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Seeding Alfalfa with a Grain Drill

By C. H. BRAMBLE.

MY first experience in growing alfalfa, ten years ago, was not a success, due to the fact that I did not inoculate the seed or the soil. I secured a good stand of alfalfa on ten acres of ground that was in a high state of cultivation. On parts of the field the alfalfa seemed to thrive and investigation showed plenty of nodules upon the roots. On other parts of the field the plants did not thrive, looked yellow and refused to grow. Investigation showed there were no nodules on the roots of the plants. That the lack of growth on part of the field was due to lack of inoculation was proved by the fact that two years later I planted this field with corn for two years in succession, then reseeded to alfalfa. The following spring, without plowing the field this time, I secured a perfect stand and a splendid growth upon all parts of the field. On careful examination I found plenty of nodules upon the plants in all parts of the field. The thorough cultivation for two years had scattered the inoculation to all parts of the field.

My next experience in growing alfalfa was seven years ago and was a complete success. The following is the way I treated this field: The land was a heavy clay loam with clay subsoil, properly drained. This soil and subsoil had a large per cent of lime. This field prior to sowing alfalfa was planted to corn two years in succession with a liberal application of manure before each plowing. The third year the field was plowed early in the spring and thoroughly worked each week until June 15. This resulted in a firm seed bed with a fine surface mulch of at least two inches. To secure the inoculation for this field I went to my old alfalfa field that was thoroughly inoculated and took seven or eight bushels of surface soil, sifting the same through a quarter-inch-mesh sieve. This I mixed with an equal amount of a 1:8:2 fertilizer. This made it possible to sow the mixture with a fertilizer drill. The earth alone was too moist to be drilled. This mix-

ture I put in fertilizer sacks and handled the same as fertilizer. My fertilizer drill had an attachment to run the grass seed from the grass seed hopper into the hose of the drill. I set the seeder to sow six pounds of alfalfa seed to the acre, and 300 pounds of fertilizer. I then drilled the field the same as I would drill in oats or barley. In this way I put the alfalfa seed, fertilizer and inoculated soil into the ground together, depositing it on the firm seed bed, which was moist

ing in the field. The second picture shows the first crop of alfalfa on the above described field ready to be drawn, with at least three tons of cured hay per acre. I am satisfied we clip alfalfa entirely too much the first year. During the first year we desire to grow as large a root system as possible and this cannot be done without a good growth of leaf and branch. If it is necessary to clip the new seeding in order to destroy weeds it should be done only when the buds have started

Fourth, drilling in good seed with inoculated soil.

Fifth, do not clip the first season unless absolutely necessary to destroy weeds.

Lenawee Co. C. H. BRAMBLE.

An Unfavorable Experience with Drilling.

Several years ago when the writer was industriously trying to solve the problem of successful alfalfa culture on his own farm, a field had been prepared for midsummer seeding. This land was fertilized with stable manure and plowed rather late in the spring after the spring crops had been planted and time could be taken for this work. Unusually dry weather during June and July did not afford any favorable time to sow the seed by broadcasting and harrowing same in, by which method we had intended to sow it. By repeated harrowings all the weeds had been killed and a fine seed bed prepared. There was sufficient moisture to insure the germination of the seed if it was sown at the ordinary depth of drilling grain, and after waiting in vain for a good shower to produce favorable surface conditions for seeding, we finally concluded to take a chance on drilling the seed at a sufficient depth to insure its germination.

An ordinary grain drill was used for this purpose, with the hose pipes from the grass seeder run into the drill hoes. The seed was drilled about one and one-half inches deep, and the soil was not rolled after drilling. The seed sprouted nicely, but unfortunately for our experiment a shower occurred three or four days after the seed was sown and just before the plants reached the surface. This shower was just sufficient to form a crust over the surface, and was rapidly evaporated, leaving the ground as dry as before, but covered with a crust so hard that the great majority of the young plants did not succeed in breaking their way through same. Probably a light har-

(Continued on page 483).



From a Photo of Drilled Alfalfa Taken Three Weeks After Sowing.

the seed being covered at least one to one and one-half inches deep.

It was very dry at this season of the year and fortunately for me no rain fell for ten days. The result was that the alfalfa came up in six days. In three weeks' time it was from three to four inches high. The accompanying picture was taken of this field just three weeks from the day it was sowed.

I did not clip this field the first season as it was fairly free from weeds. It went into the winter at least one to one and one-half tons of alfalfa stand-

upon the crown of the plant. If clipped before this time it will injure the alfalfa nearly as much as it will the weeds. I have followed the practice of drilling in alfalfa with the inoculated soil and fertilizer for several years with universal success.

The following conditions I consider necessary to successful alfalfa culture: First, a large amount of humus in the soil.

Second, plenty of lime in the soil.

Third, a good, hard seed bed, resulting from thorough cultivation, and soil properly drained.



The First Crop of Alfalfa on the Same Field the Following Season, Yielding at Least Three Tons Per Acre.

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DETROIT, APRIL 8, 1916

CURRENT COMMENT.

The range of profitable investments for farmers is exceedingly broad, but among this large class of investments those which will prove most profitable and should first be made, are such as will tend to increase the producing power of the land or the earning capacity of the owner. Of this more limited class of investments, those which will increase the producing power of the land itself should properly come first. Land which needs better drainage for the production of maximum crops should be tiled; land which is in poor mechanical condition or low in available fertility should be stimulated by the addition of humus and plant food. A practical and prosperous farmer was recently heard to remark that these constituted the expenditures or investments for which any farmer is warranted in borrowing money, no matter what his present resources or financial condition may be.

An investment which is very nearly in this class is the purchase of good seed which, excepting only the factors of soil drainage and soil fertility has a greater influence upon the crop than any other one factor which can be provided with so small an investment. There are very many other things which fall in the same class, such as labor-saving equipment, implements designed to facilitate the best care of growing crops, etc. As above noted, when these primary needs are supplied, good investments for farmers are almost unlimited, and may include anything from comforts and conveniences in the home to so-called luxuries for the enjoyment of the family. All these things will be more quickly possible however for the man who realizes the importance of making needed investments which will increase the producing power of his land or his own earning power as a farmer.

At a market conference of agricultural publishers and business men held in Detroit last week, special consideration was given to the marketing of manufactured products to the farm trade. Of the many personal experiences given, that contributed by Mr. Moon, a notably successful merchant in a small Indiana town of only 300 inhabitants located about ten miles from the Michigan line, was the most remarkable.

Mr. Moon has succeeded in building up a trade of \$60,000 per annum among the farmers of his community. He has accomplished this by intelligent merchandising in which general and local advertising has been a prominent factor. Mr. Moon expressed a strong preference for the selling of known

goods or goods which are nationally advertised and have a general reputation among users for quality.

While most of his remarks were directed to the business men present, telling them things which they ought to know, in order to market their products successfully in rural communities, he touched briefly on things that farmers ought to know with regard to the manufacture and sale of the goods which they purchase. One of the chief things which he stated farmers ought to know which they did not generally understand, is that the purchaser of known goods or nationally advertised articles, does not pay the cost of advertising. He emphasized this by giving his own experience in having reduced his selling cost from something like 22 per cent to around 14 per cent, with an annually increased expenditure of more than \$1,500 for advertising. Mr. Moon explained to the satisfaction of his hearers that the increased demand for goods of merit which resulted from making them generally known through judicious advertising campaigns, reduces selling costs by an amount which not only pays for the advertising, but makes it a profitable investment for both manufacturer and distributor.

This opinion of a remarkably successful country merchant, who must have given exceptional service to the people of his community to have built up such a large business, will be profitable food for thought for every reader who has labored under the delusion that advertising cost is added to the price of the goods purchased, since there is no doubt that judicious advertising of meritorious articles ultimately reduces rather than increases selling costs.

In the last issue what is designed to be a general and thorough discussion of the milk inspection problem from all angles was opened by the publication of a talk on same given by Hon. George B. Horton at the Lenawee County Round-up Farmers' Institute. That issue also contained an editorial comment setting forth the reasons why this subject has not previously been opened for general discussion in our columns, the reasons for opening it at this time, and the broad basis upon which same will be conducted in an effort to aid the dairymen of the state in arriving at an intelligent conclusion as to what their future attitude should be, and what action they should take in the matter, both individually and collectively.

In another column of this issue appears the first article of the continued discussion of this topic by the editor of our Practical Science Department, who needs no introduction to our readers, and no recommendation as to his competence to write with the authority of both technical and experimental knowledge on this most important question. We bespeak for all of the articles which will appear in our columns upon this subject a careful reading by every subscriber who is interested in the business of dairying, to the end that the greatest possible benefit may accrue to the dairy farmers of the state from a full and frank review of the arguments pro and con as seen from every angle by leaders who are interested both in the advancement of dairy farming in Michigan and the safeguarding of the public health.

After a long campaign with that object in view a fairly adequate parcel post has been established in this country, and within its natural limitations has operated greatly to the satisfaction and profit of the people of the county, particularly the residents of rural communities, to whom it is an exceedingly great convenience.

When the present parcel post was established, the weight limit for packages which could be transported was made comparatively low, but power

was vested in the post office department to increase the weight limit of packages which might be transported by parcel post as might, in the opinion of the postmaster-general, seem desirable. Two such increases in weight limit have been made until the weight limit of parcel post packages at the present time is fifty pounds.

Since the enactment of the present parcel post law, satisfaction with its operation has been so general that no attempt has been made to directly alter its provisions. An attempt is, however, being made in congress to take from the post office department the power now vested in the postmaster-general to further increase the weight limit of parcel post packages. This provision is in the form of a rider so-called, incorporated in the general post office appropriation act in the form of a proviso that no parcel post package shall exceed fifty pounds in weight, which is attached to the clause of Section 16 of the above mentioned act relating to the parcel post service.

What disposition will be made of this proviso by the committees of congress having same under consideration cannot, of course, be foretold. As a matter of precaution it would be well for all Michigan Farmer readers who are interested in the further development of the parcel post service as conditions may seem to warrant to write their representative in congress and the United States senators from Michigan urging them to use their vote and influence against this so-called Madden amendment to the post office appropriation act, which seeks to limit such development of the parcel post service in the manner above noted.

The benefit to the roads derived from a seasonable use of the split log drag or any of its large family of near relatives in the line of road leveling implements has been so long urged upon the public, both from the institute platform and through the press as to make further comment along this line seem superfluous, yet in only a comparatively few rural communities has road dragging contributed anything like the benefit which might be derived from it. The weather conditions which have prevailed during recent weeks have been such as to make the roads bad everywhere and almost impassable in many places. The fine spring days which followed the breakup have caused the rapid thawing of the remaining frozen ground and promise an early settling of the soil.

The judicious use of the road drag at just this time will be of great benefit to the ordinary earth road. It will aid in the rapid drying up of the surface and the rapid removal of surface water from the spring rains, so that good hard smooth roads will be enjoyed weeks sooner than would be the case if such dragging were not practiced. In addition to this the roads will remain hard and smooth through the summer in places where deep mud holes would prevail during the wet season.

Highway officials should everywhere avail themselves of the opportunity to improve the earth roads by dragging at just the right time this spring. If they do not voluntarily discharge this duty, it should be urged upon them by interested citizens who have acquainted themselves with the benefits to be derived from the judicious use of the road drag at this season of the year.

HAPPENINGS OF THE WEEK.

Foreign.

The European War.—There was renewed interest in the attack on Verdun last week. German forces were successful in capturing Malancourt west of the Meuse river, and Vaux east of that stream. These successes have added to the advantage of the German positions and should aid them in the attacks on other Verdun forts. Efforts against the French line in the Champagne sector were not so successful. Along the remainder of the western front, engagements reported

have been small and of secondary importance. The position of the forces on the eastern front remains as a week ago. Russian successes in Asia Minor, where they are systematically forcing the Turks back from a long line reaching from the Black Sea into Persia, are being looked upon with additional interest because of the success of British boats in reducing the forts protecting the harbor of Smyrna. British forces have now practically completed the conquest of German East Africa, which is the last of Germany's colonies. Zeppelin attacks were made on London and other cities last week, and a number of persons are reported killed or injured. One of the Zeppelins was wrecked and forced to descend in the Thames river east of London.

Mexican Affairs.—The United States troops are continuing their pursuit of Gen. Villa into Mexican territory. Last week they had a skirmish with the bandits in which Villa himself was wounded and several participants killed. Villa escaped, however, and the race to capture him before he reaches the recesses of the Sierra Madra mountains is now on. The United States has been granted the use of certain Mexican railroads for supplying the troops now engaged on Mexican soil. The two aviators recently reported as missing have returned after a severe struggle in a storm. Gen. Diaz has landed in southern Mexico and is organizing an army for the purpose of attacking Carranza's forces. The provisional government has issued a mandate threatening merchants in Mexico City and nearby places for charging exorbitant prices for foodstuffs.

Chinese affairs are considerably disturbed by the political crisis resulting from a general lack of confidence in the central government. A short while ago arrangements by a representative body to change the present constitutional government to a monarchy were completed, but these have recently been thwarted through the refusal of President Yuan Shi-Kai to accept the role of emperor. He states it is impossible to do this, by reason of his oath to support the constitution. Last week Chang-Chow-Fu, one of the largest cities of China, declared its independence of the present government. To maintain peace Chinese officials requested an American warship to be sent to the district. This was done and marines landed to protect foreign interests.

The Russian government has decreed that Jewish hostages from Galician cities must be sent to Siberia, while other Jewish people from that country may choose places of residence anywhere outside the sphere of military operations.

Reports circulated that American Ambassador Gerard to Germany intended to resign, have been denied in a public communication in which the ambassador states that he feels it a duty to remain at his post until the close of the war.

National.

James B. Angell, president emeritus of the University of Michigan, died at his home on the campus last Saturday at the age of 86. For a generation Dr. Angell was one of the leading educators in the country. He was president of the U. of M. from 1871 to 1909, before which he was at the head of the University of Vermont. In the diplomatic service of the country he has been a prominent personality, having successfully negotiated treaties with China in 1880-1881, and with England on the Canadian fisheries in 1887. He was chairman of the Canadian-American deep waterway's commission in 1896 and minister to Turkey in 1896-1897.

Startling disclosures were made last week when Hans Tauscher, husband of the famous opera singer, Mme. Johanna Gadske, was arrested by agents of the United States department of justice on a federal warrant charging him with being concerned in a conspiracy to blow up the Welland Canal in Canada on September 14, 1914.

The failure of proper signalling of trains either through the impairment of the signal system or improper adjustment, resulted in a rear end collision at Amherst, Ohio, in which 24 persons were killed and 40 more or less seriously injured.

As the result of a strike by milk producers, who are dissatisfied with low prices offered by Chicago milk distributors, fully 500,000 quarts of milk are being fed daily to stock on Illinois farms. The distributors have a surplus on hand which will satisfy the trade for a few days, after which it is expected that there will be a shortage of milk in that city.

Two youthful Battle Creek aviators narrowly escaped death while flying in an improvised biplane near that city. The accident was due to a failure to properly adjust the machine to the weight of the two passengers.

Success with the Clover Crop

THE failure of the clover crop usually means that something is wrong with the soil or method of seeding. Lack of success is generally due to some feature under control of the man who, more than likely, was unfamiliar with the habits and characteristics of the crop.

A Germination Test is Important.

My experience with clover seed prompts me to give a little advice to those who contemplate seeding a large acreage. A few years ago we bought five bushels of clover seed of a responsible dealer and submitted samples to the experiment station for further examination. The two samples showed less than 60 per cent of germinable seed. It is needless to say we returned the seed to the dealer, who in turn sent it back to the seed house and received a new supply. Seed should be sold on a guaranteed test as to germination and adulteration. Two years ago we seeded 20 acres with seed of high germination test and prime quality. Although a severe drouth cut down the stand on many fields in this section, our crop made a good stand in the wheat and oat stubble. We use a microscope to examine the seed, and also test it for germination.

We make the germination test by taking two large plates, a piece of cloth that will fit between the plates, count two hundred seeds and place a cloth over the seed and put the plates together, wet the cloths with warm water, not hot water, and set them in a warm place. In a few days the seed will germinate. Then count the seed and the number of strong, vigorous sprouts and determine the per cent that have germinated. If the percentage is lower than 90 per cent it will be necessary to sow more than the usual amount of seed in order to secure a full stand. A little time and patience will enable one to determine with approximate accuracy if the seed is adulterated or inferior in germinating qualities.

Methods of Selling.

Our best results seeding clover have been secured by seeding the crop on wheat ground as early in the spring as weather conditions permit and covering the seed with a light smoothing harrow. This covers the seed and proves beneficial to the wheat crop. It also tends to encourage the plants to root deeper into the ground and to withstand a few days of dry weather after the wheat crop is harvested. On oat ground, plowed and hastily fitted, in the spring it is very difficult to establish a compact seed bed and the clover plants are less likely to go through periods of drouth without injury. If the oat ground is plowed the previous fall, and only two bushels of oats sown to the acre one is more certain to secure a good stand, than is the case when the ground is plowed in the spring and more oats sown to the acre.

On many fields it is useless to sow red clover on account of too much moisture or an acid condition of the soil. Drainage and the use of lime will usually restore such land to a condition to produce good crops of clover. If the land is not too wet and contains a large percentage of clay, one will find alsike more certain to make a satisfactory stand than the common red variety. On one of our fields there are several low places where we sow alsike after the field has been seeded with red clover. This helps to make a better stand and prevents the weeds from taking possession of the spots where the red clover does not thrive. We use some alsike in all of our mixtures and find that in many cases it has proven of much benefit in thickening the stand and insuring a larger crop of hay.

Lime is Often Required.

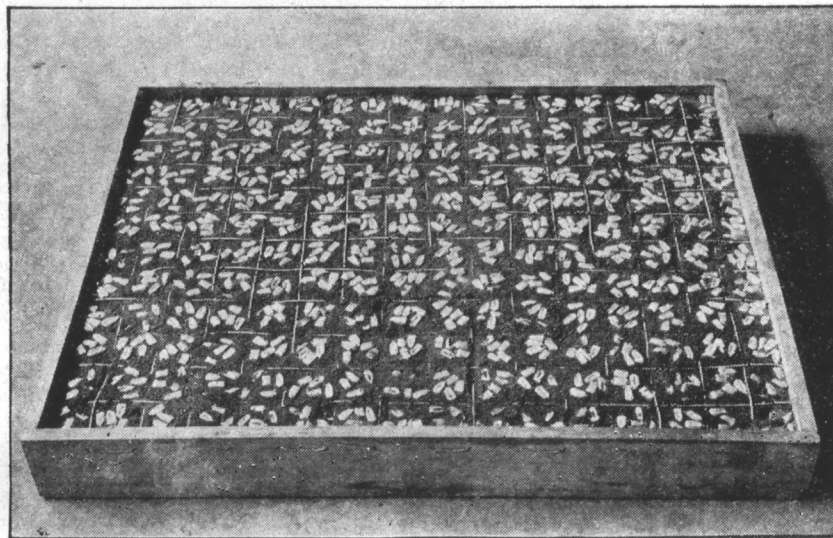
If the ground has become acid an application of lime will help to insure a

stand of clover. The best time to apply lime is in the fall when the ground is being prepared for the wheat crop. On account of the difficulty of securing limestone ground sufficiently fine to produce quick results we prefer the caustic or water-slaked forms. An application of 40 bushels of caustic or 50 bushels of water-slaked lime will be adequate to restore an ordinary soil to a condition sweet enough to produce good crops of clover. Never mix lime with fertilizer containing ammonia before applying it to the soil, because the lime tends to set free into the atmosphere some of the ammonia. Never add lime to acid phosphate or the mixtures containing this element, for such a procedure would result in some of the available phosphoric acid being changed to an unavailable form.

As a general proposition, I believe it is better to delay seeding clover until the weather has become settled in the spring. The practice of sowing the seed when the ground is frozen and relying on the spring snows and rains to wash the seed down into the ground is not my idea of proper seeding. If the work is delayed a few weeks and the seed properly covered, better results are likely to follow.

Plenty of Organic Matter is Essential.

Perhaps the most frequent cause of failure to secure a good stand of clover is due to a deficiency of organic matter in the soil. The best organic matter that may be used for starting clover is farm manure. This furnishes both organic matter and plant food. On farms where the soil is badly run down and is not sufficiently supplied with organic matter to get a good



The Germination Box, Properly Used, will Insure a Good Stand of Corn.

catch of clover, no better use may be made of the available manure than to apply it to the field either before or after seeding to this crop. One crop of clover properly handled will put the soil in condition to grow other crops without the addition of more manure. In this way one can gradually increase the acreage of clover that may be grown each year until a maximum acreage is obtained. Such a method is too slow for farmers who have a large acreage and keep only a few head of stock. On such farms the plowing under of green manure crops will add the necessary organic matter and put the soil in a good physical condition. On such soils the living processes that should be going on beneath the surface are dead. The decay of old life has stopped because there is no old life to decay—and decay must go hand in hand with life. Before one can obtain satisfactory results from the use of fertilizers he must go back to the first principles of nature and put organic matter in the soil—manure, green manure crops, weeds or stubble—anything organic—for the bacteria to seize, live upon, thrive and multiply. Without organic matter the use of chemical plant foods will prove inadequate.

New York.

W. MILTON KELLY.

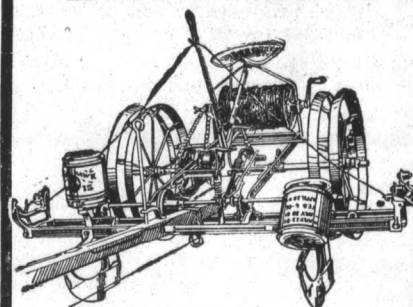
SOWING ALFALFA WITH A GRAIN DRILL.

(Continued from first page).

sowing at just the right time might have made the crop a partial success, but this was not resorted to for several reasons, first because where the seed did not get covered to the normal depth of the drilling, rows of the plants could be seen for a considerable distance, notably in the rows where the drill hoe followed the wheel which had previously packed the ground so that the seed did not get so deeply covered as in other places. Another reason for not harrowing the ground was that in the mellow soil the drill hoes had made quite deep furrows and the plants would have been covered to a still greater depth by such harrowing. Then, too, there was the possibility of more showers, which often occur once a drouth is broken. The result was that in a few scattering places there were short rows of healthy alfalfa plants, while on the balance of the field there was nothing. The ground was again fitted the following spring and a good stand of alfalfa was secured.

This one unfavorable experience caused the writer to abandon the sowing of alfalfa seed with the grain drill where midsummer seeding was practiced without a nurse crop. Where the seed is sown in spring grain, the seed is always sown ahead of the drill hoes with the seeder attachment to the drill. Since we have learned the essential requirements in preparing the soil for alfalfa which are so well stated in the above article, we have adopted this method of seeding alfalfa wherever conditions can be made favorable. Where the crop is to be sown

Black Hawk



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Plant Good Seed

EVERY pound, and every bushel of farm products raised on an acre of land up to a certain amount, has to go to pay expenses of raising the crop, including interest on investment, and taxes on the land. Every pound or bushel raised above that amount is profit.

The lesson is obvious, grow bigger crops. Now how are we to go about it? Farming is a science, not a lottery, for while to a certain extent the farmer is at the mercy of the elements in the production and harvesting of his crops, I have always noticed that no matter what the season may be, the careful painstaking farmer who applies this science (though perhaps doing it unconsciously) cleans up a good profit each year, season for season.

One necessary element of such success is good seed. If you expected to raise a good tree, or shrub, you would hardly set out a scrubby, spindling seedling. Now, go farther with this rule and apply it to your seed.

The larger, more vigorous seed of any form of vegetation, will produce larger and more vigorous plants than a smaller seed, and in the aggregate more pounds of produce. This is as true as is the fact that like begets like.

If we wish to raise a bumper crop of oats we will rig up the fanning mill, put on the proper screen and take off the big heavy kernels, letting the rest screen through and blow away. What is blown over is worth as much as ever for feed, or for sale for feed, and we have the choicest of seed.

Corn ripens later in the season, there is the ever present danger of frost damage to the seed, so where the seed is not selected in the fall it should be thoroughly tested in the spring as to germination.

There is considerable difference of opinion as to what is the best size in a seed potato. Everybody agrees the seed should be smooth and free from scab, but where the amount of seed planted per acre is as large as it is with the potato crop, it is quite an item in the expense, and there is quite a temptation to plant unmerchantable seed. However, it does not pay.

A word as to grass seed. Many farmers seem to look on the grass seeding as more or less of a lottery; if clover seed is high they sow scantily, filling in with more timothy, and they seem to think that somehow maybe they will get a good clover catch; if they don't they will have the season to blame. Anyhow, more or less wild grasses will fill and make a sort of a meadow. I think the meadow seeding is more neglected than any other portion of the farm work. Sow good clover seed, and enough of it every year, this should be one of the farm commandments.

This same rule applies to all farm crops, for every foot of land that has not a proper seed planted, is to all intents and purposes fallow, and takes some other foot of land to make up the deficiency.

Many farmers since elevators clean all grain sold, do not keep a fanning mill, this is a big mistake, as no farm should be without its fanning mill. Try this year to plant better seed and see if the effect on your crops is not a marked one.

Isabella Co. WM. J. COOPER.

LILLIE FARMSTEAD NOTES.

We finished sowing 60 acres to clover seed Friday, March 24. It was quite an investment to sow clover this year. We used on this 60 acres 11 bushels of clover seed and three bushels of timothy. However, no matter what the price of clover seed no one can afford to neglect to use it, for the only way to keep up the supply of organic matter in the soil is to fill it full of clover roots once during the rotation, and the shorter the rotation the better it is for the fertility of the land.

It is claimed that the ideal time to sow clover seed on wheat land is before breakfast on a clear still morning early in the spring, when the ground has frozen hard the night before, and when in all probability it will thaw that day and freeze again the coming night. The action of the frost will bury or cover the seed even better than can be done by tillage implements. On clay soil or clay loam that will "honey-comb" by the action of the frost this is certainly a good time to sow the seed, but on light sandy soil, many farmers claim they get better results by waiting until the land is dry enough to harrow, then sow the seed and harrow well. The harrowing helps the wheat, it is claimed, as well as covering the clover. On our land which is clay and clay loam, I am satisfied this is one of the best times of the year to sow clover seed and under my system of farming it is best to seed the wheat ground to clover. We are more sure of getting a catch than in any other way.

A good lively man with a good hand seeding machine can cover a lot of ground in a few hours. Many years ago when I first began operating a farm for myself, I read the late Mr. T. B. Terrey's book, "Our Farming," and in that book is a picture of Mr. Terry with his hand seeder sowing 20 acres of clover seed before breakfast. He began at daylight and finished in time for a seven o'clock breakfast. It is not a big job to seed 20 acres to clover if the ground is smooth and frozen hard.

But how is the dairy farmer to sow clover seed before breakfast, or even very early after breakfast? The cows must be fed and milked at that time and all the other chores must be attended to also. For several years I insisted that this practice be followed according to Terry. One man would go to sowing clover seed as soon as we got up and the rest of us would do his chores. That worked very well, only the system was somewhat disarranged. We had to change milkers, which is bad and never should happen if it can be prevented. We have to do this once in a while but don't like to. Then it always delayed breakfast and the women folks grumbled as it disarranged their work also. We have finally changed the practice and try to sow the clover seed a little earlier in the season, while the ground is permanently frozen, so a man can work during the middle of the day. Understand that, under ideal conditions, the land thaws out so much that by eight or nine o'clock it is too muddy to travel on the field. By sowing a little earlier in the season we get seemingly just as good results and not even the women folks are inconvenienced.

It is a splendid thing to have a little snow on the ground at the time of sowing. Too much snow would interfere with travel but a little does not and it does away with the necessity of setting stakes to travel by. A person can see his tracks and travel by them and do a good job. If the ground is bare and the wheat not very large one must set stakes and travel to them to get an even distribution. If the wheat is good and large and one sows the same way the wheat is drilled, many times he can follow the rows of wheat and thus do away with the necessity of setting stakes, which is not a pleasant job when the ground is frozen hard. But whichever way you do it, if you seed clover in growing wheat be sure and sow early before freezing weather is over so the action of the frost will cover the seed.

Only twice in the history of my farming have I lost a clover catch and then both times the seed was sown late, after the ground was thawed out. Once the land was not dry enough to harrow when we sowed the clover, but there was no freezing weather afterwards. And once we waited until the ground was dry and harrowed the land both ways. In both instances we lost the catch.

COLON C. LILLIE.

Farm Notes

Legumes as Nitrogen Fixers.

What is the comparative value as nitrogen builders of the soil, of alfalfa, sweet clover, mammoth, June and alsike?

J. S. J.

While all of the legumes mentioned are active in the fixing of nitrogen in the soil through the action of the bacteria which find a home on their roots by absorbing nitrogen directly from the air in the soil, their activity in this regard, other things being equal, will be largely in proportion to their root growth. The root growth of these various plants corresponds quite closely to their relative growth above the ground. Something, of course, will depend upon the place which these crops are given in the rotation.

The red clovers and sweet clover are of much shorter life than is alfalfa, which will not only supply most of its nitrogen needs through the activity of the nitrogen-fixing bacteria so long as the stand endures, but will naturally, because of this fact, leave a larger amount of nitrogen in the soil for the use of succeeding crops. On the other hand, where a crop is desired to be plowed down for green manure, sweet clover would probably fix a maximum amount of nitrogen through this same medium, and would at the same time furnish a larger amount of vegetable matter also rich in nitrogen to be plowed down and later converted into humus. On the other hand, where a short crop rotation is practiced, and where the soil is in a condition to insure the success of the common clovers, this will doubtless serve a better purpose in the fixing of nitrogen than any of the other legumes mentioned, for the reason that the bacteria peculiar to these species is already plentiful in the soil, and good inoculation is secured at once, thus insuring a maximum activity of the bacteria during the year in which the clover is given the use of the soil.

Inoculating for Alfalfa.

I would like to know if land that will grow clover will need to be inoculated to grow alfalfa? I have a field that I will sow to oats this spring and would like to seed to alfalfa. Will it be alright to seed the same as clover, or would it be better to sow a small quantity this spring to inoculate the ground and then fit the ground after oats are cut and seed again?

Gratiot Co. SUBSCRIBER.

On good strong land where there has been no previous difficulty in securing good stands of clover, it is very frequently not necessary to inoculate alfalfa in order to get a successful stand. The bacteria peculiar to this plant are likely to be present in any soil which has not become acid, though there is never any certainty that this is the case. The bacteria peculiar to alfalfa is not the same species as that which makes a host of the clover plant, at least it has a different habit of growth and frequently little, if any, inoculation occurs on alfalfa, even on soil which contains an abundance of the red clover bacteria, as practically all Michigan soils in a good state of fertility do.

The cost of inoculating is so small that it is always a wise precaution to at least inoculate the seed with a pure culture of the bacteria. On land that has given any previous trouble in the securing of a good stand of clover, there is every likelihood of the need of lime to make the soil a fit home for these bacteria, else inoculation may not prove successful.

