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Sheep On Michigan Cut-Over Lands

THERE have been honest doubts as to whether the breeding of sheep and raising and fattening of lambs on the cut-over lands of northern Michigan would prove profitable. As Field Agent of the Michigan Agricultural College I have advocated the raising of sheep in these regions, both for the profits to be derived from the business, and as a great help in clearing the land of brush, weeds, briars, etc. Experiments have proved profitable where yearlings were used. The freight from and to Chicago, however, cut a large hole in profits, and because of this fact it was decided to try experiments with breeding ewes. On August 5, 1914, Dean Shaw, of the Michigan Agricultural College, and myself purchased three carloads of Washington yearling ewes of Clay, Robinson & Co., Chicago, for breeding experiments. These ewes averaged 85 pounds at Chicago.

One of these carload lots, consisting of 221 ewes, went to Mr. George Mashek, of Cornell, Delta county, Michigan. He fenced in 100 acres of cut-over land with woven wire fence to keep the sheep and to prevent dogs and wolves from molesting them.

This piece of land had produced cedar, pine, hemlock, and a very little hardwood. In places it was low and wet. It was covered with logs and brush and was apparently not a desirable place to put sheep. Indeed, there was not a more unpromising piece of land in the neighborhood for the purpose.

Two sheep died from dysentery, one of them being sick when the sheep were unloaded. The sheep were turned on to the public highway for a short time to pasture, and were attacked by dogs set on them by the boys, and two sheep killed. That is all the loss that has occurred.

These sheep were pastured in the 100 acre lot until January 6, 1915, and received no other feed except what they browsed from the brush, and grass in their pasture. On January 6 Mr. Mashek began feeding straw and fed only straw until early March, and then fed hay and some corn fodder. There was not over one ton of corn fodder. They were fed hay till May 1 and then turned on pasture.

For shelter a comfortable shed of boards covered with tar paper was provided, as seen in one of the accompanying cuts. It is an interesting fact, however, that in clear weather, and frequently on clear sharp nights, the sheep appeared to prefer lying in the open, and especially where the straw or hay had been scattered for feed.

These ewes were bred to Hampshire rams of good quality. On June 3 when I visited this flock, it contained over 100 per cent of lambs.

About the first of May the sheep were sheared and averaged seven pounds of wool per fleece. The fleeces were of ten months' growth only, since the sheep were sheared the latter part of June the year before.

(Continued on page 25).



Fig. 1.—View of Land and Brush Unattacked by Sheep.

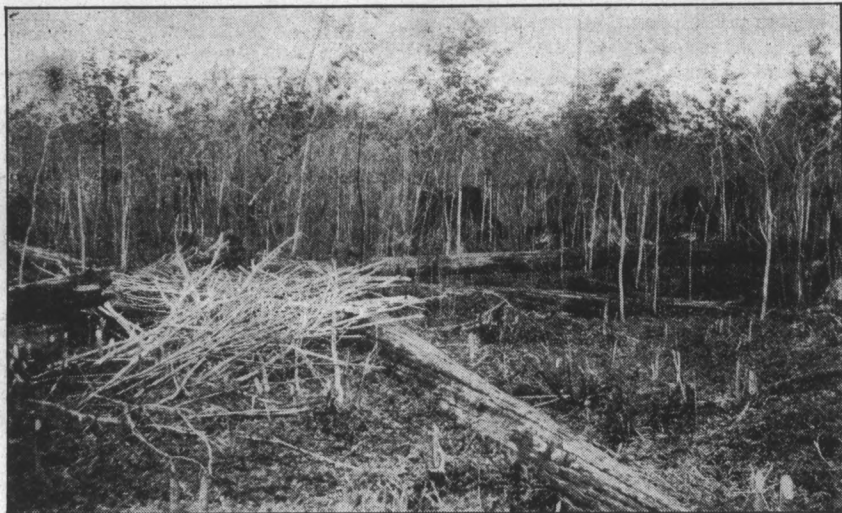


Fig. 2.—View of brush on June 3, 1915. Much of the brush, which is willow and poplar, has been killed as shown by the absence of leaves. Many of the small trees show how completely the sheep have removed the bark. In the foreground lies a brush pile cut during the winter season. The twigs and bark were largely removed by the sheep immediately after the cutting and piling took place. Fig. 3.—A view of a part of the sheep on the morning of June 3. In the background is a partial view of the shed in which the sheep were wintered.



Fig. 4.—A view of the lambs photographed on the morning of June 3. In the background is seen a part of the land upon which the sheep have been pastured. The brush which the sheep did not consume was destroyed and has been cut off. Fig. 5.—A somewhat extensive view of the land upon which the sheep ranged. The brush which was not consumed by the sheep has been cut off. In the distance is seen the shed in which the sheep were wintered.

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DETROIT JULY 10, 1915.

CURRENT COMMENT.

Our leading article for this week touches in a practical and forceful manner on one phase of Michigan's live stock industry. Demonstrating as it does the feasibility of keeping sheep on cut-over lands with profit from the flock and profit accruing to the owner through the assistance of sheep in clearing the land, there should be a marked increase in the flocks maintained in northern Michigan.

In former years Michigan was in the first rank of sheep producing states, but her sheep breeding industry has gradually given way to sheep feeding as a business, while the flocks maintained upon the farms of the state are mostly small and are kept as a side line rather than a prominent factor in the farm production. The demonstration described in the article above referred to should encourage the keeping of many more flocks of considerable size.

One discouragement which has operated to limit sheep breeding in Michigan is the depredations of dogs. Where sheep are pastured on cut-over lands, however, and the same are enclosed with suitable wire fences, the danger from dogs is very greatly reduced if not entirely obviated. The price of sheep and lambs on our markets in recent months has been such as to encourage the growth of this important industry. There is place for a few sheep upon every farm and unquestionably for larger flocks on new land and land which is in the process of clearing. Michigan sheep feeders are finding it difficult to purchase feeder lambs from western points, and the more extensive breeding of sheep in the newer sections of the state would be a welcome addition to the available supply.

There is also room for a rapid growth in our beef producing industry. While the supply of cattle in the country has increased to some extent during the past decade, it has in no wise kept pace with the increase in population. Foreign trade in meat products has grown enormously since war was declared in Europe, while an outbreak of foot-and-mouth disease in this country has tended to reduce the supply of fat cattle, since it has been impossible to take feeders back to the farm from the big markets, as is the common practice under normal conditions. There is no doubt but that beef production will bring a more liberal reward in the future than it has in the past. The western ranges are being broken up, and it is the consensus of opinion of all competent judges that the main source of supply in future years will be the farms of the

central and northern states instead of the free western ranges, which produced the world's cheapest beef for so many years.

Further south where other natural conditions would favor beef production on a larger scale, the cattle tick keeps the industry in check and will keep it in check for many years until the interest of southern farmers is sufficiently aroused to bring about the eradication of this pest throughout the entire infested territory. There is opportunity for profit in the production of beef as a side line if not as a specialty upon practically every Michigan farm, and not a few farmers are finding it profitable to produce first-class baby beef under present conditions.

Progress in the control of hog cholera is encouraging and indicates that the mortgage lifter will be more plentiful and common on Michigan farms in the future than it has been in the past. Altogether the outlook for Michigan's live stock industry was never more promising. Notwithstanding the complaints of consumers and the advice of agricultural propagandists, the farmers of Michigan and the country at large have demonstrated their ability to produce a liberal supply of any commodity when the market price is such as to give them suitable remuneration for the labor involved. This will hold true with live stock as well as other special products, and should live stock products continue to command prices which have obtained in the recent past, our live stock industry may be expected to grow rapidly along all lines in the near future.

The Distribution of Farm Products.

Gradually it has come to be recognized by all interested parties that some improvement on the methods now in vogue for the distribution of farm products from the farm to the consumer would be most desirable. Various methods have been suggested, and many plans have been tried, generally by producers and with varying though indifferent success.

Occasionally the consumer or a club of consumers take the initiative in establishing a more direct route from the farm to the family table. This method is being followed satisfactorily in many cases, and is greatly facilitated by the establishment of the parcel post and the general reduction of express rates.

