@215 and good teams salable at \$350@390. Drafters are going at \$175@250 singly and up to \$250@300 for the few choice to extra ones offered. Big manufacturing firms have buyers in the market looking for high-class drafters.

STATE HORTICULTURAL SOCIETY MEETING AT JACKSON, MARCH 18-19.

The winter meeting of the Michigan Horticultural Society will be held in Jackson, March 18-19, in conjunction with the Jackson County Fruit Growers' Association, which has over 120 active members. The program is to include practical addresses and discussions on the growing and marketing of fruits. There will also be a fine fruit show.

THIS IS THE FIRST EDITION.

In the first edition the Detroit Live stock markets' are reports of last week; all other markets are right up to date. Thursday's Detroit Live Stock markets are given in the last edition. The first edition is mailed Thursday, the last edition Friday morning. The first edition is mailed to those who care more to get the paper early than they do for Thursday's Detroit Live Stock market report. You may have any edition desired. Subscribers may change from one edition to another by dropping us a card to that effect.

DETROIT LIVE STOCK MARKETS.

Thursday's Market.
February 27, 1913.
Cattle.

Receipts, 1264. Market dull at Wednesday and last week's prices.
We quote: Best steers, \$8@8.50; steers and heifers, 1000 to 1200, \$7@7.50; do. 800 to 1000, \$6.25@7; do. that are fat, 500 to 700, \$5@6.25; choice fat cows, \$6@6.50; good do., \$5@5.50; common do., \$4@4.50; canners, \$3.50@4; choice heavy bulls, \$6@6.75; fair to good bolognas, bulls, \$5.25@5.75; stock bulls, \$4.50@5; choice feeding steers, 800 to 1000, \$6@6.50; fair do., 800 to 1000, \$5.50@5.75; choice stockers, 500 to 700, \$5.50@6; fair do., 500 to 700, \$5@5.50; milkers, large, young, medium age, \$5@7; common milkers, \$3.50@4.50.

Roe Com. Co. sold Sullivan P. Co. 9 butchers av 871 at \$6.85, 2 cows av 875 at \$4, 1 heifer weighing 530 at \$5.50, 4 steers av 1175 at \$8, 4 do av 925 at \$7, to Newton B. Co. 26 butchers av 612 at \$6.10; to Sullivan P. Co. 1 cow weighing 840 at \$4, 3 do av 1213 at \$5.75, 2 do av 1020 at \$5.50, 2 do av 1090 at \$4.60, 1 do weighing 1150 at \$5.50, 2 steers av 875 at \$6.60; to Nagle P. Co. 2 cows av 1270 at \$6.25, 2 do av 1015 at \$5, 2 do av 985 at \$5.25, 7 do av 1077 at \$6; to Kamman B. Co. 5 butchers av 750 at \$5.50, 9 do av 802 at \$6.50; to Rattkowsky 1 cow weighing 970 at \$4.50; to Hammond, S. & Co. 5 butchers av 738 at \$6, 1 cow weighing 930 at \$4; to Mich. B. Co. 2 do av 1030 at \$5.25; to Thompson Bros. 1 do weighing 1130 at \$5, 1 steer weighing 960 at \$7.

Spicer & R. sold Sullivan P. Co. 2 cows av 920 at \$5.25, 7 do av 874 at \$4.60, 12 butchers av 685 at \$6.70; to Newton B. Co. 5 cows av 928 at \$6, 3 butchers av 713 at \$5.40, 13 steers av 841 at \$7, 5 do av 784 at \$6.50, 1 cow weighing 740 at \$4.50, 8 butchers av 792 at \$6.75, 2 cows av 1080 at \$5.50; to Nagle P. Co. 25 steers av 1122 at \$7.65, 7 do av 951 at \$5.50; to Mason B. Co. 9 do av 870 at \$7.25.

Bishop, B. & H. sold Bresnahan, Jr., 14 heifers av 564 at \$5.50; to Newton B. Co. 6 butchers av 816 at \$5.75, 1 cow weighing 900 at \$4, 1 steer weighing 1030 at \$6.75, 3 do av 980 at \$7, 10 butchers av 849 at \$5.75, 6 cows av 840 at \$4, 1 do weighing 1110 at \$5.50; to Mason B. Co. 2 do av 1050 at \$5.25, 3 steers av 870 at \$6.75, 2 cow and bull av 915 at \$6; to Sullivan P. Co. 2 cows av 930 at \$5.75, 1 do weighing 690 at \$4.75, 6 steers av 960 at \$7, 5 cows av 928 at \$5.25; to Nagle P. Co. 3 do av 1010 at \$5.25, 16 steers av 1053 at \$7.65, 3 do av 873 at \$5.25; to Kamman B. Co. 16 butchers av 743 at \$6.40, 4 cows av 1000 at \$5.50, 6 steers av 860 at \$7; to Hammond, S. & Co. 3 cows av 900 at \$4.25, 2 do av 1105 at \$5.25, 3 steers av 823 at \$6.75, 25 do av 1025 at \$7.50, 5 do av 884 at \$7.25, 1 bull weighing 1600 at \$6.25, 12 steers av 922 at \$7; to Nagle P. Co. 1 bull weighing 1680 at \$6.75; to Hammond, S. & Co. 3 cows av 1000 at \$4.15; to Newton B. Co. 25 steers av 863 at \$7, 1 bull weighing 1120 at \$7, 1 do weighing 680 at \$5.50, 2 heifers av 620 at \$3.75; to Breitenbeck 30 butchers av 916 at \$6.90; to Sullivan P. Co. 6 do av 860 at \$6.75, 5 cows av 1020 at \$5.50, 6 do av 950 at \$4.75; to Rattkowsky 4 do av 1102 at \$5.65.

Haley & M. sold Sullivan P. Co. 3 cows av 826 at \$4, 3 butchers av 683 at \$6, 2 cows av 755 at \$4.25, 1 do weighing 710 at \$4, 2 do av 1160 at \$5.90, 4 do av 925 at \$4.50; to Nagle P. Co. 3 do av 1270 at \$6, 2 do av 1085 at \$5, 17 steers av 959 at \$7.25, 3 cows av 1093 at \$5.85; to Wyness 1 heifer weighing 750 at \$6.60, 1 do weighing 680 at \$6.50; to Mich. B. Co. 15 butchers av 966 at \$6, 9 do av 733 at \$6.30; to Mason B. Co. 9 do av 808 at \$6.35; to Grant 6 do av 400 at \$5, 10 do av 837 at \$5.10; to Newton B. Co. 1 cow weighing 680 at \$3.75, 1 do weighing 900 at \$4; to Mich. B. Co. 2 bulls av 865 at \$5.85, 2 cows av 1040 at \$6, 2 steers av 860 at \$6.75, 1 cow weighing 1090 at \$5.50, 6 butchers av 526 at \$5.75, 5 steers av 784 at \$6.75, 2 cows av 855 at \$6, 3 steers av 873 at \$7, 3 do av 697 at \$6.75; to Goose 8 cows av 920 at \$4.60; to Mason B. Co. 4 do av 835 at \$4.50, 2 do av 950 at \$5.50, 2 steers av 835 at \$7; to Sullivan P. Co. 1 bull weighing 1670 at \$6.75, 2 cows av 990 at \$3.50; to Hirschleman 23 butchers av 667 at \$6.50.