On land which has never before grown alfalfa, seeding in a grain crop is not normally as successful as seeding alone without a nurse crop, at least unless the amount of grain seed used is less than a full seeding. The writer has had good success in seeding alfalfa with oats where not more than a bushel of oats were sown per acre, but better success on land which had been previously seeded to alfalfa. It would be better to mix the alfalfa and clover seed in about equal quantities, then sow about half more than would

be sown of clover. In case the alfalfa succeeds, this will be a sufficient amount to give a very good stand the second year after the clover becomes thin. If the alfalfa does not become well inoculated and make a healthy growth, there would still be sufficient clover to make a profitable crop, and the alfalfa which does survive will aid in inoculating the soil by nature's process, so that the next time the field is seeded, there will be a better prospect of success with this crop.

Plowing the oat stubble after the oats are harvested and sowing to alfalfa is an uncertain proposition, since success will depend largely upon the available moisture supply at that season of the year, which is, of course, an unknown quantity in the making of spring plans. Midsummer seedings of alfalfa should not be sown later than August 1 for best results.

Destroying Canada Thistles.

Can Canada thistles be destroyed by cutting, and putting kerosene in the hollow stem? If so, when is the best time to treat?

Muskegon Co.

F. L. W.

Almost any noxious weed can be effectually destroyed by applying kerosene or preferably gasoline, to the stem after same has been cut off just below the surface of the ground. This can be best applied with a common machine oil can, and is said to be effective in destroying almost any kind of noxious weeds. Such treatment would, however, destroy only the stalk to which it was applied, and probably would not be effectual in killing the root stalks of healthy Canada thistle plants unless same were applied comparatively late in the season when all of the plants had become normally developed, say about the time they begin to come in bloom. Often cutting at just the right time will discourage the thistle plants to a considerable extent, and if this treatment were given then, it would likely be more effectual. Where only a small patch of thistles must be dealt with, a more satisfactory way would be to cover the area with tar paper, so that the thistles could make no growth above ground, which would be effectual in killing them off in a short time.

SEED CORN TESTING.

The early frosts that swept the state last fall made seed corn a problem. A large number of farmers of the state did not make field selection; in fact, some farmers have no seed for this year's corn crop. Tests of seed corn for different parts of the state show that Michigan has very poor seed corn.

If ever corn needed the individual ear test it is this spring. This may be accomplished by the germination box. An ordinary store box three feet square and at least four inches deep, has all the requirements of a tester. This box should be filled to within an inch of the top with sand or sawdust and covered with a white cloth which is marked off with lead pencil in two-inch squares, which should be numbered. Or the box may be divided into squares with strings, as shown in the preceding illustration. It is desirable to leave the outside row of squares vacant, as they are most liable to dry out. The ears tested should have corresponding numbers. If the ears are on a seed-corn tree a number may be placed beside each nail.

Five or six kernels from each should be placed in their respective square. Each ear should be tested in the same manner until squares are all taken. Then the corn and sawdust, or sand, should be thoroughly moistened and covered with a dry cloth and on top of this a second cloth covered with sand or sawdust. This should be placed in a warm room for six or seven days. Care should be taken in removing the cover or some of the sprouts may be broken. Save only the ears from which all of the kernels have thrown vigorous sprouts and a good stand of corn is certain.

Tuscola Co.

CHAS. JENKINS.

Orchard Heating in Michigan

By GEORGE M. LOW.

PROTECTION against frost injury is by no means a new thing, although some recent writings and discussions would lead one to believe that it is. The protection of plants and fruits from frost injury dates back more than two thousand years. It was recommended by Pliny and practiced by the Romans. The French also practiced it in the sixteenth century and during the latter part of the eighteenth century it was compulsory in some parts of Germany. It was during the early nineties that the California and Florida orange growers were experimenting along this line. Up to date the California Citrus Fruit Growers have spent close to five million dollars, on the safe premise that an ounce of prevention is worth a pound of cure.

Every year more fruit growers of Michigan realize that their orchards are subject to damage by late spring frosts. This was brought out very clearly in my own case in 1913, when I lost the crop in one of my Dutchess orchards consisting of 1,640 trees. In 1911 this orchard produced a crop that sold for more than five thousand dollars, but in 1913 Jack Frost did the

the up-to-date instruments. There are several different electric alarm devices on the market, but to my mind they do not sound their alarm soon enough. I use the Cunningham frost predictor and by taking the reading at sundown, it is possible to foretell about how cold it will get during the night. If frost is predicted, you have ample time to notify extra help to be ready at a minute's notice.

The help proposition is an important one and should be treated as such. Three good men will light a thousand heaters in about an hour. In securing help remember this: it is a man's job and it is up to you to see that hustlers are secured for the purpose. Don't try to light the heaters with a bunch of old rags soaked in oil. The money necessary to purchase two or three automatic torches will be one of the most profitable investments in your entire equipment.

The proper time to start lighting the pots is not fully settled in my own mind. This year the College will carry on some very extensive experiments along this line. I will co-operate with them and next year we trust that we



Orchard Heating is Proving Profitable in Michigan.

harvesting. Realizing the same thing might happen in future years I thought the heating proposition was worth at least a trial. I wrote the Agricultural College and asked for information on the subject. The answer I received was somewhat discouraging. It stated that so far as they knew no one had tried it out in this state on a scientific basis; only one man had tried burning oil in pails but no satisfactory results had been obtained.

The Necessary Equipment.

After trying out several different makes of heaters, I purchased one thousand, and ordered six thousand gallons of oil suitable for smudging purposes. The heaters or smudge pots hold two gallons of oil and will burn nine hours without attention and can be readily extinguished any time by replacing the cover. A pot is placed in the center of every square formed by four trees, and were placed in alternate spaces in every row. This method sets fifty pots to the acre and leaves enough to reinforce the three outside rows all around the orchard. This is done so that in case the wind should blow slightly and carry off the smoke, extra protection could be given the trees on the windward side of the orchard.

The oil is stored in a large concrete tank which is located on a side hill. It is emptied into and drawn out of the large storage tank by gravity. This saves time and does away with a pump and, best of all, allows the water to be drawn out very easily. All oil, especially crude oil, contains some water, and naturally the water goes to the bottom. This point should be kept in mind by anyone who contemplates storing oil for smudging purposes because a small amount of water will cause the pots to boil over and render them useless until they are refilled.

When to Expect Frost.

Just when to expect frost is comparatively easy with the aid of some of

will be able to give the growers of Michigan some definite information on this subject. However this year I shall follow the same plan I have in the past. The thermometers are hung among the trees about five feet from the ground and when the temperature gets down to 31 degrees F. the pots on the lower ground are fired. On the start only every other row is lighted but should the temperature continue to fall the others are started as the occasion demands.

Get Reliable Thermometers.

If any part of the equipment is to receive or needs particular attention, it is the thermometers. Stop for a moment and think just what is at stake. Think of the returns a good crop of fruit will bring you, especially if your crop is saved when others are frosted. Get some good thermometers but don't be satisfied with the dealer's word that they are all right. Test them yourself and if any corrections are necessary see that they are placed on a conspicuous tag attached to the case so that a stranger could read the thermometer correctly. Have at least one thermometer for every five acres of orchard. You will also need two or three to place outside of the orchard where they will not be affected by the heat from the pots. Without these you will be unable to tell what temperature you will have to combat.

The Cost of Equipment.

Although I have seen but two years of service on the "Frost Firing Line," I am convinced that it is a paying proposition. Pardon a few personal figures and I will show you whereof I speak. The entire cost of 1,000 pots, 6,000 gallons of oil, instruments, storage tank and house for storing oil, heaters, etc., (the house is built on top of the tank), was in round numbers, \$600. Say we allow \$50 (this will more than pay it) each year for labor of putting the pots in the orchard, filling them and taking them out

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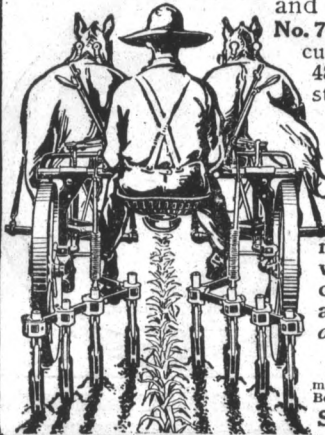
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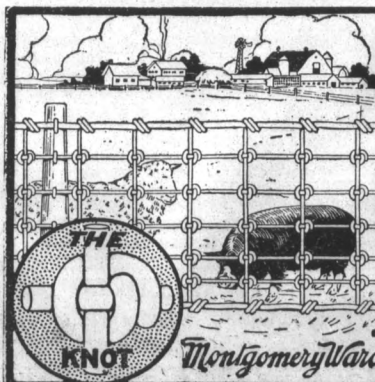
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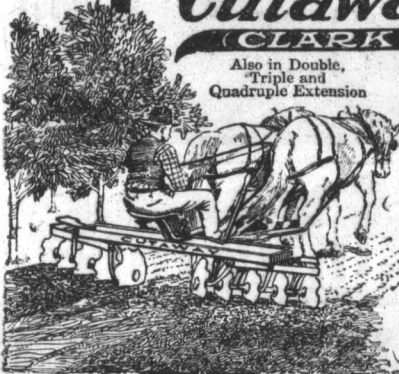
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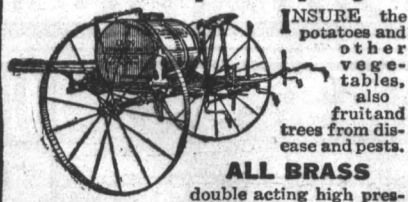
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when the danger period is over. All you could burn up would be the oil, and the cost of oil and labor would be \$260, (oil costs three and one-half cents per gallon). In my mind this is very cheap insurance. If you get through without a frost and get a crop you will not miss the money that is tied up in the equipment and if the pots save your crop and your neighbor's crop is harvested by Jack Frost, then certainly your verdict will be that it pays. I have successfully combated a temperature of 26 degrees and did not need to light all of the heaters.

Remember this, the frost comes in the still of the night and sometimes when least expected. I can assure you that it will pay you to be prepared to give it a warm reception. Have your smudge pots filled and ready to burn.

SPRAYING HINTS.

I have lost time and been annoyed by the use of a direct, or straight-ahead spray for small trees, currants and bushes, for in order to cover all sides we have to walk clear around each bush, so I took off the nozzle and put in its place an elbow. In it I have a short nipple and put the nozzle on the nipple. This throws the spray at right angles to the spray rod. By holding the rod at one side of the tree or bush the spray shoots into that portion, then swing the rod over the top and to the other side, keeping the nozzle faced toward the plant by a mere turn of the wrist and the whole plant is soaked while the operator stands in one position.

This scheme works well on trees but ten feet high where an eight-foot rod is used. The spray can be shot up under, into the sides and down from the top by simply swinging the rod and turning the direction of the stream. A direct right angle is the only turn that works out satisfactorily.

I find a piece of galvanized quarter-inch gas pipe very satisfactory for spray rods, of a length to suit the work. It is not expensive, not very heavy, and never gives out. On larger trees than mentioned above the direct spray is the only way. It is easy to take off the elbow and put the nozzle on the end of the rod when larger objects are to be covered.

To prevent the spray solution from dripping down the spray rod and wetting the hands, slide a short piece of rubber hose over the rod just below the nozzle. A piece one to two inches long is sufficient, and will turn the drip in ordinary work. In high trees, where the rod is held more upright follow this piece with a leather washer about two inches in diameter, then put on a second short piece of hose. Press the leather snugly between the two links of hose and no drip will run down the rod. Where bamboo rods are used an iron coupling and three-inch iron nipple can be added to the outer end of the rod to take the rubber hose and washer.

Allegan Co. H. H. HUTCHINS.

TROUBLE DEPARTMENT.

The Care of Peach Trees.

Kindly tell me how to care for peach trees. How deep should I set them? What time of year should they be trimmed? When should they be sprayed first time, and what should be used for spray?

Montcalm Co. K. C. C.

Before setting peach trees, all of the broken roots should be cut off and the longer ones cut back so that they are all about the same length. The tops should also be cut back quite severely, preferably to a whip, leaving it about three feet high.

The trees should be set a little deeper than they were in the nursery. Also make sure that the earth is firmly packed around the roots so as to leave no air pockets.

The best time to trim peach trees is early spring, and it is advisable to give them annual prunings. The usual practice is to cut out cross limbs and

weaker limbs. Those which are left should be cut back about one-half. In trimming peach trees, there are several things which should be kept in mind; one is to keep the tree well shaped, another is to use pruning as a means of thinning out the fruit buds, and still another is to keep the bearing wood of the tree as low as is practical. If one does not clip back the limbs which are going upward, the dense foliage of the tree will kill out the lower limbs, and in time the tree will have a spindling appearance.

For best results it would be advisable to spray the peach trees the spring following planting. The best mixture for this purpose is lime-sulphur which can be purchased in concentrated form. This should be used at the strength of about one gallon to eight of water, and should be applied early in March so as to control the curl leaf as well as the San Jose scale. In common practice this is all the spraying necessary. A few growers of fancy fruit are taking up the practice of spraying peach trees in summer with self-boiled lime-sulphur; however, it is a much disputed question whether the summer spraying of peach trees is of any practical value in this state. Should you be interested in this summer spraying, we shall be glad to give you further details upon request.

REDUCING MOLE INJURY.

When moles crossing a lawn cause long ridges of earth to rise over the grass, the injury to the lawn can be reduced by immediately raking all of the fine earth around until it filters down among the roots and does not hide any one portion of the grass from the sunlight. The hummocks of earth heaved up by the moles will soon kill the grass if they are allowed to remain and a lawn is soon ruined in appearance.

In a strawberry bed or garden of bulbs the moles often cause serious damage by burrowing the earth away from the plants. In cold weather the freezing air striking the crowns of the strawberries may cause them to winter-kill. This can be avoided by inspecting the beds where moles have been working and carefully pressing down the soft earth wherever the pests have raised it above the surface.

Moles may be trapped with the ordinary spring trap which spears the rodent. These traps may be set in the runs in the lawn or garden and they should be moved frequently as moles will often make new paths and not retrace the old ones where the traps have been set. Dogs will hunt moles and often catch them on soft ground but when the pests are ruining a lawn the spring trap is the only solution as the family dog will do more damage than the mole if allowed to hunt them indiscriminately.

Ingham Co. R. G. KIRBY.

TAR PADS FOR CABBAGE MAGGOTS.

Of the insecticides that are employed to destroy cabbage maggots, carbolic acid emulsion has generally been regarded as the most efficient. Tests with the emulsion with recommended strengths have demonstrated that it will prevent the hatching of the eggs and is fatal to the younger stages of the larvae. It may, however, cause injury to young seedlings and is not a safe remedy for the treatment of plants recently set in the field.

The value of tar pads, or hexagonal tar paper collars, for the purpose of preventing the adult of the cabbage maggot from placing eggs about the stems of the plants, has been previously demonstrated, but, in spite of its effectiveness, this method of protecting cabbage has not been generally adopted by truck growers. Tests made by the New York Station have shown that tar pads will protect early cabbage from the pest at a cost of about \$1.40 per thousand plants.

Saving the Young Pigs

More than three-fourths of the pigs which will constitute the pig crop from which pork is made on Michigan farms will be farrowed during the months of April and May. Of course, there will some be farrowed in March, but very many find that there are a good many chances to take on losses by several causes during that month. If the March pigs are saved at farrowing time there are many things with which they meet, and are liable to either die or be injured in a way to make it impossible to secure the best results with them. There is the danger from cold weather at farrowing time, for we know that on most farms suitable farrowing places are not provided, and the often repeated story like the following is heard: "I had bad luck with my pigs; they came on a stinging cold night, most of them got chilled and died, and what did live have not done well."

There are other things that take away the early farrowed pigs than freezing cold weather. If there is an abundance of straw in the nest the pigs crawl into it, get stepped on, or laid on, by the mother, and are killed. If foul bedding is allowed to accumulate the little pigs get filthy moisture on them, they are too warm some of the time, and during cold nights they catch cold, have a cough which lasts them a long time and often destroys them. If they remain in the nest a good deal, which they are likely to, they get fat, become tender, and dur-

are too logy and do not handle themselves well; get on the pigs and are too lazy to get up to save them.

Important Factors of Success.

When the pigs are due to arrive, which is just 112 days, or sixteen weeks, see that everything is in readiness. If there is considerable space around the nest fence it in to prevent the pigs from crawling away from the sow, which they do sometimes if there is room. Better use a few pieces of boards than to take any chances on losing a valuable pig or two.

After the pigs have arrived do not be in a hurry to crowd the sow with feed. A little lukewarm, sloppy feed can be given as soon as she manifests a desire to eat. Feed lightly for 24 hours. Do not be in a hurry to get the sow back to full feed. When the pigs are small, during the first week, they do not draw heavily on the sow, so increase the feed gradually for a week or ten days, then watch her requirements as to amount of feed needed and meet them. A sudden increase in heavy grain feeds will cause a fevered condition of the sow, which will be felt by the pigs, and may cause the loss of a part of the litter and sometimes the whole of it.

Keep the quarters clean. Take all the filth out of the nest each and every day, and replace with dry straw. Give the pigs pure air and sunlight as soon as possible. Handle the pigs a little while they are small and they will not be afraid of you afterwards.



A Pair of Good Brood Mares will Keep the Horse Stock Good.

ing a cold wave, catch cold, get inflammation of the diaphragm, have what we usually call "the thumps," and die. In the hands of the average pig raiser, pigs rarely recover from the thumps.

The First Thing to Do.

When the sows are expected to farrow soon, one of the first things to do is to provide a suitable place for them. Make the quarters comfortable by preventing possibilities of draughts of cold air, and be sure that there is not much space above the back of the sow when standing in the nests. Cold air coming down from an open space above the nests kills more young pigs than any other one condition in cold weather. Better make a false cover over the nest than to lose the pigs.

Do not use too much bedding. A moderate amount of dry wheat straw, put in the nest a few days before the pigs arrive, will get packed down and broken up so that the pigs will not get tangled in it. Never use oat straw with which to bed pigs; it takes up a good deal of moisture and is poison to them even after they have attained a considerable size.

Prepare the sow for the ordeal by feeding some laxative food. Be sure and avoid a constipated condition of the bowels. The frenzied fits in which the sows eat their own pigs are almost invariably caused by constipation. Put a little salt in the sow's sloppy feed for a few days before farrowing. Do not feed heavily at this time; give just enough feed to satisfy hunger. If given too much feed they

The success in saving the pig crop depends very much on the man attending to the sows at the critical time of farrowing and while the pigs are small. If he has a liking for the business and has good judgment he can succeed. If he can realize that the profits of the business the coming season depend on how he does his work at this time, and has a just appreciation of the necessity of sacrificing self in way of labor, and sleep, perhaps, for a time, he can, and undoubtedly will, succeed.

Pigs at the present time, are jewels of great value. It is worth the while to do all that can be done to save them.

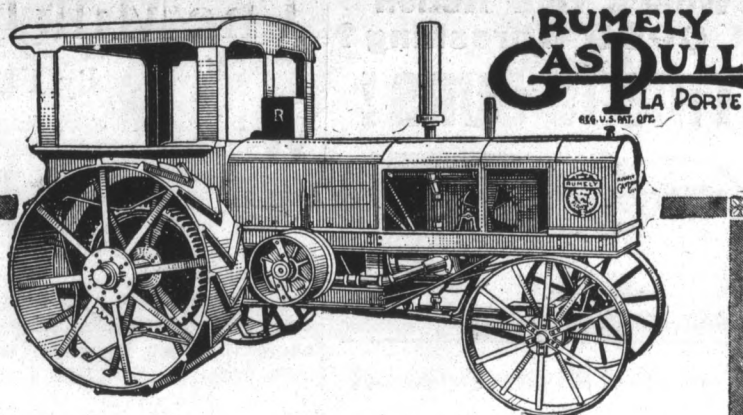
N. A. CLAPP.

Sheepmen complain that some of the big packing firms have been active bidders for lambs and sheep recently in feed lots and feeding stations, their sole object being to obtain flocks of fat live muttons at less than open-market prices by eliminating competition as far as possible.

Large supplies of prime Kansas fed cattle have been marketed in Chicago during recent weeks. Horace Thompson, of Kansas, marketed there a short time ago two carloads of fancy Hereford steers of his own feeding which averaged 1,453 lbs. at \$9.95 per 100 pounds.

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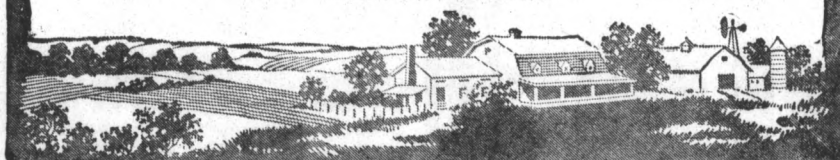
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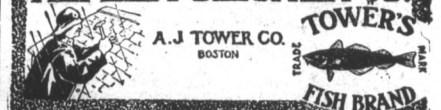
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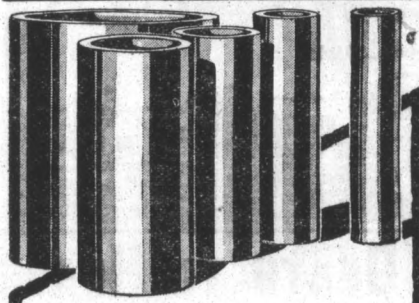
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The Milk Inspection Problem

By FLOYD W. ROBISON

WE have been exceedingly curious to know how long dairymen would consent to some of the methods in practice in the inspection of milk before they would stand up and demand for themselves some real consideration.

We have discussed through these columns from time to time, our ideas as to the way in which the market milk problem should be handled. We have suggested repeatedly that the legislature should be importuned or the government petitioned to appoint a commission of competent men to inquire into the methods of producing and marketing milk which goes into the city milk supply, with the idea of advising the legislature what steps should be taken to secure a uniform treatment of the dairymen throughout the state, to secure a high-grade article of food for the consumer and to eliminate the very frequently arbitrary rulings and inspections of different boards of health and different government officials and to make the business of dairying a business worth while to the farmer.

The Record of the Legislature of 1905.

It seems strange to me that this consideration has been withheld so long. Influenced by its appreciation of the extent of the dairy industry in this state and its enormous possibilities for the betterment of the farmers of the state, the legislature of 1905 went on record in one of the most unique manners of any recorded example, in making it the duty of the State Dairy and Food Commissioner to foster and encourage the dairy industry in this state. Many members of that legislature were personally aware of the enormous influence for good which the dairy industry has upon the people of the state. Many sections of the state lay their present flourishing condition entirely at the root of the dairy industry. In many sections the farmers' only cash income is through the medium of the dairy business, and if we were to take a poll of individual farmers throughout this state we would find an overwhelming sentiment testifying to the importance of this industry to the business of farmers in general. The dairy cow has been the mortgage lifter on many and many a dairy farm, and we are not compelled to go to the farming districts to appreciate that indeed, the dairy cow is, as it were, the foster mother of the human race.

Let the milk supply be cut off for a day or so and how clearly it is felt within the confines of the city. The consumers owe quite as much to the producers of milk, indeed, as the producers owe to the consumer, and it is extremely important that these relationships be inter-dependent and should be handled by men who know and men in whom the people have confidence.

Qualifications of a Milk Inspector.

The selection of a city milk inspector, as he is considered in some quarters, is a matter of as great importance really as the selection of any other officer in the city government. A man who knows how to test milk is not by that knowledge alone, competent to become a city milk inspector; a man who knows how to produce milk on a farm, is not, by that evidence alone, competent to become a city milk inspector; and the man, regardless of his other qualifications, who is at all imperialistic or autocratic in his ideas is much less than either of the first mentioned fitted to fill the office of city milk inspector.

The farmers of our country are perhaps, if anything, the most independent class of people we have. What they obtain in the way of financial return is obtained in a way in which they exactly know. There is no spec-

ulation with them. It is a matter of hard-earned and well-deserved compensation, and for any individual no more a citizen than he, possessed of no inalienable rights, to tell him what he must or must not do in the regulation of his business, can never fit into the administration of a business which requires the giving and taking to the extent that the business of producing and marketing of city milk demands.

The Issue is Raised by George B. Horton.

We have read with much interest and with deep appreciation, the address of the Hon. George B. Horton, on the "Modern Idea of Dairying," as given at the Lenawee County Round-up Farmers' Institute, and published in the last issue of the Michigan Farmer. We said at the beginning of this article that we were surprised that these matters were not more forcibly inquired into and that it had not been done before. We think all of our readers will agree that when inquiry is made by a man of the standing and undoubted integrity of Mr. Horton, it bespeaks a real awakening in the minds of the dairymen and a determination to see if this business of dairying cannot be put upon a plane where a man can engage in it and hold up his head with the consciousness that he is engaging in a legitimate and profitable business.

There is only one way that we can see, only one line of action which seems to us will accomplish our results. The legislature of 1905 started in the right direction, by providing an executive department of this state with power to do things which should be done, and which a sincere officer finds must be done to develop and foster and encourage an industry which the chosen representatives of the people of the state realized, is essential to the permanent welfare of the state.

The Problem Requires Competent Non-partisan Deliberation.

We must go farther than this now. The question of what should be done to remedy the evils which have repeatedly and steadily grown upon us is in all probability beyond the ability of one man to correct. This is the function of the legislature and we are not anxious that a legislature by itself should attempt to decide what should be done, what laws shall be passed, what laws should be changed, to bring about a harmonious result and to bring about the highest degree of perfection in the quality of the products produced; because political discussion has brought us probably as far as we can go by that means. The members of the legislature have not time to devote to this investigation but there should be at their command, through their own instance or through the governor's, a concise resume of the deliberations of a committee of competent men who have proposed a feasible scheme which should govern all over the state. The dairyman supplying milk to the city of Ann Arbor, the city of Howell, the city of Kalamazoo, the city of Lansing or any other community should be governed by exactly the same conditions which confront the dairymen who supply milk to Detroit, Grand Rapids and our other large cities. It should not be within the power of a board of health of any city to impose conditions arbitrarily, or conditions which are not warranted by good judgment on any business, particularly a business of the far-reaching importance of the dairy business.

Let us be Frank with Each Other.

Our readers know that these columns have never been used to stir up antagonism between the farmer and the city inspector, or the consumer. In our discussions before farmers' organizations, instead of telling them their

good points or how much they have been abused by city organizations, we have told them in plain language the responsibility which rests upon them in their dealings with the consumer. We have told them the consumer's side of the story in the effort to get them to appreciate the consumer's point of view, and the consumer's problem, so that while they are thinking over their various grievances there will be at hand, to think of, some information regarding the consumer's problem and his interests. In talking with city organizations, executive officials and consumers, we have spread before them the many difficulties which the farmer finds in the way of producing the dairy product which he does submit for the consumer's approval. Nothing can be gained, nor progress made, in talking the dairy business to consumers and producers from the standpoint of the politician. His effort is to please for his own ends. Our efforts must be to achieve positive results through an acquaintance by the producer and consumer, each with the individual problems and points of view of the other.

Scientific Dairying has had Many Able Advocates in this State.

For the past forty years and more, prominent men of this state have been going up and down, in and out, advocating the installation of scientific methods of farm and dairy management. The idea of cleanliness in the dairy is not a new idea. Farmers have been taught the modern methods of milk production; have been taught the methods by which milk becomes contaminated and hence an inferior article of food. They have learned about bacteria and know, more or less in a general way, how these germs affect, for good or evil, the product which they produce. There is no difference of opinion among farmers at the present time as to the desirability of producing clean milk; there is no denying the fact among them that consumers have the right to demand clean, high-grade milk. It requires no argument of executive officials to convince dairymen of this fact. We may safely start with this premise but in so doing we should bear in mind that we must expect to find the dairyman's first interest must necessarily be in the remuneration which he is to expect from the business in which he is engaged. There is no need of avoiding this point. There are very few commercial businesses that are built up and operated devoid of the financial considerations as the first consideration. This is natural. Why should it be expected less of the dairyman than of a physician, a business man, a lawyer, or, if you please, an executive officer?

Each one has his clients' interests at heart, but with that greater degree of satisfaction will he enter into it if he realizes that he will secure adequate pay for his services at the same time.

The Business Must be Made Worth While to the Dairyman.

We must not allow our enthusiasm in the securing of a merchantable, safe milk, blind our eyes to the fact that this can never be a successful proposition until we have returned a financial consideration of sufficient magnitude to let the dairyman realize he is engaged in a profitable business.

There are men in this state who own and operate successful modern dairies, who know as much about milk and its various by-products as is known by the most competent authorities in the country, who have not been able to market their milk on the city market because they would not submit to the dictates of what they called arbitrary executive officials. The state law should take this matter in hand and provide a uniform, and we would have it rigid, statute for city milk.

Our next issue will take up more in detail the ideas which we have here presented in a general way.

Is the Dairy Farmer Making Good?

By W. MILTON KELLY.

IS the dairy farmer making good? The common notion, especially in milk producing communities, is that he is not, that as a business man he is a practical failure; that the feed dealers and the big milk companies find it easier to separate him from his just profits than to take cream from fresh milk with a modern power separator. For many years it has been claimed that after settling his accounts at the feed dealers and country store the milk producer had very little money to show for his year's business.

Once this question of whether a man can invest in dairy cows and equipment and make it pay profits would have been promptly answered in the affirmative; today some of the best posted farmers in the milk producing business will tell you they don't know. Under the spell of modern agricultural enthusiasm many thousands of capable farmers have installed excellent dairy plants—just plain buildings, equipment and good grade cows—not fancy dairy establishments with an absurd overhead expense. How many of these men have succeeded in producing a suitable quality of milk and found a ready sale for it at remunerative prices?

Can Dairying be Made Profitable?

These men had the idea that the harsh and disagreeable features of dairy farming had largely disappeared; that dairy farming was a sadly neglected and undeveloped business where the application of plain business brains would bring a rare and beautiful harvest of profits. But after a few years' experience with crop growing, cow feeding and getting along with hired labor, they have now discovered it costs several cents per gallon more to produce a gallon of quality milk than they can get for it from the city milk companies, creamery companies or condensaries. These are the men who are debating the question: Has a practical business farmer with expensive land, good buildings and equipment, a fair chance to realize a profit from an investment in the dairy business. And some of these men are debating the question with a seriousness that demands a fair and thoughtful answer—one on which they may, perhaps, take definite and practical action.