Over in Nebraska a plan has been tried which was inaugurated by the local merchants in a good country town. These merchants raised a fund of \$1,000 for the erection of a receiving station for farm products. All agreed that they would buy no produce direct from farmers, but would take same through the medium of the receiving station. At the receiving station produce is purchased from growers upon a quality basis and is thereafter graded to suit the market, in order that the highest price may be realized. Trade checks good at any store in town are given in payment for the produce. The receiving station is not intended to make any profit aside from maintenance and overhead expenses. This plan is said to be giving greater satisfaction among both merchants and producers than did the old plan of taking in butter and eggs and other produce at the grocery store either for cash or in payment for goods.

There are several advantages to the plan, one of the most important of which is that the producer is paid for his produce on the quality basis. The ideal method of distribution would be from an organization of producers through an organization of consumers to the ultimate consumer, but until this plan shall have been worked out satisfactorily through many years of experience, any plan which promises to be beneficial to both producer and consumer is well worthy of consideration, even though it may make no radical

change in present established methods of distribution.

Training and Efficiency.

As a general proposition, training has come to be regarded as a prerequisite of efficiency. There may be exceptions to this general rule, but the rule is very generally conceded to obtain in the great majority of cases. Apparently it applies to both mental and physical training. In a test recently made to determine the relative efficiency of boys in the schools of New York as compared with those of a small New England town, three athletic tests were selected which were commonly met by the boys in the New York schools. These tests were in jumping, running and chinning. When this test was applied only one of the boys in the village school was able to fulfill these three simple requirements in accordance with the standards commonly attained in the city schools. In the chinning test, or pulling the body up by the arms, the village boys did only about half as well as the boys from some of the most congested sections of New York city. The difference in efficiency was not due to any inherent inability of the country boys, but rather to the fact that they had not had physical training under direction which the city boys had enjoyed.

The same fact obtains with regard to mental training, whether it be along technical lines or not. The farm surveys which have been conducted by the Office of Farm Management of the U. S. Department of Agriculture show in almost every case that where the farmers included in the survey are classified as to educational attainments those who have enjoyed high school training are relatively more efficient and successful as measured by labor income than are those who have not enjoyed such advantages. Those who have had technical training of a higher order are proportionately more successful as a class.

These are all facts which should be carefully pondered by country people, to the end that the farm boys and girls may not be handicapped by lack of either physical or mental training in the preparation for their life's work. Efficiency is at a premium everywhere, and is just as important on the farm as elsewhere.

Efficiency in Farm Management.

Various self appointed experts who are interested in the so-called rural uplift movement are often heard to deplore the incompetency and inefficiency of the average farmer. The public press, or a large section of it, is periodically calling attention to the losses suffered from insect pests and contagious diseases, which are charged to inefficient management. The city consumers in quite another strain complain of the high cost of farm products. If the suggestions and advice from each of these sources were put into practice production would be greatest amount of products from a country, with the result that the reward of the farmer's labor would be very much less while the benefit to the consumers would be exceedingly doubtful, since the lessened purchasing power of the farmer would more than offset the slight reduction in the cost of necessities to the consumer. The pessimist who is looking forward to the time when our population will be relatively greater than our supply of food stuffs may assure himself that just so rapidly as it becomes profitable for them to do so, just so fast will the farmers of the United States increase their production of food staples.

Efficiency in farm management does not consist altogether in growing the greatest amount of products from the given area of land, but rather in economic production which will leave the greatest possible net profit or labor income for the farmer and his family. It is true that by increased

production without increasing labor cost a single farmer or a considerable class of farmers can increase their net profit or labor income, but this will not work when applied to the farmers of the country; for them the only method of increasing the net profit or labor income is to reduce the cost of production or distribution or both, since by the first means they will obviously have a larger net revenue, either by reducing labor cost or securing a larger percentage of the consumer's dollar. Both these are worthy ends, and progressive farmers are thinking and working in that direction.

HAPPENINGS OF THE WEEK.

Foreign.

The European War.—The Germans have sent fresh troops to the western theatre of war and taken the offensive at many points on the long battle line. Reports would indicate that with but one exception these attacks have failed. At Le Petre in northern France the Teutons advanced about 400 yards along a front of nearly a mile. The Russians in Galicia continue to retire from position to position although the retreat is not being forced as vigorously and is being opposed more stubbornly by the Russians. Italy has gained ground consistently along her entire front against the Austrians, and her forces are now marching on Plava. In the Dardanelles battle the Allied forces are making decisive gains on the Turks, and have greatly improved the positions held on the Gallipoli peninsula. The Turks have suffered heavy losses during recent engagements. The submarine warfare is being prosecuted as vigorously as ever by the Germans. In a naval battle in the Baltic Sea between German and Russian boats, a German battleship was reported destroyed, but this has been denied by Berlin reports.

Gen. Porfirio Diaz, former President of Mexico, died in Paris last Friday after a short illness. He was the iron man of Mexico for 35 years until he was compelled to resign as president following the successful Madero revolution in 1911. He has since resided in Europe.

Three British steamers and four sailing vessels were sunk last Thursday and Friday by German submarines, according to the British admiralty reports. So far as known, there was no loss of life on any of the vessels.

An investigation of conditions in England since the war began shows that prices of foodstuffs have advanced 43 per cent since the first of August, 1914. This means an additional burden of \$1,000,000,000 a year on the consumers.

National.

Gen. Huerta and other Mexicans were arrested last week at El Paso, Texas, by United States authorities, charged with plotting to launch a new revolution in Mexico. It is stated that additional arrests will be made in connection with the alleged plot. The bonds of Gen. Huerta and those arrested with him are placed at \$15,000.

The Grand Trunk docks and freight sheds at Port Huron burned Monday, July 5. The loss is estimated at \$250,000 to \$425,000. The origin of the fire is unknown.

An attempt was made on the life of J. Pierpont Morgan at his home at Glen Cove, N. Y., last Saturday. The financier's wounds are not considered dangerous. The would-be assassin also confessed to having placed the bomb that exploded on the Senate side of the Capitol building at Washington last Friday night. The belief is that the man is mentally unbalanced. Officials are endeavoring to learn his past as it is now believed that he is a former professor of Harvard University who disappeared suddenly in 1906.

Preliminary reports on fatalities and injuries resulting from the Fourth of July celebration throughout the nation, show eight persons killed and 177 injured. In 1914 the total number of victims was nine killed and 601 injured. The fire loss due to accidents, combined with the use of explosives, was \$66,550 this year as compared to the loss of \$76,035 last year.

The board of supervisors of Alger county has ordered an inspection of all the cattle in the county for tuberculosis. This is the first county in the state to undertake the task of making a complete survey of the whole county for this plague.

Five persons were killed in auto accidents in Detroit last Sunday and Monday.

A two weeks' conference is being held at the Michigan Agricultural College for the study of the state's rural problems.

A Lesson from the Old World

THROUGH the rifts in the war clouds we are catching now and then gleams of light, telling us something about the farming methods of the old-country folks, and from these we may gain some lessons that will stand us in good stead, if we will only let them do so. "We live to learn" is just as true of farming as it is of anything in the world. When we stop learning, we stop everything.

One who has studied the ways of the farmers of Belgium tells us, for example, that "the soil is given no rest. Always the farmers are digging, turning over the ground, hoeing, weeding and harvesting." When we remember that there is a proverb among the Flemish people to the effect that "the spade is a gold mine to the peasant," we can understand better why they are always keeping at it with this necessary farming tool. The farmers have quite up-to-date tools which they use to good purpose, but the spade is the Belgian farmer's most valued utensil.

Now, the farmers of this county might do well to think of this disposition on the part of their neighbors across the sea to keep the soil of their farms working. We have too much idle land. Think of the thousands upon thousands of acres of land in this country that bring in practically nothing. We have too much land; we can't get around to all of it often enough to keep it in the best possible condition. We follow a rotation of crops in a measure, and that helps, but our terms of changing about are too far apart.

Usual Methods.