Weeks sold same 8 butchers av 836 at \$5.75, 30 steers av 881 at \$7.20.

Veal Calves.

Receipts, 476. Market steady at last week's prices. Best, \$10@11; others, \$5.50@9.50; milch cows and springers, good grades strong.
Bishop, B. & H. sold Rattkowsky 1 weighing 140 at \$9.50, 2 av 150 at \$9.50, 2 av 130 at \$9; to Parker, W. & Co. 26 av 140 at \$10, 2 av 145 at \$10.50; to Goose 5 av 125 at \$10; to M. Goose 6 av 125 at \$9.50, 10 av 129 at \$9.50; to Parker, W. & Co. 3 av 140 at \$10, 8 av 125 at \$10, 1 weighing 190 at \$6.50, 4 av 155 at \$10.50; to McGuire 7 av 180 at \$11, 1 weighing 140 at \$10, 4 av 120 at \$8, 3 av 140 at \$10; to Mich. B. Co. 9 av 150 at \$10.50, 16 av 135 at \$10; to Hammond, S. & Co. 6 av 155 at \$11, 5 av 150 at \$10.50, 6 av 140 at \$10, 5 av 165 at \$6, 1 weighing 150 at \$11, 4 av 140 at \$10, 1 weighing 110 at \$9, 8 av 140 at \$10.50; to Burnstine 11 av 140 at \$10, 6 av 145 at \$10, 10 av 160 at \$10, 8 av 160 at \$10.50, 8 av 155 at \$10.50.

Bennett & S. sold Nagle P. Co. 17 sheep av 130 at \$5.25.

Haley & M. sold Newton B. Co. 2 av 150 at \$10; to Kull 11 av 150 at \$10; to Costello 6 av 155 at \$8.50, 1 weighing 190 at \$7; to Goose 3 av 115 at \$8, 6 av 140 at \$10.50; to Mich. B. Co. 6 av 125 at \$10; to Goose 19 av 120 at \$9.50; to Thompson Bros. 7 av 150 at \$10; to Rattkowsky 12 av 125 at \$10, 5 av 120 at \$9.50, 8 av 150 at \$9.50, 2 av 115 at \$7; to Mich. B. Co. 3 av 155 at \$10.50.

Dancer & K. sold Newton B. Co. 13 av 135 at \$10.25, 3 av 120 at \$8.
Sheep and Lambs.
Receipts, 2736. Market steady at last week's and Wednesday's prices. Best lambs, \$3.40@8.50; fair do., \$3@8.25; light to common do., \$6@6.75; fair to good sheep, \$5@5.75; culls and common, \$3@4.25.

Bishop, B. & H. sold Moore 7 feeding lambs av 60 at \$7.50, 54 do av 70 at \$7.50, 29 do av 60 at \$7.50; to Thompson Bros. 24 do av 55 at \$6; to Nagle P. Co. 141 lambs av 80 at \$8.50, 19 do av 75 at \$8.35, 46 do av 77 at \$8.50, 14 do av 80 at \$8.50, 133 sheep av 100 at \$5.10, 15 do av 95 at \$4.50, 11 do av 95 at \$4; to Sullivan P. Co. 20 lambs av 55 at \$6.50; to Breitenbeck 15 sheep av 80 at \$5; to Moore 57 lambs av 60 at \$7.50; to Thompson Bros. 20 do av 45 at \$5.60; to Parker, W. & Co. 83 yearlings av 80 at \$7.50; to Mich. B. Co. 25 lambs av 65 at \$7, 32 do av 60 at \$7, 16 do av 45 at \$5.50, 19 sheep av 130 at \$5.50, 42 do av 90 at \$5.25; to Richardson 22 feeders av 67 at \$7.25, 25 do av 60 at \$7.75; to Fitzpatrick Bros. 34 lambs av 80 at \$8.40, 41 sheep av 100 at \$5.75, 1 buck weighing 180 at \$4.50.

Spicer & R. sold Mich. B. Co. 12 sheep av 105 at \$5.25; to Newton B. Co. 37 lambs av 70 at \$8; to Thompson Bros. 11 sheep av 88 at \$4.50; to Costello 16 lambs av 50 at \$7.25; to Mich. B. Co. 19 sheep av 100 at \$5.75, 19 lambs av 55 at \$8; to Newton B. Co. 44 do av 65 at \$8; to Costello 16 do av 55 at \$7; to Young 49 do av 75 at \$8.50.

Roe Com. Co. sold Young 29 lambs av 105 at \$8.50; to Barlage 31 do av 75 at \$8.40, 15 do av 55 at \$7; to Sullivan P. Co. 16 sheep av 115 at \$4.50.
Haley & M. sold Thompson Bros. 7 sheep av 75 at \$3.50, 13 do av 100 at \$5; to Newton B. Co. 26 lambs av 55 at \$7, 25 do av 60 at \$8, 15 sheep av 80 at \$5.50; to Mich. B. Co. 8 lambs av 78 at \$8, 18 sheep av 130 at \$5, 4 lambs av 50 at \$8, 12 sheep av 100 at \$5; to Nagle P. Co. 102 lambs av 75 at \$8.50.

Hogs.
Receipts, 3139. None sold at noon; sales were 5c lower than on Wednesday or last week.

Range of prices: Light to good butchers, \$8.40; pigs, \$8.45@8.50; light yorkers, \$8.35@8.40; heavy, \$8.35; stags one-third off.

Bishop, B. & H. sold Hammond, S. & Co. 1850 av 170 at \$8.40, 610 av 215 at \$8.35.

Same sold Newton B. Co. 317 av 180 at \$8.40.

Haley & M. sold Parker, W. & Co. 408 av 180 at \$8.40.

Sundry shippers sold same 1020 av 190 at \$8.40.

Roe Com. Co. sold Sullivan P. Co. 275 av 190 at \$8.40.

Friday's Market.
February 28, 1913.