Not long ago a practical fruit grower, who owns 40 acres of pear and apple orchard and 120 acres of farm land, put the question to the writer: "You have had twelve years' experience operating a dairy farm, and spent considerable time during the past five or six years going about the country investigating dairy conditions, talking with breeders of registered dairy cattle, producers of certified milk and farmers who have made a success and done things a little out of the ordinary. What about the dairy business as a complement to the fruit growing business? Would you advise me to invest in good buildings, equipment and dairy cows and produce a few cans of milk a day so that I can keep my two regular hired men busy during the off seasons? Or is it true that one must be a born dairy farmer and raised among cows to make a success of it? I have about 120 acres of farm land, worth, perhaps \$7,000 that is barely paying operating charges, and I want to get it in shape to produce crops to work into manure for my berry and bush fruit plantations. I've a notion that by using fertilizer quite freely to grow general farm crops that I could use, at least, a half of the manure for my berry and bush fruit crops. Then, too, I want to keep my steady hands and provide them with profitable labor during the year so long as I am able to exercise ordinary executive ability. Besides I have a kind of desire to get into something that will keep my mind busy and not stagnate around the house or country store during the win-

ter months. In your investigations you must have found many farmers who have developed dairying as a complement to other branches of farming. How have these men started and how have they succeeded? What would be my chances of success, allowing, of course, that I use an ordinary degree of intelligence and back it up with the capital needed to get things in running order? How much should I make from 20 to 24 pretty good cows. I can sell my milk for 16 cents per gallon for the year. You don't need to tell me it all depends upon the man and the farm. I know that at the start. Don't dodge the issue and play safe on the personal equation argument—just get down to brass tacks and give me a fair, straightforward answer to the problem of making the business pay. I want to know how and why."

Dairy Business Must Grow to be Profitable.

In about six years of study and investigation, covering some of the most prosperous dairying sections of the country the one observation that stands out clearest of all is the fact that so many farmers fail before they get properly started in the dairy business; they get discouraged because they never get far enough into the business to make it a serious undertaking. They start small and they do not grow. They do not figure the profit per cow so much as they figure the gross income. It does not appeal very strongly to a man to make \$10 to \$20 profit per cow on six or eight cows unless he is of a deeply investigative turn of mind and can see in those results possibilities of profit on a larger number of cows. To make a profit of from \$15 to \$30 per cow on a herd of from 24 to 30 cows sounds better. One should keep enough cows to make the business a really serious undertaking, one worthy of a serious effort, the income from which will be sufficient to make it worth while. Of course, if one knows nothing about cows he may get some valuable experience by dabbling with a few cows for a year or two. The point to be understood is that it is not necessary in these days to go through all the preliminary stages of investigating and experimenting for oneself. The sooner the new dairy farmer begins keeping enough cows to consume his home-grown feeds and keep his hired hands pretty vigorously busy throughout the year, the better for his ultimate success as a dairy farmer.

The Kind of Cows to Select.

After the farm is properly equipped to comfortably house and accommodate a working dairy, the next thing which confronts the dairy convert is the selection of cows. One may buy young stock or a few old cows that have proved good breeders and producers, at less cost than good, young cows, but for the man who desires to become a real dairy farmer—the most economical way is to start by securing a herd of efficient, young cows, either high-grade or pure-bred. You are getting something for your money when you get a good young cow with a credible milk record. You eliminate risk, depreciation and uncertainty; and you get a fair start toward making the business pay. Here, again, you must be careful. Do not think that a cow is a cow and that anything will do. You will find that it will pay handsomely in the end to buy cows that have the ability to produce economically as well as abundantly.

The question of how much money to pay for a cow is important. It is not merely a question of how much the cow costs, but of how much she will produce. It is better to pay \$100 for a cow that will make a net profit of \$50 a year than to pay \$50 for one that will make a net profit of only \$10. Too much has been written of late

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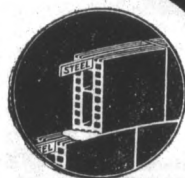
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With West Bend Automatic Swinging Stanchions you can lock up or release 2 to 50 cows at one throw of a lever as easy as you can operate one stanchion with other equipment. This is only one of the many valuable, time-saving, labor-saving features of West Bend Equipment.

The West Bend line includes Steel and Wood Stanchions (automatically and individually operated), Feed and Litter Carriers, Watering Bowls and complete systems. Write today for free catalog showing entire line. West Bend Barn Equipment Co. 266 So. Water St., West Bend, Wis.



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BARN
EQUIPMENT

SANITARY Milwaukee CREAM SEPARATOR

WHEN your herd grows you don't need to buy a new separator, if you use a Sanitary Milwaukee. Simply get a larger capacity bowl. If you have only a few cows, the 500-lb. bowl will fill the bill—as your herd grows the 750-lb. or 900-lb. bowl will take care of your requirements. It's the only separator made that "Grows with the Herd."

Gets More Cream With Half as Many Discs

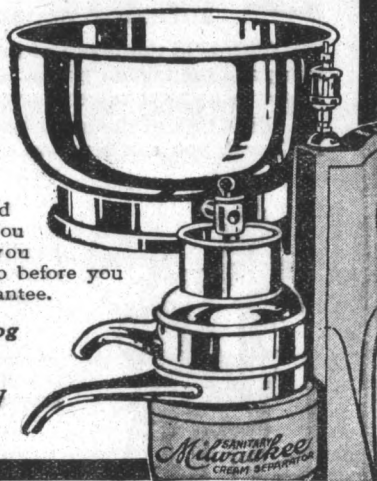
The skimming bowl in the Sanitary Milwaukee is a wonder for quick, easy, clean skimming. The discs are made of rust proof aluminum. Because of their tapered thickness and the proportional feed slides, the Sanitary Milwaukee does better work with only half as many discs as in other separators. The discs are **not numbered**. Put them on bowl core in any order. There are no holes or pockets to catch and hold impurities. The smooth aluminum discs are as easy to wash as a coffee cup, no trouble at all to thoroughly clean—not **merely rinse** them.

Certificate of Test With Every Outfit

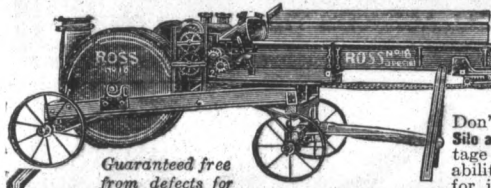
Every Sanitary Milwaukee bowl is tested with whole milk before it is shipped. You get a sworn certificate of this test—you know exactly what **your** separator will do before you buy it. You also get an iron-clad guarantee.

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ROSS Ensilage Cutters and Silo Fillers with Blower



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Special Proposition for Early Orders

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A complete line at different prices. Strength, easy to operate, safe and simple locks. The best of materials are used in all models. Wood, or steel with wood lining. They are Adjustable to Small Calf or Large Cow

We also make a complete line of Steel Stalls for cattle or horses; Water Bowls; Cow, Calf and Bull Pens; Feed Trucks and 26 styles of Carriers. Ask us about Stanchion No. 3—it's a winner.

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MITCHELL STANCHIONS

STEEL
STALLS

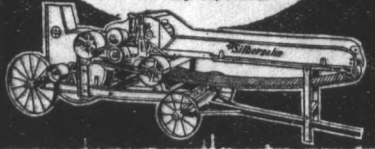
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Raise your calves and get the bigger money to which you are entitled. But do not feed the calf whole milk, with butter fat worth \$600 a ton.

You can sell all the mother cow's milk or butter and make your calf pay you a big profit on its feed, by raising it on

Blatchford's Calf Meal

The Recognized Milk Equal
You get 100 gallons of rich milk feed from 100 pounds of Blatchford's Calf Meal, and it costs you only one-fourth as much. It will make your calf grow fast and well. Blatchford's Calf Meal is composed of the elements the young calf needs in the most trying period of its life; is thoroughly steam cooked—prevents bowel troubles and other ills due to improper milk substitutes.

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Can any Blatchford's Calf Meal will pay anyone 100 Pct. Chaff his calves to raise it

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WITH
**BLATCHFORD'S
CALF MEAL**

a cow that cost only \$50 has proved to be worth \$100. And there are many cows for which \$100 has been paid that have been worth only their value for beef.

Breeding up the Herd.

In these days of wonderful milk records dairy experts and dairy writers are telling us how easy it is to breed up a herd of cows that will produce an average of from 12,000 to 14,000 pounds of milk per cow per year. The general advice is to buy a pure-bred bull from a line of heavy milking ancestry and of a breed adapted to the farm and type of dairy farming one is following, grade up the herd, sell the strubs, and run the business so as to make money selling milk at three and a half cents per quart. All of this advice makes good reading and probably inspires the masses. Theoretically, it is the short cut out of the dilemma, but only a few have found it the practical route. Figuring on the cost of producing milk should be based on what happens on the average, and not what some of the best cows in the herd produce.

Acting upon the belief that discretion is the better part of valor after making a bold statement the writer is going to throw the burden of proof upon a man who is in a position to defend his statements. Let us study a bulletin from the Storrs Experiment Station giving the results of the Connecticut Agricultural College herd for five years, together with some of Prof. J. M. Trueman's remarks.

"The college herd consists of Jerseys, Holsteins, Ayrshires and Guernseys. It contained 25 milking cows on the average for five years included in the records. The cows have virtually been raised on the college farm. Only four were bought in the five years, and only one of those remains in the herd today. Well-bred bulls have been kept and a constant effort has been made to improve the herd by breeding and selection. Most of the increase in milk flow, however, has come by better feeding and care rather than from better cows. A careful study of the animals in the herd at the present time, compared with those in the herd five years ago, shows that the individuals are not much improved.

Results of Breeding Work.

"This is a distinct disappointment to those who have charge of the breeding. It was hoped that enough good calves would be born every year to keep on increasing the average milk yield to seven and then to eight and possibly nine thousand pounds per cow. It has been found possible to increase the yield from 5,000 to 6,000 pounds without much trouble, but further improvement is slow. A large number of the heifers born fall below that standard and must be discarded. This adds greatly to the cost of maintaining the herd."

My own experience, as well as that of many milk producers with whom I have compared notes, leads me to say that the Connecticut figures approximate the results obtained by practical dairy farmers who have purchased pure-bred bulls and attempted to build up their herds. The first crop of calves from the pure-bred dairy sire almost always show a vast improvement, and by the continued use of prepotent sires of the same breed it is possible to gradually increase the average production of the herd until the cows, if well fed and given proper care, will yield somewhere between 7,000 and 8,000 pounds of milk per year. Of course, certain individuals will produce far above the average, while others will, for various reasons, such as abortion, accidents, or inferior capacity, fall far below that average.

Breeding Pure-bred Cows.

Provided a man has the time, inclination and necessary capital it may pay him to add another string to his money-making bow and buy a herd of pure-bred cows and gradually develop that phase of the business. The experience gained by working with a small but select lot of pure-bred cattle,

in connection with his milk producing herd, will prove of great value and by the time he has enough pure-bred cows to make up a working dairy he will be able to conduct the herd so as to make it pay satisfactory profits. It is always better to go into the business on a moderate scale and learn to creep before you attempt to walk. Breeding pure-bred cattle is quite an undertaking and one should know cows from A to Z before he invests too liberally in foundation stock.

After getting together a herd of efficient cows, either grade or pure-bred, the next problem is that of providing an abundance of good feeding materials. A careful study of crop production on dairy farms shows that the cow that produces only 4,000 pounds of milk per year is no more to be reckoned with than the acre of ground that yields but 30 bushels of corn in a season. When they are both found on the same farm conditions are doubly bad.

Dairying and Farm Management.

Every acre should be made to contribute something toward the support of the business. The two most vital questions before the dairy farmers are feed and fertility. These two questions are so closely related that they should be considered together, for the more fertile the soil the larger the crops, and the more cows can be kept and the more manure can be made. The growing of suitable food crops for the dairy herd carries with it the idea on intensive practice, an increase of soil residues, and a gradual building up of the soil. The need of a wider growth of suitable forage, grass and grain crops is shown by the tendency on the part of dairy farmers to neglect their farming and purchase protein concentrates. In too many cases the soils are not improving; they are growing too little and buying too much both of feeds and fertility. To buy standard protein feeds such as cottonseed meal, oil meal, gluten, brewers' and distillers' dried grains is entirely proper. The great economic fault is that of buying too much, both of feeds and fertility, that should be produced on their own farms. This kind of farming does not require much skill, neither does it pay much profit. Unless a man is willing to study the crop growing problem and grow as nearly as possible a balanced ration of suitable feeding materials on his own farm, he had better not invest in dairy barns, equipment and cattle.

The Crop Rotation.

In adopting a crop rotation for the dairy farm, corn, oats, peas, clover and timothy are the best rotation crops in a northern climate. Alfalfa is without doubt the best forage and fodder crop and it ought to have a place on every dairy farm where it will grow successfully. On many farms soy beans should be grown to put in the silo with the corn crop. It improves the protein content of the silage and helps to reduce the use of purchased concentrates.

Thousands of dairy farmers have made their farms pay a profit by growing a cash crop of high market value in the rotation practiced in growing food for the cattle. Potatoes, wheat, beans and timothy hay are the most common crops—others grow fruit and truck crops. On a large number of farms the growing of these crops has nearly doubled the labor income and reduced the labor and teamwork charges against the dairy end of the business more than 40 per cent. This explains, in a measure, how it is possible for many dairy farmers to lose money on their milk business and still make a comfortable living from their farms. The man who has a good apple and pear orchard and other small fruit plantations and 120 acres of reasonably fertile land should be able to develop a profitable dairy business and keep production costs lower than one who has only one source of income. The purchase of a liberal amount of fertilizer to encourage the growth of

about the high prices of cows and too little about their ability to produce economically. The buyer should know the quality of the cows he buys. Many the rotation crops would undoubtedly help to get the system well started so that in a few years considerable of the manure could be used to advantage on the berry and small fruit plantations. In case the manure is used for the fruit crops one should not charge the dairy business with the cost of fertilizers used on the farm lands.

With a herd of from 20 to 24 good cows and by keeping them on high pressure one should be able to produce 56 gallons of milk daily during the year which, at 16 cents per gallon, would give an income of \$3,300 for milk, and perhaps, \$100 for the young calves. From this we must deduct \$1,200 for purchased grain feeds, fertilizers and seeds; \$225 depreciation of stock; \$400 interest on investment of \$8,000; \$70 taxes; \$120 cost of silo filling; and 60 per cent of the labor cost of operating the farm, or \$600. This would leave a net profit of \$785. These figures are based on the results to be expected from good producing cows, the proper kind of home-grown and purchased feeding materials and good management. I consider it a fair answer to the question the gentleman submitted.

A SUCCESSFUL DAIRY FARMER.

Reading the article in your issue of March 25, on "How Many Cows to an Acre?" called to mind an interesting case of a farmer living in Marinette county, Wisconsin, who has thirteen cows and a team of horses on a farm of twenty-eight acres—twenty-six when you exclude the land on which the buildings are situated.

This in itself would not be so remarkable were it not for the fact that nine years ago the former owner of the same farm allowed it to be sold for taxes because he could not make a bare living for himself on the place with two cows and one horse. The land was, in fact, red sand on the edge of a swamp. Now and then a foot of soil from one field would transfer itself during a stiff northeaster, to a neighboring field. Today Martin Lorenzen, the owner, is looked upon as the most successful grower of alfalfa in upper eastern Wisconsin. He takes five tons per acre annually from the fields devoted to alfalfa, which were formerly "blow sand," and does not think much of the accomplishment.

Why anyone should have elected to farm on the piece of land in question when all about were good lands costing very little more than this strip of sand on the edge of a swamp, I do not know, but Lorenzen came from the rugged lands of Denmark, and considers obstacles as one of the incentives to good farming.

When asked how he could keep thirteen cattle on twenty-six acres of land that was formerly sand, Lorenzen gave this explanation: "The more cows I keep the more the farm will support." The use of crushed lime to correct soil acidity and dairy farming are the two things which made of this former unproductive spot a neat little farm which is making a modest fortune for its owner.

The place is a good example of intensive agriculture in more ways than one. The farm lies on a main road, and there was also a lane leading between two of the fields. Last fall Lorenzen tore the fences down along this lane, and plowed up the space.

"I could reach both fields from the main road," he said, "and the land occupied as a lane will support another cow." There are not many square feet of land on the Lorenzen farm which are not serving their purpose and yielding revenue to the owner. He keeps in active touch with the Marinette County Agricultural School, and although he speaks and reads English with difficulty, he keeps in touch with farm papers, farm bulletins and other

sources of information and puts into practice the suggestions which his own common sense tell him are likely to prove successful. H. L. Wood.

DAIRY PROBLEMS.

The Secretion of Milk.

I am at a loss to find out whether milk is extracted from the blood by the milk glands in the udder before or at time it is milked out of the udder. Some have the idea that the milk is extracted from the blood between milkings and stored in the udder, and others think that it is taken from the blood as it is milked out of the udder. Which is true? N. K.

The udder of the cow, or mammary gland, is all the time secreting milk from the blood. When the process of milking begins the gland is stimulated by this manipulation to secrete faster or more profusely.

Between milkings the milk is stored as complete or normal milk, in the ducts of the udder and also in the cells of the udder in a more or less degree of completion. When milking begins this portion already completed is drawn off rapidly and that in process of completion is rapidly completed to take its place. No doubt some milk is entirely produced from the blood during the process of milking. Glands secrete very rapidly when called upon by nature at certain times, as for instance, notice the very liberal secretion of the salivary glands when the cow is eating dry food. There is sufficient saliva secreted in a short time to thoroughly moisten large quantities of dry food.

Wheat Bran vs. Buckwheat Bran for Cows.

What is the difference in value between wheat bran and buckwheat bran for milch cows? Wheat bran is \$1.50 per cwt. and buckwheat bran \$1. Wayne Co. SUBSCRIBER.

Buckwheat bran is an uncertain quantity. Sometimes it is simply the hulls of the buckwheat and then it is practically worthless as a food. It is not digestible or palatable. Sometimes it consists of the hulls, (bran proper), and the middlings mixed together. Then it has more value. Some mills where they make buckwheat flour, bolt or screen, the hulls from the middlings. The middlings in this case are valuable as food for dairy cows, containing over 20 per cent protein, but the bran, as stated above, is good for nothing.

Wheat bran contains 15 per cent protein, and buckwheat middlings 20 per cent, hence the buckwheat middlings are the more valuable. The probability is that in the case mentioned the hulls and middlings are not separated and that they go in that locality under the name of buckwheat bran, which would have about the same feed value as wheat bran.

An Early Silo Crop.

I would like some advice on silage crops. What would you recommend as a silage crop to put in a silo early, as we are short on pasture? Would oats and cowpeas be good, and how do you sow them? Do you think it would pay to put them in the silo or feed them green? D. E. C.

Canada peas, the common field pea, is the best early silaging crop we have. We can sow a few oats with them to hold them up somewhat, so we can harvest them better. This crop will be ready to ensilo the last of June. It should be cut when the peas are nicely formed in the pods. It doesn't have to be run through a cutting box. If the vines are well tramped, they will keep perfectly in a good silo. This pea vine silage makes a splendid food for July and August feeding.

The trouble in using this crop, or any other for that matter, to feed green, for silaging, is that it gets ripe too quickly. It only lasts a few days as green feed.

About the cheapest feed for summer drouth is corn silage kept over from the previous year. To do this right one should have a summer silo of smaller diameter. Fill it in the fall for the purpose of feeding the next summer. COLON C. LILLIE.

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Our new model Reliance represents every reasonable demand, every practical suggestion, made by farmers during our twenty years in the separator business.

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ALL WORKING PARTS INCLOSED

and flooded with oil from the supply in the gear case, which needs replenishing only once a year.

Put your old Aermotor wheel and vane on this self-oiled motor, and have an up-to-date outfit at small cost.

DUPLICATE GEARS RUNNING IN OIL
Oil Annually
EVERY BEARING FLOODED WITH OIL

This helmet keeps out rain keeps out dust keeps in oil

Don't waste your time climbing to oil an old mill. Replace it, on your old tower, with an Auto-Oiled Aermotor which will last you a lifetime and furnish you an abundance of water.

IT NEEDS ATTENTION ONLY ONCE A YEAR.

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You Will Now Find Carbide Lights in houses, barns and out-buildings on over a quarter of a million farms—and

Carbide Gas Cooking Ranges and Hot Plates in most of the kitchens of these same farm homes.

This means—that in the struggle for the "survival of the fittest," Carbide-Light-and-Cooking Plants have won first place.

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For fifteen years, country home families have been testing lighting plants of many types. Literally hundreds of different kinds have been given thorough trials on thousands of farms.

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Carbide Light and Fuel Plants are comparatively inexpensive—they are built to last a life time. Their parts are simple and heavy—they don't wear out and they call for few or no repairs.

Carbide Light Plants, the modern kind, are automatic—they work only when the lights and stove are "going"—they start and stop themselves—they merely require occasional filling and cleaning, and they operate without care for weeks, and even months at a time.

Filled with UNION CARBIDE these plants supply brilliant light to every room in the house, and gas for the cooking range in the kitchen. The lights can, too, be equipped to turn on without matches—and are specially adapted for use in barns and out-buildings.

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Consider then all these advantages—the double value of light and fuel, as against light alone—the advantage of

weekly or monthly attention as against *daily attention*—the advantage of simple heavy parts as against delicate complex parts—the advantage of parts which last a life time as against short-lived parts which call for constant repairs and renewals, and last but not least, the advantage of lower cost—not only low first cost, but inexpensive maintenance and inexpensive operation.

All told, there are some twenty reliable manufacturers of efficient Carbide Light and Fuel Plants in the United States. The plants made by these manufacturers include—those installed in cellars, those made to set in holes under ground, and those which set on top of the ground.

Our own business is confined to the sale of UNION CARBIDE which all of these plants are built to use. For the country home trade we carry immense stocks of UNION CARBIDE in our own distributing warehouses, located in every section of the United States. From these warehouses we ship the Carbide in hundred pound "drums" direct to most 300,000 country home customers. Kept in these drums the Carbide lasts indefinitely.

While we do not sell the Carbide Plants themselves, we are of course, vitally interested in helping our future customers get plants that will give the greatest possible satisfaction. To this end we are always glad to furnish confidential advice, and mail free of charge authoritative printed matter telling just how Carbide Light and Cooking Plants work, and how easily one can be set up on any country place. Address your letter to—

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Magazine Section

LITERATURE
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PUBLISHED WEEKLY.
JOURNAL
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The FARM BOY
and GIRL
SCIENTIFIC and
MECHANICAL

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

ALTHOUGH a great deal of general attention has been given to Mexico since the Revolutionary War of 1911 which led to the resignation of General Diaz as president of that republic, the recent invasion of Mexican territory by United States troops following the attack on Columbus, New Mexico, by Mexican bandits under the leadership of Gen. Villa, has aroused a much wider interest for Americans in the old Aztec country.

A few comparisons will give a much

Interesting Facts on Mexico

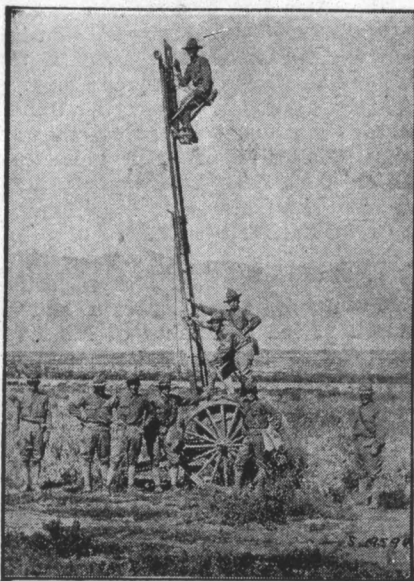
By A. HAYMAKER.

better comprehension of the size of border. The northern boundary is Mexico. The country is thirteen times the size of Michigan. From the eastern point of the peninsula of Yucatan to the northwestern point of Lower California is a distance of 1,950 miles. The most southernly point is 1,250 miles south of the extreme northern

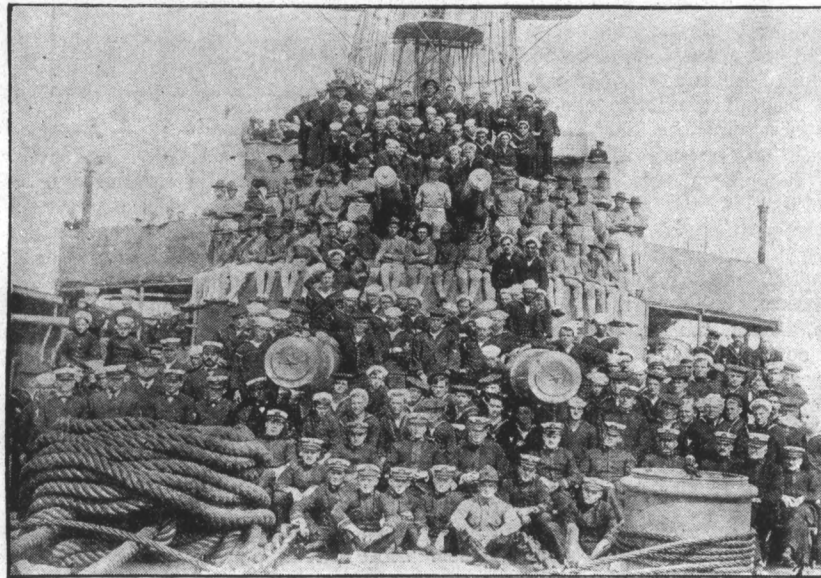
one a general idea of the vastness of the territory of Mexico.

There are two general ranges of mountains passing across the country, as are shown upon the accompanying map. The one to the east is the Sierra Nevada, and the western range is a continuation of the Rocky Mountains of the United States. Between these two ranges the surface consists of an elevated plateau while steep slopes lie between the mountains and both coasts. The peninsula of California

WORLD EVENTS IN PICTURES



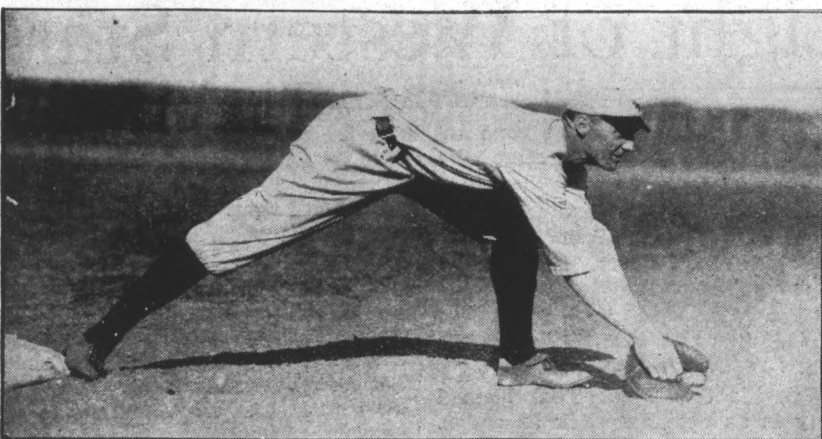
Observation Tower Being Used by United States Troops.



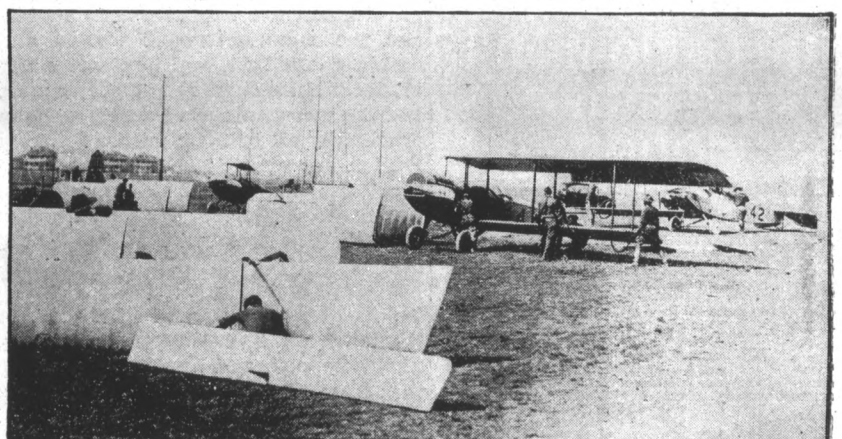
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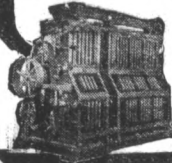
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has a very mountainous surface. Tropical regions are found along the coast below the 1,000-foot level. The climate is temperate in altitudes ranging from 3,000 to 5,000 feet, and on the plateaus reaching over 5,000 feet above sea level, it is uncomfortably cold.

The government is a federal republic having a constitution based upon the fundamental law adopted in 1857 with subsequent amendments. It is divided in the same manner as the federal government of the United States, having executive, legislative and judicial divisions. The legislature has a senate of 56 members who are elected for four years, and a chamber of deputies of 33 members who are elected for two years. The judicial department consists of a federal supreme court of 15 judges, three circuit courts and 32 district courts. The country is divided into 27 states each having its own government for the management of local affairs, two territories and a federal district.

Although primary education is free and nominally compulsory, there is probably less than 20 per cent of the population that is literate. This is largely due to the fact that about 80 per cent of the total population consists of partially civilized native Indian races, of whom very few take advantage of any educational opportunities. The primary schools are maintained by local taxation with stipulated federal grants. Most of the private schools are under clerical control. The secondary public schools are few in number and the attendance at these institutions is very small, but the special schools of this class are better attended. There are no universities in the country.

Agriculture and mining constitute the chief industrial activities of the inhabitants. The principal crops are corn, wheat, barley, chili pepper, sugar, coffee, cotton, tobacco, vanilla, grapes, flax and tropical fruits. The mineral wealth is very great, and while much mining has been done, it is presumed that there are still large fields of mining territory that have not been fully surveyed. Gold, silver, copper, lead, quicksilver, iron, and coal are the leading products of the mines. The value of the gold and silver produced in 1910 aggregated \$65,000,000. There are also extensive oil fields in the vicinity of Tampico. Although the government has endeavored to encourage the manufacture of woolen and cotton goods by a high protective tariff, the results have been discouraging, and the merchants are obliged to make practically all of their purchases from foreign concerns. The trade with foreign countries in 1912-1913 aggregated nearly \$500,000,000, of which about \$125,000,000 was with the United States.

According to the 1910 census Mexico had a population of 15,063,207, of whom about 20,000 were Americans, 25,000 Spanish and 13,000 Chinese. At that time there were only three cities having more than 100,000 population. These were Mexico City with 470,659, Guadalajara 118,799 and Puebla with

101,214. There were twenty other cities with populations ranging from 20,000 to 85,000.

Following the resignation of General Diaz in 1911, General Madero, who led the revolt became the chief executive. He was later deposed by General Huerta, and was subsequently shot. General Huerta assumed the office of president pending an election, but the vote being insufficient, the election was declared to be void. From the fall of 1913 until July, 1914, the country was in the throes of civil war, and on July 15, 1914, General Huerta re-



Gen. Funston Leads U. S. Forces in Mexico.

signed and Senor Carvahal was declared provisional president, which position he held until the Constitutionalist army under command of General Carranza entered Mexico City on August 15, whereupon General Carranza was declared the first chief of the Constitutionalist army in charge of the executive power of the republic.