This is the way it goes with the great body of farmers. They fit up a piece of land for corn and potatoes, we will say, and plant it. Considerable barnyard manure is, as a rule, thought necessary where we are to have corn, although many use very little until we are compelled to. For potatoes, too, many fields are put in with absolutely no form of fertilizer, save such as nature has already locked up in the earth, and this may have been badly overdrawn through successive cropping without any recompense of reward.

After the corn, comes some kind of a grain crop, oats, it may be. This exacting crop demands good soil conditions; but in very many cases no fertilizer is used, unless it may be now and then some commercial fertilizer. With many farmers land sowed to the small grains is seeded down; and it is left that way, being mowed constantly for many years, until what fertility there was originally in the soil has mostly been taken up and disposed of by the crops grown.

The seeded land lies in this condition often many years, every year becoming thinner and poorer with each passing harvest. The grass roots "run out," as we say, so that often we do not cut more than half a ton of hay to the acre.

Unprofitable Results.

Now just stop a minute and let me whisper something in your ear about this very subject. The latest figures show that in the year 1913 there were produced in the United States 64,116,000 tons of hay. It took 48,954,000 acres of land to do this. Take out your pencil and figure this out. You will find that the average yield of hay for that year was only 1.3 tons per acre. The great state of Missouri gives us this report: Acres in grass, 3,000,000; product, 1,800,000 tons, or six-tenths of a ton to the acre. Too bad isn't it, that we should have to mow over so much land to get a ton of hay, when by proper care and management we might cut three or four times as much to the acre!

And that is the lesson for us. Stop getting so much more land and cultivate what we have a great deal better. The people of Belgium all have

little farms. To get a living they must make the very most of every foot of land. Not a single bit of land is left idle. In this country we have been too anxious to get more land. Now let us turn over a new leaf and farm what we have better. That is the best possible kind of farming. It is going to be the only kind that will succeed in the very near future.

New York.

E. L. VINCENT.

PLOWING VS. CULTIVATING CORN.

"What fool chose that title?" I hear someone asking that very question when they see the title to this article. My friends in Illinois, Indiana and Ohio say they plow the corn while we Michigan people say we cultivate it, but all of us use similar tools and perform the same operation. This morning I saw a double shovel cultivator in a corn field. I knew it was a double shovel, not because I could see the shovels, but because of the "form" of the cultivator. My friend was literally digging the bowels out of the earth and I am going to call this "corn plowing." By cultivation I mean the harrowing of the surface soil and pulverizing of the surface particles.

When Plow and When Cultivate?

Now that we know each other on this matter of corn plowing and corn cultivating, let us see which one is better and why? It cannot be said that either one should be used to the exclusion of the other. The thing that will guide us in knowing when to plow the corn and when to cultivate it is to find out the habits of the plant. After sprouting, it takes some time for the roots to grow to any great length. If the rows are 44 inches apart, it will be some time before the roots extend far out into the rows and if plowing is ever justifiable, it is before the roots have grown very much. It may be a good thing at this time to cultivate deeply and aerate the soil. This not only allows some oxygen to get to the roots of the plant, but soil experts tell us that it breaks up the plant food in the various soil particles.

Last year I dug up a corn plant six weeks old and honestly, I was surprised to see what an extensive root system it had. At that time, the feeders ran clear out into the middle of the row. Only the tips of the roots are capable of taking in the plant foods and so it is easy to see how harmful it is to cultivate deeply both ways in the field. If the cultivation is a deep one, many of these feeders are cut off all the way around the plant and surely, the corn plant cannot grow unless it can take in plenty of plant foods. There is no question about it and it has been demonstrated many times that deep cultivations after the plant is knee high are very harmful and cut down the yield considerably.

Ingham Co.

I. J. MATHEWS.

DRAGGING ALFALFA.

I often see in your valuable paper where Mr. Colon C. Lillie strongly advocates the dragging of alfalfa fields. I think he advocates it a little too strongly. He told us at the farmers' institute at Bangor, to drag it good and thorough. "Don't look behind you to see what it is doing to the alfalfa, but just go ahead and drag it as if you were fitting it for corn."

So this spring I did so, or at least I started to do so. But I did not follow directions. I looked behind me, and I made up my mind I was hurting the alfalfa, so I thought I would experiment a little. Part of the field I dragged twice, part once and the balance not at all. When I cut the field the part I dragged twice was very thin and scattering. The part I dragged once was much better and the balance was good.

Now, what was wrong? Our land may not be ideal alfalfa land. It is a good clay loam. It was quite dry when I dragged it, using a three section spring-tooth with four horses. You can see that the alfalfa roots would have to be pretty tough to make the drag dodge around them in the hard clay.

Van Buren Co.

W. C. WILCOX.

FARM NOTES.

Sweet Clover.

I would like to ask a few questions about sweet clover. What is the difference between yellow and white blossom sweet clover; which is the best for forage and for enriching the soil and which is the most hardy? At \$18 per bushel for hulled seed and \$6 per bushel for seed with the hull on, which is the cheapest and how much of the latter should be sown per acre? I am planning on putting in nine acres and expect to drill it, and had thought of sowing a little alfalfa with it. Any other suggestions that you could furnish me other than what I have asked for would be appreciated.

Washtenaw Co.

O. B. P.

The white sweet clover makes a much larger growth and is very much better adapted to use as a forage crop or soil improver in Michigan than the yellow blossomed variety.

The proportion of seed in a bushel of unhulled seed as compared with that which is hulled would be very nearly in proportion to its weight, as the chaff would weigh very little, and this would be a safe method of estimating the amount which should be sown where unhulled seed is used, and the relative value of same.

There would be no advantage in sowing alfalfa with sweet clover, since the same nitrogen-fixing bacteria inhabit the roots of both plants, so that the growing of sweet clover will aid in the inoculation of soil for alfalfa. Land that is in a sufficiently fertile condition to grow alfalfa should preferably be seeded to that plant, while sweet clover is better adapted to growing on land that is low in its content of humus and available fertility as a preparation for alfalfa or as a green manure crop.

Alfalfa After Early Potatoes.

I have a field planted to early potatoes which will be harvested by September 15. The land is good for 150 to 200 bushels of potatoes, being a clover sod well manured. I would like to put alfalfa in after the potatoes. My neighbor right across the road has about a quarter of an acre which is about five years old and is getting better every year and he never inoculated or put lime on either. My field is higher but better land, and there is considerable limestone all over the hill. Now, will September 15 be too late? What kind of seed? Does it need more lime? Should I sow wheat for nurse crop? How much soil should I get from my neighbor to inoculate? Or would it be better to wait until next year? The land will be in excellent shape after the potatoes come off. These two fields are just the width of the road apart.

Leelanau Co.

G. S.

September 15 is later than it is safe to sow alfalfa in lower Michigan; in Leelanau county it might be a safer proposition on account of the fact that snow is apt to come before the ground freezes severely in more northern counties, and ordinarily stays on more continuously throughout the winter.

However, successful seedings have resulted from seed sown in the late fall, and under favorable conditions this field might be successfully seeded by sowing as late as the middle of September. It is a safe proposition to depend on alfalfa doing equally as well as clover will do, provided soil conditions are favorable for its growth when sown in the same way and at the same time. If it is a safe proposition to sow clover this late in the fall, then alfalfa could be seeded with equal prospects of success. If some of the hardier varieties of seed from an old stand is sown, this might increase the chances of it surviving the winter. As the land would be in excellent condition to seed to alfalfa af-

ter early potatoes, the expense of sowing then would not be great, and it could be again reseeded in the spring if a successful stand did not result. The experiment would be worth a trial. A light nurse crop of winter wheat would be some protection during the winter or some crop which will winter-kill might be sown, such as buckwheat, which we have seen successfully used as a cover crop for fall-seeded clover.

The presence of limestone in this field would indicate that lime enough is present to insure the success of alfalfa, although a part of the field should be limed to determine this question absolutely, if there is any doubt as to the condition of the soil. There is such a great difference in the growth of alfalfa on land which contains plenty of lime and land which does not, that it does not pay to take chances on this proposition unless one is sure. In inoculating for alfalfa with soil from an old alfalfa field, some farmers claim much better results where a ton of soil per acre is used. This amount, however, need not be used to secure good results. Some claim to get good results by the glue method where only a small amount of soil is used with the seed. It would be better to sow 200 or 300 pounds per acre than less, dragging same in immediately after sowing, doing the work preferably on a cloudy day.