Cattle.
Receipts this week, 1685; last week, 1529; market steady at Thursday's prices; run very light. Best steers, \$8; steers and heifers, 1000 to 1200, \$7@7.75; do. 800 to 1000, \$6.25@7.60; do. that are fat, 500 to 700, \$5.50@6.25; choice fat cows, \$6@6.50; good do., \$5@5.50; common cows, \$4@4.50; canners, \$3.50@4; choice heavy bulls, \$6@7; fair to good bolognas, \$5@5.75; stock bulls, \$4.50@4.75; choice feeding steers, 800 to 1000, \$6@7; fair do., 800 to 1000, \$5.50@6; choice stockers, 500 to 700, \$5.50@6; fair do., 500 to 700, \$5@5.50; milkers, large, young, medium age, \$5@8; common milkers, \$3.50@4.50.

Veal Calves.
Receipts this week, 728; last week 747; market steady with Thursday; quality common. Best, \$10@11; others, \$5@9.50; milch cows and springers steady.

Sheep and Lambs.
Receipts this week, 3844; last week, 5964. Market steady at Thursday's prices. Best lambs, \$8.40@8.50; fair do., \$7.75@8; light to common lambs, \$5.50@6.50; fair to good sheep, \$5@5.75; culls day; light to good butchers, \$8.55; pigs, \$8.55; light yorkers, \$8.55; heavy, \$8.45@8.50; stags one-third off.

and common, \$3@4; western wethers, \$8; western ewes, \$7@7.35.

Hogs.
Receipts this week, 4874; last week,

Leading Chicago live stock commission firms are advising their country patrons who have healthy, thrifty pigs, shoats and immature swine to hold on to them, as they will pay well in the end for their keep and good care until attaining maturity. But the good fat hogs that weigh around 250 lbs. and heavier should be sent to market at earliest convenience, for it is always assuming a big risk to hold fat stock with the express purpose of striking a higher market.

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We get the top price on consignments, make liberal advancements and prompt remittances.

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SEED CORN—Mich. Yellow Dent, home Golden Fleece and Reg. Swedish Select Oats. Send for sample and circular. F.A. Bywater, Memphis, Mich.

WHITE Cap Dent Seed Corn, fire dried, 99% germination, \$2.50 per bu. shelled, bags free. GEO. E. LAPHAM, R.R. St. Johns, Michigan.

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Are filled with extra heavy Peerless Fencing of close woven all No. 9 wire—strong enough to turn the heaviest animal—close enough to hold small pigs.

Perfectly adjustable, never sags out of shape or drags on the ground and fitted with a double latch. No chains, springs, or other toggle to give out and make trouble.

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Cost only one-third as much as ordinary iron, wire or gas pipe gates, but last twice as long. Neat in appearance—best and strongest gate made—light, easy to handle, opens both ways. Boards are double bolted between eight angle steel uprights and double truss braces, guaranteed never to sag.

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Can't-Sag Gates are furnished complete, ready to hang, or just the Gate Steels which include everything except the boards. Patent self-locking hinge feature—reinforced two piece malleable hinges. Six Triangular Truss Braces make gates extra strong.

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The cost of a manure spreader must be figured by the years of service it gives you and the kind of service you get out of it. The first cost of a Great Western may be a little more than the price of some shoddy, poorly-made, heavy-draft spreader, but it costs more to make a Great Western, and that extra cost is made up to you many times in the kind and length of service it gives. Based on the cost per year, the Great Western is the cheapest spreader you can buy. The extra dollars you pay at the start are paid for quality, and you'll get them all back, with many more.

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embraces all the great features that have kept it ahead of all others for over twelve years. More than 100,000 farmers testify to the superiority of this machine. There's but one opinion regarding this spreader, and that is that it is the one per cent spreader.

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Wheels under the load—roller bearings—rear wheels track with the front—lightest draft—no neckweight—simplest direct drive—no hidden parts, no enclosed gears—individual rollers—strong, rigid oak beater rails—these are

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LIVE STOCK NEWS.

The situation in the hog market could hardly be stronger than it is, with the shortage throughout feeding districts of the great corn belt even more serious than it was at first believed to be. Recent receipts of hogs at primary points proved disappointingly small, and as a result, prices have soared still higher, reaching the greatest altitude seen at any time since last October. The spread in prices has narrowed meanwhile, with the great bulk of the hogs offered on the Chicago market going within a range of five cents per 100 pounds and prime light hogs still bringing the best prices. Eastern shippers have been conspicuous buyers in the Chicago stock yards, their purchases having undergone a marked increase within a short time, and competition between them and local packers and speculators has made strong markets most of the time.

Patrick Cudahy, the Milwaukee packer, expresses himself as feeling bullish in provisions, in a recent interview, and he says that, in his opinion, hogs will sell at nine cents a pound or higher in April. Most of the hog shippers from the country with whom he has talked believe that the next summer is the time when the real shortage of hogs will be felt, and he points out that a live hog costing 8 1/4c per pound amounts to a cost of a little over 10c per pound dressed, or about the recent price paid for loose steam rendered lard. Mr. Cudahy goes on to point out that it is the beginning of the cotton planting season, and when the negro works, he must have his pork. Meanwhile the accumulations of pork, ribs and lard have been very much smaller during the four months of the winter packing season than in most former years, owing to the light receipts of hogs and the big consumption of hog products, especially of fresh pork. He adds: "We are now just at the beginning of the three months when receipts of hogs are generally light and trade big. I believe we will see a tight situation in both ribs and lard between now and May 1. It would not take much of a capitalist to pay for the 8,000 barrels of pork in the country, and I will wager that there is upwards of 250,000 barrels of pork sold on the Chicago Board of Trade today. Lard and ribs are selling far below cost price."

Never has the situation in the sheep industry been stronger than it is now, with the great shortage in feeding districts generally and the good demand for mutton. Reactions in prices after booms in lambs, yearlings, wethers and ewes still leave values far in advance of former years, and fortunately for the interests of sheepmen everywhere, the Colorado sheepmen are taking plenty of time in marketing their lambs and thereby preventing a glut and thus breaking values. Feeding stations around Chicago have been kept pretty well filled with these choice flocks of lambs, and they are almost invariably marketed only when good and fat, some flocks being reserved for shearing. Colorado lambs and yearlings are marketed mostly in Chicago and in Missouri river packing cities. The Iowa lambs and sheep were mostly marketed earlier than usual, as the singularly mild, open winter and abundance of cheap feed that was furnished unstintingly by their owners fattened them quickly, and there is little danger of over large marketings from Michigan, Ohio, Indiana and other feeding districts. Prime lambs have sold during the season as high as \$9.50 per 100 lbs., and prime feeding lambs requiring only a short period for finishing have brought as high as \$8.40 per 100 lbs. Most of the choicer class of feeders have been taken by the packers and smaller butchers in the absence of sufficient offerings of choice killers, and despite the extremely large demand for feeder stock, very few have been secured. The preference shown by packing concerns for lambs causes much comment, and it is within the bounds of the truth to say that the market requirements call for fully 75 per cent of lambs and for not more than 25 per cent of sheep.