During the administration of President Huerta, some United States vessels were sent to Tampico to protect American interests. On April 9 two members of the crew of the "Dolphin" were arrested by a Mexican officer while loading some supplies, and taken to Tampico. The arrest was regarded as a serious affront, and Rear Admiral

Mayo demanded that reparation be made through a salute of the American flag by the military commander of the fort. President Huerta refused to order such a salute, and the United States Congress thereupon authorized the employment of armed forces in such a way as to secure satisfactory reparation from the Mexican government. A fleet was collected in the harbor of Vera Cruz and the customs house of that port was seized on April 22 in an action which resulted in the loss of sixteen American soldiers killed and seventy wounded. A few days later an offer of Brazil, Argentine and Chili to use their good offices in an attempt to bring about friendly relations between the United States and Mexico was accepted, which resulted in the Niagara Falls conference, and brought about a partial settlement of the situation. It resulted, however, in General Huerta resigning the provisional presidency, although success of the Constitutionalist army undoubtedly would have forced him to abdicate regardless of diplomatic influence.

Following the ascension of General Carranza to the position of chief executive, the United States forces were ordered to leave Vera Cruz. The evacuation, however, was delayed by a declaration of war upon the Carranza government by General Villa who, up to this time had assisted the Constitutionalist army. Villa demanded Carranza's resignation as the price of the support he had given to the Constitutionalist campaign. Later the United States government recognized the Carranza administration, since which time the chief executive has waged a more or less successful campaign against the rebels under Gen. Villa.

Having been driven from one point to another, Villa and his supporters apparently became desperate, and on March 12 led a number of Mexicans into United States territory and attacked the town of Columbus, New Mexico. During the attack on the town and the clash with a small troop of United States cavalry, several American civilians and soldiers were killed. This act led to the recent arrangement between the United States government and the Carranza government to co-operate in the capture of General Villa and his followers.

Light of Western Stars

By ZANE GREY

"Wal, Miss Majesty, we've gone an' made a fozzie right at the start," he said dejectedly.

"A fozzie? But the game has not yet begun," replied Madeline.

"A bad start, I mean. It's amazin' bad, an' we're licked already."

"What in the world is wrong?" She wanted to laugh, but Stillwell's distress restrained her.

"Wal, it's this way. That blamed Monty is as cute an' slick as a fox. After he got done declaimin' about the handicap he an' Link was so happy to

take, he got Castleton over hyar an' drove us all dotty with his crazy gol-lof names. Then he borrowed Castleton's gol-lof coat. I reckon borrowed is some kind word. He just about took that blazin' coat off the Englishman; though I ain't sayin' but that Castleton was agreeable when he tumbled to Monty's means, which was nothin' more than to break Ambrose's heart. That coat dazzles Ambrose. You know how vain he is. Why, he'd die to get to wear that Englishman's gol-lof coat; an' Monty forestalled him. It's plumb pitiful to see the look in Ambrose's eyes. He won't be able to play much, I reckon Monty was right about brains bein' what wins!"

The game began. At first Madeline and Dorothy essayed to direct the endeavors of their respective players; but all they said and did only made their team play the worse. At the third hole they were two down and hopelessly bewildered. What with Monty's borrowed coat, with its dazzling effect upon Ambrose, and Stillwell's vociferous disgust, and the clamorous pursuit of the cowboy supporters, and the embarrassing presence of the ladies, Ambrose and Ed wore through all manner of strange play until it became ridiculous.

"Hey, Link!" came Monty's voice booming over the links. "Our esteemed rivals are playin' shiny."

Madeline and Dorothy gave up presently, when the game became a rout;



Map of Mexico Showing Geographical Relation with United States.

and they sat down with their followers to watch the finish of the match. It came with spectacular suddenness. A sharp yell pealed out, and all the cowboys turned attentively in its direction. A big black horse had surmounted the rim of the mesa and was just breaking into a run. His rider yelled sharply to the cowboys. They wheeled to dash toward their grazing horses.

"That's Stewart. There is something wrong!" said Madeline in alarm.

Castleton stared. The other men exclaimed uneasily. The women sought Madeline's face with anxious eyes.

The black got into his stride and bore swiftly down upon them.

"Oh, see that horse run!" cried Helen. "See that fellow ride!"

Helen was not alone in her admiration. Madeline divided her emotions between growing alarm of some danger menacing and a thrill and quickening of pulse beat that tingled over her whenever she saw Stewart in violent action. No action of his was any longer insignificant, but violent action meant much—might mean anything.

For one moment she remembered Stillwell and all his talk about fun and plots and tricks to amuse her guests. Then she discountenanced the thought. Stewart might lend himself to a little fun, but he cared too much for a horse to run him at that speed unless there was imperious need. That alone sufficed to answer Madeline's questioning curiosity.

Her alarm mounted to fear, not so much for herself as for her guests. But what danger could there be? She could think of nothing except the guerillas.

Whatever threatened, it would be met and checked by this man Stewart who was thundering up on his horse; and as he neared her, so that she could see the dark gleam of face and eyes, she had a strange feeling of comradeship and trust in her dependence upon him.

The big black was so close to Madeline that when Stewart pulled him the dust and sand kicked up by his pounding hoofs flew in their faces.

"What is it, Stewart?" cried Madeline.

"Guess I scared you, Miss Hammond," he replied; "but I'm pressed for time. There's a gang of bandits hiding on the ranch, most likely in a deserted hut. They held up a train near Auga Prieta. Pat Hawe is with the posse that's trailing them, and you know Pat has no use for us. I'm afraid it wouldn't be pleasant for you or your guests to meet either the posse or the bandits."

"I fancy not," said Madeline, considerably relieved. "We'll hurry back to the house."

They exchanged no more speech at the moment, and Madeline's guests were silent. Perhaps Stewart's actions and looks belied his calm words. His piercing eyes roved round the rim of the mesa, and his face was as hard and stern as chiseled bronze.

Monty and Nick came galloping up, each leading several horses by the bridles. Nels appeared behind them with Majesty, and he was having trouble with the roan. Madeline observed that all the other cowboys had disappeared.

One sharp word from Stewart calmed Madeline's horse; the other horses, however, were frightened and not inclined to stand. The men mounted without trouble, as did Madeline and Florence; but Edith Wayne and Mrs. Beck, being nervous and almost helpless, were got into the saddle with some difficulty.

"Beg pardon, but I'm some pressed for time," said Stewart, coolly, as with iron arm he forced Dorothy's horse almost to its knees.

Dorothy, who was active and plucky, climbed astride; and when Stewart loosed his hold on bit and mane, the horse doubled up and began to buck. Dorothy screamed as she shot into the air. Stewart, as quick as the horse, leaped forward and caught Dorothy in his arms. She had slipped head down-



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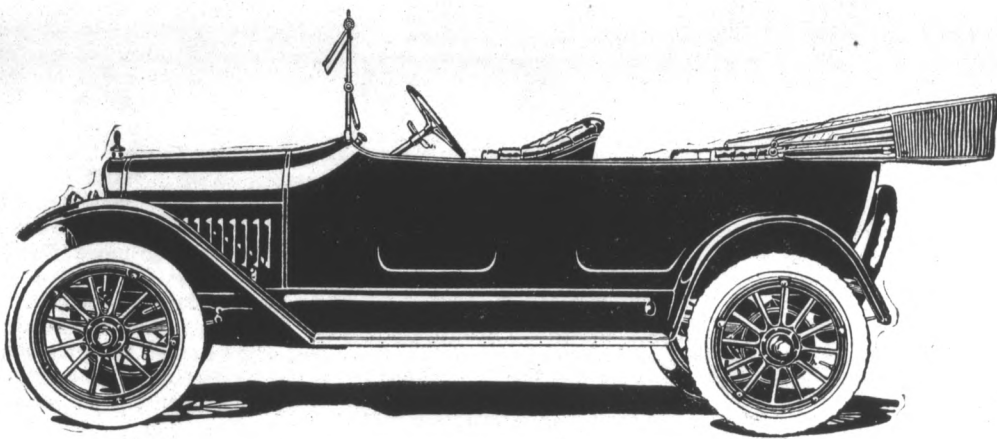
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ward, and, had he not caught her, would have had a serious fall.

Handling her as if she were a child, Stewart turned her right side up to set her upon her feet. Dorothy evidently thought only of the spectacle she presented, and made startled motions to readjust her riding-habit. It was no time to laugh, though Madeline felt as if she wanted to. Besides, it was impossible to be anything but sober with Stewart in violent mood.

He had jumped at Dorothy's stubborn mount. All good cowboys are masters of horses. It was wonderful to see him conquer the vicious animal. He was cruel, perhaps, yet it was from necessity. When, presently, he led the horse back to Dorothy, she mounted without further trouble. Meanwhile Nels and Nick had lifted Helen into her saddle.

"We'll take the side trail," said Stewart shortly, as he swung upon the big black.

He led the way and the other cowboys trotted in the rear.

It was only a short distance to the rim of the mesa; but when Madeline saw the steep trail, narrow and choked with weathered stone, she felt that her guests would certainly flinch.

"That's a jolly bad course," observed Castleton.

The women appeared to be speechless.

Stewart checked his horse at the deep cut where the trail started down.

"Boys, drop over and go slow," he said, dismounting. "Flo, you follow. Now, ladies, let your horses loose and hold on. Lean forward and hang to the pommel. It looks bad, but the horses are used to such trails."

Helen followed closely after Florence; Mrs. Beck went next, and then Edith Wayne. Dorothy's horse balked. "I'm not so—so frightened," said Dorothy. "If only he would behave!"

She began to urge him into the trail, making him rear, when Stewart grasped the bit and jerked the horse down.

"Put your foot in my stirrup," said Stewart. "We can't waste time!" He lifted her upon his horse and started him down over the rim. "Go on, Miss Hammond. I'll have to lead this nag down. It'll save time."

It was a loose trail. The weathered slopes seemed to slide under the feet of the horses. Dust-clouds formed, rocks rolled and rattled down; cactus spikes tore at horse and rider. Mrs. Beck broke out into laughter, and there was a note in it that suggested hysteria. Once or twice Dorothy murmured plaintively.

Half the time Madeline could not distinguish those ahead through the yellow dust. It was dry and made her cough. The horses snorted. She heard Stewart close behind, starting little avalanches that kept rolling on Majesty's fetlocks. She feared her horse's legs might be cut or bruised, for some of the stone crashed by and went rattling down the slope.

At length the clouds of dust thinned and Madeline saw those before her ride out upon a level. Soon she was down, and Stewart also.

Here there was a delay, occasioned by Stewart changing Dorothy from his horse to her own. This struck Madeline as being singular, and made her thoughtful. In fact, the alert, quiet manner of all the cowboys was not reassuring. As they resumed the ride it was noticeable that Nels and Nick were far in advance, Monty stayed far in the rear, and Stewart rode with the party.

When they rounded the head of the mesa, bringing into view the ranch-house and the valley, she saw dust or smoke hovering over a hut upon the outskirts of the Mexican quarters. As the sun had set and the light was fading, she could not distinguish which it was.

Then Stewart set a fast pace for the house. In a few minutes the party was in the yard, ready and willing to dismount.

Stillwell appeared, ostensibly cheer-

ful—too cheerful to deceive Madeline. She noted, also, that a number of armed cowboys were walking with their horses just below the house.

"Wal, you-all had a nice little run," Stillwell said, speaking generally. "I reckon there wasn't much need of it. Pat Hawe thinks he's got some outlaws corralled on the ranch—nothin' at all to be fussed up about. Stewart's that particular he won't have you meetin' with any rowdies."

Many and fervent were the expressions of relief from Madeline's feminine guests as they dismounted and went into the house. Madeline lingered behind to speak with Stillwell and Stewart.

"Now, Stillwell, out with it," she said briefly.

The old cattleman stared, then he laughed, pleased with her keenness.

"Wal, Miss Majesty, there's goin' to be a fight somewhere, an' Stewart wanted to get you-all in before it come off. He says the valley's overrun by vaqueros an' guerillas an' robbers, an' goodness knows what else."

He stamped off the porch, his huge spurs rattling, and started down the path toward the waiting men.

Stewart stood in his familiar attentive position, erect, silent, with a hand on pommel and bridle.

"Stewart, you are exceedingly—thoughtful of my interests," she said,

IN NATURE'S SCHOOL.

BY ALONZO RICE.

Dear one, the day is spent,
The bird now seeks its young;
Above the west's high battlement,
The moon's pale horn is hung.

The star of even trims
Its weak, unfavored light;
And through the scented ether swims
The sharp-eyed elf of night.

The trees inverted stand,
Reflected in the stream,
And by the light-winged zephyrs fanned,
Are wakened from their dream.

Come, take my hand in thine,
And lead me as a child,
To where the ivies clasp and twine
Amid you thicket wild.

The hum of homing bee,
The lowing of the herds,
All seem far sweeter now to me
Than any written words.

The toil and care of day,
Where willows wail and fret,
And read upon the shell-strewn shore
The ripple's alphabet.

Let's seek the sunset brake,
The sedge-encircled pool,
And lead me on as thou wouldst take
A little child to school!

wanting to thank him, and not readily finding words. "I would not know what to do without you. Is there any danger?"

"I'm not sure; but I want to be on the safe side."

She hesitated. It was no longer easy for her to talk to Stewart, and she did not know why.

"May I know the special orders you gave Nels and Nick and Monty?" she asked.

"Who said I gave those boys special orders?"

"I heard Stillwell tell them so."

"Of course I'll tell you, if you insist; but why should you worry over something that'll likely never happen?"

"I insist, Stewart," she replied.

"My orders were that at least one of them must be on guard near you day and night—never to be out of hearing of your voice."

"I thought as much. But why Nels or Monty or Nick? That seems rather hard on them. For that matter, why put anyone to keep guard over me? Do you not trust my other cowboys?"

"I'd trust their honesty, but not their ability."

"Ability? Of what nature?"

"With guns."

"Stewart!" she exclaimed.

"Miss Hammond, you have been having such a good time entertaining

your guests that you forget. I'm glad of that. I wish you had not questioned me."

"Forget what?"

"Don Carlos and his guerillas."

"Indeed I have not forgotten. Stewart, you still think Don Carlos tried to make off with me, and may try it again?"

"I don't think. I know."

"And besides all your other duties you yourself have shared the watch with these three cowboys?"

"Yes."

"And this has been going on with-out my knowledge?"

"Yes."

"Since when?"

"Since I brought you down from the mountains last month."

"How long is it to continue?"

"That's hard to say. Till the revolution is over, anyhow."

She mused a moment, looking away to the west, where the great void was filling with red haze. She believed implicitly in him, and the menace hovering near her felt like a shadow upon her present happiness.

"What must I do?" she asked.

"I think you ought to send your friends back east, and go with them, until this guerilla war is over."

"Why, Stewart! They would be broken-hearted, and so should I."

He had no reply for that.

"If I do not take your advice it will be the first time since I have come to look to you for so much," she went on. "Cannot you suggest something else? My friends are having such a splendid visit. Helen is getting well. Oh, I should be sorry to see them go before they want to!"

"We might take them up into the mountains and camp out for a while," he said presently. "I know a wild place up among the crags. It's a hard climb, but worth the work. I never saw a more beautiful spot. Fine water, and it will be cool. Pretty soon it'll be too hot here for your party to go out of doors."

"You mean to hide me away among the crags and clouds," replied Madeline, with a laugh.

"Well, it'd amount to that. Your friends needn't know. Perhaps in a few weeks this spell of trouble on the border will be over till fall."

"You say it's a hard climb up to this place?"

"It sure is. Your friends will get the real thing if they make the trip."

"That suits me. Helen, especially, wants something to happen; and they are all crazy for excitement."

"They'd get it up there—bad trails, canons to head, steep climbs, windstorms, thunder and lightning, rain, mountain lions, and wildcats."

"Very well, I am decided. Stewart, of course you will take charge? I don't believe I—Stewart, isn't there something more you could tell me—why you think my own personal liberty is in peril?"

"Yes, but do not ask me what it is. If I hadn't been a rebel soldier I would never have known."

"If you hadn't been a rebel soldier, where would Madeline Hammond be now?" she asked earnestly.

He made no reply.

"Stewart," she continued, with warm impulse, "you once mentioned a debt you owed me." Seeing his dark face pale, she wavered, then went on. "It is paid."

"No, no!" he answered huskily.

"Yes! I will not have it otherwise."

"No. That never can be paid."

Madeline held out her hand.

"It is paid, I tell you," she repeated.

Suddenly he drew back from the outstretched white hand, which seemed to fascinate him.

"I'd kill a man to touch your hand, and go to perdition for doing it; but I won't touch it on the terms you offer."

His unexpected passion disconcerted her.

"Stewart, no man ever before refused to shake hands with me, for any reason. It—it is scarcely flattering,"

she said, with a little laugh. "Why won't you? Because you think I offer it as mistress to servant—rancher to cowboy?"

"No."

"Then why? The debt you owed me is paid. I cancel it. So why not shake hands upon it, as men do?"

"I won't—that's all."

"I fear you are ungracious, whatever your reason," she replied. "Still, I may offer it again some day. Good night."

He said good night and turned. Madeline wonderingly watched him go down the path with his hand on the black horse's neck.

She went in to rest a little before dressing for dinner, and, being fatigued from the day's riding and excitement, she fell asleep. When she awoke it was twilight. She wondered why her Mexican maid had not come to her, and she rang the bell. The maid did not put in an appearance, nor was there any answer to her ring.

The house seemed unusually quiet. It was a brooding silence, which presently broke to the sound of footsteps on the porch. Madeline recognized Stillwell's tread, though he appeared to be stepping more lightly than usual. Then she heard him call softly in at the open door of her office. The suggestion of caution in his voice suited the strangeness of his walk.

With a boding sense of trouble she hurried through the rooms. He was standing outside her office door.

"Stillwell!" she exclaimed.

"Anybody with you?" he asked in a low tone.

"No."

"Please come out on the porch," he said somewhat peremptorily.

She complied. Stillwell's grave face, paler than she had ever beheld it, caused her to stretch an appealing hand toward him. He intercepted it and held it in his own.

"Miss Majesty, I'm amazin' sorry to tell worrisome news." He spoke almost in a whisper, cautiously looked about him, and seemed both hurried and mysterious. "The fact is, we're in a bad fix. If your guests ain't scared out of their skins, it'll be owin' to your nerve an' how you carry out Stewart's orders."

"You can rely upon me," replied Madeline firmly, though she trembled.

"Wal, what we're up against is this—that gang of bandits Pat Hawe was chasin' are hidin' in the house!"

"In the house?" echoed Madeline, aghast.

"Miss Majesty, it's the amazin' truth an' shamed indeed I am to admit it. Stewart—why, he's wild with rage, to think it could hev happened. You see, it couldn't hev happened if I hedn't sloped the boys off to the gol-lof links, an' if Stewart hedn't rid out on the mesa after us. It's my fault. I've hed too much femininity around fer my old haid. Gene cussed me—he cussed me sure scandalous. But now we've got to face it—to figger—"

"Do you mean that a gang of hunted outlaws—bandits—have actually taken refuge somewhere in my house?" demanded Madeline.

"I sure do. Seems powerful strange to me why you didn't find somethin' was wrong, seein' all your servants hev sloped."

"Gone? Ah! I missed my maid. I wondered why no lights were lit. Where did my servants go?"

"Down to the Mexican quarters, an' scared half to death. Now listen. When Stewart left you an hour or so ago, he follered me direct to where me an' the boys was tryin' to keep Pat Hawe from tearin' the ranch to pieces. At that we was helpin' Pat all we could to find them bandits; but when Stewart got there he made a difference. Pat was nasty before, but seein' Stewart made him wuss. I reckon Gene to Pat is the same as red to a greaser bull. Anyway, when the sheriff set fire to an old 'dobe hut, Stewart called him, an' called him hard. Pat Hawe hed six fellers with him, an'

from all appearances bandit-hunting was some festa. There was a row, an' it looked bad fer a little; but Gene was cool an' he controlled the boys. Then Pat an' his tough depooties went on huntin'. That huntin', Miss Majesty, petered out into what was only a farce. I reckon Pat could hev kept on foolin' me an' the boys, but as soon as Stewart showed up on the scene—wal, either Pat got to blunderin' or else we all shed our blinders. Pat Hawe wasn't lookin' hard fer any bandits; he wasn't daid set huntin' anythin', unless it was trouble fer Stewart. Finally, when Pat's men made fer our storehouse, where we keep ammunition, grub, liquors, an' sich, then Gene called a halt, an' ordered Pat Hawe off the ranch. Pat hollered law. He pulled down off the shelf his old stock-grudge on Stewart, accusin' him over again of that greaser murder last fall. Stewart made him look like a fool—showed him up as bein' scared to death of the bandits, or hevin' some reason fer slopin' off the trail. Anyway, the row started all right. In the thick of it, when Stewart was drivin' Pat an' his crowd off the place, one of them depooties lost his haid an' went fer his gun. Nels threwed his gun an' crippled the feller's arm. Monty jumped then an' throwed two forty-fives, an' fer a second or so it looked ticklish; but the bandit-hunters crawled, an' then lit out."

Stillwell paused in the rapid delivery of his narrative; he still retained Madeline's hand, as if by that he might comfort her.

"After Pat left we put our haid together," began the old cattleman, with a long respiration. "We rounded up a lad who had seen a dozen or so fellers—he wouldn't say they was greasers—breakin' through the shrubbery to the back of the house. That was while Stewart was ridin' out to the mesa. Then this lad seen your servants all runnin' down the hill toward the village. Now, heah's the way Gene figgers. There sure was some deviltry down along the railroad, an' Pat Hawe traileed bandits up to the ranch. He hunts hard, an' then all to wunst he quits. Stewart says Pat Hawe wasn't scared, but he got wind in some way that there was in the gang of bandits some fellers he didn't want to ketch—sabe? Then Gene, quicker'n a flash, springs his plan on me. He'd go down to Padre Marcos an' hev him help to find out all possible from your Mexican servants. I was to hurry up hyar, an' tell you—give ou orders, Miss Majesty. Ain't that amazin' strange? You're to assemble all your guests in the kitchen. Make a grand bluff an' pretend as your help has left, that it'll be great fun fer your guests to cook dinner. The kitchen is the safest room in the house. While you're joshin' your party along, makin' a kind of picnic out of it, I'll place cowboys in the long corridor, an' also outside in the corner where the kitchen joins on to the main house. It's pretty sure the bandits think no one's wise to where they're hid. Stewart says they are in that end room where the alfalfa is, an' they'll slope in the night. Of course, with me an' the boys watchin', you-all will be safe to go to bed. We're to rouse your guests early, before daylight, to hit the trail up into the mountains. Tell them to pack outfits before goin' to bed. Say, as your servants hev sloped, you might as well go campin' with the cowboys. That's all. If we hev any luck, your friends'll never know they've been sittin' on a powder mine."

"Stillwell, do you advise that trip up into the mountains?" asked Madeline.

"I reckon I do, considerin' everythin'. Now, Miss Majesty, I've used up a lot of time explainin'. You'll sure keep your nerve?"

"Yes," Madeline replied.

"Better tell Florence. She'll be a power of comfort to you. I'm goin' now to fetch up the boys."

Instead of returning to her room,

Madeline went through the office into the long corridor. It was almost as dark as night. She fancied she saw a slow-gliding figure darker than the surrounding gloom; and she entered upon the fulfillment of her part of the plan in something like trepidation. Her footsteps were noiseless.

Finding the door to the kitchen, and going in, she struck light. Upon passing out again she made certain she discerned a dark shape, now motionless, crouching along the wall; but she mistrusted her vivid imagination. It took all her boldness to strike the corridor light. Then she went on through her own rooms and thence into the patio.

Her guests laughingly and gladly entered into the spirit of the occasion. Madeline fancied her acting must have been pretty nearly perfect, seeing that it deceived even Florence.

They trooped merrily into the kitchen. Madeline, delaying at the door, took a sharp but unobtrusive glance down the great, barnlike hall. She saw nothing but blank, dark space.

Suddenly, from one side, not a rod distant, protruded a pale, gleaming face, breaking the even blackness. Instantly it flashed back out of sight; yet that time was long enough for Madeline to see a pair of glittering eyes and to recognize them as Don Carlos's.

Without betraying either hurry or alarm she closed the door. It had a heavy bolt, which she slowly, noiselessly shot. Then the cold amaze that had all but stunned her into inaction throbbled into wrath. How dared that Mexican steal into her home? What did he mean? Was he one of the bandits supposed to be hidden in her house?

She was thinking herself into greater anger and excitement, and probably would have betrayed herself, had not Florence, who had evidently seen her bolt the door, and read her thoughts, come toward her with a bright, intent, questioning look. Madeline caught herself in time.

Thereupon she gave each of her guests a duty to perform. Leading Florence into the pantry, she unburdened herself of the secret in one brief whisper. Florence's reply was to point out of the open window, passing which was a file of stealthily moving cowboys. Then Madeline lost both anger and fear, retaining only the glow of excitement.

Madeline could be gay. She initiated the abandonment of dignity by calling Castleton into the pantry, and, while interesting him in some pretext or other, imprinting the outlines of her flour-covered hands upon the back of his black coat. Castleton innocently returned to the kitchen, to be greeted with a roar.

That surprising act of the hostess set the pace and there followed a merry, noisy time. Everybody helped. The miscellaneous collection of dishes so confusingly contrived made up a dinner which they all heartily enjoyed. Madeline enjoyed it herself, even with the feeling of a sword hanging suspended over her.

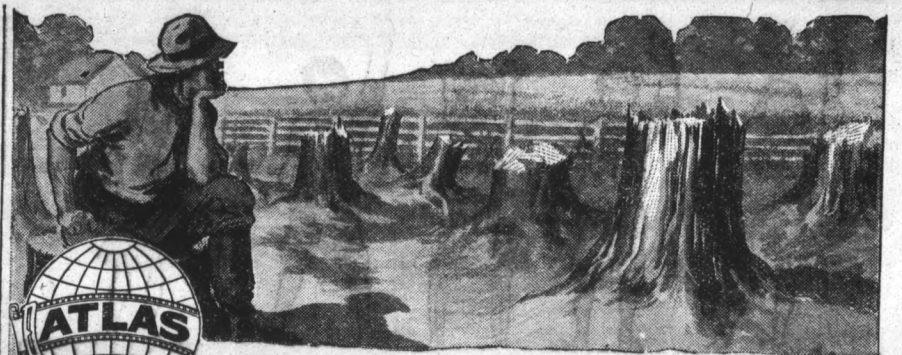
The hour was late when she rose from the table and told her guests to go to their rooms, to don their riding-clothes, to pack what they needed for the long and adventurous camping trip, which she hoped would be the climax of their western experience. (Continued on page 499).

GUILTLESS?

BY CORA B. HOWDEN.

Is the man that makes the bullets
Guiltless of the blood they shed?
Do the men that ship the cannon
Help to stain the earth with red?
Do the hands that shape the gun-
shanks,
Help to dig the soldier's bed?

Will the verdict be found waiting
For the soul that helps to pour
Over field and over hillside
Reeking, staining, bloody gore?
Will those ugly spots wash off, or
Will they stay—forevermore?



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Land O' Nod Stories.

By HOWARD T. KNAPP

After the Battle.

AS soon as the battle was over, Billy Be By Bo Bum and Tinker Teedle Tee slid down the oat tree, from the branches of which they had watched the fight. The Queen's army now was returning home through the oat forest, each soldier either carrying an egg or cocoon or dragging a dead or wounded Negro warrior.

"Whew! But that certainly was a bloody battle," said Billy gazing at the heaps of dead warriors that covered the plain surrounding the looted Negro city like a red and black carpet. "But tell me, Tinker, why are those soldiers dragging away the dead and wounded ants? They surely can't expect to make slaves of them."

"That is one trait of the ants that I don't like to talk about," replied Tinker.

"Why, what do you mean?" demanded Billy.

"Well, to tell you the truth, all ants are cannibals at times. Although they live chiefly on seeds and grain and the milk of their aphids or ant cows, they are not above eating each other when they get a chance."

"I never saw any signs of their doing that when I was back in the city," protested Billy.

"Oh, no, they don't kill and eat their friends," replied the elf. "But when they go to war they not only carry off the eggs of their victims to bring them up as slaves, but they also eat the bodies of the soldiers killed in defending their home. But even here you see how unselfish they are. Instead of stopping to devour their prey on the battlefield, they carry the bodies back to the city where they share the meal with the workers who remained at home while the soldiers went to war."

For several minutes Billy walked on in silence, thinking of this new side of ant nature. At this point the trail emerged from the oat forest and crossed a sandy road, but Billy was so busy with his thoughts that he did not notice where he was going, until Tinker shouted a warning. The little boy was so startled by the sudden cry that he jumped back a step, and it was well that he did, for if he had taken another step forward he would have fallen into a deep, funnel-shaped pit that yawned in front of him.

"Good gracious, who under the sun dug that awful hole right in our path?" demanded Billy, but before Tinker could reply there was a great commotion in the pit and a volley of sand and tiny pebbles shot up over the rim, falling on all sides as though it was raining gravel. Billy turned to run, but before he had taken two steps he was

struck by several grains of sand and knocked sprawling.

"We've stumbled onto a volcano in full eruption," gasped Billy as he struggled to his feet.

"A volcano. Ho, ho, ho," shouted the merry little elf, laughing so hard he tumbled over onto a bed of moss where he lay kicking up his heels like a kitten at play. Of course, when Billy saw Tinker laughing he knew there was no real danger, but just the same he didn't like to be made fun of.

"Well, if it isn't a volcano, maybe you can tell me what it is," grumbled Billy.

"That is the trap of an Ant Lion," replied Tinker sitting up and straightening the weeny copper kettle he wore for a hat.

"A what?" remanded Billy in astonishment.

"The trap of an Ant Lion," repeated the elf. "And just let me tell you that if you had tumbled into that pit, as you surely would if I hadn't shouted in time, you would have been chewed to pieces by this fierce ogre that is lying in wait at the bottom of the pit for some poor, luckless ant to fall into his trap."

"But what caused the shower of sand?" asked Billy.

"The Ant Lion," replied Tinker. "He was hoping that some of the pellets would strike you and knock you into his pit. Now if you would like to see how this terrible fellow, who is one of the worst enemies our friends the ants have to contend with, does his hunting, we will climb a nearby tree. If we tried to crawl near the edge of the trap he might succeed in snaring us, but from the branches of an oat tree, we can watch him in safety."

So Billy and the elf shinned up the stalk of a spear of grain, and next week I'll tell you what they saw.

AS WISE MEN SAW LIFE.

Fear is a wonderful goad to remorse.—H. H.

Men are what their mothers made them.—Emerson.

It is a great deal better to live a holy life than to talk about it.—Moody.

It is with lent money that all evil is mainly done, and all unjust war protracted.—Ruskin.