Hydrated Lime vs. Ground Limestone.

Can you inform me where to obtain hydrated lime? Am advised to use it in seeding alfalfa for quick results. What is the nature of the lime? Must it be kept in the dry until ready to use? What is its cost compared with ground limestone and how much should one sow to the acre on a very acid soil?

Berrien Co.

M. W. K.

Hydrated lime is caustic lime which has been slaked by a steam process without having sufficient moisture added to it so but that it can be kept for a considerable period in the paper sacks in which it is ordinarily sold. It should, of course, be kept dry until used, but will not deteriorate quickly as will ordinary lump lime. It can be purchased from any builder's supply concern, as it is the form of lime now commonly used in building operations. It costs more than double the amount per ton that ground limestone can be secured for, but contains a much larger proportion of calcium, for which reason it is not necessary to use such a large amount to sweeten an acid soil. It gives very much quicker results in the neutralizing of soil acidity.

The writer has found 500 pounds per acre of hydrated lime to be more effective the first year than 2,000 pounds of ground limestone. It does not, however, furnish as much actual lime to the soil and will not supply needed lime for so long a period of time. Not more than one ton per acre of hydrated lime should be used on a very acid soil, and probably half that amount would be sufficient to correct any ordinary condition of acidity. We have developed the practice of sowing both ground limestone and hydrated lime where a field which has not been previously limed is being prepared for alfalfa, on account of the quicker action gotten from the hydrated lime.

HARVESTING VETCH.

I would like to know if any Michigan Farmer readers have had any experience in cutting rye and vetch for seed, and what machine they used. I cut mine with a mower last year, and it threshed out most of it, but it does not look to me as if a binder would work in it.

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That beats them all. One horse cuts 2 rows. Carries to the shock. Worked by 1, 2 or 3 men. No danger. No twine. Free Trial. We also make Stump Pullers and Tile Ditchers. Catalog Free. Agents Wanted. **H. G. BENNETT & CO., Westerville, Ohio.**

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LIME—You should get the highest grade of limestone manufactured. Buy it upon the basis of analysis. We manufacture the highest grade pulverized limestone sold in Michigan. Let us prove it. Ask for sample and analysis. **CAMPBELL STONE CO., Indian River, Mich.**

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For general farm use. Finely pulverized, made from highest high calcium stone. Quick shipments in closed cars. Let us send sample and price. **Northern Lime Co., Petoskey, Mich.**

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Ginseng—Its Possibilities and Probabilities

By G. H. COONS

WITH the appearance of a Farmers' Bulletin (551), giving a rather complete account of the growing of ginseng, more and more inquiries are going to arise in the minds of small householders about this interesting plant. Men with a vacant back lot or so, farmers with a small acreage or with a small woodland, are beginning to wonder if ginseng is not the crop to utilize the idle spaces. Those who may have passed the allurements of the startling ginseng advertisements, "\$60,000 an acre," will not, with complete information at hand, be considering the possibilities of this plant as part of a gardening scheme. It is the purpose of this article to tell in a few words the routine of the culture of ginseng; to answer the usual questions as to markets; and to throw light on the returns which are obtainable. Let me remind the reader that anyone can figure the possibilities per acre and figures twice as extravagant as those which I shall name are current. In the rest of the paper the rosy picture conjured up under possibilities is necessarily dimmed by the probabilities of the case. It is not my purpose to be merely pessimistic, but no one should enter the business of raising ginseng with only possibilities in mind. The various items which may properly be considered as factors in diminishing "arithmetical returns" are investment in shading, danger of depredations, costs of labor, etc.

A Native Forest Plant.

Ginseng is a forest plant of wide distribution in northeastern and central United States, and in its culture in any of these native regions forest conditions are maintained or imitated. The commerce in ginseng began long ago, and for scores of years "Sang" hunters have scoured the woods to find the patches of the wild plant. A lucky find would easily pay for the winter's "grub." The Indians in northern Michigan and Wisconsin were very industrious in this prospecting, and developed into shrewd traders. The story has it that many a tack or even lead bullet found its way to the unsuspecting Chinamen. With the increasing scarcity of the wild root and a marked increase in price, the culture of the plant has commenced in all parts of the country.

The plant is grown in beds and these should be well drained and heavily shaded. Shading is usually made of lath, spaced about five-eighths of an inch and supported six or seven feet above the ground on durable wood posts or discarded gas pipes. Types and kinds of shade materials are so numerous that shading is a study in itself. Naturally enough no two growers agree on this complex proposition—one uses a peaked shade with hinged drops, another lays the lath in squares, which may be removed in winter, while still another uses brush. Each is sure he is right and has the better shade without knowing why. Accordingly, the growers' conventions are usually lively enough. All agree that the sides should be open to allow free ventilation.

Making a Start.

The beginner buys seed at two dollars or less per thousand, and usually some two and three-year-old roots. Since the seed requires a resting period of about 18 months before it will sprout, seed of 1914 will not grow until the spring of 1916. For a slight advance in price one can buy "stratified seed" from the crop of 1912, and this will germinate immediately. The seed is sown broadcast, or is drilled into a prepared seed bed. The seeds germinate slowly in warm favorable weather, and the young seedlings must be watched carefully, and the ground stirred about them in order to prevent

damping off. The seedlings are left in the beds for two years, and then are reset in another bed, in rows six inches apart, and with the plants six or seven inches apart in the row. The plants are allowed to grow in this bed until they are five years old. Some growers, however, advocate leaving the roots to become six or seven years old before digging, claiming that the increase in weight and quality more than pays for the additional time. The old roots are dug, washed, sorted, and dried slowly. The fibrous roots are broken off, and this fibre can be sold from 50 cents to \$1 a pound. When the main roots go to market, various gradings affect it. First-class roots of the right type bring about \$5 or more a pound. Small or misshapen roots may bring \$2.50, or it may happen that there is little demand for them. The term "right type" probably needs attention, for in this business of great uncertainty, there is nothing more uncertain or elusive than the exact type that the buyers want. The ginseng buyers lay the blame on the Chinese markets, and judging from their vagaries, the wants of the Chinaman are as unstable as the wind.

The Orient the Chief Market.

Ginseng as a commercial article has practically only one outlet—the Orient. A small amount of ginseng is used in this country—but for the most part this is the ginseng fibre, or the ill-favored, undersized roots. We read of certain cure-all medicines which contain ginseng as an active principle, but ginseng is not all widely used in American medicine. There is a carbonated drink with the ginseng flavor, and a ginseng gum is being pushed vigorously just now, so that in time ginseng may rival the aromatic mint. Many growers with an eye to the future hope that a domestic market may be developed, as they fear that the oriental trade may either slacken or be supplied otherwise, since the Japanese, who control the Korean ginseng, are strong competitors of the Americans. The Chinese use the root extensively. There are countless wild stories—usually traceable to some medieval consular report or some sailor yarn—as to the use of ginseng abroad. It is to the Chinese a national medicine, much like our quinine, and the Chinese take ginseng just about as we take quinine, whether we need it or not! Ginseng is their universal tonic for old and young. It is interesting to note that our own "old-fashioned," but still very popular spring tonic is sarsaparilla, a full cousin to the ginseng of the Chinaman. The Chinese also use ginseng as a flavoring in tea and soup, and it is readily seen that a diet composed largely of rice could be made of a better flavor by this aromatic spicy root. The crop of American ginseng is bought by a few firms in this country, which have agencies in Hong Kong. No set of growers has ever perfected an organization to sell directly to the Chinese merchants.

The Probable Profits.