The cattle markets of the country have gathered fresh strength recently from marked reductions in offerings, but the general demand has not undergone any great increase, although during the cold spells of weather the consumption of beef was reported as improved. The great hindrance for these many months to a normal consumption of beef has been its great dearthness, and complaints have been heard from everywhere that reductions in prices for carcasses by the packers have not been followed by corresponding lowering of prices by the retail markets of the country. The principal call is for light cuts of beef that can be retailed at moderate prices, and extremely little high-priced beef is required.

The remarkable shortage of cattle in feeding districts throughout the country is impelling many farmers to look around for stocker and feeder cattle to consume their surplus of corn, roughage and other cheap feed, but the average stockman balks at paying the prices asked in the Chicago and other western markets for prime weighty feeders. These have been bid up to \$7.50@7.75 per 100 lbs. within a short time by packing firms, these finding them acceptable for converting into comparatively cheap beef. Many country buyers are substituting well-bred light stock steers, which cost high, it is true, but cost less per head than heavy feeding cattle. These stockers are purchased with a view of roughing through the winter, and putting on grass, later and finishing off on corn.

Buyers of horses in the Chicago market include those from many distant points, one from British Columbia being seen recently. He wanted a mixed car load of good horses that weighed from 1,450 lbs. upward. With express charges of \$50 per head or more, and the duty added, horses sold to teaming concerns in Vancouver must come high.

Veterinary.

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

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

Contagious Abortion.—I am having considerable trouble with abortion in my cows. Two aborted in the fall while on grass, one two months before due, the other four weeks too early and now another one on the 14th of February; she was due to come fresh the 26th of April. Have four more coming in soon; now is there danger of them; if so, what can I do to prevent it? Have been told that my mares will contract the disease from the cows as they are in the same basement. J. T. M., Uby, Mich.—Your mares and your other cows are, of course, in danger of contracting the disease, but I am inclined to believe that the infective germs are usually in the uterus when they cause abortion. Heifers are more apt to abort than aged cows. There is no preventative; however, there are new preventative remedies being used which some Vets. and dairymen seem to have confidence in and perhaps some of them are worthy of a trial. It is extremely important to use disinfectants and as much cleanliness as possible in your dairy and if this is done you will doubtless prevent it spreading. When a cow aborts the afterbirth should be promptly and completely removed and together with the foetus burned. The uterus should be washed out with a weak solution of salt and water; 1 oz. of salt to 2 gals. of tepid water. Or 1 dr. permanganate potash in two gallons of tepid water and these applications should be made once or twice a day for ten days or two weeks. Give her a tablespoonful of powdered nitrate of potash at a dose twice a day.

Inactive Udder.—I have a cow that has a large cold udder, she came fresh a short time ago and is not giving nearly as much milk as she did two years ago. Last year when she came fresh she was much the same as now. Her bag has never been tender and she is not sick. D. P. R., Kalkaska, Mich.—Hand-rubbing will greatly assist in restoring udder to a normal condition; also rub bag with alcohol twice a day.

Lump Jaw. Three days ago a lump came on jaw of cow; this lump is painful to touch and I would like to know if her milk is fit for use. She appears to be well and healthy. J. S., Buckley, Mich.—Apply one part red iodine mercury and four parts lard to lump every week and give her 2 drs. potassium iodide at a dose in feed two or three times a day. When lump jaw is suppurative it is contagious and the milk should not be used.

Sore Udders—Obstructed Teats.—Several of my cows flinch when being milked, acting as if it hurt them. There are no bunches in bag; these cows are grain-fed heavily. D. F. T., Wayne County.—Are you sure that the udder is not made sore at milking time? Hand-rub udder and give a tablespoonful nitrate of potash at a dose in feed twice a day. Bed them well and keep them out of cold wind and rain storms.

Opening in Side of Teat—Weakness.—Jersey freshened one week ago; since then I find a hole in side of teat from which milk flows when she is milked. Brood mare is weak and not thriving. J. R., Holton, Mich.—Make edge of hole raw, stitch edges together and apply boracic acid to wound twice a day. Her grinder teeth may need floating and give her 1 oz. gentian, 1 oz. ginger and 1/4 oz. fenugreek at a dose in feed three times a day. Are you feeding her enough grain? Feed her 1/4 pint molasses in feed twice a day.

Septic Fever.—Have a heifer that didn't shed afterbirth until nine days after calving; she gave 8 qts. of milk when fresh, now she is dry. Her appetite is poor and she is sleepy and dull. A. W., Jr., Baldwin, Mich.—Give her 2 drs. boric acid, 1 oz. ground gentian and 1 oz. ginger at a dose in feed or as a drench in a pint of water three times daily.

Worms—Brain Trouble.—Yearling colt is not thrifty; rough coated and although he eats plenty, keeps thin. I also have a four-months-old pig that moves in a circle, always going in the same direction, but he eats fairly good. G. N. W., Delton, Mich.—Give colt 1/2 oz. ground gentian, 1/2 oz. ground ginger and 1 dr. ground worm seed in feed twice a day. Give pig 10 grs. potassium bromide at a dose in feed three times daily.

Abscess.—One of my fat hogs had a bunch in throat the size of a coffee cup, which opened and discharged offensive smelling pus, and a core came out. A hard bunch remains and I would like to know what to apply and would also like to know if his flesh would be fit for food. C. S., Kingsley, Mich.—Apply iodoform to wound until it heals, then apply tincture of iodine to bunch daily until bunch is gone. In ten days his throat should be well and if he is not suppurating from throat his food would pass inspection if nothing else ailed him.

Impaction.—Have been feeding lambs for market in warm basement barn; am feeding bean pods and oats. About a week ago I noticed they began to act as sheep do in fly season, uneasy, with their nose to the ground. They eat well and are in good order. What can be done for them? H. K., Alto, Mich.—Feed some roots and salt them well to increase

thirst, then the water will moisten excrement in bowels and they will get relief. Give small and repeated doses of sulphate of magnesia or sulphate of soda twice a day. Feed food that has a laxative tendency.

Vaginitis.—One of my cows came fresh Dec. 22, and since then she has occasionally had some vaginal discharge. Will you kindly tell me what to do for her? C. W. H., Dowagiac, Mich.—Dissolve 1 dr. permanganate potash in a gallon of water and inject her every day or two. Also give her two tablespoonfuls bicarbonate soda at a dose in feed three times a day.