The art of knowing when one is needed is more difficult than that of helping.—Hardy.

The best way to put boyishness to shame is to foster scholarship and manliness.—Eliot.

People are always cheating themselves with the idea that they would do this or that desirable thing, if they only had time.—Anonymous.

The Gypsy Camp



LIGHT OF WESTERN STARS.

(Continued from page 497).

and to snatch a little sleep before the cowboys roused them for the early start.

Madeline went immediately to her room and was getting out her camping apparel when a knock interrupted her. She thought Florence had come to help her pack; but the knock was upon the door opening out on the porch. It was repeated.

"Who's there?" she questioned. "Stewart," came the reply.

She opened the door. He stood on the threshold. Beyond him, indistinct in the gloom, were several cowboys.

"May I speak to you?" he asked.

"Certainly." She hesitated a moment, then asked him in, and closed the door. "Is—is everything all right?"

"No. These bandits stick to cover pretty close. They must have found out we're on the watch. But I'm sure we'll get you and your friends away before anything starts. I wanted to tell you that I've talked with your servants. They were just scared. They'll come back tomorrow, as soon as Bill gets rid of this gang. You needn't worry about them or your property."

"Do you have any idea who is hiding in the house?"

"I was worried some at first. Pat Hawe acted queer. I imagined he'd discovered he was trailing bandits who might turn out to be his smuggling guerilla cronies. But talking with your servants, and finding a bunch of horses hidden down in the mesquit behind the pond, I changed my mind. My idea is that a cowardly handful of riffraff outcasts from the border have hidden in your house, more by accident than design. We'll let them go—get rid of them without even a shot. If I didn't think so—well, I'd be considerably worried. It would make a different state of affairs."

"Stewart, you are wrong," she said. He started, but his reply did not follow swiftly. The expression of his eyes altered. Presently he spoke:

"How so?"

"I saw one of those bandits. I distinctly recognized him."

One long step brought him close to her.

"Who was he?" demanded Stewart.

"Don Carlos."

He muttered low and deep, then said:

"Are you sure?"

"Absolutely. I saw his figure twice in the hall, then his face in the light. I could never mistake his eyes."

"Did he know you saw him?"

"I am not positive, but I think so. Oh, he must have known! I was standing full in the light. I had entered the door, then purposely stepped out. His face showed from around a corner, and swiftly flashed out of sight."

Madeline was tremblingly conscious that Stewart underwent a transformation. She saw as well as felt the leaping passion that changed him.

"Call your friends—get them in here," he ordered, and wheeled toward the door.

"Stewart—wait," she said.

He turned. His white face, his burning eyes, his presence now charged with definite, fearful meaning, influenced her strangely, weakened her.

"What will you do?" she asked.

"That needn't concern you. Get your party in here. Bar the windows and lock the doors. You'll be safe."

"Stewart! Tell me what you intend to do."

"I won't tell you," he replied, and turned away again.

"But I must know," she said. With a hand on his arm she detained him. She saw how he halted—felt the shock in him as she touched him. "Oh, I do know. You mean to fight!"

"Well, Miss Hammond, isn't it about time?" he asked. Evidently he overcame a violent passion for instant action. There were weariness, dignity, and even reproof in his question. "The fact of that Mexican's presence here

in your house ought to prove to you the nature of the case. These fellows have found out you won't stand for any fighting on the part of your men. Don Carlos is a sneak, a coward, yet he's not afraid to hide in your own house. He has learned you won't let your cowboys hurt anybody. He's taking advantage of it. He'll rob, burn, and make off with you. He'll murder, too, if it falls his way. These greasers use knives in the dark. So I ask, isn't it about time for us to stop him?"

"Stewart, I forbid you to fight unless in self-defense. I forbid you!"

"I reckon what I mean to do is self-defense. Haven't I tried to explain to you that just now there are wild times along this stretch of border? Must I tell you again that Don Carlos is hand and glove with the revolution? The rebels are crazy to stir up the United States. You are a woman of prominence. Don Carlos would make off with you. If he got you, what an easy matter to cross the border with you! And where would the hue and cry go? Through the troops along the border! To New York! To Washington! Why, it would mean what the rebels are working for—United States intervention; in other words, war!"

"Oh, surely you exaggerate?" she cried.

"Maybe so; but I am beginning to see the don's game. And Miss Hammond, I—it's awful for me to think what you'd suffer if Don Carlos got you over the line. I know these low-caste Mexicans. I've been among the peons—the slaves."

"Stewart, don't let Don Carlos get me," replied Madeline, in sweet directness.

She saw him shake, saw his throat swell as he swallowed hard, saw the hard fierceness return to his face.

"I won't! That's why I'm going after him."

"But I forbade you to start a fight deliberately."

"Then I reckon I'll go ahead and start one without your permission," he replied shortly, and again he wheeled.

This time, when Madeline caught his arm, she held to it, even after he stopped.

"No!" she said imperiously.

He shook off her detaining hand and strode forward.

"Please don't go," she called beseechingly; but he kept on. "Stewart!"

She ran ahead of him, intercepted him, and turned to face him with her back against the door. He swept out a long arm as if to brush her aside; but it wavered and fell. Haggard, troubled, with working face, he stood before her.

"It's for your sake," he exposulated.

"If it is for my sake, then do what pleases me."

"These guerillas will knife somebody. They'll burn the house. They'll make off with you. They'll do something bad, unless we stop them."

"Let us risk all that," she implored.

(Continued next week).

APPLE BLOSSOM TIME.

BY ELLA E. ROCKWOOD.

O, Michigan, my Michigan,
In apple-blossom time,
What a world of wondrous beauty,
And what loveliness is thine!

Fleecy clouds above are winging
Lazily across the blue,
On the hills and in the forests,
Flowers bloom with dainty hue.

Hark, the lark, his love note calling
To his mate in mellow chime,
From the fields we hear him lifting
Now it's apple-blossom time.

Poets sing of glorious sunsets,
In the countries 'cross the sea—
Laud the East, the West, the South-
land,

But my heart still clings to thee.

Other lands have other beauties—
Some a more salubrious clime,
Michigan's the peer of any
When it's apple-blossom time.

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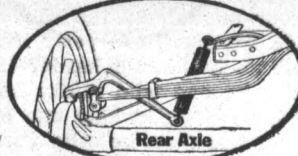
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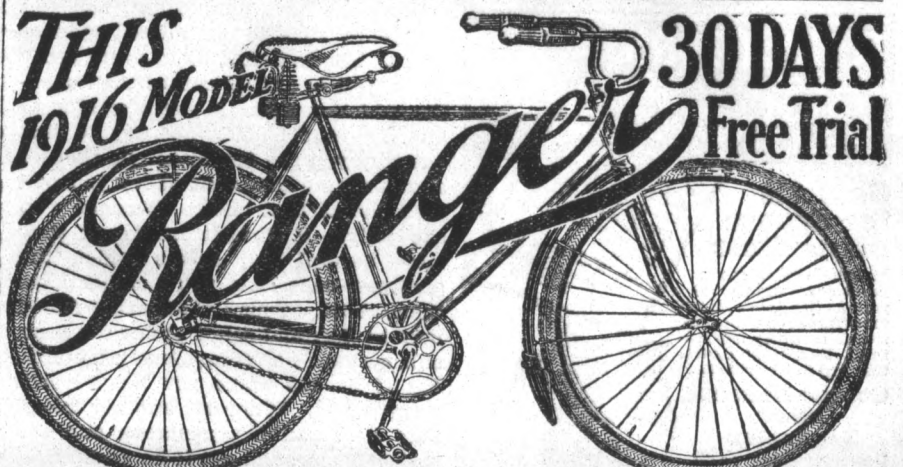
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A Merry Heart Excuseth a Multitude of Sins

EVERYONE wants to live long, but more serious minded girl would fail. For when her shiftless ways cause domestic squalls her good humor and refusal to get ruffled will smooth things over and Jack will forgive her.

Good nature and an inward chuckle are life's lubricators. They keep the wheels running smoothly and keep us young while we do live, if they do not lengthen our lives. And they make us remembered when we are gone, even more than all the deeds of sacrifice we perform. If we can smile ourselves and make someone else smile, we have done more for the world than all the efficiency experts put together.

DEBORAH.

"Immediately upon waking have a good yawn."

"Enjoy an inner chuckle."

"Take a liberal stretch and a full, deep breath."

"To this add a thought of joy, of courage, of love toward all mankind, toward the day and its work."

Whether or not the following of these rules would add to our length of years, certain it is that their observance would add to the enjoyment of what years we do live. Our physical being would benefit by the deep breathing, and our mental, by the chuckles with which we met life's petty irritations. For no one has a harder time living than the one who thinks he is having a hard time, and no one gets more out of life than he who puts a laugh in it.

Then, if we add to our own keener enjoyment, the greater comfort of our fellows, we have done more than add ten years' time to our allotted span of years. For in living, as in every other fine art, it is quality rather than quantity which counts. If you ever stop to analyze your friends and try to find out why you are fonder of one than of another, nine times out of ten you will pick out as first choice the ones who are jolly. It doesn't matter if they have several bad habits which the glummer ones lack, you'd rather have them about. Your light-hearted friend may be lazy and selfish, none too neat, and perhaps not scrupulously truthful, but if he can make you laugh you'll forgive him. Whereas, another friend may be ambitious, generous and the soul of honor, and yet if he goes about with a sad countenance and throws a damper over you, you'd just as soon he stayed away.

Good nature often explains why one child is the favored one in a family. So far as desirable traits of character are concerned he may be somewhat lacking, but if he is always unruffled and smiling he is forgiven his shortcomings and the whole family wait upon him. The fatted calf was not killed for the glum son who stayed at home and worked, but for the gay young fellow who had a good time and went out and stirred things up.

For the same reason an honest, hard working young man often passes up the honest, hard working young woman, who really would make him a desirable wife, for an empty-headed doll who doesn't know how to work and would not learn if she could.

"What is that girl's hold on Jack?" I asked another whose son is infatuated with a shiftless, none too neat girl, jolly and light hearted, but absolutely without ambition or purpose in life.

"She is bright and always laughing, and when she wants to fix up for a man she can make a fine appearance. Jack doesn't run in there mornings, so he never saw her in a dirty kimoni, with uncombed hair and run-down slippers," said the mother bitterly. "She makes him laugh now and jollies him up, and he can't see she is bound to make him cry if he marries her."

So Jack will marry the girl, and she will hold him, where a more worthy,

as garments still have an opportunity for usefulness as dusters, wash cloths, or work aprons, and I rip them up and lay aside for those purposes. The remainder I cut into strips and wind into balls, that are then ready for the rag carpet weaver to be made into rugs, or they can be turned into braided or hooked rugs at home.

All the scraps left make contributions for the rag bag and they should be sold or destroyed as soon as possible as they only become dust and insect gatherers if lying around.

THE PASS-IT-ALONG CLUB.—II.

BY ELLA E. ROCKWOOD.

The ladies came to the next meeting with note books and pencils, determined not to lose any suggestions as the first meeting had been so helpful.

Mrs. Smith was first called on. "As you know, I have four small daughters and do all my own work, so it is my endeavor to save as much time as possible. I have discarded white panties for my little girls entirely—except as they are in white dresses. I make bloomers, either of black sateen or to match their dresses, which are usually of gingham for everyday wear. These are gathered full with an elastic and fit just above the knee. With these no petticoats are required and the amount of washing and ironing saved is quite an item."

Mrs. Strong, second on the program, gave a jelly-making hint. "When making jelly from currants or berries I double the quantity without detriment to the quality, by using one-half as many apples as I have of the other fruit. If, as in the case of the earlier fruits, apples are not in season I use apple jelly made the previous season. Snow apples are about the best, although any firm, tart variety will do. Melt the apple jelly and add to the other before removing from the fire."

Mrs. Turner, a bride of a few months declared her recent success in pie-making, after repeated failures, was so gratifying to herself and husband that she felt as if she must pass it along, thinking some other member might be in need of a hint of the kind. "I found by repeated experiments," said she, "that my pie crust was best when I used very little water. So now I measure out one and one-half cups of flour to one-half cup of lard. This I rub together between my hands until it is granulated. Then I add a very little water, only a tablespoonful or two at a time, until the flour and lard will barely hold together and not another bit do I use. This, when rolled out and baked, makes a rich, flaky crust and the amount given is just about enough for one round pie. I have found, too, that one reason for pies running over in the oven is too fast baking, which starts the steam, thus forcing the boiling juices out of the crust. Wetting the crust to make them hold together makes them hard, but a strip of clean cloth bound around the edges does no harm and will keep the juices inside. If care is observed in the baking, however, no trouble will be experienced."

"Speaking of pie crust reminds me of an icing discovery I recently made," said Mrs. Travis, as she responded to her name. "I found that instead of using one cup of granulated sugar to each egg white, one-half cup makes just as much. Now I boil one-half cup of sugar in a little water until it spins a thread then pour it over the beaten white of the egg. For a layer cake, or when more than the outside is to be

SUMMER CARE OF WINTER CLOTHES.

BY N. M. FAIRPOINT.

The habit of saving everything because it may be of use "some day," is one of the fallacies that come down to us from the days of hand-woven fabrics. I like to sort out the things that can be worn as they are a little longer, or with slight changes in trimmings or minor points. I next select those whose cloth is good and by remaking can be made of service for another season or two. In a third assortment I put those that are thoroughly worn out or outgrown.

The things that are to be worn another season, I give the first attention. I brush and shake them free of any dust and with a good cleaner I remove any spots. I mend any slight rips in seams, put on new bindings on skirts and buttons and hooks and eyes that are missing, and do any slight things that need doing so they can be put away in perfect order. I hang them out on the line, where sun and air can penetrate every part and another brushing removes the last trace of dust.

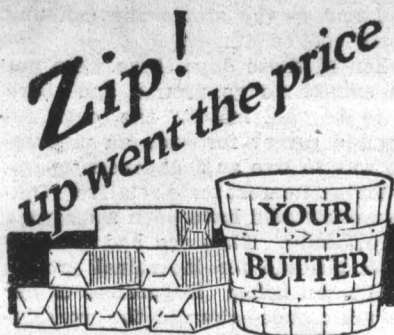
I always use the largest table in the house to fold them on, and take particular care to see that every crease and wrinkle is smoothed out. Soft tissue paper tucked into the sleeves and placed between the folds helps wonderfully to keep the shape of the garments.

If anyone does not object to the smell of camphor or moth balls a small amount may be sprinkled among the folds, but if it is unpleasant to the wearer there are very slight chances of insects attacking clothes from which the dust is thoroughly removed and that are securely packed.

When the things are folded, I wrap in a liberal amount of newspapers, as the smell of printer's ink is an objectionable odor to insects, and put them in a card box such as suits are sent home in. When the box is securely tied, I paste a strip of paper all round where it opens. This effectually prevents moths, and buffalo bugs from getting in, and if the clothes have been well aired and cleaned you know there are none in there to start with.

The second set of things, those which can be remade, I rip apart and clean and air well, then fold smoothly and pack away like the first set, to be made up when needed.

In the third assortment there may be some things that could be used by someone else. If I do not know of any one who would be glad of them, I send them to some of the charitable societies. Others that are of no further use



"JUST as an experiment, I made up a batch of butter a while ago with Worcester Salt.

"I soon noticed that the butter was better in a good many ways. First of all, the Worcester Salt distributed and dissolved evenly. No mottles in the butter, no grit or brine-pockets.

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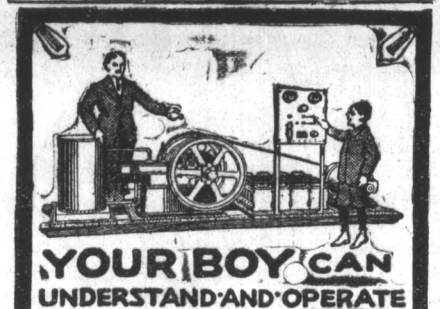
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frosted, I use one cup of sugar and the whites of two eggs."

"At our house," responded Mrs. Walters, when her turn came, "we had several feather beds for which in recent years we have had no use. I make lots of pillows and cushions, but the beds which were not in use were almost a nuisance. I finally discovered a way to utilize them. I sent them to a factory where they were renovated and made into mattresses. Now we thoroughly enjoy the old feather beds which grandmother took such pains to make. They are so soft, and yet so comfortable in the hottest weather."

The final response of the afternoon came from the hostess, who took a pretty white apron from a table and handed it around for inspection. "There is nothing unusual or particularly remarkable about it," she observed as it went from hand to hand, "only for the fact that it represents one of my pet economies. It is made from the back of a man's shirt. The front part and the sleeves had become worn out while the back was still good, as is usually the case with shirts, I find. This one was of fine white madras, but any of the better quality of percales or madras in colors are equally as pretty. The lace edged ruffle which trims it was originally on a fine white undergarment of my own, which wore out before the ruffle did. So there you see a perfectly good white apron which cost not one penny. It is good for at least a year's wear with careful handling."

As the ladies closed their note books they decided to continue the meetings under the name of the Pass it Along Club, each member to contribute a helpful hint at least once a month, for the benefit of the others.

CAN MEAT FOR SUMMER USE.

There is an important winter, as well as summer, canning season, if an adequate meat supply is to be provided for the family during the summer months when salt meats only are available to those distant from market. If a beef has been killed, preserve part for winter use by freezing. The remainder, including the inferior cuts, may be canned successfully by the following method: Strip the meat from the bones, using that which is well streaked with fat, or add sufficient fat to each can to give it richness and flavor. Cut the meat into suitable sized pieces, pack closely in glass jars; add salt and pepper to taste. Fill the jar almost full of the meat, adding no water. Put on new rubbers which have been boiled for five minutes, and the tops. If glass tops are used, adjust the top spring only. In the case of screw tops, screw the top on until it touches the rubber. Put the jar into a boiler or any receptacle having a false bottom, and tight cover, which has in it enough cool or luke-warm water to cover the jars. Boil from three to four hours, depending on the age of the beef, counting time when the water begins to boil. Remove from the boiler and tighten cover. Do not invert the jars as it will disturb the layer of fat on top.—N. D. Agril. Col.

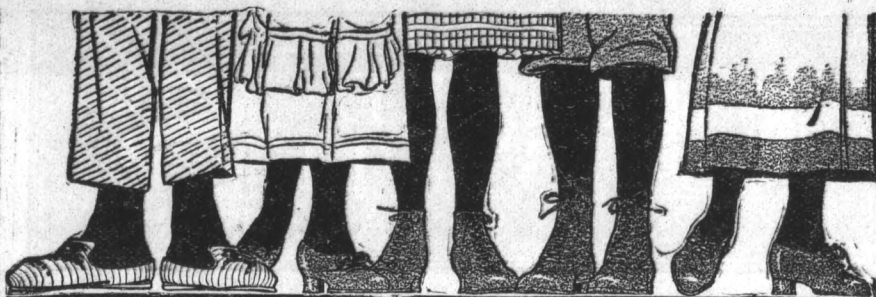
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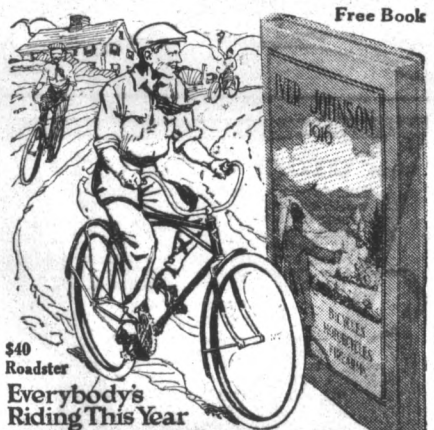
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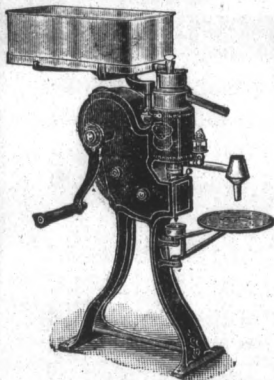
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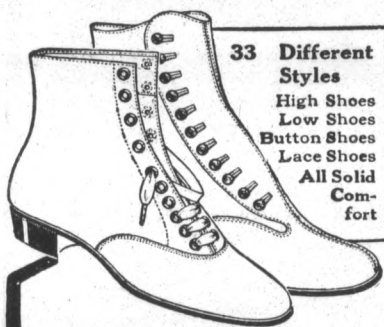
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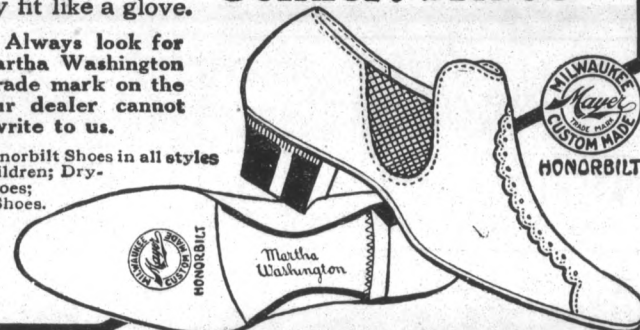
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Fig. 1531 "Pyramid"

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some of these not till late in life. But college women are fastidious and will have none but worthy fathers for their children. And the woman who is concerned on this latter ground is not going to have a wide choice of husbands. Those college women who do marry, as a rule, marry well and make devoted wives and ideal mothers.

But earth knows no hotter hell than the ill-assorted marriage. And those women who remain "old maids" rather than marry the wrong man just for the sake of having a husband and home, are to be praised and not criticised. And they have made their lives so comfortable and—yes, happy—that they have fooled the rest of the world and almost fooled themselves. Yet, at heart, every normal woman yearns for her own home, her own husband and children. This instinct is too deeply seated to be eradicated by either education or other changes of custom.

Woman has not yet completed the transition period, and transitions furnish queer, unpleasant types and conditions. One hears much of unwelcome motherhood and race suicide. What some thoughtless women have done along this line is frightful. And yet the mistresses are not all to blame for the childless homes. At random and within very narrow range I know three superior women whose deepest sorrow is that no children bless their homes. One has now consoled herself by adopting two homeless children and lavishing upon them all the fruits of her rich education.

It was rather the women of fifteen or twenty years of age who criminally practiced race suicide. And there was a psychological reason for it. Her mother had been the unwilling mother of, perhaps, a dozen or more children, a task far too big for any woman. An unwelcome degree of motherhood is no new thing. By too much motherhood this unfortunate woman was defrauded of her other human rights. So from her the daughter inherited an inborn revolt against a condition and this carried her to the other extreme. But a younger generation is resuming the cares of a natural motherhood and of a vastly improved motherhood.

In itself motherhood is not necessarily either beautiful or sacred, any more than it sums up a woman's whole destiny. We love and venerate mothers because of the noble women who have made motherhood lovely and venerable. Unhappily the human mother is still not extinct whose sense of her office ranks perilously near that of the lower animals. To become a mother one must first be a noble woman.

Woman's seeming abandonment of the home is not altogether intentional. It is due to industrial as well as educational causes. Along with the opening of colleges to women came the evolution of machinery. By this the high-priced workman could be discarded and his place taken by a cheap, unskilled workman. The skilled workman was thus deprived of his human right to work and support his family; and yet his family must live. So the wife and children came to take his place. Again, the cheap, unskilled factory worker could not earn enough decently to support his home, and his wife and children had to help. So women went into the factories. Thus it has gone on; the machinery which, by providing more leisure, should have freed the race to finer living, has welded the chains of slavery. But none of these people are to blame for what has happened to them.

Further, machinery has removed the old work from the home. Once every thrifty housewife spun, colored, wove, cut and made all the clothing for her numerous family. She made her own carpets and curtains, soap and butter, and provided all the illumination. Now all this work is done in factories and by machinery. With only the simplest tools she did her own washing and housecleaning. Now machinery has made all this comparatively short and easy. She need not even bake her own

bread and at the stores she can buy a ready-cooked dinner.

When in those days there were not men enough to go around and there had to be "old maids," the only respectable career for such an unfortunate was to live as a dependent parasite on her nearest male relative. Outside work would have been a disgrace to the family. Thus she had the narrowest latitude for individual growth as a human being. Regardless of her own preferences she did the work required of her as the unpaid servant of the house. This was no longer ago than fifty years. Yet what self-respecting woman of today would submit to such a fate. The "old maid" of today is too fine a human being to be so at the nod and beck of others' whims.

To this unmarried woman machinery as well as education came as a liberator. The home no longer had enough work for her to do. And is it not far better that such women, unlucky enough not to have husbands, should have other careers in stores, offices, and schoolrooms where they may do useful work for an independent living and even support others? Yes, indeed; to American women many desirable careers outside the home are open. Think of Frances Willard, Jane Adams, Ella Flagg Young, whose usefulness to the world even the good wife and mother can hardly match.

We cannot all become famous and, after all, fame is a hollow thing. But it is the privilege of every American woman to make of herself whatever she will. And whether she ever marry or not, she may lead an altogether useful and happy life.—Charlotte Bird.

MICHIGAN FARMER PATTERNS.

Our latest Fashion Book, containing illustrations of over 1,000 designs of ladies', misses' and children's garments in current fashions, also newest embroidery designs, and articles which give valuable hints to the home dress-maker, will be sent to any address upon receipt of ten cents.



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No. 7018—Ladies' Skirt. Cut in sizes 22 to 32 inches, waist measure. The skirt has a circular cut and may be made in one or two pieces.

No. 7685—Ladies' Dress. Cut in sizes 36 to 44 inches, bust measure. The dress has a four-gored skirt with high or regulation waistline.

Grange.

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

INGHAM COUNTY POMONA MEETING.

A beautiful spring day greeted the Ingham County Grangers, Saturday, March 25, as they gathered from different parts of the county to hold their Pomona meeting with Okemos Grange. Okemos Grange is one of the most thriving and active Granges in Ingham county, have usually met once in two weeks, but this winter they have had so much business to attend to and so many new members coming in that they have had to meet every week.

A great deal of business was attended to in the forenoon. This included the roll call of Granges of the county and the obligating in the fifth degree of 14 candidates. State Master J. C. Ketcham, who was present, gave them the obligation. By the time the call came for dinner the hall was overflowing, so it was announced that the afternoon session would be an open meeting and would be held at a nearby church. After an excellent dinner served by the ladies of Okemos Grange, all adjourned to the church.

As the question of local option is to be submitted to the people of Ingham county this spring this was local option day for Ingham County Pomona and a local option program was given. Music was furnished by Okemos Grange, one selection by a male quartette and one by a mixed octette. Four little children, two little Raymond children and two little Daniels children, gave a motion song entitled, "From a Man to a Jug." Master James Webb, of Williamston Grange, gave a recitation which was a regular "Grange" recitation, and Miss Jessie Turner, in a very pleasing style, gave a reading, "The Horn of Plenty." Mrs. E. E. Keeler, of Alaledon Grange, was present and favored the Grange with two of her fine readings. The event of the afternoon was an address by State Master Ketcham. For the last three days Master Ketcham has been delivering local option addresses to the Grangers throughout the county, meeting with Ingham Grange at Dansville, Thursday afternoon, March 23, with Stockbridge Grange that evening, with Fitchburg Grange on Friday afternoon, March 24, with Holt Grange that evening, and spending Saturday with Ingham County Pomona at Okemos and closing the week with Telephone Grange at Leslie that evening. His address was interesting, revealing the weaknesses of the arguments of the "wets." He took as his subject, "Dust," and likened the arguments of the "wets" to dust that they were trying to throw in our eyes to obscure the vision of the real questions at issue. It was thoroughly enjoyed by all. Master Ketcham is a forceful speaker, with an animated delivery, and never fails to capture and hold the attention of his hearers. After a song by the choir, the Grange adjourned to meet with Fitchburg Grange April 22.

Ingham County Pomona Grange has in the last year been following a new line of procedure about initiating candidates. They hold only a day session with the forenoon for business and the afternoon open to the public, with a program in charge of the worthy lecturer. So a class is obtained in the fifth degree in two or three near-by Granges, then at some set time the fifth degree members go to one of these Granges and initiate the class. It has been found better to do this than to initiate once a year as they used to do as it was hard for the candidates to all get together in one place. The fourteen candidates obligated will be initiated with others from Okemos, Williamston, and other near-by Granges, at Okemos, May 6.—Mrs. H. M. Young.

Farmers' Clubs

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

CLUB DISCUSSIONS.

Benefits Derived from Local Option.—A notable feature of the program of the annual temperance meeting of the Essex Farmers' Club, of Clinton county, was a paper on the above named topic, read by Ex-Associational President J. T. Daniels, which is given in full by request of the Club.

The above question has been assigned to me by the program committee for correct answer, but I am not sure that I shall be able to list the entire number or to state the full value of the many benefits accruing to Clinton county through the wise action of its citizens in banishing from its domain the harmful saloon.

Clinton county is the recipient of but the same benefits, in this matter, that are certain to come to each and every county which is wise enough to place the correct estimate in the injurious influences of the legalized saloon and then second that estimate with the ballot.

As long as human nature remains "Human Nature," with a disposition, so often shown, to take the "wrong road" when coming to the "parting of the ways," just so long will humanity laws, whereby the "right way" may need the helpful aid of restrictive become its choice.

There is a period in the life of each individual when the age of personal responsibility is reached and at this period it is presumed that the years of good discretion and sound judgment have been reached, but, most unfortunately, this is, often, not the case, many being yet, but "children of a larger growth," and needing, still, wise counsel and the helpful aid of good laws, and fully enforced.

The question is yet being asked, as of old, "Am I my brother's keeper?" and the answer comes back, through the ages, assuring that we are, to a certain extent, responsible for the acts and resulting conditions of our associates and this responsibility we cannot avoid.

The fact is undisputed that each and every one exerts an influence, either helpful or harmful, to a greater or less degree, upon their associates and, also, upon the public sentiment of the times in which they live.

Clinton county banished the saloon because public sentiment had become educated and enlightened to that extent that the destructive influences of the saloon had become recognized and the result has been the bringing of much real good to Clinton county.

Men who formerly spent their leisure hours and spare money in the saloon are now spending those hours in their homes and more money is now available to make comfortable the inmates of those homes and the former saloon-supporters are becoming the supporters of worthy causes, this resulting from the better influences now surrounding them. The "Moral Uplift" which has come to our saloonless county is, perhaps, the most valuable asset therefrom, and this will increase in value as the years go by. We have not the statistics at hand, but it is well known that the court calendar is much reduced in the saloonless county and that the county jail has, from this cause, become, in some instances, without an occupant.

Mention has, herein, been made of but a portion of the many benefits which have resulted from the banishing, from our county, the saloon which is justly charged with being responsible for a very large percentage of the poverty, suffering and crime which exists. The indications are very favorable that when the opportunity soon to be given, occurs, the people of our beautiful peninsula state will banish from its borders the destructive saloon.