Now for the profits. We left the two-year-old plants set six inches apart, starting on the long growing period of three or four years. A stout, vigorous plant at the end of this time should have a root worth 50 cents, since on an average there are about ten roots to the pound. A bed seven feet wide by 100 feet long could have in round numbers, 2,800 such roots—returns \$1,400. Or to be in line with the advertisements, let us put this on an acre basis. In an acre there are more than 43,000 square feet. Assuming four plants to the square foot, we have a grand total of more than 172,000 roots, each worth 50 cents—\$86,000 for one acre. Lest some reader write indignantly, let me hasten to country.

say that this is not exactly the case, although figure and deny as you will, these are typical arithmetical returns, in fact everything except the real returns.

(To be continued).

NURSERYMEN'S CONVENTION.

At the fortieth annual convention of the American Association of Nurserymen held in Detroit, June 23-25, the notable feature was the sending of a telegram to President Wilson, whose patriotic and wise policy during the present war crisis the association endorsed and commended. Special praise was voted the legislative committee for the work done toward uniform inspection laws in all states. A bill has been prepared for presentation when the several legislatures next convene. The committee on nomenclature recommended the standardizing of names on all nurserymen's catalogs, the authorities to be the American Pomological Society's list for fruits, and Bailey's Standard Cyclopedia of Horticulture for botanical names of ornamental plants.

The small space at the disposal of the exhibitors was crowded to the limit with nurserymen's and fruit growers' necessities and conveniences.

After the consideration of nine invitations from cities, Milwaukee, Wis., was chosen as the place to hold the convention of 1916. Twenty-six states were represented by vice-presidents who reported the slate of candidates for office. The election was unanimous as follows: President, E. S. Welch, of Shenandoah, Iowa; vice-president, John Watson, of Newark, N. J.; treasurer, Peter Youngers, of Geneva, Neb.; executive committee, one year, J. B. Pelkington, of Portland, Oregon, and Floyd C. Stark, of Louisiana, Mo.; two years, J. H. Dayton, of aPinesville, Ohio, and Henry B. Chase, of Chase, Ala.; three years, J. R. Mayhew, of Waxahackie, Texas, and F. J. South, of Geneva, N. Y.

TROUBLE DEPARTMENT.

Spray Mixture for Potatoes.

Could you inform me how to make a mixture for spraying for potato blight, so as not to damage the tops? I have tried it, and don't seem to get it right.

Mecosta Co.

W. P.

The best mixture for spraying potatoes is Bordeaux mixture and Paris green. The Bordeaux mixture should be made with four pounds of sulphate and six pounds of fresh lime to 50 gallons of water. The copper sulphate should be dissolved and diluted to about 15 or 20 gallons. The lime should be slaked carefully so that it will be of a smooth, creamy consistency after slaking.

When slaking the lime in small amounts, it is best to use hot water, adding a little at a time as is necessary. While it is slaking it should be constantly stirred, so that the water can get through the lime and prevent its burning. This lime should also be diluted to about 15 or 20 gallons. The lime and copper sulphate should then be poured together into a third receptacle, the mixture being constantly stirred while the lime and copper sulphate are uniting. In this way a smooth and efficient Bordeaux mixture which will be entirely safe on potato vines, can be made.

About six ounces of Paris green should be added when it is desired to keep the potato bug in check. This spray mixture will not burn unless it is improperly mixed or does not contain a sufficient amount of lime.

Insects destroy thirty million dollars worth of fruit annually in this country.

Live Stock and Soil Fertility

It is taken for granted by the heading of this article that the production, and removal of crops from the farm removes a portion of its fertility which must be restored or eventually the farm will become impoverished. It is also inferred, (though not stated), that the keeping of live stock in sufficient numbers, will maintain its productiveness, if the manure is carefully saved and applied to the land. It is not denied that some farmers have kept up the fertility of their farms by the use of commercial fertilizers, and plowing under green crops to provide humus.

It does not seem necessary to prove that land under continual cultivation is constantly losing its fertility, not only by the production of crops, but by erosion. We have seen some of the surface earth, and some of the manure that had been spread on it carried away with the rain water into the creeks and rivers at flood time and borne down to the ocean. Only a fraction of this is ever returned to the farm in the shape of fish, oysters, and sea weeds. That the dung of animals when applied to the land maintains its capacity for the production of crops has been known to farmers in all ages of the world. Several places in the Old Testament speak of "dung upon the earth," "dung upon the face of the earth," and "dung upon the ground." In the New Testament the dresser of the vineyard knew the value of dung for fruit trees when he said: "Lord leave it alone this year also, till I shall dig about it, and dung it."

It is said that Abraham was rich in cattle, and farming with cattle was general in ancient Greece and Rome. In the former cattle were considered of so much importance that the figure of an ox was stamped on their money.

Thomas Hale, an Englishman who wrote in 1758, says: "Dung furnishes the great standing article of manure throughout the kingdom." The dung of domestic animals contains all the materials for the formation of every variety of plants, in an available form, and in about the right proportion.

Live Stock vs. Green Manure.

Live stock is as necessary to the farm, as the farm is to the live stock. They feed each other to their mutual benefit, and the benefit of the farmer. They are bound together as closely as the Siamese twins. Farm stock consume a great amount of roughage, such as straw, cornstalks, unmarketable hay, grain, weeds, culling apples, small potatoes, loose headed cabbage, beet tops, and things that could not be sold at any price, and turn them into meat, wool, and things that have a cash value, and a ready sale. These too, in addition to the value of the manure the animals make. Very few farmers place value enough on the manure of farm stock. Prof. Roberts of Cornell university, valued the manure of a large cow, fed on grain for making milk, at 16 cents a day, as compared with the cost of commercial fertilizers containing the same amount of fertility. In England, the farmers raise and fatten cattle, and do not expect to make a profit, or pay for their labor for feeding, except the value of the manure. When they have this clear, they consider themselves well paid.

The kind of stock most profitable to raise depends on the surrounding conditions. In some localities, it is milch cows, in others, hogs, horses, or sheep.

A few farmers have claimed that they maintained the fertility of their farms by plowing under crops of clover. They deceived themselves. The clover returned nothing to the soil it had not extracted from it except a small quantity of nitrogen. The almost universal recourse of farmers in keeping their land in good condition for raising crops continuously, is now, and always has been, in keeping live stock. The few farmers who have succeeded

without live stock were surrounded with peculiar conditions that enabled them to do so. In the southern states where cotton is principally raised and all sold, fewer cattle are kept than in the northern, and western states. The plantations there are growing poorer, and thousands of acres have been abandoned. Millions of dollars worth of commercial fertilizers are applied to the land every year in the vain attempt to maintain the fertility without sufficient live stock. The slow, and steady waste of fertility from the ground in spite of keeping live stock, would in the long ages of the future make the earth as barren as Sahara, were it not that a kind Providence has stored the earth bountifully with mineral fertilizers, such as South Carolina rock, potash, kainit, gypsum, lime and marl. The atmosphere surrounding the earth contains an unlimited quantity of nitrogen which can be obtained, and appropriated by raising leguminous plants. Nitrate of soda has recently become a staple manure, and is found in inexhaustible quantities in Peru, South America. The bones of our animals, if saved and ground would supply a large quantity of excellent fertilizer. The blood of animals, and their intestines, now often wasted, should be preserved for manure. Among the natural manures used by the farmers in England to advantage, are burned chalk, burned clay, ochre, sea shells, Fuller's earth, ashes, soot, sea weeds and old rags. Pure sand will improve a clay soil, and pure clay will benefit a sandy soil.

Pennsylvania. J. W. INGHAM.

SHEEP ON MICHIGAN CUT-OVER LANDS.

(Continued from first page.)

Mr. Mashek said the sheep got very thin by January, browsing upon the brush and other wild feed available, and this year he will begin feeding earlier. It should be understood that Mr. Mashek purposely subjected the sheep to these extremes of pasture with a view to studying the possibilities of such wild pastures.