Chronic Cough—Indigestion.—One of my three-year-old colts has been coughing more or less for the past two months and I also have an eight-year-old mare that has not been thriving for several weeks. H. S., Fremont, Mich.—Give her 1 oz. of ground licorice, ½ oz. ground ginger at a dose in feed three times a day. Also give your other mare 2 drs. powdered sulphate iron, 4 drs. ground gentian and 8 drs. of ground ginger at a dose in feed two or three times a day.

Partial Dislocation of Stifle—Worms.—My 19-months-old colt is troubled with a partial dislocation of stifle joint, when out he drags toe for a few steps and then can go no farther; however, the joint seems to slip into place, then he goes fairly well. I also have some horses and hogs that are wormy. H. A., Ypsilanti, Mich.—Apply one part red iodide mercury and eight parts lard to stifle once a week. Give your horses 1 dr. of santaline and 1 oz. ground gentian at a dose in feed three times a week for two weeks. Give your wormy pigs fluid extract of spigelia and senna equal parts; the dose for a full grown hog is ½ oz. twice a day until the bowels move freely.

Chronic Grease Heel.—I have an eight-year-old horse that has had sore hind legs for the past four years, the skin on back part of hind legs is rough and uneven and our local Vets. have failed to do his legs much good. E. D. S., Charlotte, Mich.—Apply one part oxide of zinc and three parts vaseline and give him ½ oz. Donovan's solution at a dose in feed or water two or three times a day.

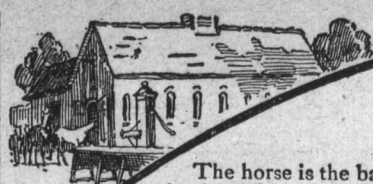
Filly Coughs—Nodular Disease in Sheep—Kidney Disease.—I have a three-year-old filly that is troubled with a slight cough, but seems to be in good condition and not unhealthy. About three weeks ago my five-year-old buck was taken sick, acted dumpy, with loss of appetite, eating very little corn fodder, but not touching clover hay at all. Some ten days later he commenced to scour, then I looked up back numbers of the Michigan Farmer and concluded from reading that he might have nodular disease. I gave him 4 ozs. of a one per cent solution of sheep dip, which is the same, I suppose, as the coal-tar creosote you recommended in your veterinary column. This I gave him in the morning and at night I gave him 4 ozs. of raw linseed oil. He seemed a little better for a day or two, but the scours continued and he died four days later. I opened him, the small intestines were covered with small hard bunch or nodules, as I called them; these bunches contained a green looking substance almost like dry manure balls. Were these the nodules? This sheep had been fed clover hay, corn fodder and bean pods and he was fleshy. His kidneys seemed to be almost rotten, but all other organs were healthy. What caused his death? W. E. B., St. Johns, Mich.—Your filly will be benefited by giving her 1 oz. of powdered licorice and 1 oz. of ground ginger at a dose in feed two or three times a day. Coal tar sheep dip or coal tar disinfectant is not coal tar creosote, but is sometimes given in nodular disease. Your ram suffered from nodular disease and kidney disease in the advanced stage, therefore treatment would have no effect. Your other sheep may suffer from nodular disease in a mild form and will do them very little harm. It is well to keep in mind that there is no cure for this ailment, but your sheep will be benefited by giving them equal parts of ground gentian, ginger and salt in their feed; ½ a teaspoonful is a dose for a full grown sheep and give the medicine twice a day.

Barrenness.—According to your directions I fed my sow that did not come in heat, a teaspoonful of ginger, ½ teaspoonful capsicum and one-sixtieth of a grain tablet of strychnine in feed three times a day for less than one week to young sow and obtained satisfactory results.—E. E. W., Highland, Mich.

Abscess.—I have a cow that has a sore between the angles of lower jaw and I would like to know what to apply. G. S., Breckenridge, Mich.—Apply iodoform to wound twice a day and give her 3 drs. of iodide potassium at a dose three times a day.

Stocking.—My 11-year-old horse stocks in hind legs and swells under belly, but does not appear to be sick. S. M., Grand Haven, Mich.—Give your horse a teaspoonful of powdered nitrate potash, two tablespoonfuls of ground gentian and 1 dr. ground nux vomica at a dose in feed three times a day. It is needless for me to say that the bowels should be kept open and he should be exercised some every day.

Fracture.—I have a driving mare that fractured fore leg and our local Vet. tells me the head of the ulna is fractured, making it impossible to apply a permanent bandage. Have you ever used Bergunda pitch bandage in treating fracture? W. O'M., Emmet, Mich.—Yes, I have used pitch bandages many times and they gave me good results, but I prefer plaster paris bandage; however, do not believe you can bandage your horse's legs and obtain satisfactory results. Place your horse in a sling, keep him quiet and you may perhaps get a bony union, if so he will recover and not be lame, but if you get a fibrous union he will perhaps always be lame.



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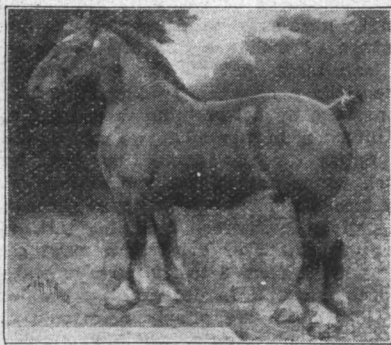
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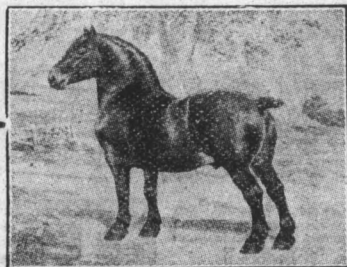
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Practical Science.

ECONOMY OF RETAIL MEATS.

BY FLOYD W. ROBISON.

Incidental to the discussion of comparative costs of different cuts of meat, it is interesting to note the very great variation in the water content of the different cuts of meat from the same animal carcass.

	Water Content. Per Cent.
Clod	63.04
Round	60.86
Hind shank	61.02
Fore shank	60.95
Neck	56.32
Chuck	55.77
Loin	47.42
Rump	46.25
Rib	45.15
Plate	39.42
Flank	32.26

As is to be expected, although we apprehend, not generally known, those cuts of meat which show the highest content of moisture show the lowest content of fat. In other words, the clod which contains 63.04 per cent moisture shows 17.96 per cent fat, while the flank which showed only 32.26 per cent moisture showed 57.16 per cent fat. If the cut of meat consisted entirely of lean meat without any fat whatsoever, in other words, 100 per cent lean, it would show by analysis 75 per cent of water and no fat. We will see, then, that the nearer the cut approaches the lean, the higher the content of water until we get to the point where it is absolutely clear lean meat, in which condition the maximum content of water, or 75 per cent, is shown. This condition, by way of digression, for a moment, is of great interest because it furnishes the clue to the determination of the addition of water artificially in comminuted meats. It would seem that, with a natural meat showing 75 per cent of water, when perfectly lean, that the amount of water were sufficient as provided by nature. But it has been the practice of certain manufacturers to add still greater quantities of water in the manufacture of comminuted meat products. In the case of Armour & Co. vs. Bird, an injunction against the State Dairy and Food Commissioner, the contention was made and substantiated that it was by no means uncommon for manufacturers to actually add to sausage from 5 to 40 per cent of water beyond the normal 75 per cent which was already in the meat.