We, of the older generation, can remember that once it was lawful to sell a woman on the auction block, as a chattel, if in her veins there flowed the blood—even in smallest degree—of the Negro race. That crime of our nation, with its deep stain, has been washed out with blood and with tears and the present generation of citizens will surely be permitted to see the glad day when it shall no longer be lawful to sell intoxicating liquors, for beverage purposes, with all of the attending harm, if only a prescribed portion of the money be paid into the coffers of the state and the nation. The great wrong of licensing the saloon must not continue if our nation is to be prosperous and blessed of God.

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is ready for you today. I want you to get it because this offer, in connection with my new lower than ever 1916 prices on Galloway Masterpiece Engines from 1 1/4 h. p. to 16 h. p., will save you money. You cannot buy a better engine than the Galloway Masterpiece. Tens of thousands of Galloway Masterpiece engine users have said so themselves. I build this engine right here in Waterloo in my own factories and build it so good that when it goes out into the hands of a customer, one Masterpiece engine sells from one to a dozen more. Galloway Engines sweep whole communities like wildfire. That's why I say—

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Until you have seen this new 1916 250-page book that tells all about Galloway engines and explains my new extra special advertising distribution offer. If you answered all the engine advertisements ever published you would not find an offer fairer, squarer or more in your favor. You owe it to your pocket-book and the satisfaction that you demand in the operation of the engine you buy to answer this advertisement and learn the particulars of this new 90-day offer to distribute 10,000 more Masterpiece Engines. The great Galloway chain of factories are running day and night. We are turning out more Masterpiece Engines than ever and the reason is that we are building them so good, from such a highly perfected design, of such good materials, and by such thoroughly skilled workmen that every Galloway Masterpiece sells one or more wherever introduced. Six liberal selling plans, cash or terms. Write today.

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For Sale Registered dark bay Belgian Stallion, ten years old, sound and a sure foal getter, weight 1850 lbs. Cheap if sold at once. Address **J. G. Warner, Owosso, Mich., Route No. 6.**

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Markets.

GRAINS AND SEEDS.

April 4, 1916.

Wheat.—With predictions that the United States winter wheat crop will probably be the smallest of any for the past twelve years, buyers became anxious early this week and prices advanced on Monday from three to five cents per bushel in the important grain markets. The largest advance was for July options. This bullish situation is augmented by conditions in the spring wheat districts where work has been delayed and sowing will be unusually late, thus giving the crop a bad start. Foreigners also took hold of the market freely on Monday, and it is stated that reserves in Holland are exhausted. The extreme gain of values last week amounted to over 13½¢ per bushel in Chicago. One year ago No. 2 red wheat was quoted at \$1.55½ per bushel. Detroit's last week's quotations were:

	No. 2	No. 1	May
Wednesday	1.16½	1.11½	1.17½
Thursday	1.18½	1.13½	1.19½
Friday	1.17½	1.12½	1.19
Saturday	1.18½	1.13½	1.20
Monday	1.22½	1.17½	1.24

Chicago.—No. 3 red wheat \$1.19@1.24½; May \$1.20½; July \$1.19½.

Corn.—The corn market is strong; receipts have been small and the demand from eastern points and Canada has been lively. The upward trend in wheat values has also imparted strength to corn. One year ago No. 3 corn was quoted at 74½¢ per bushel. Prices in Detroit last week were:

	No. 3	No. 2	Yellow
Wednesday	72	74½	75½
Thursday	73	75½	76
Friday	73½	76	76
Saturday	73½	76	76
Monday	74½	77	77

Chicago.—No. 2 yellow corn 81¼@81½¢; May 76¼¢; July 77½¢.

Oats.—Delay in seeding in important oat growing sections and the probable reduction in the acreage in northern United States and Canada, due to the late spring, has given a firmer tone to the oat deal. There was a substantial decrease in the visible supply and the domestic consumption is fully up to normal. One year ago standard oats were quoted at 59½¢. Last week's prices were:

	Standard	No. 3	White
Wednesday	48	47	47
Thursday	48	47	47
Friday	48	47	47
Saturday	48	47	47
Monday	48½	47½	47½

Chicago.—Standard oats 46½@47¢; May 45½¢; July 45½¢.

Barley.—At Milwaukee the malting grades are quoted at 69@76¢ and at Chicago 62@77¢.

Rye.—Trade is firm and quiet with a fair demand. Cash No. 2 is 93¢ per bushel.

Beans.—This trade remains steady with last week. Supplies are small. Cash beans at Detroit \$3.65; April \$3.70; May \$3.75. At Chicago values have advanced and trade is firm. Pea beans, hand-picked \$3.90@4.60; prime \$3.45@3.85; red kidneys \$4.75@5.25.

Peas.—Market unchanged at \$2.40@2.50, sacks included, at Chicago.

Clover Seed.—Market is easy. Prime red clover \$10.60; prime alsike \$9.25. At Toledo prime cash is \$10.45; do alsike \$9.25.

Timothy Seed.—Prime \$3.50 per bu.

FLOUR AND FEEDS.

Flour.—Jobbing lots in one-eighth paper sacks are selling on the Detroit market per 196 lbs., as follows: Best patent \$6.50; seconds, \$6; straight \$5.70; spring patent \$6.70; rye flour \$6.

Feed.—In 100-lb. sacks, jobbing lots are: Bran \$24; standard middlings \$25; fine middlings \$30; cracked corn \$31.50; corn and oat chop \$28 per ton. Hay.—No. 1 timothy, \$18.50@19; standard timothy \$17.50@18; light mixed \$17.50@18; No. 2 timothy \$15.50@16; No. 1 mixed \$14@15; No. 1 clover \$12@13.

Chicago.—Higher. Choice timothy \$19.50@20.50; No. 1 do \$18@19; No. 2 \$15.50@16.50.

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

DAIRY AND POULTRY PRODUCTS.

Butter.—Market continues firm at slightly higher prices for dairy and packing stock. Other kinds remain unchanged. Extra creamery 36¢; firsts 34½¢; dairy 25¢; packing stock 22¢.

Eggs.—The supply of fancy goods is still light and prices remain unchanged.

ed. Price for the week, based on the sales, is 36¢.

Chicago.—The tone of the market is easy but prices remain unchanged. The supply is slightly increasing but it is still light. On account of high prices buying in small lots prevails. Extra creamery 36¢; extra firsts 35½¢; firsts 33@34½¢; extra dairies 35¢; packing stock 23½@24¢.

Eggs.—The demand is good and the market firm at higher prices. Current receipts are quoted at 20¢; candled firsts 20½¢.

Chicago.—The feeling is steady at prices slightly higher than last week. Liberal arrivals, however, are making buyers more cautious. Firsts 19¼@19½¢; ordinary firsts 18½¢; miscellaneous lots, cases included 18½@19½¢ a dozen.

Poultry.—Market is active and the receipts are light. Prices are well maintained. Turkeys 16@17¢; spring turkeys 21@22¢; fowls 14@19½¢, according to quality; spring chickens 17@19¢; ducks 19@20¢; geese 17@18¢.

Chicago.—The feeling is firm and prices are higher. The demand is good but buyers are reluctant to pay higher prices. Turkeys 17@19¢; fowls 12½@18¢; springs 18¢; ducks 18¢; geese 10@13¢ a pound.

FRUITS AND VEGETABLES.

Apples.—Apples are easy and active. Prices are unchanged. Greenings \$2.50@3.50; Spy \$3.50@4; Baldwins \$3@3.50; Steel Red \$4@4.50. At Chicago barrel stock showing effects of storage is easy. Good firm stock sells well at unchanged prices. No. 1 Greenings are quoted at \$2.50@3.50 per bbl; Jonathans, No. 1 \$3.50@4; Baldwins \$3@3.25; Spys \$3.50@4.

Potatoes.—Potatoes are in good demand at last week's prices. Carlots on track, white \$1.05@1.08; red 95¢@1 per bushel. At Chicago the market is fairly active at slightly lower prices. No Michigan stock quoted; other kinds sell from 87@95¢. At Greenville potatoes are selling at 85¢.

WOOL AND HIDES.

Wool.—The trade shows continued firmness both in the manufacturing centers and in the growing districts. In the west sheepmen are making contracts at prices from two to four cents higher than dealers are getting for the same grades in the east. This would indicate confidence in the market during the coming year. The bullish side of the trade was encouraged this past week through negotiations by the American government for uniform goods made necessary through the trouble in Mexico. The general domestic trade and the demand from foreign countries point to a sustained market. Michigan unwashed delaines are quoted in Boston at 31@32¢; do combing 32@37¢; do clothing 26@31¢.

Hides.—No. 1 cured 17¢; do. green 15¢; No. 1 cured bulls 13¢; do. green 10¢; No. 1 cured calf 25¢; do. green 24¢; No. 1 horsehides \$4.50; No. 2 \$3.50; No. 2 hides 1¢ lower than the No. 1; sheepskins 50¢@52, according to amount of wool.

GRAND RAPIDS.

The potato market shows no material change, with the price around 80@85¢. It is not expected that potatoes will go much lower than this and it seems reasonable on the other hand, to expect \$1 stock before many weeks. Late blight has affected tubers to a large extent. The egg market continues rather firm, with dealers bidding 18@19¢. At this season many eggs are going into incubators or under hens for hatching and table consumption is also very large. The apple market continues slow. Fancy Spies will bring \$1.75 in a small way, and from this figure this best all-round apple ranges down to 50¢ according to quality. No 2 red wheat is quoted at \$1.09, with other grains unchanged.

DETROIT EASTERN MARKET.

Considering the season, there was a fairly good volume of business transacted on the Eastern Market Tuesday morning. Excepting apples, products moved fairly quickly. Apple prices ranged from 75¢@1.75, but sales were slow and purchases were usually small. Potatoes \$1.15@1.25; lettuce 60@70¢; cabbage 60@75¢; parsnips 55@65¢; carrots \$1@1.15; eggs 25¢; loose hay is easy at \$18@22, not much coming in on account of bad roads.

LIVE STOCK MARKETS.

Buffalo.

April 3, 1916.
(Special Report of Dunning & Stevens,
New York Central Stock Yards,
Buffalo, N. Y.)
Receipts here today: Cattle 135 cars; hogs 60 d. d.; sheep and lambs 50 d. d.; calves 1100 head.

With 135 cars of cattle today, there were around 20 cars of shipping cattle, and all the big eastern buyers were in the market, although the trade was slow and 10@15¢ lower. There was a good demand from the outside for the butcher cattle, but the bulk of them had to go at 10@15¢ decline. We look for a fair run of cattle next Monday and a steady market.

Receipts of hogs all over the country today were much lighter than some time past, consequently a sharp advance in prices at all markets. The general run of yorkers and mixed sold at \$10.25, with a few at \$10.30 and an occasional load of fancy at \$10.35; pigs sold at \$9.50 and light hogs from \$9.75@10. About everything sold at the close and late trade was strong, with a good clearance.

Market was active on choice sheep and lambs, but slow on heavy and coarse, with prices 20¢ lower than the close of last week. About all sold and we look for steady to possibly a shade higher prices the last of the week.

We quote: Lambs \$11.65@11.75; cull to fair \$8@11.60; yearlings \$8.50@10.75; bucks \$4.50@7.50; handy ewes \$8.50@9; heavy ewes \$8.50@8.75; wethers \$9@9.40; cull sheep \$4.50@7; veals, good to choice \$10.25@10.50; common to fair \$8@10; heavy \$6@9.

Chicago.

April 3, 1916.

Cattle. Hogs. Sheep.
Receipts today.. 9,000 20,000 16,000
Same day 1915.. 11,350 30,774 11,177
Last week.... 43,590 149,975 52,176
Same wk 1915.. 32,378 100,343 40,181

The cattle supply is unusually small for Monday, and butcher stuff sold freely at advances of 10@15¢, but buyers of steers were holding back, with a view of preventing the advance that seemed likely to occur later in the day. Hogs were scarce and 25¢ higher, with sales at \$9.25@9.80. Hogs received last week averaged 215 lbs.

Cattle were in very fair general demand last week, but increasing supplies gave buyers an opportunity to stop the recent upward movement of prices, and several declines took place for the rank and file of the offerings. The decline was pretty general, taking in canners and cutters, as well as the better kinds of cattle, with the bulk of the steers selling at \$8.50@9.65 and the best long-few weighty steers going at \$9.50@10. The common to fair steers of light weight and thin in flesh brought \$7.25@8.50, while medium to good grade steers brought \$8.60@8.95, and good lots sold for \$9@9.45. Butchering cattle were in demand at \$5.15@8.75 for cows and \$5.25@9.15 for heifers, with a sale of 21 fancy yearling heifers that averaged 689 lbs. at \$9.15, but sales of cows and heifers near top prices were insignificant. Cutters sold at \$4.50@5.10, canners at \$3.25@4.45 and bulls at \$5.25@8.40, the bull market being higher for the better class. Calves were lower, with sales at \$4.50@9.25, with early week sales up to \$10. There was a fair traffic in stockers and feeders, and great rejoicing took place when the announcement was made public that there was an end of the quarantine on live stock, the whole country being free from the hoof-and-mouth disease at last after the long period of waiting. Stockers and feeders were purchased at a range of \$5.50@8.40, prices depending mainly on the quality, with slow sales of the poorer offerings, and prime little yearling steers among the highest sellers. Illinois has been the chief buyers of these cattle of late, Michigan also taking hold pretty well, but from now on a free outward movement to various states is looked forward to, the principal obstacle being the ruling high prices asked for good stockers. At the close cattle averaged around 25¢ lower than a week earlier, and some going off more and others less, with the quoted top \$9.90 and the best calves selling around \$8.50.

Hogs suffered several bad breaks in prices last week, greatly to the surprise of most sellers, who had counted upon firm markets. Increasing receipts were not offset by larger shipping purchases, the eastern demand falling off, and large numbers of hogs were carried over unsold from day to day, these accumulations playing into the hands of buyers. Hogs were largely good in quality, and recent receipts averaged 221 lbs., the heaviest since last September, being six pounds heavier than a week earlier, comparing with 194 lbs. two months ago and 237 lbs. a year ago. The general expectation was that the decline in prices would check receipts until the loss was recovered. Friday was low day, with the top at \$9.40, but a boom the following day lifted hogs to \$9.05@9.55, with one sale of prime butcher weights at \$9.60. Shippers bought hogs at \$9.45@9.55, while pigs brought \$7@8.40. A week earlier hogs brought \$9.35@10.

Lambs, yearlings and sheep were as active as ever last week, and prices were far higher than in former years

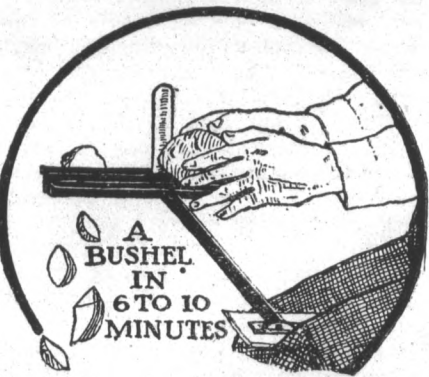
at corresponding dates, notwithstanding some marked declines on days when the local packers were the chief buyers. Colorado furnished the principal part of the lambs, and early sales made the phenomenal record of \$11.90. Shorn lambs and sheep were offered fairly and sold at a liberal discount, with increasing offerings. Feeders were scarce and greatly in demand, and prices ruled higher than ever, Michigan shearers paying \$11.15 per 100 lbs. for three carloads of 72-lb. western lambs from Iowa in rather light flesh, but of high shearing capacity. Light Colorado yearlings made a new high record at \$10.75. At the week's close lambs were lower, with sales at \$9@11.50, feeding lambs bringing \$10.25@11 and heavy lambs \$9.50@10.50. Yearlings closed at \$9@10.75, wethers at \$8@9.25, ewes at \$5.50@8.85 and bucks at \$6.50@7.75.

A CO-OPERATIVE COMMUNITY.

In the court house in the city of Hillsdale, occurred recently, a meeting of unusual interest and importance to all connected with the co-operative movement. At this meeting, attended by 150 representatives of co-operative associations, a permanent federation was formed to be known as the United Co-operative Societies. The name Michigan was omitted, as it is hoped that co-operative associations of Ohio and Indiana will join the federation, thus making it something more than a state organization. The three counties of Hillsdale, Branch and Lenawee were most strongly represented at the gathering, although delegates were in attendance from other sections. Owing to the fact that Hillsdale county associations were initiators of the wider movement, Hillsdale city was made the headquarters of the federation. W. F. Vedder, of Chicago, managing director of the American Co-operative Federation Bureau, was present and assisted in forming the permanent federation. It is expected that the new sectional association will affiliate with the national co-operative organization.

The officers of the newly formed association are for the most part, men prominently connected with the co-operative movement in their respective localities. The list is as follows: President, John Hoolihan, Montgomery; vice-president, Delbert Parker, Palmyra; secretary-treasurer, Carl Martin, Coldwater; directors, John Hoolihan, Montgomery; Elsworth Lovell, Jonesville; W. E. Sheldon, Litchfield; Delbert Parker, Palmyra; Carl Martin, Coldwater. One of the principal objects of the new association will be to advocate and promote the standardization and grading of farm products, and to assist in marketing them. This larger organization and larger work has grown naturally out of the unprecedented growth of the co-operative idea in this section. When it is stated that 30 co-operative associations were represented at the Hillsdale meeting, it will be possible to form some adequate idea of the rapidity and extent to which the co-operative movement has attained in Hillsdale county and its neighbors, during the past two years. As the writer has more than once stated in these columns, the co-operative idea has come to stay. It is giving the farmer the opportunity for which he has waited for centuries.

Hillsdale Co. J. A. KAISER.



The RICHARDSON Seed Potato Cutter

Makes the work of cutting seed potatoes a pleasure, rather than a job to be dreaded. You can have this wonderful, common-sense invention made of solid substantial metal parts with best steel knife it is possible to make, and wrench for adjusting also a set of screws for securing to board. All for \$1.25.

Get one, cut your seed quicker, easier and better this spring than ever before and just as you wanted, halved, quartered or one eye to the piece.

Send \$1.25 only and we will send you this labor, time and money saver, parcels post paid. Your money will be gladly refunded and no questions asked if it is not everything we claim.

Remit by P. O. Money Order, Express Order or your check. Address

RICHARDSON TOOL CO., East Jordan, Mich.

THIS IS THE FIRST EDITION.

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

DETROIT LIVE STOCK MARKET.

Thursday's Market.

March 30, 1916.

Cattle.

Receipts 1762. The run in all departments at the local yards was light this week, due to the bad condition of country roads. Drovers from all parts of the state report so much water that it is almost impossible to drive anything but cattle. All local railroads, however, made good time with what they did get and everything was yarded early on both Wednesday and Thursday.

In the cattle division the trade opened up strong at last week's prices, but closed a trifle dull, especially on the common stuff. Common milch cows are still very hard to sell and bring low prices, but good grades are selling well and in good active demand.

The demand for the country was more active than in several weeks and quite a few went back for feeding.

We quote: Best heavy steers \$8@9; best handy weight butcher steers \$7.50@7.75; mixed steers and heifers \$7@7.25; handy light butchers \$6.75@7; light butchers \$6.50@6.75; best cows \$6@6.50; butcher cows \$5.50@5.75; common cows \$4.50@5; canners \$4@4.50; best heavy bulls \$6@6.25; bologna bulls \$5.50@5.75; stock bulls \$5.25@5.75; feeders \$6.50@7.25; stockers \$5.25@6.25; milkers and springers \$4@9.00.

Bishop, B. & H. sold Bresnahan 1 cow wgh 1170 at \$5.25, 2 do av 765 at \$4.25, 5 do av 1090 at \$5.40, 1 steer wgh 980 at \$7.50, 2 do av 985 at \$7.50, 2 bulls av 1060 at \$6; to Thompson Bros. 25 steers av 860 at \$7.60; to Applebaum 1 bull wgh 770 at \$6.25; to Newton B. Co. 17 steers av 1093 at \$8.25, 6 do av 1275 at \$8.25, 9 do av 909 at \$7.40, 3 do av 917 at \$7.40, 30 do av 881 at \$7.60, 1 do wgh 1150 at \$8, 6 do av 825 at \$7, 4 cows av 1025 at \$6, 9 do av 794 at \$5.50, 3 do av 977 at \$6.50, 7 do av 971 at \$6, 2 do av 960 at \$5.25; to Biefert 2 do av 1070 at \$4.50, 2 do av 1000 at \$6; to Newton B. Co. 8 steers av 1013 at \$7.75, 1 cow wgh 1140 at \$4.75, 3 do av 1017 at \$6.75, 5 steers av 980 at \$7.25, 4 cows av 930 at \$6.25, 5 steers av 966 at \$7.60, 3 do av 1193 at \$8, 3 do av 1050 at \$6, 2 do av 925 at \$7.50, 1 bull wgh 1520 at \$6.50, 2 steers av 1275 at \$8, 2 do av 1025 at \$7.75, 5 do av 958 at \$6.25, 5 bulls av 954 at \$6; to Bray 3 steers av 1280 at \$9, 6 cows av 1158 at \$6.50.

Veal Calves.

Receipts 638. The veal calf trade was 50c lower than on Wednesday and about 75c lower than they were a week ago and the heavy and common grades were hard to sell at the decline. Best grades \$10@10.50; common and medium and heavy \$7@9.50.

Haley & M. sold Dunn 15 av 160 at \$11.50; to Thompson Bros. 15 av 140 at \$11; to Parker, W. & Co. 2 av 205 at \$8, 1 wgh 160 at \$11, 18 av 140 at \$11.

Sheep and Lambs.

Receipts 710. There was hardly sheep and lambs enough on sale to establish a market, being less than 800 for the entire week. The market for what was here was active and strong at 35@50c higher than last week on good lambs; sheep selling strong. Best lambs \$11.65; fair lambs \$10.50@11.25; light to common lambs \$8.50@10; yearlings \$10; fair to good sheep \$7@8.25; culls and common \$5@6.50.

Bishop, B. & H. sold Nagle P. Co. 13 lambs av 80 at \$10, 141 do av 75 at \$11.25; to Thompson Bros. 104 do av 80 at \$11.65; to Sullivan P. Co. 120 do av 85 at \$11.65; to Mich. B. Co. 99 do av 53 at \$9.50, 10 sheep av 82 at \$7, 98 do av 85 at \$11.65; to Nagle P. Co. 4 lambs av 80 at \$10.50, 42 do av 50 at \$10.

Hogs.

Receipts 6056. Hogs had a slump of 15@20c on Thursday from prices paid on Wednesday, and are selling at \$9.25@9.45 for yorkers and mixed and \$8@8.25 for pigs. This is 15@25c lower than they were a week ago and dull at the decline.

Friday's Market.

March 31, 1916.

Cattle.

Receipts this week 2402; last week 2758. Market opened steady; closed 10@15c lower. Best heavy steers \$8@9; best handy weight butcher steers \$7.50@7.65; mixed steers and heifers \$7@7.15; handy light butchers \$6.75@7; light butchers \$6.50@6.65; best cows \$6@6.40; butcher cows \$5.50@5.65; common cows \$4.50@4.85; canners \$4@4.50; best heavy bulls \$5.75@6; bologna bulls \$5.25@5.50; stock bulls \$5@5.50; feeders \$6.50@7.25; stockers

\$5.25@6.25; milkers and springers \$40@90.

Veal Calves.

Receipts this week 1109; last week 1234; market steady. Best \$10@10.50; others \$7@9.50.

Sheep and Lambs.

Receipts this week 807; last week 1362. Market is steady. Best lambs \$11.65; fair do \$10.50@11.25; light to common lambs \$8.50@10; yearlings \$10; fair to good sheep \$7@8.25; culls and common \$5@6.50.

Hogs.

Receipts this week 10,109; last week 11,111; market 10@15c lower. Pigs \$8; yorkers and mixed \$9@9.25.

LIVE STOCK NEWS.

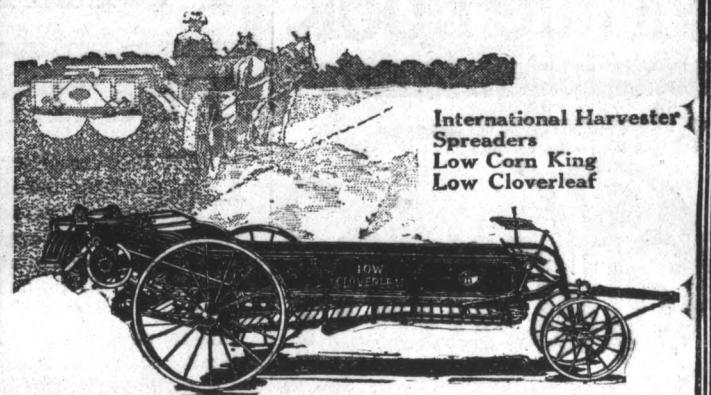
There has never been a year when the cattle industry was in better shape from the feeder's standpoint than the present one, and it is no wonder that there is such a growing desire among farmers of various states included in the corn belt to engage in making beef during the approaching grass season. Turning backward, it is recalled that a year ago steers were selling on the Chicago market for anywhere from \$5.65 to \$8.80 per cwt, while five years ago sales ranged from \$5.15 to \$7.05. Quite recently steers have sold for \$7.25 to \$10.05 for an extreme range, with limited receipts, and low-priced beefs look a long way off. Of course, everybody knows that the present scarcity of cattle is the inevitable result of the wide-spread sacrifice of short-fed cattle during the winter feeding period, during which good feeding corn was scarce and unusually dear, and high prices may be counted upon for months to come, or until a new crop of beefs can be produced on grass and corn. The advanced prices charged everywhere for beef are curtailing its consumption a good deal, but other meats are advancing at the same time, including fresh pork, so long a comparatively cheap article of food, so that beef is not so much out of line with other meats after all. Cheapening prices for southern grown vegetables are causing these to be substituted in a measure for beef, and were the receipts of cattle of normal proportions, it would be utterly impossible to hold values where they are now. It is natural that at such a time there should be a good demand for stockers and feeders, but the limited offerings of the better class of these cattle and their comparative dearthness tend to check the shipments to feeding districts. Most stockmen refuse to buy the numerous inferior little stockers, and the local killers are bidding up prices for well-bred feeders carrying a moderate amount of flesh. In doing this, the packers are working against a future supply of fat cattle.

Recent developments in the hog market have demonstrated fully the firm position of stockmen throughout the country who are so fortunate as to be the owners of thrifty, growing young hogs and pigs; for the decreasing marketings of hogs from all directions show plainly that the last crop of pigs has been largely disposed of already. Meanwhile there is a large demand most of the time from local packers and eastern shippers, and despite declines in values from time to time, the market usually recovers. It is the prevailing impression among those who are best informed about such matters that ultimately hogs will go higher than ever, and it certainly pays farmers to put plenty of good corn into thrifty, growing pigs. Ruling hog prices are far higher than in most past years, comparing with \$5.40 to \$6.80 last December and with \$6.25 to \$6.75 a year ago.

Early lambing in Idaho is reported as extremely successful, the practice having extended widely in regions where it is practicable. It began about the tenth of February, following a hard winter, with a good deal of snow, which necessitated abundance of feed for breeding flocks, as well as close attention. Losses proved to be light, and shipments of early lambs are expected as early as the first half of June, followed by the greater part of the early dropped lambs along in the following month. Of late the markets have depended largely on northern Colorado for supplies of lambs, sheep and yearlings, with lambs greatly predominating, and by this time the best part of the Colorado holdings are out of the way. As many lambs as usual were wintered in northern Colorado, nearly as many as a year earlier in the Arkansas Valley, while there was but a small number wintered in the San Luis Valley. During the winter season Iowa sheepmen were compelled to market a large share of their lambs prematurely because of the lack of feed, and these had to be slaughtered, as quarantines prevented their being sent into Ohio and Michigan feeding districts. A shortage of southern lambs is expected, and Texas has very few fat live muttons to send to market.



Eight Feet Wide, or Better



ONCE you have seen both kinds of work you will say: "There is certainly a wide gulf between the ordinary spreader and the modern IHC machine, with its good, wide-spreading device. Give me the up-to-date, time and labor-saving spreader."

International Harvester spreaders—Low Corn King and Low Cloverleaf—are made with wide spreaders that throw the manure out in a wide, even spread, and broken up into fine particles by the disks that give it a second beating. In this condition the soil takes up quickly and evenly the fertilizing elements.

Though they are narrow, conveniently handled spreaders, easy to drive right into stables for loading, they spread to a width of 8 feet, or better. This cuts the spreading time in half, increases the tractive power of the spreader by keeping the wheels off the slippery manure, and gives you the best machine made for top dressing. IHC spreaders are simply built, and very strong. They are low for easy loading. They are built in sizes to suit any buyer, and they do work that is uniformly satisfactory.

Be sure to see the IHC dealer who can sell you a Low Corn King or Low Cloverleaf—or write us for catalogue.

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Minnesota Grown Early Ohio \$4.00 per 150 pound sack. Cash with order. Spring delivery, order now. E. C. BAKER & SONS, Jackson, Mich. Ref. Jackson Savings Bank, Produce Reporter Co., Chicago.

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HAY Ship To The Old Reliable House Daniel McCaffrey's Sons Co., 623-625 Wabash Bldg., Pittsburgh Pa.

HAY Ship your good quality to us. Highest Market Prices. E. L. Richmond Co., Detroit.

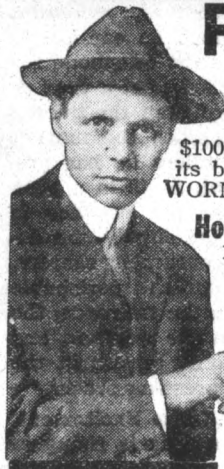
THE HARPSTER COMMISSION CO., Union Stock Yards, Toledo, O. Sell live stock on commission, get highest prices and best fills. Try them. Daily market, force of six looks after your interest. Financially backed by over \$1,000,000.

FARMERS—We will pay premiums whenever possible above the highest official Detroit Market quotation for your eggs shipped direct to us by express. Write us for information. It will pay you. American Butter & Cheese Co., Detroit, Mich.

Cull Beans We offer split and cull beans at \$18.00 ton in bulk, car lots, and \$19.50 ton sacked, in ton lots, f.o.b. Detroit. With corn poor quality and high price you can save big money by feeding cull beans. Post Bros., 983 Junction Ave., Detroit, Mich.

MANURE Will pay farmer to haul away. 254 Jefferson Avenue West, Detroit.

Farmers Lost \$90,000,000 Last Year From Worms and Indigestion



How Much Did YOU Lose?

Do you know that the live stock losses in the United States last year were about \$100,000,000? The U.S. Department of Agriculture says in one of its bulletins that probably 90% of live stock losses are caused by WORMS AND INDIGESTION—both of which can be prevented.

How Much of This \$90,000,000 Loss Did You Suffer?

How much was your feed loss—feeding worms?
How much was your loss in stock which did not thrive well?
How much was your loss in pigs which died from worms and indigestion or the train of ills which follow—even contagious disease, of which these conditions are often forerunners?
How much was your loss in sheep and lambs, or other stock?
These are the losses which totaled last year \$90,000,000. And, remember, the chief causes—Worms and Indigestion—can be prevented.