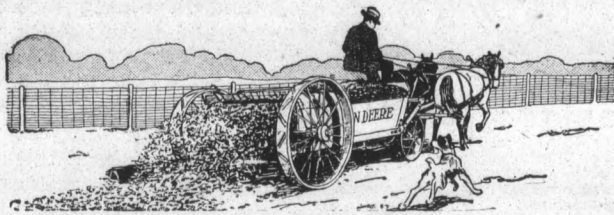
What Mr. Mashek has done others can do, for there are thousands of acres of cut-over lands in northern Michigan, the great majority of them superior to those used by him to pasture sheep, and the land is benefited by their pasturing upon it. A study of the accompanying cuts will prove of interest. Northern Michigan is naturally a grass and clover soil. In the limestone districts and in the heavy clays, blue-grass and clover become self seeded and just naturally grow wild. This region offers great opportunities for sheep and wool production.

W. F. RAVEN,
Stock Agent for M. A. C.

The development of a fair export demand for heavy cattle to export to France to be used for beef for the Allied forces in the field was an important factor in the marked rise in prices in western feeding districts. During the month of May heavy steers advanced fully \$20 per head, and offers of \$9 per 100 pounds at country shipping points were refused by owners in a number of instances. Recently published official figures of the federal government show that during the ten months ending with April fresh beef exports reached the enormous total of 101,944,565 pounds, while 55,702,781 pounds of canned beef were exported; comparing with exports of only 5,182,842 pounds of fresh and 2,932,419 pounds of canned beef during the like period a year ago. In addition there were exports of 21,960,203 pounds of pickled beef during ten months ending April 30.

W. W. Terrett, a pioneer cattle grower of Montana, said recently: "Cattle should be prime by the middle of August if present prospects are fulfilled. There will be less cattle to go forward than last year from this section, as many owners were tempted to sell their three-year-old cattle last autumn."

John Deere Implements



John Deere Spreader

The Spreader with the Beater On the Axle

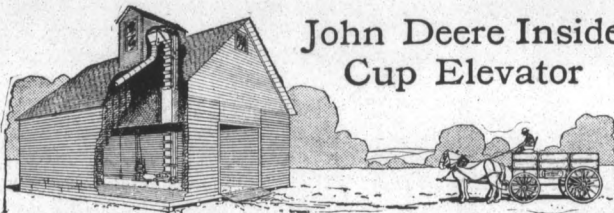
The beater—the business part of a spreader—and all its driving parts, is mounted on the rear axle. This is a patented feature. You cannot get it on any other spreader.

The beater on the axle means there are no clutches to give trouble, less than half the parts heretofore used on the simplest spreader, big drive wheels and a low down spreader without stub axles. Only hip high to the top.

New Revolving Rake

In addition, the John Deere Spreader has a revolving rake that delivers an even amount of manure to the beater. It keeps the beater clear and working free. It works entirely independent of the rest of the spreader and assures uniform spreading. It decreases—not increases—the draft. Another exclusive feature.

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



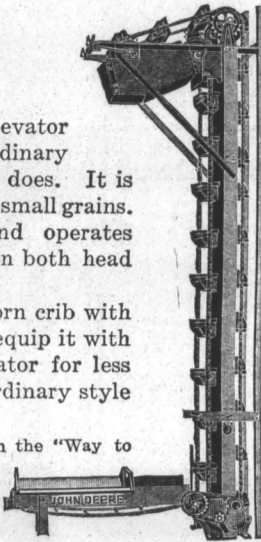
John Deere Inside Cup Elevator

Why an Inside Elevator

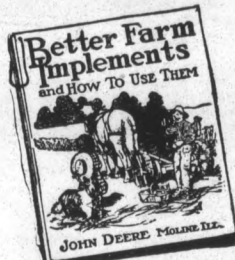
The John Deere Inside Cup Elevator is always in the dry, and with ordinary care will last as long as the crib does. It is always ready for either ear corn or small grains. It is simple in construction and operates easily. Runs on roller bearings in both head and boot sections.

Best of all, you can put up a corn crib with a granary over the driveway and equip it with a John Deere Inside Cup Elevator for less money than you can build the ordinary style of crib. Ask about it.

To get our "Suggested Plans" on the "Way to Build a Corn Crib and Granary, in one, with the Largest Capacity for the Least Building Cost," free, state whether you are interested in grain elevators—stationary or portable.



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Managing a Summer Dairy

MUCH has been written and said upon the subject of winter dairying, and in consequence very many more cows freshen now in the fall or early winter than formerly. This is an improvement over the old method of having all the cows freshen in spring, give a large quantity of milk in the early summer when butter was cheap, and the weather so warm that it was a task to make good butter at all, go down in their milk flow in July, and stand in the stable dry all through the winter. Truly we have made some progress within the past few years, and all our campaigns of education have not been wasted.

But much as we might like to have all our cows freshen at a particular time, things do not at all times shape themselves exactly to our liking, and it occasionally happens that the old cows have ways of their own, and we are obliged to be thankful to have them come fresh in spring, if they will not do so in the fall.

Summer Dairying a Problem for All.

Then, too, it is sometimes best for certain reasons, to have some of our cows freshen in the latter part of the winter, and even though they all have given milk through the entire winter, they will give almost as much as when the grass is good in the month of May as cows that have just freshened.

Cows that freshen in October or November should give an excellent flow of milk through May and June, and not fall off greatly before the latter part of July. So it happens that we all have the problem of the summer dairy to contend with.

My mind often goes back to the days when I was a boy and took my first lessons in summer dairying, hunting cows among the hills of northwestern Pennsylvania. The cows wandered in the best of pasture throughout the first half of the summer, but by and by the dry period of summer came and the cows gave less and less, until in the early winter, they dried up altogether, their only remaining occupation being to eat timothy hay, with a little clover mixed in for variety.

Plenty of Feed Necessary.

But father was a good dairyman, for he lived up to the light he had, and those cows made 200 pounds of butter each in a year. Had they been privileged to live under modern conditions of feed and care they would have done him great credit.

The greatest necessity of the summer dairy is plenty of the right kind of feed all the time. As long as the cattle feed on nature's balanced ration on the green pasture hills, there is no trouble, but the pastures do not last and when they grow short and dry something must be done or the milk will be as short as the pastures.

I always hesitate a little before telling a beginner that his cows should have grain when they are on grass. It always seems to me that if we can only get him to feed them well while they are in the stable, he will learn for himself the value of liberal feeding and will of his own accord continue this same liberal treatment even after they are turned out.

Cows need a much smaller allowance of grain when they are running in the pasture than when they are on a winter ration, but it pays to feed them grain when they are in the pasture. I do not know that it greatly increases their flow of milk at the time, but it gives them a certain degree of reserve force, that always means more milk later on when the pastures get shorter.

Summer Feeding of Grain Helpful.

It also helps to keep up the regular flow of milk, when the grass is temporarily shortened, and the cows do not get as much in consequence. No one who has followed the practice of

feeding a little grain to cows on pasture, will doubt the truth of this statement. But shall we continue to pasture our cows or shall we feed them throughout the summer months from crops grown on the farm, supplemented by feeds purchased outside?

Pasture grass has this advantage, it can be harvested by the animals that consume it. Also, it will grow on rough ground, where it is not possible to run improved machinery.

We should without doubt pasture all fields that are not in condition for tillage, and should so care for the pasture, as to get the largest amount of grass from it during the season.

But in addition to the grass furnished by the pasture and the small amount of grain fed, we need still more feed, and so we must build the summer silo. Generally we need not open it until the pastures begin to fail or a little later, but we can each judge of that for ourselves.

Summer Silo Beneficial.

If it is to be of the most service to us, the summer silo should be filled with corn that is quite well matured. It will not do to think that because the cows are on pasture, they can get along with poorer ensilage than when they are in winter quarters. Ensilage that is immature and watery is not nearly so good as that which is just right. When the corn is nicely dentured it is fit to go into the silo, and though it may go in sooner, it is always at a loss of food value.

The summer silo should be smaller in diameter than the one used to store feed for winter use. Ensilage spoils quickly when it is exposed to the air in warm weather, and so it is important to remove considerable from the top of the silo at each feeding. If the ensilage is lowered from two to two and a half inches each day, the quality will remain excellent all through the summer.

In feeding ensilage in warm weather, much care should be taken to keep the mangers sweet and clean. Some cows are very sensitive about their mangers and some are less particular, but in any case the mangers should be cleaned out each morning, as soon as the cows are turned out.