One Cut of Meat is Not More Watery than Another.

The great variation which we have shown in the water content of the different cuts, varying as it does between 32 and 63 per cent does not indicate that one portion of this meat is any more watery than another portion but does simply indicate that one portion is more fatty than another portion, the absolute fat tissue containing no water whatsoever.

How to Determine Added Water in Meat.

We have maintained that to determine the presence of added water in meat it is simply necessary to determine the percentage of moisture and the percentage of lean meat and as the lean meat is essentially a nitrogen product, and mainly protein, by determining the percentage of nitrogen in the meat we are enabled to figure directly from this just how much water not originally contained was put into this meat. A study of these figures given heretofore indicates that one part of protein or dried lean meat carries with it from 3 to 3.2 parts of water. Consequently, if in determining the lean meat in a cut we simply determine the percentage of protein, which is an ordinary laboratory operation, then multiply this percentage by 3.2 and we will have the amount of water which naturally belongs to that meat. If, for example, then, we have before us a sample of sausage or other comminuted meat, a product prepared in such a way that the original structure of the meat is destroyed, the simplest way to determine the presence of added water is to determine the nitrogen content which fixes the true amount of lean meat in the product, and, of course, as we have explained above, the lean meat is the only part of the product which carries water. Suppose, for example, we find in a certain sample of can not afford to do without it at this sausage 10 per cent of protein. We then low price.

multiply this 10 per cent by 3.2, which gives us 32 per cent, the amount of water which would be natural to that meat product, due to the lean meat which it contains. Suppose, now, an actual analysis reveals 70 per cent of water in this meat product. We then know by a simple calculation that 38 per cent of that water was introduced from without. In other words, the sausage has been adulterated with 38 parts of water in every 100.

This is not a theoretical proposition but one which is closely connected with the problem which we are here discussing, i. e., the pecuniary economy and nutritive value of meats.

The Real Adulterant Passed By.

In the case just previously cited, the supreme court, in passing upon the evidence in the case, reviewing as it did the opinion handed down by the Honorable Howard Weist, Judge of the Ingham County Circuit Court, passed solely upon the relationship of so-called cereal to sausage, holding that whenever cereals were used, it was incumbent upon the manufacturer to reveal in so many words, upon the label, that the product contained cereal. We were conscious in the presentation of this case that while cereal constituted an adulteration, in our opinion, which opinion was substantiated by the supreme court, that to allow the proposition to rest solely upon the cereal point was in reality pushing to one side the real adulterant in the case. The evidence submitted by the complainant, said Armour & Co. itself, plainly disclosed that cereal did not improve the product except where it concealed inferiority in the grade and quality of meats used in the sausage. This admission was more forceful when it became known, as the trial showed, that the complainant itself manufactured for commercial purposes a very high-grade sausage which contained no added cereal whatsoever, and this sausage was considered of sufficiently greater value so that it was necessary that it retail in the market for at least two cents per pound higher than was the case with the cereal sausage. We have not contended, nor do we venture to assert now, that the cereal is used in the sausage solely for the purpose of concealing the water added, because our contention was that it was, as well, at least in many instances, to conceal the lower grade of meats which were used therein.

Lean Meat Has a High Affinity for Water.

When it is realized that lean meat in its normal natural condition contains as high as 75 per cent of water and that as much as 40 per cent of water over and above this content has been added to meat without destroying the marketability of the product, then our readers must appreciate what an enormous combining power lean meat tissue has with water when skillfully manipulated.

We regret very much that this point was not brought into prominence by the decision of the supreme court for it is this question of water and not cereal which in reality affects the economic value of comminuted meats. Cereal is an indicator, at least, of a low quality of meats, but water in excess of the lean meat quantity is an evidence of direct adulteration and as an evidence of direct adulteration having no nutritive value whatsoever, it becomes a very important factor in the matter of high cost of living.

We have been taken to task a number of times for our insistence upon the constancy of this relationship between the protein in meat and its water content, but of the great number of analyses which have been studied by us, we have yet to see any discrepancy whatsoever in the statement made in this particular.

In our next discussion we shall attempt to show the exact economical aspect so far as the ultimate consumer is concerned of the different retailed cuts of meat.

RENEW AT ONCE.

If your Michigan Farmer subscription is about to expire send at once 50c for one year, \$1.00 for two years, \$1.25 for three years, or \$2.00 for five years. You can not afford to do without it at this low price.

Farmers' Clubs

Address all communications relative to the organization of new Clubs to Mrs. C. P. Johnson, Metamora, 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.

WHAT THE LOCAL CLUBS ARE DOING.

Summit Farmers' Club, of Jackson County.—The delegate from this Club raised the important question, "Are many Clubs neglecting an important feature in the published yearly programs?" This Club gets up the program from month to month and finds the plan an unsatisfactory one. The delegate suggested a program committee in the state organization in order to make suggestions which would be valuable to the local Clubs. A feature only second in importance in the opinion of this delegate, was the Club fair which the Club has held with good success. A special feature of this Club's work is children's day in July. The question box is made a feature of the monthly meeting. A basket picnic is held in August and a Club fair in October. The roll call is made a feature of interest by having the responses suitable to the occasion, as for instance, in February the roll call is answered by quotations from Washington and Lincoln.

The Howell Farmers' Club, of Livingston County, was represented by Mrs. R. R. Smith, who described in an interesting manner the work of that Club. The Club has monthly programs prepared especially for each meeting, the delegate explaining that in this way the members thought they received greater benefit from the discussions, as these were directed along up-to-date lines and the members were able to discuss the latest things from the "wire" instead of some set topic selected several months in advance. This Club is an exception to most others, if not all others, in the state in that no meals are served except at one meeting, when an annual banquet is held, which is made a general rally.