I'll Show You How to Prevent These Losses This Year

I am doing it for thousands of other farmers. I will do it for you. I'll prove it before you pay me a cent. I'll do it with SAL-VET.



The medicated salt, farm animals take freely and rid themselves of worms. It requires no dosing—no drenching—no starving. Contains no antimony. Costs only 1-12 of a cent a day for each sheep or hog, and only 1-3 of a cent a day for each horse or head of cattle. I prove what it will do before you pay on my 60 days trial offer.

"Have found 'Sal Vet' a most valuable remedy for stomach worms in sheep. I never used anything as good." Willis S. Meade, R. 3, Lapeer, Mich.

Don't Send Money—Just the Coupon

Fill out the coupon and mail to me today. I'll supply you enough SAL-VET to last all your stock 60 days. You pay the freight when it arrives and feed it according to directions. If SAL-VET fails to do what I claim, I'll cancel the charge; you won't owe me a cent.

Address: SIDNEY R. FEIL, Pres. Dept. 80 The Feil Mfg. Co., Chemists, Cleveland, O.

Prices	
Each 40 lb. package	\$2.25
Each 100 lb. package	5.00
Each 200 lb. package	9.00
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Each 500 lb. package	21.12

Extra discount in larger quantities. No orders filled for less than 40 lbs. on this offer. 60 days trial shipments are based on 1 lb. of SAL-VET for each sheep or hog and 4 lbs. for each horse or head of cattle. Dealers sell SAL-VET at above prices but in the far West and South the prices are a little higher on account of the extra freight charges.

THE FEIL MFG. CO., Dept. 80-4-8-16 Cleveland, Ohio

Supply me enough SAL-VET to last my stock sixty days. I agree to pay the freight, feed it as directed, and will then pay for it if it does what you claim. If it fails and I so report specifically in 60 days, you are to cancel the charge and I will owe you nothing.

I have.....hogs.....sheep.....horses.....cattle

Name.....

P. O.....

Ship. Sta.....State.....

May I send you that free
Picture Book
about Eastern farmers in
winterless

California?

Last fall I personally escorted two trainloads of Eastern farmers on a special rail and auto trip, inspecting first hand hundreds of California's farms and orchards.

What they saw and what they said has been put into a book — mostly pictures.

You will enjoy reading this book, which is written by real farmers for farmers.

It's free — write for a copy.

The Santa Fe has no land to sell. Its mission is to help populate the districts along its lines with thrifty farmers who grow things.

That's why we want you.

That's why we help California advertise herself.

California has no winter. Cattle and chickens can forage outdoors every month. The man in overalls can work outdoors every day, in comfort. You and your family will live longer there than back East, and make more money, too.



Let me help you plan your trip. Reduced excursion fares this Spring and Summer on the Santa Fe. And ask for the book.

C. L. Seagraves, Gen. Col. Agent
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A Real Kerosene Engine

We dwell particularly on low fuel cost, because we have perfected our engine to run on coal oil (kerosene), alcohol, distillate, etc.

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Built by the largest makers of two cycle engines in the world, every engine has a million dollar company back of it. This is your guarantee that the Bessemer must give you satisfaction. Sizes 2 to 10 H. P., and also direct connected to many kinds of machinery. Get our prices and terms.

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Those who need more power should use the Bessemer Fuel Oil Engine. 15 to 200 H. P. Free catalog "O" explains them.

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Rides Like An Auto

The New Patented Harvey Bolster Springs are made just like the finest automobile springs. They absorb all the bumps, jars and jerks of rough, uneven roads, and change an ordinary wagon into an easy-riding spring wagon. A set on your wagon will enable you to get your perishable produce to market in first class condition always. Insist on Harvey's. If your dealer can't supply you write us for free catalog and price list.

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International Motor Institute, 62 Kenner Bldg., Chicago

Farm Commerce.

The Traverse City Market

THE Traverse City potato market is a highly efficient institution. It is partly municipal and partly private. It is self-regulating and is performing an economic service at a low cost. It is both simple and effective.

The market consists of a set of municipally operated scales, a weighmaster, a scale house, the adjoining streets and from five to ten cash buyers along with the potato growers within a radius of fifteen miles. The market is strong, rather because of its potentialities than because of its daily activities. It is a balance wheel which keeps the whole business of potato marketing running steadily and assures the grower that, as a rule, he will get all for his product that can reasonably be expected.

The scales, scale house and weighmaster exist because of city ordinance. The city maintains them. They are the core of the marketing machinery. They are for all products sold in bulk where accurate and "vouched for" weights are necessary. Hay, straw, live stock, bones, paper, rubber, salt, ashes, wood, stone and many other things are weighed, and receipts issued therefore. But the commodity that nearly monopolizes the scales and the attention of the weighmaster, is the annual potato crop. A city ordinance says that the buyers of farm produce must confine their soliciting activities to such portions of the public streets as are within a block of the market site. This limiting clause is the secret of the efficiency of the selling and buying plan—it raises it to the dignity of an institution. It creates a market where the law of supply and demand has free play. It has all the advantages of a public auction.

Farmers Like the Plan.

The market is in operation every week day and the farmer needing a little cash and having potatoes in his frost-proof cellar can be accommodated. He needs but to call the weighmaster on the telephone, learn the prevailing price and bring to town enough tubers to realize the amount of money he needs. If he is a farmer who has a reputation for producing a high grade of potatoes he can easily close a bargain over the telephone for his load, and very likely get a cent or even five cents more than the quoted price. When he reaches the market site with his load, unless he has previously closed a deal, he is in a position to get all that the produce is worth, considering the supply and demand in the large consuming centers, the freedom with which perishable freight is moving on the railroads, the probable changes in the weather, and the needs of the local buyers in the way of stock to fill pressing orders.

Advancing Markets Cause Excitement.

If the price of potatoes is rising in the consuming centers, or if there is any symptom that it is likely to advance there is a keen rivalry for every load that arrives at the market, provided, of course, that the quality is not below the standard. On a rising market the differences between the Traverse City and Chicago or Pittsburg or New York prices is less than the transportation costs from Traverse City to those cities. This is because the buyers are optimistic and expect that they will be able to get the potatoes to the big market at just the right moment to capture the top-notch price. They are speculators and enjoy the excitement found in contemplating the possibilities of making a big "stake." The producer gets his pay in a check which is easily turned into cash. Whenever

there is a hint of a prospect of better prices in the outside world the buying on the Traverse City market is active. Not infrequently the grower will have several bids in succession put upon his load and the price offered him may be three, five or even eight cents above the average price for the day.

Are the Buyers Leagued Together?

It is believed by many growers that the buyers are leagued together to keep the price down and that each buyer gets, as his share of the spoils, a certain number of loads each day. It is true that at times the market has an appearance which makes such a conclusion not unreasonable, and it is also true that with the least indication of an advance in price in the wholesale markets, all understandings, if there are any, are shattered and the buyers are as true competitors as can be found in any market. When prices are falling the buyers are loath to buy for fear that they will be caught with a quantity of stock on hand. The farmer who does not examine closely thinks that he is facing a buying trust. It is not unlikely that occasionally agreements are reached, but they do not last long, for the personnel of the buyers is constantly changing. One day A is buying to get a few carloads, another day B or C are on the market for potatoes to fill some orders they have managed to secure. There are a few

firms who are always in the market for potatoes and stand ready to pay the Chicago price less the cost of transportation. But the velvety prices come from those who are anticipating big advances and handsome profits.

Handles But a Fraction of the Crop.

From three to four thousand loads of potatoes are sold each year on this market. The loads vary in size from thirty to one hundred bushels, with the average over fifty. As the annual potato crop in the territory contiguous to Traverse City is in the neighborhood of a million bushels it will be seen that only a fraction of the crop is sold on the Traverse City market. This fraction, however, is large enough and the amount of publicity connected with the sales great enough, to establish the price for the entire territory. The potatoes not sold on the public market are bought at receiving stations on the five railroad tracks radiating from the city and at the warehouses within the corporate limits. Every grower, nevertheless, within hauling distance keeps one eye on the public market and insists that he be given the same deal as those who weigh up on the municipal scales. The influence of the market is even more far-reaching than the hauling distance for several of the buyers maintain loading stations along the railroads traversing the region and buy at prices which are governed by the Traverse City trading.

The truly vital features of the Traverse City potato market are, in brief, that it is publicly controlled, that it is a spot cash market, that the bidding is done in the open, and that the competition is sufficient to maintain the price at as high a level as a country-wide demand and supply will warrant.

Gd. Traverse Co. R. H. ELSWORTH.

Reducing Cost of Odd Jobs

HERE are the items covering three consecutive days of labor on Fred Richard's farm, as recorded by him in his dairy for 1915:

Monday, June 7.

Slightly cloudy but fair. Delivered milk. John finished fitting the potato ground with big team. Albert started cultivator in field seven, but quit at 3:30 to go to Brandon's for 25 bushels of seed potatoes. I set posts for fence along back pasture.

Tuesday, June 8.

Weather fine. Delivered milk. Took shovel plow to Granger's for repairs. John used team upon return to mark out potato field and with help of the Porter boys finished planting by 2:30 o'clock. Drove to M— for wire fencing, salt and repairs for double-row cultivator. Albert cultivated full day.

Wednesday, June 9.

No change in weather. Delivered milk. John starts double-row cultivator and field seven was finished one way and started other. Drove "Brindle" to Merideth's. Finished pasture fence.

Fred Richard's farm consists of 120 acres, all being under cultivation except 10-acre lot which is part brush and is used for pasture. He has two boys, John who is just past twenty, and Albert who will be eighteen in May. He uses four horses, one draft team weighs about 3,200 pounds and the other adapted to all-round service, tips the scales at 2,350 pounds. An automobile has taken the place of the driving horse.

With these facts in mind let us go over the items mentioned in the record printed above to learn how time could have been saved by the addition of a trailer to his equipment.

The milk was delivered at a receiving station one and one-half miles from the Richard's home. It required an hour to make this delivery with the horse. Thirty minutes would be a liberal allowance for doing it with the auto and trailer. Brandon's farm, where the seed potatoes were purchased lies five and three-quarters miles to the south. It would have been one-quarter the trouble to bring these potatoes home in the trailer, and the

team could have been kept busy in the fields. In the morning before John went to the potato patch he hitched to the wagon and drew fence posts to the pasture lot for the building of a fence preparatory to turning the stock in. The trailer could have been employed for this job also.

On the following day the milk could have been delivered with the trailer, the shovel plow taken to Granger's blacksmith shop two miles distant, while the team remained on the farm, the potatoes removed from the granary to the field for planting, and the trip made to town, six and a quarter miles away, for the salt, fence and cultivator repairs. The potatoes would have been planted and the field of corn cultivated one way by quitting time if the horses had not been needed off the farm.

From the record of June 9 the trailer would have made another delivery of milk, could have been used to transport "Brindle," a thorough-bred Shorthorn, to Merideth's three and one-half miles away, and brought her home much more quickly and with practically none of the fatigue resulting from leading her. Then the wire fencing brought from town the previous day could have been readily taken to the pasture lot without spoiling a half hour's time required from the team.

The farmer always has had a great deal of his time taken up with miscellaneous jobs, and he perhaps always will, and while the practices of Mr. Richards for the three days covered may be criticized by some from the viewpoint of efficiency, it must be agreed that these days are typical of all the active summer days on the average farm. Accordingly it would appear that the farmer who can cut down the cost of doing these odd jobs will have added to his net profits at the close of the year.

While it is impossible to determine just how much the trailer would have actually saved Mr. Richards during the three days mentioned, roughly fig-

ured, it would aggregate, at the low-est, five dollars.

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Carroll Co., March 27.—Farmers are behind with their work. Roads are in bad condition. Wheat looks good. There is some corn to husk yet, and stock is looking good, and farmers have only enough seed to supply their wants.

Hancock Co., March 25.—Roads in bad condition. Wheat crop is nearly ruined by frost, and probably 75 per cent of the acreage will be plowed for spring crops. Stock in normal condition with enough roughage on hand for the season. Cream 35c; eggs 17c; wheat \$1; potatoes \$1; cattle 6@8c; hogs \$8.25@9.30. Spring pig crop is large.

Indiana.

Wayne Co., March 27.—Roads are almost impassable. Wheat and meadows are looking poorly. Live stock is doing well and feed is in ample supply. An average amount of maple sugar was made this spring. Hens are laying well. Eggs 18c; butter 25c; butter-fat 35c; oats 35c; corn 65c; hogs \$9.50.

Kansas.

Franklin Co., March 24.—Roads are fine and spring work has begun. Most of the oats are sown and a large acreage is given over to this crop. Wheat and meadows are in fair condition. Farmers have a good supply of feed, and live stock is in fine shape. Demand from the oil fields is making it difficult to secure farm help. Butter-fat 34c; eggs 16c; cattle \$8.50; hogs \$8.80; wheat 95c; potatoes \$1.25.

Lincoln Co., March 27.—Roads are in fine condition. Wheat and alfalfa are promising, although rain is needed. Cattle are doing fine, and the farmers have an ample supply of feed, with a little for sale. Hogs \$8.50; cattle \$9.50@10; cream 33c; butter 18c; eggs 16c; wheat 95c; potatoes \$1; seed potatoes \$1.50. Quite a number of people have their potatoes planted.

Missouri.

Warren Co., March 26.—Roads dry. Wheat and rye look poorly, while the meadows are in good condition. Live stock looks well and farmers have a surplus of roughage. Timothy hay \$12; wheat is being marketed freely at \$1.02; corn 82c; eggs 17½c; hens 12c; butter-fat 37c; potatoes \$1.75; cattle \$8; hogs \$10. A large acreage of oats now being sown.

Vernon Co., March 25.—Roads are very muddy. Wheat and meadows do not look good. Farmers have plenty of feed. Hay \$7.50; corn 65c; wheat 85c; oats 40c; potatoes \$1.25; hogs \$8.50; cattle \$5@8; butter 25c; eggs 17c; hens 14½c; ducks 15c.

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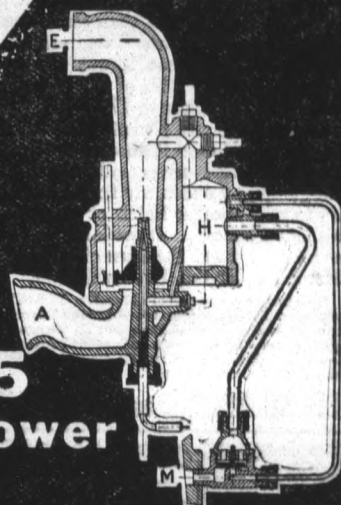
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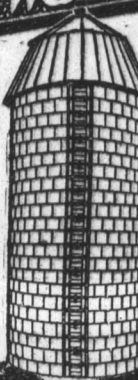
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Seed Oats, Garton No. 5, "The Corn Belt Oat," Free from smut. Not damaged by wet. Free from smut. Sample and prices on request. E. S. CHRISTIANSEN, CORAL, MICH. Member Michigan Experiment Association.

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LIME Pulverized lime rock for "sour" soils. Write for LOW PRICES DIRECT TO YOU and we will send sample and full particulars. Write to office nearest you. LAKE SHORE STONE COMPANY, Muskegon, Mich., and Benton Harbor, Mich.

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Farm Commerce.

The Traverse City Market

THE Traverse City potato market is a highly efficient institution. It is partly municipal and partly private. It is self-regulating and is performing an economic service at a low cost. It is both simple and effective.

The market consists of a set of municipally operated scales, a weighmaster, a scale house, the adjoining streets and from five to ten cash buyers along with the potato growers within a radius of fifteen miles. The market is strong, rather because of its potentialities than because of its daily activities. It is a balance wheel which keeps the whole business of potato marketing running steadily and assures the grower that, as a rule, he will get all for his product that can reasonably be expected.

The scales, scale house and weighmaster exist because of city ordinance. The city maintains them. They are the core of the marketing machinery. They are for all products sold in bulk where accurate and "vouched for" weights are necessary. Hay, straw, live stock, bones, paper, rubber, salt, ashes, wood, stone and many other things are weighed, and receipts issued therefore. But the commodity that nearly monopolizes the scales and the attention of the weighmaster, is the annual potato crop. A city ordinance says that the buyers of farm produce must confine their soliciting activities to such portions of the public streets as are within a block of the market site. This limiting clause is the secret of the efficiency of the selling and buying plan—it raises it to the dignity of an institution. It creates a market where the law of supply and demand has free play. It has all the advantages of a public auction.

Farmers Like the Plan.

The market is in operation every week day and the farmer needing a little cash and having potatoes in his frost-proof cellar can be accommodated. He needs but to call the weighmaster on the telephone, learn the prevailing price and bring to town enough tubers to realize the amount of money he needs. If he is a farmer who has a reputation for producing a high grade of potatoes he can easily close a bargain over the telephone for his load, and very likely get a cent or even five cents more than the quoted price. When he reaches the market site with his load, unless he has previously closed a deal, he is in a position to get all that the produce is worth, considering the supply and demand in the large consuming centers, the freedom with which perishable freight is moving on the railroads, the probable changes in the weather, and the needs of the local buyers in the way of stock to fill pressing orders.

Advancing Markets Cause Excitement.

If the price of potatoes is rising in the consuming centers, or if there is any symptom that it is likely to advance there is a keen rivalry for every load that arrives at the market, provided, of course, that the quality is not below the standard. On a rising market the differences between the Traverse City and Chicago or Pittsburg or New York prices is less than the transportation costs from Traverse City to those cities. This is because the buyers are optimistic and expect that they will be able to get the potatoes to the big market at just the right moment to capture the top-notch price. They are speculators and enjoy the excitement found in contemplating the possibilities of making a big "stake." The producer gets his pay in a check which is easily turned into cash. Whenever

there is a hint of a prospect of better prices in the outside world the buying on the Traverse City market is active. Not infrequently the grower will have several bids in succession put upon his load and the price offered him may be three, five or even eight cents above the average price for the day.

Are the Buyers Leagued Together?

It is believed by many growers that the buyers are leagued together to keep the price down and that each buyer gets, as his share of the spoils, a certain number of loads each day. It is true that at times the market has an appearance which makes such a conclusion not unreasonable, and it is also true that with the least indication of an advance in price in the wholesale markets, all understandings, if there are any, are shattered and the buyers are as true competitors as can be found in any market. When prices are falling the buyers are loath to buy for fear that they will be caught with a quantity of stock on hand. The farmer who does not examine closely thinks that he is facing a buying trust. It is not unlikely that occasionally agreements are reached, but they do not last long, for the personnel of the buyers is constantly changing. One day A is buying to get a few carloads, another day B or C are on the market for potatoes to fill some orders they have managed to secure. There are a few

firms who are always in the market for potatoes and stand ready to pay the Chicago price less the cost of transportation. But the velvety prices come from those who are anticipating big advances and handsome profits.

Handles But a Fraction of the Crop.

From three to four thousand loads of potatoes are sold each year on this market. The loads vary in size from thirty to one hundred bushels, with the average over fifty. As the annual potato crop in the territory contiguous to Traverse City is in the neighborhood of a million bushels it will be seen that only a fraction of the crop is sold on the Traverse City market. This fraction, however, is large enough and the amount of publicity connected with the sales great enough, to establish the price for the entire territory. The potatoes not sold on the public market are bought at receiving stations on the five railroad tracks radiating from the city and at the warehouses within the corporate limits. Every grower, nevertheless, within hauling distance keeps one eye on the public market and insists that he be given the same deal as those who weigh upon the municipal scales. The influence of the market is even more far-reaching than the hauling distance for several of the buyers maintain loading stations along the railroads traversing the region and buy at prices which are governed by the Traverse City trading.

The truly vital features of the Traverse City potato market are, in brief, that it is publicly controlled, that it is a spot cash market, that the bidding is done in the open, and that the competition is sufficient to maintain the price at as high a level as a country-wide demand and supply will warrant.

Gd. Traverse Co. R. H. ELSWORTH.

Reducing Cost of Odd Jobs

HERE are the items covering three consecutive days of labor on Fred Richard's farm, as recorded by him in his diary for 1915:

Monday, June 7.

Slightly cloudy but fair. Delivered milk. John finished fitting the potato ground with big team. Albert started cultivator in field seven, but quit at 3:30 to go to Brandon's for 25 bushels of seed potatoes. I set posts for fence along back pasture.

Tuesday, June 8.

Weather fine. Delivered milk. Took shovel plow to Granger's for repairs. John used team upon return to mark out potato field and with help of the Porter boys finished planting by 2:30 o'clock. Drove to M— for wire fencing, salt and repairs for double-row cultivator. Albert cultivated full day.

Wednesday, June 9.

No change in weather. Delivered milk. John starts double-row cultivator and field seven was finished one way and started other. Drove "Brindle" to Merideth's. Finished pasture fence.

Fred Richard's farm consists of 120 acres, all being under cultivation except 10-acre lot which is part brush and is used for pasture. He has two boys, John who is just past twenty, and Albert who will be eighteen in May. He uses four horses, one draft team weighs about 3,200 pounds and the other adapted to all-round service, tips the scales at 2,350 pounds. An automobile has taken the place of the driving horse.

With these facts in mind let us go over the items mentioned in the record printed above to learn how time could have been saved by the addition of a trailer to his equipment.

The milk was delivered at a receiving station one and one-half miles from the Richard's home. It required an hour to make this delivery with the horse. Thirty minutes would be a liberal allowance for doing it with the auto and trailer. Brandon's farm, where the seed potatoes were purchased lies five and three-quarters miles to the south. It would have been one-quarter the trouble to bring these potatoes home in the trailer, and the

team could have been kept busy in the fields. In the morning before John went to the potato patch he hitched to the wagon and drew fence posts to the pasture lot for the building of a fence preparatory to turning the stock in. The trailer could have been employed for this job also.

On the following day the milk could have been delivered with the trailer, the shovel plow taken to Granger's blacksmith shop two miles distant, while the team remained on the farm, the potatoes removed from the granary to the field for planting, and the trip made to town, six and a quarter miles away, for the salt, fence and cultivator repairs. The potatoes would have been planted and the field of corn cultivated one way by quitting time if the horses had not been needed off the farm.

From the record of June 9 the trailer would have made another delivery of milk, could have been used to transport "Brindle," a thorough-bred Shorthorn, to Merideth's three and one-half miles away, and brought her home much more quickly and with practically none of the fatigue resulting from leading her. Then the wire fencing brought from town the previous day could have been readily taken to the pasture lot without spoiling a half hour's time required from the team.

The farmer always has had a great deal of his time taken up with miscellaneous jobs, and he perhaps always will, and while the practices of Mr. Richards for the three days covered may be criticized by some from the viewpoint of efficiency, it must be agreed that these days are typical of all the active summer days on the average farm. Accordingly it would appear that the farmer who can cut down the cost of doing these odd jobs will have added to his net profits at the close of the year.

While it is impossible to determine just how much the trailer would have actually saved Mr. Richards during the three days mentioned, roughly fig-

ured, it would aggregate, at the lowest, five dollars.

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Monmouth Co., March 24.—Roads are bad and getting worse. Grass is looking well. Live stock farmers have plenty of feed on hand. Cream 40c; milk 4½c; eggs 30c; wheat \$1.20; potatoes \$1.25; rye 90c@1.

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Lancaster Co., March 25.—Wheat and meadows are in good condition. Live stock is looking well, and there is plenty of feed to finish for the markets. Milk 5c per quart; eggs 20c; wheat \$1.08; potatoes \$1.10; cattle 10c; hogs \$10½c.

Ohio.

Guernsey Co., March 28.—Warm and wet, with roads in bad shape. Wheat is badly winter-killed. Meadows look good. Plowing has started. Just about enough feed to supply farm needs. Milk \$1.80 per cwt; butter-fat 32c; eggs 20c; wheat \$1.20; potatoes 80c@1; cattle 7c; hogs 8c. Business is very good in this section.

Carroll Co., March 27.—Farmers are behind with their work. Roads are in bad condition. Wheat looks good. There is some corn to husk yet, and stock is looking good, and farmers have only enough seed to supply their wants.

Hancock Co., March 25.—Roads in bad condition. Wheat crop is nearly ruined by frost, and probably 75 per cent of the acreage will be plowed for spring crops. Stock in normal condition with enough roughage on hand for the season. Cream 35c; eggs 17c; wheat \$1; potatoes \$1; cattle 6@8c; hogs \$8.25@9.30. Spring pig crop is large.

Indiana.

Wayne Co., March 27.—Roads are almost impassable. Wheat and meadows are looking poorly. Live stock is doing well and feed is in ample supply. An average amount of maple sugar was made this spring. Hens are laying well. Eggs 18c; butter 25c; butter-fat 35c; oats 35c; corn 65c; hogs \$9.50.

Kansas.

Franklin Co., March 24.—Roads are fine and spring work has begun. Most of the oats are sown and a large acreage is given over to this crop. Wheat and meadows are in fair condition. Farmers have a good supply of feed, and live stock is in fine shape. Demand from the oil fields is making it difficult to secure farm help. Butter-fat 34c; eggs 16c; cattle \$8.50; hogs \$8.80; wheat 95c; potatoes \$1.25.

Lincoln Co., March 27.—Roads are in fine condition. Wheat and alfalfa are promising, although rain is needed. Cattle are doing fine, and the farmers have an ample supply of feed, with a little for sale. Hogs \$8.50; cattle \$9.50@10; cream 33c; butter 18c; eggs 16c; wheat 95c; potatoes \$1; seed potatoes \$1.50. Quite a number of people have their potatoes planted.

Missouri.

Warren Co., March 26.—Roads dry. Wheat and rye look poorly, while the meadows are in good condition. Live stock looks well and farmers have a surplus of roughage. Timothy hay \$12; wheat is being marketed freely at \$1.02; corn 82c; eggs 17½c; hens 12c; butter-fat 37c; potatoes \$1.75; cattle \$8; hogs \$10. A large acreage of oats now being sown.

Vernon Co., March 25.—Roads are very muddy. Wheat and meadows do not look good. Farmers have plenty of feed. Hay \$7.50; corn 65c; wheat 85c; oats 40c; potatoes \$1.25; hogs \$8.50; cattle \$5@8; butter 25c; eggs 17c; hens 14½c; ducks 15c.

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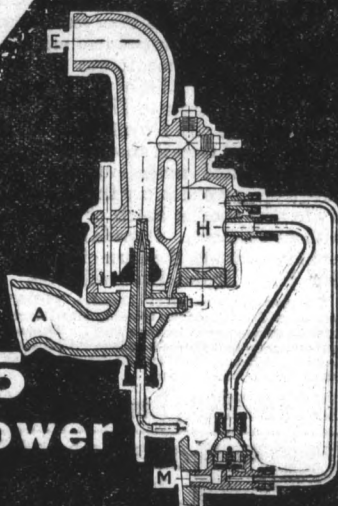
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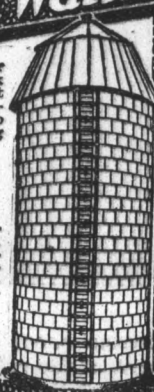
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"I am sixty-one years of age and have been raising poultry ever since I was seventeen. I never had much trouble except with White Diarrhoea, and sometimes I have lost my entire incubator hatch with this dread disease. Last year I read a lot about Chictone but thought it would be no more help than some others I had used. However, a friend told me what it had done for her, and that it was a very effective remedy, with not a bit of poison in it, so I sent a dollar money order to The Wight Company for two 50c boxes, and I want to say the result was wonderful. I used it about 8 weeks, raised over 600 chicks and never lost one. I didn't even have a droopy one in my flock and I will never try to raise another hatch of chicks or turkeys without Chictone. It made my work a pleasure and I know it was the cause of my good success."

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Chictone gets results! Resolve TODAY that you will save YOUR chicks from White Diarrhoea. Chictone is guaranteed to save 90%. There are lots of substitutes, but there's only one Chictone. Chictone is not a poison. Sold in 50c boxes. Delay is dangerous. Order today from

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Tells why chicks die

E. J. Reefer, the poultry expert, 4384 Reefer Bldg. Kansas City, Mo., is giving away free a valuable book entitled, "White Diarrhoea and How to Cure it." This book contains scientific facts on white diarrhoea and tells how to prepare a simple home solution that cures this terrible disease over night and actually raises 88 per cent of every hatch. All poultry raisers should certainly write Mr. Reefer for one of these valuable FREE books.

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Raise your own honey. We start you right. Send today for Bee Supply Catalog and Sample copy of American Bee Journal. FREE. Oldest Bee paper in America—all A. G. WOODMAN CO., Dept. 16, Grand Rapids, Mich.

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BARRED PLYMOUTH ROCK EGGS from full blood stock, \$1.50 per 15. Have won at leading shows for years. J. A. BARNUM, Union City, Michigan.

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Choice Barred Cockerels

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Cousins Northern King Strain Barred Plymouth Rocks. Have won many prizes. Some nice Cockerels and Pullets for sale. Write for prices. David W. Cousins, Northport, Mich.

BARRED ROCKS 200 Egg Strain with records to 290 eggs a year—\$1.50 per 15. Delivered. By Parcel post. Fred Astling, Constantine, Mich.

BARRED ROCK EGGS and Baby Chicks from sturdy vigorous stock. W. C. Coffman, R. 3, Benton Harbor, Mich.

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RINGLET BARRED ROCKS direct from Thompson's a limited amount of eggs for hatching from vigorous stock. \$1.50 per 15. G. Gardner, Petersburg, Mich.

Chicks that Live \$15 per 100. Silver, White and Partridge Wyandottes. White Leghorn Chicks \$12 per 100. Pekin and Rouen Ducklings 25 cents each. **ALDHAM POULTRY FARM, R. No. 37, Phoenixville, Pa.**

Prize Pen Bred-to-Lay B. P. R. 13 eggs \$3.00; Utility \$1.00—13. Pine Knoll, Box 391, Shelby, Oceana Co., Mich.

JOHN'S Big, beautiful, hen-hatched Barred Rocks. Eggs, 30, \$2.50; 100, \$7.00. Select matings 15, \$4; 30, \$7.00, all postpaid. Photos. Circulars. John Northon, Clare, Mich.