We should give the cows all the ensilage they will consume, but no more. If we try to make them eat more than they want by giving them too large a feed, they will leave quite an amount and gradually they will get the habit of culling, and will not eat as much as they would had we given them simply what they would consume at the time with a relish.

Supplementing Short Pastures.

In supplementing short pastures with ensilage, a little grain will be found to pay. The grain should be rich in protein. Bran and gluten meal make an excellent mixture. If the grass is constituting quite a proportion of the ration, then corn meal, corn flake feed, or hominy may be used in the grain mixture.

If we have alfalfa hay, we need feed no grain with the ensilage. The cows will eat enough alfalfa, grass and ensilage to keep them giving a good flow of milk all summer, and while they will not do quite as well as though they were fed grain, we shall get a larger net profit out of them unless we wish to keep more cows. In this case, we may feed grain, and increase our herd, cutting down the allowance of roughage somewhat.

There is work to fill each day in the summer, too full as it seems to us sometimes, and the feeding of ensilage and grain to the cows throughout the busiest time of the year, suggests more work. The prospect is not inviting, and it is no wonder that at first we shrink from it. But only by feeding the herd liberally and regularly, can we get the most out of them in

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proportion to the expense of maintaining them, and it is much better to keep a smaller dairy and take proper care of them, than to have a lot of cows running in a brown pasture looking for something to eat and finding only enough to keep them alive and nothing, or next to nothing, out of which to make milk.

Dairying and General Farming.

As it seems to the writer, the only sensible thing for the man to do who wishes to keep a dairy in connection with the managing of a general farm, is to keep as many cows as he can care for and no more, to be sure that those cows are the very best he can have at the time, and to so care for them, and so breed them as to be sure of getting the very most out of them that it is possible to get, and to have constantly coming on, young heifers, well-bred and well-kept, to take their places by and by.

A small dairy made up of the right kind of cows, properly fed and cared for, will bring in each month in the year a nice little sum which will be always welcome, for it will come along just at the right time to meet the needs of the household.

It will make a little more work to be sure, but this work can be divided among the different members of the family, and if it is properly done, the lesson is a good practical one in agriculture for the boys in the home.

The herd thus maintained will add much to the fertility of the farm and its influence will be felt in every crop that is grown. Finally, if one wishes to dairy at all, the profit is all on the side of working each cow in the herd for all she can do, and for so breeding them that better and better cows may be produced as the years go by.

W. F. TAYLOR.

JERSEY CLUB MEETS AT THE COLLEGE.

The Michigan Jersey Cattle Club met at the Agricultural College, East Lansing, Friday, June 25. Prof. and Mrs. Anderson and niece were the host and hostesses in behalf of the College, and the club members were escorted by them on a tour of inspection through the dairy building, where they were treated to ice cream, and then out to the yards where the Jersey cows were placidly grazing. They certainly looked contented and happy and, together with the Jersey calves running about, were a beautiful sight.

Strolling along further we found chairs placed in a semi-circle on the well-kept lawn, and in the shade of stately trees.

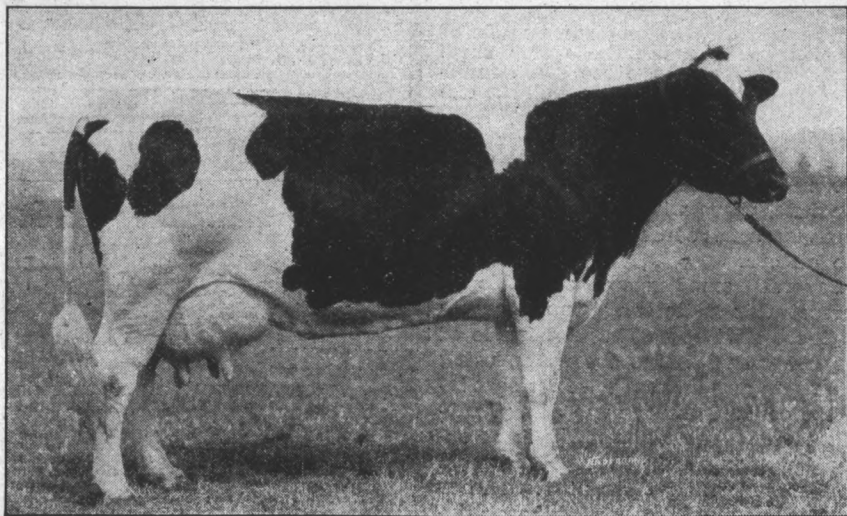
The meeting was called to order by Mr. R. R. Smith, the president. The minutes of the January meeting were read and approved. Mr. Probert, of Jackson, outlined the plans of the American Jersey Cattle Club whereby they hope to establish a uniform model constitution outline and it was decided to postpone printing the new constitution and by-laws until this plan is completed. Mr. Probert also told of the resolution passed by the A. J. C. C. at the annual meeting authorizing the board of directors to employ a field manager whose duty it shall be to attend the meetings of the state associations and to aid in the promotion of the Jersey in any way possible.

The national club also proposes to place a publicity man on the field who shall, among other things, systematize all advertising of the clubs in such a manner as to make it both more economical and effective. General discussion of the needs of the club, how to make it of more benefit to its members, and how to better promote the Jersey interests, followed. Prof. Anderson announced dinner and the club adjourned to the dining-room, where full justice was done to a very fine dinner which had been prepared by the College.

After a short intermission the meeting was again called to order. After general remarks and discussion by several of the gentlemen the matter of booths at the county fairs was taken up. It had already been decided by the executive committee to have Jersey booths at the various county fairs where the people would be welcome and where Jersey literature would be distributed and Jersey interests promoted. Several gentlemen volunteered to take charge of such a booth in their several counties. Mr. Probert reported that the A. J. C. C. would furnish pictures and literature for the booths free of charge.

Mr. W. F. Raven, the only charter member of the club, told of the growth and progress of the club since its organization. After more informal talk the club adjourned. There were about 35 gentlemen and ladies in attendance and all felt that the day had been one of pleasure and profit. The club wish to express their most hearty thanks to the College and to Prof. and Mrs. Anderson for their entertainment and the good things provided for their comfort and pleasure.

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month in yearly test Funderne Pride Johanna Rue was placed on strict official test for 30 days with every milking watched, weighed, sampled and tested by the supervisor then in charge, and in that time produced 2,437.3 pounds of milk containing 117,639 pounds. During the best seven days, beginning 358 days after freshening, the production was 602.4 lbs. of milk containing 28,831 lbs. fat; and by this production she for the second time broke the record in the division of records begun not less than 240 days from freshening. Thus, this cow produced in seven days almost as much fat at the close of her yearly test as she did in her best seven days at the beginning of that test, and she now stands as queen of all dairy cows.

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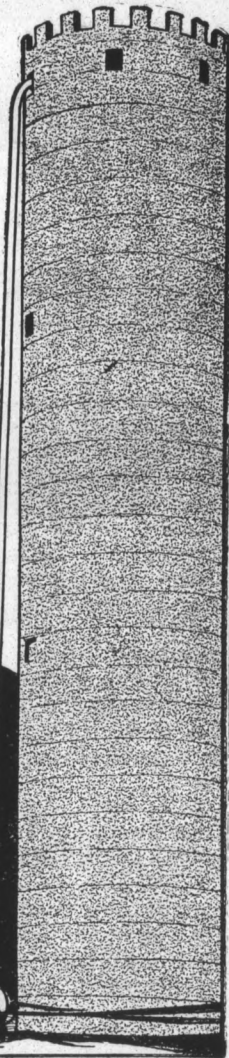
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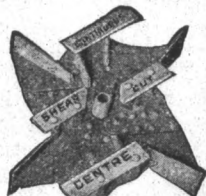
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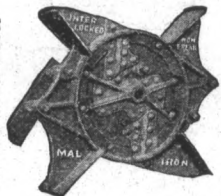
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Practical Science.

RELATION OF CHEMISTRY TO AGRICULTURE.

No. 2.

BY FLOYD W. ROBISON.

Soil.