Hadley and Elba Farmers' Club, of Lapeer County, is 14 years old, as stated by the delegate, and holds 12 regular meetings during the year. It has a membership of 128, which is the largest in the state and includes 60 to 70 families. Special features are a July picnic and in August the Club joins with the Lapeer County Farmers' Association picnic, while in January an oyster dinner is held and in November the gentlemen serve the dinner. Dinner is served at the meetings during the winter months and supper during the summer months. The dues have always been 25 cents per member, but are to be raised to 40 cents per member. The traveling library is utilized by this Club, two sets of books per year being secured. A children's meeting is held and as an innovation the Club contemplates the holding of a series of lectures at which the Grange will be asked to join. The Club has held a Club Fair for a number of seasons until this year.

CLUB DISCUSSIONS.

Hold Temperance Meeting.—The Assyria Farmers' Club was very royally entertained at the Baseline M. E. church on Saturday, Feb. 22. There were about 200 present to enjoy the dinner and most excellent program; most excellent because we had the pleasure of listening to a temperance address by Mr. T. H. Burke, of Detroit, Superintendent of the State Anti-Saloon League. He said in part: "This question is a fight and deserves hard work. To make life worth while choose a vocation and stick to it, and this temperance question is as important as any. If the liquor question is none of our business why do the saloon element put the question to a vote to find out if they may have the right to sell liquor? It is a partnership and if you vote wet you are in partnership with the saloon element. Again, the saloon men are a privileged few. Their business is unconstitutional for it says no one has the right of special privilege. Look at Ingham county. The committee sent to investigate the jails reported that either the jails must be enlarged or the saloons must be closed. There was an increase in the number sent to jail, of 500 per cent, or an average of 87 per month. If we could see this as God sees it the virtue of our girls is no more precious than the sobriety of our boys." This address was right to the point and very much enjoyed as Calhoun county expects to vote on this question this spring. Following the address were sev-

eral recitations and musical numbers. This was one of the best meetings in the history of the Assyria Farmers' Club. Our next meeting will be with Mr. and Mrs. George Kent, March 22.—Ruth E. Cargo, Reported.

Discuss National Questions.—The February meeting of the Wixom Farmers' Club were entertained by Mr. and Mrs. Thomas Hartland at their very pleasant farm home. At the noon hour the large house was filled with Club members and visitors, who partook of the usual good dinner. After the social hour we were called to order by President Nicholson and listened to a good program, consisting of music and recitations. The questions mostly discussed were: "The Income Tax," and "The Extension of the President's Term." While both brought out quite a discussion, the opinion of the Club was equally divided. A committee of three was appointed to draft resolutions on the death of our much loved and very active member, Mrs. E. M. Moore.—Mrs. R. D. Stephens, Cor. Sec.

The Farmers' Institute held at the town hall, Salem, Feb. 10, was one of the best ever held by the Club. Good music and recitations filled in between the excellent talks, the first of which was given by State Speaker A. C. Potts on the subject, "Conservation of the soil." The speaker illustrated his points by chemical tests before the audience. A bountiful dinner of chicken-pie and other good things was served. The afternoon session was occupied with addresses from State Speaker Potts and Prof. Harvey, of the State Normal College. The latter spoke on "the value of an education." An excellent paper was given by Robert Ross on "Potatoes." The speaker thought the seed was a minor point when compared with the preparation, cultivation and fertilization of the soil. In the evening Prof. Harvey spoke on the "Central High School, its economic and educational value," and A. C. Potts spoke on "Progressive Agriculture," and "How to keep the boys and girls on the farm." Lively discussions through the day showed our farmers to be interested in these live subjects, and anxious to learn more about them. Closed with music. Next meeting of the Club will be held with Mr. and Mrs. J. M. Crane.—H. C. T.

The February Meeting of the Indianfields Farmers' Club was held at the pleasant home of Mr. and Mrs. Robert Parks. About 60 members and invited guests were present. Among the number were a few members of the Hickory Club. At the noon hour the usual good dinner was served by Mrs. Ella Andrews and her assistants. After the social hour the Club was called to order by the president, William L. Eldridge. Meeting opened by singing, after which all joined in repeating the Lord's Prayer. After the usual business meeting the program of the day was given. Aside from several good musical numbers Mrs. Ellen Purdy read a paper entitled, "Some country gentlemen and what they are doing." Question for discussion, "Is the new mortgage tax law beneficial to the borrower?" The question box was well patronized, which proved after being answered, to contain many useful items. Club closed by singing.—Mrs. Margaret Arnold, Sec.

Grange.

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

ANOTHER SUCCESSFUL INTER-COUNTY POMONA.

The co-operative county meeting of Osceola and Mecosta counties was a notable event in the histories of these two Pomonas. A brilliant winter day, Feb. 28, with an attendance of about 150, conspired to make fit conditions for the profitable sessions held in Reed City from 10 a. m. to 10 p. m. Richmond Grange acted as hostess for this gathering and most hospitably met the occasion. E. D. Clark is master of both Richmond subordinate and Osceola Pomona and led his forces admirably. Master Kiefer, of Mecosta Pomona, came in from deputy work to add his cordial presence. The program was well arranged and spiced sufficiently to keep everybody in the best of humor. Lecturers were present from Lake county, as well as the two uniting counties, and all entered heartily into the Lecturers' Conference which was the closing feature of the afternoon session. Much is due to Pomona Lecturers Orah Thacker and Mrs. Rood for arranging this meeting in all its details. In the evening Osceola Pomona officers conferred the fifth degree upon 16 candidates drawn from the three counties, doing it with great credit and beauty.

It was good thus to reach hands over county lines. Hearts were strengthened for future work, methods exchanged and, best of all, each went home feeling more conscious than ever before of the satisfaction of deepened and extended friendships. Plans are being made for a "return visit," later in the year, at some point in Mecosta county. Both of these Pomonas are issuing year-books and both have been stimulating their subordinate Granges by special efforts.—J. B.

AMONG THE LIVE GRANGES.

Sodus Grange, of Berrien county, reports renewed interest and activity resulting in the addition of a number of members since the beginning of the year. Its hall is also undergoing repairs and improvement, while indications generally point to a most successful year. Officers who took charge of the affairs

of this subordinate at the beginning of the year are as follows: Master, Wm. Heeter; overseer, Wallace King; lecturer, John Harmon; chaplain, Miss King; secretary, Miss Jameson; treasurer, Mrs. Pearl Cassidy; steward, H. Dohm; assistant steward, Elwood Shiffert; gate keeper, Miss Helen Kimball.

Charlevoix Pomona met with Maple Grove Grange on Feb. 20, with about 50 in attendance which, considering the way the roads were drifted, was very good. The lecturer being absent, a committee was appointed to "pick-up" a program and a fine one was provided. Among the topics discussed were farmers' institutes, fruit growing, hog raising and milk testing. In the evening Messrs. Emory Pierce, Clinton Bowen, Claude Bowen, Emil Nasson and Miss Pearl Chandler were obligated in the fifth degree, after which all members received the new fifth degree annual word. Grange then closed in form to meet with Peninsula Grange on Thursday, April 17.—L. D. Willson, Secretary.