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Value of Free Range for Poultry

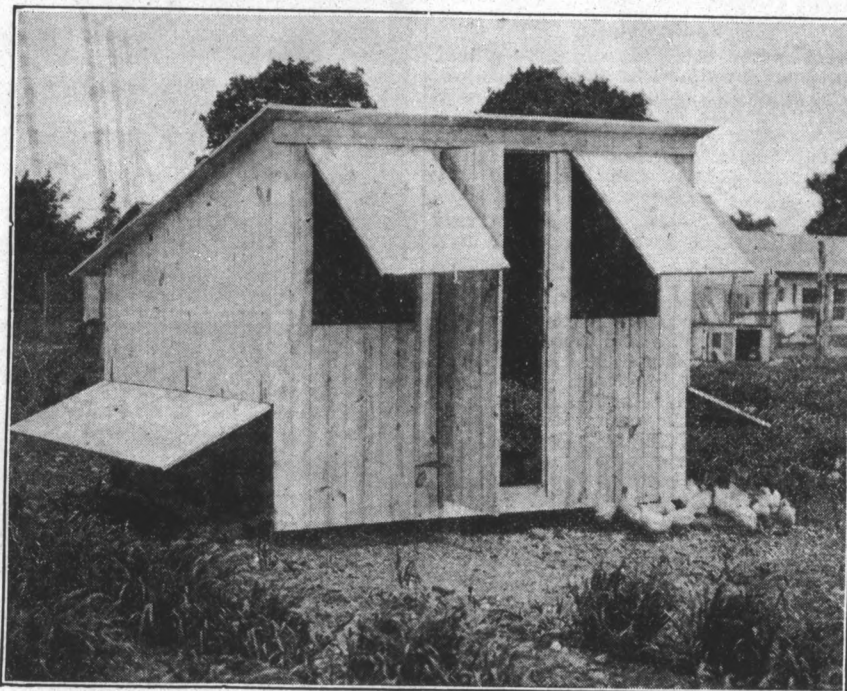
As much free range as possible is undoubtedly the best and cheapest method of raising poultry on the farm. Fowls that are closely confined require the finest of balanced rations to keep them in condition and the soil in the yard soon becomes contaminated even if the flocks are small. The hen on a free range can consume coarser feed without becoming devitalized and she consumes weed seeds, bugs, and miscellaneous vegetation which saves a corresponding amount of expensive feed.

Fowls that are given the range of the barnyard are practically on free range as they usually have access to the home orchard and the adjacent fields. However, the birds are very apt to spend the bulk of their time around the hen house or in close proximity to their roosting place and the land around the coop becomes contaminated to a certain extent. For a small flock this is all right and it will be all the free range that the birds require. When the flock grows above 200 hens they can hardly be said to have a free range if they roost in one long house and spend most of their time near it. Large flocks should be divided and the

farm flock which may consist of 100 hens has practically a free range if they are housed near the barn and given the freedom of the farm. Increase the flock and keep them all near the barn and then you can scarcely claim to be giving the birds the right kind of free range as they will not range far enough from the hen house to obtain the right quantity of bugs and weed seeds. The supply will be divided up among too many birds and the share for each will be too small. Undoubtedly the cheapest way to raise farm poultry on a large scale is to give them the largest possible range by housing the different flocks at considerable distances apart.

Free Range Means Vigor.

You will note that the best poultry farms in their advertising make a point of the fact that they can sell you young stock that has spent the summer on a range. That does not mean that a thousand or more young birds have been raised in one location without a fence. It means that the different flocks have been distributed over a fairly large range of territory and there has been no contaminated soil. The result is good for the breeder and



A Practical Colony House.

houses should be located where the area of the range will be increased by the existing distances between the houses. For example, if you have 100 hens ranging in an orchard and there is a clover field down beyond the orchard that should contain another flock, the birds will do better if the second hundred are placed in a house in the clover field. The flock in the house in the field will confine themselves quite closely to the clover field while the flock in the orchard will not usually wonder far from the orchard although they do have access to other sections of the farm. This is why the colony house is practical. It distributes the birds over a wider range of territory.

The Colony System Best.

The main disadvantage in keeping apart is the increased labor of caring for them. It seems to be a general opinion among poultry breeders that the long poultry house is a labor saver while the practice of dividing up the flock saves the birds and keeps them in much better condition. The experience of some breeders seems to prove conclusively that the increased vigor in the flock and greater egg production will more than equal the extra expense of caring for the birds when they are given free range in the fullest sense of the word.

The farm hen has proven profitable under a variety of conditions. There have been systems tried where hens have been raised on the apartment house plan but these have not been of any value to the farmer. The average

his birds. The young stock are "well grown," which means strong and healthy, able to produce their kind, and able to bring a profit to their owner.

The combination of fruit and poultry raising is practical because of the fact that an orchard makes a good poultry range. The birds gather bugs that harm the fruit and keep down the weeds which use up the moisture that the trees need. On a small scale orcharding may be carried on without cultivation if the same land is used as a poultry range. The large commercial orchard will probably need cultivation but small orchards can be used very successfully as poultry runs. Plums are excellent to furnish shade on a small scale in a small poultry yard. At the Michigan Agricultural College I have seen plum trees in the poultry yards loaded with fruit until they nearly touched the ground. A cover crop of rye had been planted under the trees and in the run and the White Leghorns scratching around the trees could scarcely be seen because of the density of the growth in which they were working. This same idea could be carried out to advantage on the farm where there is usually plenty of room for the flock and such an arrangement gives the birds a desirable environment in which to grow.

The Best Method for the Farmer.

By starting the poultry plant on a small scale and discarding the close yarding system the farmer stands more show of succeeding with poultry. As the flock increases the range can be widened by the addition of more hous-

es and shade can be supplied by the planting of orchard crops. If good clover land is used for the range and the growing of clover is continued, several clumps of sunflowers planted around the houses will assist in furnishing shade for the birds. If the poultry business is only confined to a small flock as a side line there is no use worrying about free range. The hens will have plenty of range around the farm yard and the out buildings. However, if the poultry business is increased, vigor is necessary and close yarding is conducive to disease and contaminated soil. If it comes to an argument, free range vs. close yarding, or long laying houses vs. smaller houses and several flocks, I believe that the small house with plenty of range will bring the greater success to the average farmer. You cannot make birds hunt up their range, you must put them on it. This is true when the farmer is raising a large flock of birds.

Ingham Co.

R. G. KIRBY.

TRANSFERRING BEES FROM BOX HIVES.

Will you kindly tell me as to time of handling bees? Last July I hived a swarm of bees in a box hive. They decided to stay and immediately went to work laying in supplies and also sealed the cover down, which was the only means of getting into the box. This spring I want to transfer them to a good hive and went to cut out the brood chambers and move into regular brood frames. I am planning to move them this way in order to prevent losing or killing off what they may have started as I would like to increase the colony as much as possible this season. What I want to know is what time can I transfer this colony to a new hive without chilling the brood by handling or exposing to the air enough to change them?

Gt. Traverse Co.

W. W. H.

The best time to transfer the bees from the box-hive to a movable frame hive is at the beginning of a honey flow, so that one has to know his locality and commence the transferring about the time the main honey flow opens up. With you this would be early in June when the white and al-sike clovers are coming into full bloom. There are many methods which you could follow to transfer your bees but I am going to give you the most satisfactory method, one where the bees transfer themselves.

The Best Method.

When the colony in the box-hive is fairly strong, usually in fruit bloom time, you can commence transferring them from the box-hive. Have a newly prepared hive-body with frames containing full sheets of foundation and if possible one frame of drawn comb with brood in. The box-hive cover is torn off and then the newly prepared hive-body placed on top and if these do not fit, laths must be used to close up all entrances so that the bees must enter the box-hive and can go up into the movable frame hive from the inside. If the colony is strong and the weather is fine during fruit bloom time you will find the bees taking possession of the newly prepared hive in about a week. With this method of transferring the aim is to get the queen laying in the newly-prepared hive-body so when the bees are working nicely in this hive-body we remove it and place between the newly prepared hive-body and the box-hive a queen excluder. Now, leave it for a week and then if on the second examination you find eggs present you know that the queen is above; if after a careful search the queen is not seen and eggs are not found you must remove the queen excluder and leave hive for a few days longer until such times as the queen works up into the newly prepared hive-body. When the queen is above the excluder count about three weeks from that time and then place a Porter bee-escape board, upside down, between the two hives with the escape so that the bees can go up into the newly prepared hive-body but cannot return. At the same

time that the Porter bee-escape is placed on, the entrance to the box-hive below should be closed and a wedge placed between the Porter bee-escape board and the newly prepared hive-body so that the bees have an entrance to the upper hive-body from the outside. Be sure that all the exits to the box-hive are now closed up. It is a good plan to have an alighting board reaching from the entrance of the newly prepared hive to the ground so that the bees can gain easy access to this entrance. Two or three days after the bee-escape board is in position all the bees will have transferred themselves from the box-hive and this can be removed, and if there is no disease the combs can be cut out and fitted into the frames. While the transferring is being completed, extra supers can be placed on the first new hive-body so that the work of the bees is not retarded in any way and a good crop of honey can usually be gained. This method is the most simple and if the colony is strong it is usually very successful.

To Make an Increase.

When you have your bees in the movable frame hive it is an easy matter to make some increase, and I think it would be better for you to do this after the bees are transferred. The easiest plan for you to follow would be to purchase two queens and then about the second week in July take from your colony eight frames, six containing brood and two containing honey. Place eight frames of brood and honey with all adhering bees, but be sure to leave the queen in the old colony, in two new hives. Put the two hives on new stands then introduce a queen, by the directions given by the queen breeder, into each hive. It is a good plan to be sure that you have enough young bees with these two nuclei that you make, so that too many bees do not return to the old colony and so allow some of the brood to become chilled. To avoid this it may be a good plan to shake the bees off two or three frames into these two nuclei, then the old bees will return and sufficient young bees will be left to care for the brood. Be sure that you do not shake the queen into the newly prepared nuclei when you are shaking. If you have a fall flow these two nuclei should build up in good shape and it would be well to give them a frame or two of drawn comb and fill the remainder of the hive with frames of foundation as it is needed. Keep the entrances to the newly made nuclei contracted so that only one or two bees can fly in and out at a time. This will avoid chances of robbing. When the queens are introduced you should not disturb the nuclei for a week or ten days. Queens may be purchased of any queen breeder.

Agri. College. F. E. MILLEN.

ADVANCED STAGES OF ROUP.

Is there any cure for my chickens? They commence gaping and then some kind of wart or sore comes on their heads. Their eyes are swollen closed by a big lump or matter formation. What would you advise doing for them? I feed them corn and wheat in the morning, a soft mash at noon and wheat and oats at night. Am not getting any eggs.

Ottawa Co. P. J.

From the description you give of the disease your hens have, I would say that they have an advanced case of roup. The swelling in the eyes indicates that they have what is called roup of the eyes.

I doubt whether you can do very much to clear the birds of this trouble as it is too far advanced, and would therefore suggest that you dispose of all the birds which have the disease seriously, isolate those which have it mildly, and then thoroughly clean and disinfect the coop.

Those which have the disease in a mild form should be kept in a clean, dry place, and should be fed a light ration with plenty of green food, and

bran provided. In the drinking water potassium permanganate should be used in the proportions of two teaspoonfuls of a saturated solution to ten gallons of drinking water. If the birds do not entirely recover from the disease, it would be advisable for you to get rid of them, as they would retain the disease in a chronic form and at some other time be the source of infection for whatever healthy stock you may get.

If you continue feeding the mash, be sure that it is always fresh, and do not feed more than what the fowls will clean up in a short time, for if there is any left, it will sour and become a source of trouble for the fowls partaking of it.

THE SELECTION OF BREEDING FOWLS.

The secret of successful poultry raising is to cull. The breeding stock should undergo a most rigid selection, not only for type but for constitutional vigor for unless a bird has a good, strong constitution it cannot be an economical producer. Weak chicks are more liable to disease, they are not as good egg producers, nor do the birds grow and fatten as economically.

A good constitution is indicated by a broad, deep chest, long body, active disposition, keen bright eye, a broad head and bright colored comb, glossy plumage and a very well-curved beak. Birds which have any tendency toward the elongated heads, commonly known as "crow heads," should be eliminated from the breeding pens. Females that have heavy abdomens and excessive fat so that they bag down behind should be sent to the market for they are generally poor breeders and always poor producers. The bird which is the first off the roost in the morning and the last to go on to the roost at night should be used.

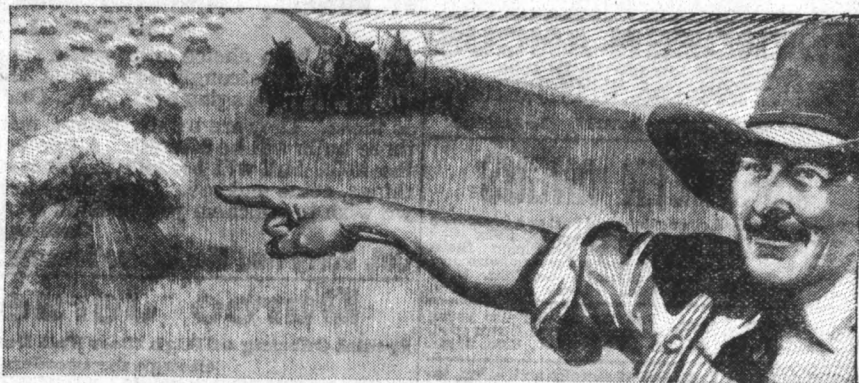
Any bird which has been sick at any time should not be used in the breeding pen. The time to begin to select breeders for the next season is when the chicks are hatched. Those birds which show a tendency towards weakness should be marked at the time that this weakness is noticed in order that they may never find their way into the breeding pens. A system of marking the birds should be used to enable the owner to tell the age of his chickens. This can be done by toe-marking the chicks with a punch when hatched; or the mature birds may be leg-banded in the fall. The fowls for the breeding pen should be selected from the one and two-year-old stock in order to secure the largest and best eggs for hatching. In fact, experience shows that in economical egg-production few hens over two years old should ever be retained.

The breeding stock should be separated from the general flock. It is an unnecessary expense to breed from the entire flock because of the extra male birds which will be necessary. It is also a poor practice to breed from the entire flock because some of the birds do not come up to the keeper's ideal of chickens, and for that reason should not be used. The worst faults of the usual method of breeding are: (1) the use of inferior males; (2) the breeding of immature or poorly developed stock; (3) the breeding from the entire flock, poor as well as good; and (4) the selection of eggs from the general egg basket. The farmer should aim to select a few of the best females and then mate to them a good, vigorous male. A few hens properly handled will produce all of the eggs necessary for hatching purposes, will eliminate the need of using additional males and will produce much better progeny.—Mo. Agri. Ex. Station.

The incubator is ready to use any time, but with hens a desire to hatch cannot be hastened.

Select eggs for hatching uniform in size. Extremely small eggs or exceptionally large eggs should not be used.

MONTANA



Your Opportunity State Thirty Million Bushels

—of grain was produced in Montana along the Great Northern Railway in 1915. Six years ago this same territory produced only Five Million bushels.

Big facts that make you realize that Montana leads the world in rapid development of farm lands. What is more, Montana leads in quality of grain produced—was awarded the Grand Prize on Exhibits of Grain over all the rival nations—over every other state—exhibiting at the San Francisco Panama-Pacific Exposition—winning a total of 513 medals.

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The homestead lands of agricultural value in Montana are going fast, but you have remarkable opportunity to purchase deeded land at very low prices. Come to the great, new, golden Montana country. Rich soil, favorable climate, convenient market and good prices for all you grow. Get the information—then decide for yourself. Send coupon today for

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Illustrated and fully descriptive, with experience-letters from settlers—affidavits of crop yields and information concerning opportunities offered home-seekers. Special Low Fares for Home-Seekers. Please use coupon.

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General Immigration Agent—Dept. 187
GREAT NORTHERN RAILWAY
St. Paul, Minn.

MEMORY JOGGER

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22 head of high grade Holstein heifers two years
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They are all from good milking strain that will
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Delivery will be made at any time desired during the
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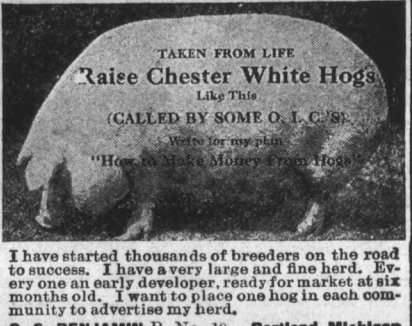
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160 lbs. to 180 lbs. H. G. Keester, R. No. 5, Cass-
opolis, Michigan.

Duroc Aug. Boars at the right price. Pigs
at weaning time.
E. J. Aldrich, Tekonsha, Mich., R. No. 1, Bell Phone.



Registered O. I. C. Swine
Stock For Sale—All Ages
Correspondence Solicited, Visitors Always Welcome
Brightside Farm
Grand Lodge, Mich.

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

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

O. I. C. choice serviceable boars; bred gilts for April and
May farrow; Fall pigs not akin. Write for low
prices and photo. A. V. Hatt, Grass Lake, Mich

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

Way Brothers Stock Farm. The home of the big
bone O. I. C. Hogs. Stock
for sale. Registered free. J. R. Way, Three Rivers, Mich.

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

O. I. C. Serviceable boars, gilts bred for June
farrow. Booking orders for Spring pigs,
no akin. H. W. MANN, Dansville, Michigan.

BIG TYPE O. I. C.'s and Chester Whites. Special
prices on all boars and fall pigs either sex. These
are sired by Abo 2nd, this boar sired our unbeaten
breeders young herd at every state fair we showed this
year, other sires are Wonder Boy, White Hall and Allen,
this boar was junior champion at Wis. State Fair last
year. Now Mr. Buyer our pigs are all sired from
champions, our price is no higher than other breeders
and the Express Co. charges just the same for a poor
pig as it does for a good one. Get our catalog and see
where the good ones are. We are booking for Spring
pigs sired by Sch oolmaster, the highest priced boar
of the breed and five times G. Champion. We Reg. Free and ship
C. O. D. Rolling View Stock Farms, Cass City, Mich.

I am booking orders for Spring pigs.
O. I. C. Swine. One yr. old Holstein bull for sale.
Elmer E. Smith, Redford, Mich.

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

O. I. C.'s 20 bred sows for sale. 8 last April gilts averaged 270
lbs. Jan. 10, 1916. They are a very growthy lot. Have
some May gilts and last fall yearlings, also a few service boars
and plenty of last fall pigs. Otto B. Schulze, Nashville, Mich.

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

O. I. C. Choice Boars ready for service. I
pay express and regis-
ter fees. JULIAN P. CLAXTON, R. 8, Flint, Mich.

Breeders' Directory—Continued on page 511.

Veterinary.

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

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Breeding Question.—I have a five-year-old Percheron stallion, weight 1,700 pounds, that has never done big seasons, and I would like to know if you believe it good judgment to breed him to two mares a day during the season, but only when it is necessary. This horse works some in a team when we are busy. R. W. R., Rose City, Mich.—I do not believe it wise to allow a horse of this kind to serve more than one mare daily, unless it is an exceptional case, then it will not harm him to serve two. Furthermore, he is better to be doing light work, than standing without exercise.

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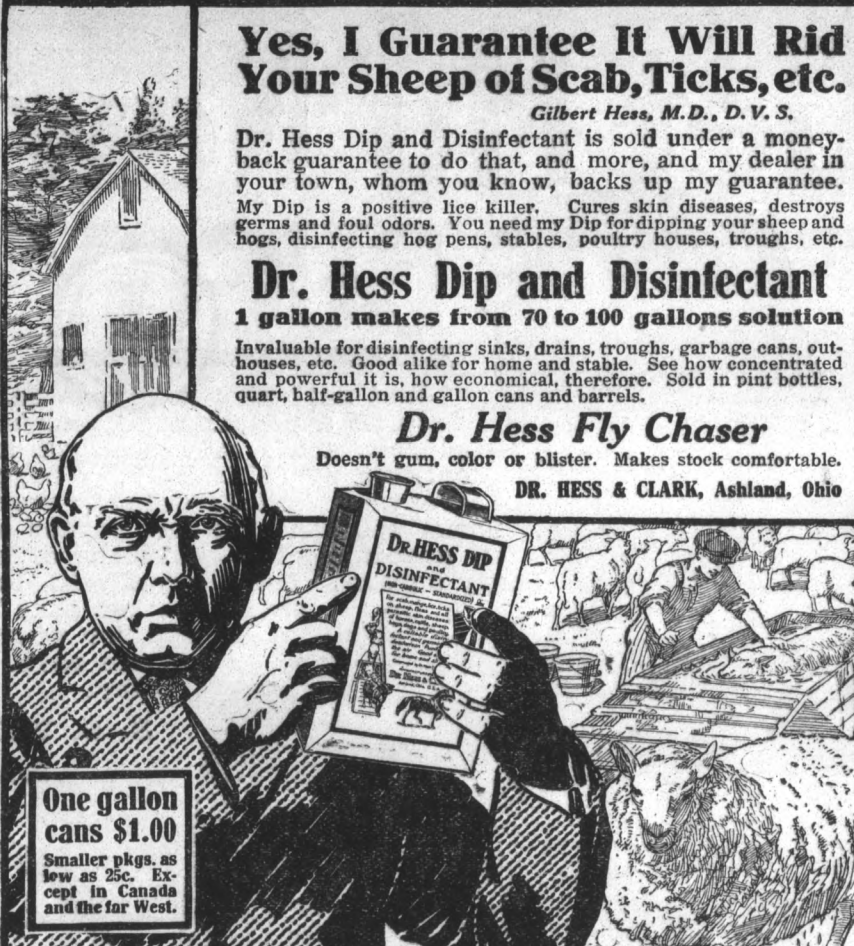
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Yes, I Guarantee It Will Rid Your Sheep of Scab, Ticks, etc.

Gilbert Hess, M.D., D. V. S.

Dr. Hess Dip and Disinfectant is sold under a money-back guarantee to do that, and more, and my dealer in your town, whom you know, backs up my guarantee. My Dip is a positive lice killer. Cures skin diseases, destroys germs and foul odors. You need my Dip for dipping your sheep and hogs, disinfecting hog pens, stables, poultry houses, troughs, etc.

Dr. Hess Dip and Disinfectant

1 gallon makes from 70 to 100 gallons solution

Invaluable for disinfecting sinks, drains, troughs, garbage cans, out-houses, etc. Good alike for home and stable. See how concentrated and powerful it is, how economical, therefore. Sold in pint bottles, quart, half-gallon and gallon cans and barrels.

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Doesn't gum, color or blister. Makes stock comfortable.

DR. HESS & CLARK, Ashland, Ohio

One gallon cans \$1.00

Smaller pkgs. as low as 25c. Except in Canada and the far West.

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HOLSTEIN-FRIESIAN CATTLE

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

For Sale. Registered Holstein Bull calf, two-thirds white, born Mar. 15, 1916, dam and sire's dam has A. R. O. record. Price \$30. CHAS. I. COOK, Fowlerville, Mich. Box 438.

Hope Farm Jerseys FOR SALE—3 yearling bulls, 2 bull calves. GEORGE C. BORCK, Grand Haven, Mich.

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

HOGS

O. I. C. SWINE

I am offering strictly O. I. C. type bred to farrow the forepart of May. Also fall pigs price right. Stock registered in pur. chaser's name free of charge. A. J. Gordon, R. 2, Dor, Mich.

O. I. C.'s FALL PIGS, EITHER SEX. Satisfaction Guaranteed. A. R. GRAHAM, Flint, Michigan.

O. I. C. Pigs. January Gilts, \$8.00. Also S. C. \$1.25 per 15 post paid. Bruce W. Brown, Mayville, Mich.

O. I. C. SWINE, Oct. boars and gilts. 3 Registered Holstein Bred, sired by 27 lb. bull. Cloverleaf Stock Farm, Monroe, Mich. No. 1.

Boars at Half Price We still have a few big boned, big type Poland China boars ready for service, weighing up to 250 lbs. not fat at \$20 & \$25 each. Registered in buyer's name. Also registered black Percheron Stallion 2 years old \$20.00. J. C. BUTLER, Portland, Mich., Bell Phone.

POLAND CHINAS

From our thousand pound Grand Champion Boar and Big Stretchy Sows. Also booking orders now for spring pigs. Hillcrest Farm, Kalamazoo, Mich.

Big Bone Poland China Brood Sows, bred for spring farrow. Few choice males ready for service. Also M. B. Turkeys. Maplewood Stock Farm, Allegan, Mich.

Big Type Poland China Pairs and trio not akin out of large litters. G. W. HOLTON, Route 11, Kalamazoo, Michigan.

POLAND CHINAS Gilts, of the big type, bred for April and May farrow. A. A. WOOD & SON, Saline, Michigan.

Large Strain P. C. 1 choice boar ready for service. Gilts left, some to farrow the last of April and first of May. At Farmers Prices. H. O. SWARTZ, Schoolcraft, Michigan.

Large Type P. C. Gilts and sows. Bred for Mar. and Apr. farrow. Sired by Big Des Moines, Big Knox Jr. and Giant Defender. Bred to Big Knox Jr. Smooth Wonder 3 and Big Jumbo, four great boars in state. Come or write. W. E. Livingston, Farm, Mich.

For Sale Poland Chinas either sex, all ages. Something good at a low price. P. D. Long, R. F. D. No. 8, Grand Rapids, Mich.

Heavy Boned Poland Chinas. Fall and Summer Pigs. Sows Bred. Eggs from big Barred Rocks \$1.00 for 15. ROBERT NEVE, Pierson, Michigan.

BIG TYPE POLAND CHINAS—bred sows and gilts all sold. Have several good spring boars and fall pigs. Both sex. Call or write. W. BREWBAKER & SONS, Elsie, Michigan.

REGISTERED Poland China Spring Boars and Sows. Rat \$15 each. Making this special price to make room for others. A. G. Meade, Stanton, Mich., Colby's Ranch.

Large Type P. C. Sows & Gilts all sold. Have 3 extra good spring boars. Sired by Big Defender. W. J. HAGELSHAW, Augusta, Michigan.

Large Yorkshire Swine all ages. Red Poll Bulls ready to use \$75 each. E. S. CARR, HOMER, MICHIGAN.

Large Yorkshires August and September pigs. 2 spring boars. Prices reasonable. W. C. COOK, Route No. 1, ADA, MICHIGAN.

Yorkshires Gilts For March & April farrowing For Sale. Waterman & Waterman, Ann Arbor, Mich.

GROWTHY THE DISEASE PROLIFIC "MULEFOOT" RESIST- PROFITABLE HOG ING

WE ARE NOW BOOKING ORDERS FOR SPRING PIGS

THE CAHILL FARMS KALAMAZOO . . . MICHIGAN

Hampshire Swine the great pasture hog. My herd contains the blood of some of the greatest champions of the breed. Headed by a son of the Great "Look Out." Bred sows and boars all sold. Booking orders for spring pigs. Can supply pairs and trios, notakin. Geo. E. Starr, Grass Lake, Mich.

Hampshire Hogs—Nothing for sale but Apr. Boars. Taking orders for spring pigs. Write your wants. John W. Snyder, St. Johns, R. No. 4, Mich.

Hampshire Swine Pigs of both sex. Bred Sows. Service Boars. Write for prices. Price to sell. FLOYD MYERS, R. No. 9, Decatur, Ind.

SHEEP.

Kope Kon Farms SHROPSHIRE and DUROCS. KINDERHOOK, MICH

Leicesters—Yearling and ram lambs from Champion flock of Thumb of Mich. Also select Berkshire swine. Elmhurst Stock Farm, Almont, Mich.

Oxford Down Sheep. Good yearling field Rams and ewes of all ages for sale. M. F. GANSLEY, Lennon, Michigan.

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DUNHAMS

Percherons

For Fifty Years The Best

Send for fine Photographic Catalogue.

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Wayne, Dupage County, Illinois

Valuable Percheron

Stallions & Mares

Must be Sold to Close Estate

A. A. Palmer, Estate,

R. R. Orleans, Mich P. O. Belding, Mich.

Additional Horse Ads. on Page 503

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For Sale. Registered Holstein Bull calf, two years old, white, born Mar. 15, 1914, dam and sire's dam reg. A. R. C. record. Price \$300. CHAS. L. COOK, Lakeville, Mich. Has 135.

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Shorthorn AND POLLED DURHAMS FOR SALE. Have red, roan and white. Have over 100 head in herd. C. P. Wilson, Leroy, Mich.

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

POLAND CHINAS

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Additional Horse Ads. on Page 503

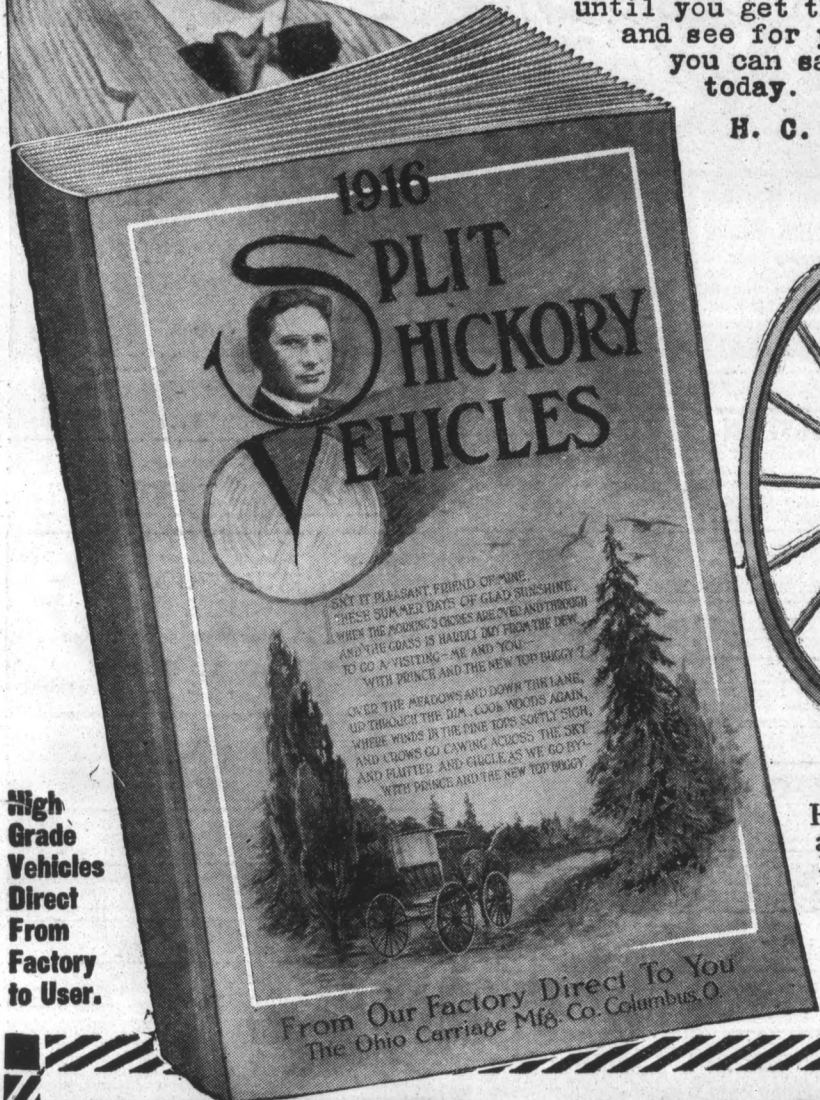
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