THE GRANGE IN OTHER STATES.

Cheering Conditions in Keystone State.

During last year the Granges of Pennsylvania increased as never before, not in membership and numbers only but in the actual amount of business transacted, and in perfecting the final arrangements for a fixed number of Grange warehouses or local exchanges to be erected in various parts of the state where the farmers will have a square deal in purchasing supplies and in disposing of their surplus produce. The state of Pennsylvania is composed of 67 counties, 65 of which contain Granges. Some of these counties have as many as 39 subordinate Granges in operation at the present time; 50 counties are represented in the Pomona Granges of the state of which there are over 40.

Pomona Grange No. 4 held its regular session in the thriving little city of Corry, Erie county, early in December last. The sessions drew an average attendance of 350 members. Discussions upon the following subjects were inspiring and educational: Legislative prospects, state and national; civic art and its relation to Country Life; What is meant by Rural Education; Christian Socialism; the best use we can make of the great work done by our National and State Departments of Agriculture, and many others of equal interest.

During the past year the writer presided over four lecturers' conferences. These conferences are being organized in all the Pomona districts of the state, and reports from our state lecturer are to the effect that they are proving beneficial to all departments of the order. Topics discussed in the Erie county conference of recent date were: The opportunities of a Lecturer; the Lecturer's Co-workers; the Grange as a Moulder of Public Opinion; Hinderances to Good Lecture Work; the Value of the Lecture Hour to the Farmer; What is a Balanced Program; How can the Lecturer Enliven her Programs; The Value of enthusiasm in Lecture Work.

The work of the State Grange, held at Clearfield during early December, was gratifying. It has a live legislative committee that is always on the job. Our state platform demands: A reform in the rules in our state legislature; equalization of taxation; increased appropriations for roads and schools; state aid for the improvement of township roads to the amount of \$25 per mile; increased appropriations to our state agricultural college; amendment to the constitution for the direct election of senators. The Grange also went on record as opposed to a fifty million dollar bond issue for state highways.—Mrs. W. D. Ripley, Lect. Erie County Pomona.

New York Patrons on Co-operation.

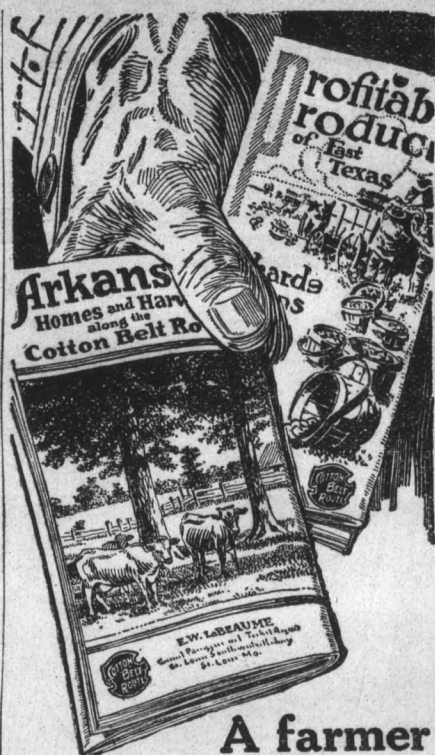
At the meeting of New York State Grange, held last month, the committee on co-operation recommended to the state body that its executive committee shall appoint a committee of three to formulate a workable, harmonious plan for the organization of co-operative societies among producers; that said committee shall report at the earliest time practicable to the executive committee of the State Grange; that upon the approval of the plan by the executive committee, proper forms for the organization of co-operative societies shall be prepared and distributed wherever required for the organization of such co-operative societies; that the executive committee of the State Grange shall thereupon appoint a competent supervisor of co-operative organization work, whose duty it shall be to endeavor, through the subordinate and Pomona Granges, to accomplish the organization of co-operative societies throughout the state among producers; and further, that as rapidly as those co-operative societies can be organized, they shall incorporate under a law which will probably be enacted by the legislature at this session, giving to the members of co-operative societies the advantages to be derived under such law.

The committee further approved of the resolutions providing for the establishment of co-operative wholesale and retail markets in New York and other cities throughout the state, also for a state marketing commission to supervise the establishment of co-operative markets. The committee disapproved of the proposed appropriation of \$20,000,000 by the legislature for the establishment of co-operation among farmers. This report received the approval of the Grange.

COMING EVENTS.

Inter-county Pomonas.

Washtenaw and Wayne Co.'s at Ypsilanti, Tuesday, March 11.
Southwestern Michigan counties, at Kalamazoo, to meet Pres. K. L. Butterfield in conference on rural life, Friday, March 14.



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Protect your comfort and health absolutely in mud, water, brush, snow and ice, just as well as on good footing, no matter what your work is. I'll send you just the pair to fit you by Parcel Post on 10 days FREE EXAMINATION AND TRY-ON at my risk.

Then, if absolutely satisfied, you keep them and they'll save you from \$5 to \$20 "shoe-money" this year and probably more than that in doctor's bills.

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Wouldn't you like to keep your feet happy? Wouldn't you like to prevent the torture that bad feet always mean? Wouldn't you like to work in perfect foot-comfort; in shoes that fit all the time; shoes that can't get hard, dry or curled up; shoes that always keep their shape? And wouldn't you like to save \$5 to \$20 per year on the cost of your work shoes? You can do all this and more, simply by wearing my Steels.

Over 600,000 workmen know these things to be true. They won't wear any other working shoe. They are the actual, the living proof of Steel's true value. And what my Steel Shoes have done for more than half a million, they will certainly do for you.

How I Make Them

No others are like them. I invented them and they are patented and protected against dishonest imitation. Sold only direct from my factory to you at the low wholesale price.

Steel Shoes are different—better than any shoe ever placed on the market for the workman. The soles, and for an inch above the bottom, are pressed out of one piece of light, rust-resisting, seamless steel, corrugated at the bottom for extra strength, and studded with adjustable steel rivets for extra wear and for traction on slippery ground.

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Leather shoes break down in the arch, causing the instep to break also, and the result is known as Flatfoot—the most intolerable, uncomfortable, incurable disease that can happen to the laboring man's feet. If it hasn't happened to you, don't run the chance of it another week. Get my Steel Shoes right away on my liberal offer. If it has happened, my Steel Shoes will prove a double blessing to you.

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Dear Sir:—I would not be without my Steel Shoes. Every farmer ought to have a pair. Yours truly, JOS. LUNDBORG.

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