The information placed at the disposal of agriculturists concerning the soil has been obtained in a large degree as a direct result of laboratory investigation. Until chemistry began prying into the secrets of the soil it was considered to be a dead, inert mass. Strange things have been discovered as a result of research into the character of soils and into the behavior of soil, discoveries which have revolutionized our ideas of the real importance of the soil. It was formerly considered to be largely a mechanical structure which conveniently held the plant while it derived its sustenance from the air and water for its growth. But laboratory research has shown that it is much more than this; that it is a living laboratory itself analytic and synthetic changes are constantly going on, which changes are the direct forerunners of crop production. It has been shown that the character and extent of crop production depends very materially on the texture, chemical composition and kind of soil, and there are definite reasons for this. It is true that by far the greater amount of material manufactured into plant tissue is not a product of the soil at all but it is through the administrative influence of certain agents in the soil that an organic structure can be built.

Water is the Medium of Plant Growth and Soil Activity.

As in all life action, one of the most important mediums of growth is water and there is probably no other product which has so important an influence upon plant growth as water. Consequently we may be prepared to believe that one of the most important soil relationships is its relationship to water. On this scale the laboratory has shed a great deal of light and the many cultivation processes that are now common practice are established upon the principles which laboratory investigation has worked out.

One of the first investigators to suggest the importance of a study of the physical components of soils was Hilgard who established a method of measuring the various sizes of soil particles which go to make up any particular soil. A careful examination of the soil will disclose various types present; types of soils which vary materially not only in physical structure but in their chemical composition, and much depends upon the comparative amounts of these different soil types which are present in any one soil and they have a very important bearing upon soil fertility.

It must be obvious that the natural plant lubricant is water and it will require but little imagination for one to realize that all nourishment and all processes which promote plant growth have an important connection with the water supply. What mineral constituents of soils are taken up by plants must be taken up, of course, through the water in the soil.

The Way in Which Water Acts.

We are in the habit of considering water as rather weak in its dissolving power, particularly as applied to soils. That this is not true is not readily appreciated but in view of the facts which laboratory investigation have uncovered regarding the character of soils and particularly in the light of Hilgard's data regarding the different sized particles which go to make up a soil we think it may be quite apparent what a tremendous factor water

is in its solvent action on the different constituents of soils. King makes a very excellent illustration in somewhat the following way. He says that if you drop a marble in a glass of water and withdraw it again it comes away surrounded by a thin film of water which covers completely the entire surface of the marble. Suppose, now, this marble will fit exactly into a cube one inch on a side. We can estimate quite accurately the influence of water on a grain of soil the size of a marble which will fit into a cube one inch on a side. Suppose, now, this marble holds a film which may be designated as 3.1416 square inches in area. Suppose, again, that the diameter of the marble is reduced from one inch to .1 inch and the cube is filled with marbles of this size. A simple mathematical computation will show that there will be 1,000 marbles .1 inch in diameter which will now fill the space originally filled by a marble one inch in diameter. Now, the area of the 1,000 marbles which is susceptible to the influence of the water film is increased from 3.1416 square inches to 314.16 square inches. Suppose, now, the diameter of these marbles be further reduced to .01 inch. Then it is obvious that it will take a million of them to fill the space occupied by 1,000, and previous to that, by one marble. The total surface area exposed to moisture influence will now be 314.16 square inches. If this computation continues until we arrive at the actual size of the soil grains in actual soils wherein many of them, instead of being .01 of an inch in diameter are from .001 to .0001 of an inch in diameter, we may readily see how great a water influence there may be due to the increased surface of the soil grains. So, therefore, we are prepared somewhat to witness the tremendous exhibition of water solvent power due to the extensive surfaces exposed in certain types of soils.

Certain Soils Resist Water Action.

It is to the interest of agriculture to increase this water solvent influence of soils to a high degree. Certain types of soils do not lend themselves naturally to the influence of water. Some clay soils, because of their gelatinous and plastic condition when wet do not promote the solvent action which we have described and laboratory investigation has shown that on such soils it is exceedingly desirable to provide a certain type of treatment with the idea of breaking up this gelatinous condition and bringing back the individual fineness of division of the soil itself.

A Laboratory Experiment.

A French chemist by the name of Pelouze, by a very ingenious experiment, demonstrated in a peculiar way what this solvent action amounted to. He took a glass flask of a certain weight and kept a definite amount of water boiling constantly for a number of days, and by weighing the flask before treatment and after treatment determined what the solubility of the water was as far as the silica content of the glass flask was concerned. Having established this factor on a glass flask where a limited surface was exposed he then took a portion of the neck of the flask and ground it to a fine powder, placing the powdered glass on the inside of the flask. He then added water as before and kept it boiling for the same period of time as in the first instance. Then by weighing the flask after drawing out the water he found that in the second treatment the water had dissolved many times as much silica as in the first treatment, showing clearly the effect

of the increased number of surfaces by the finely ground grains of glass to which water had access.

The Experiment Applied.

It is clearly evident therefore that this type of influence, as the laboratory has plainly shown, is the type of influence with which we have to deal in soils and is the influence which is exerted upon the so-called administrative agents of the soils. It is undoubtedly this solvent influence exerted upon the small soil grains which is responsible for the so uniform degree of concentration of the mineral constituents in the soil water.

The Minerals of the Soil.

We have to consider in this connection likewise the fact, as shown by laboratory investigation, of the effect of this water solubility on the different kinds of minerals present in the soil. Chemical investigations of soils and crops have proven the existence of the following metallic chemical elements: Potassium, calcium, magnesium, aluminum, iron, sodium and manganese. Of very great importance in connection with these are the non-metals: Phosphorus, carbon, oxygen and nitrogen. Occurring with these are silicon, sulphur, hydrogen, chlorine, fluorine and boron.

Modern Cultivation the Outgrowth of Laboratory Experiment.

Chemical research has indicated the desirability of laying special stress on a certain few of these elements, i. e., potassium, phosphorus, nitrogen, calcium, and on certain combinations of other elements, such as hydrogen and oxygen in the form of water (H₂O); carbon and oxygen in the form of carbon dioxide (CO₂), etc. The relations of these different elements and compounds to agriculture have been shown and have had a very important bearing on the prevailing more successful modes of cultivation of the present day. It is not always necessary in the doing of anything that the reason for so doing should be apparent. It is necessary, however, for intensive cultivation which the advance in world population necessitates, that agriculturists should know what ends are attained in certain desirable forms of soil cultivation. It means the triumph of success over failure in farm operation, and this has been brought about through the direct application of truth ascertained in the laboratory and applied to actual soil conditions in the field.

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I have heard that a cistern made of cement will make the water hard. Will you please give me some information, as I am about to build a cistern.

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Several remedies are available to correct this difficulty. One concrete engineer advises coating the inside of the cistern with liquid paraffin, using two coats and driving the first coat into the concrete by the use of a plumber's torch. Another remedy is to apply two parts cement and one part lime mixed with water into a rather thick wash, applying with a brush until the walls have a glazed appearance. When dried wash down thoroughly with water and a broom; after a second washing the cistern will give no more trouble.

Some advocate coating the inside of cement cisterns with asphalt paint. Undoubtedly the better way is to exercise sufficient care in mixing and placing the material to avoid the necessity of any treatment. Should the water be slightly hard, it can be softened by the addition of a little soda, or the first filling pumped out, when there will be no further trouble from this cause.

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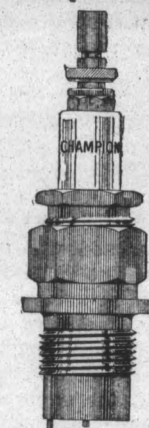
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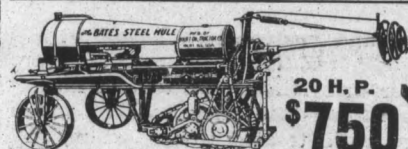
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The **FARM BOY**
and **GIRL**
SCIENTIFIC and
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This Magazine Section forms a part of our paper every week. Every article is written especially for it, and does not appear elsewhere.

THE morning after the governor of our state proclaimed, for the third season, that he set aside a certain day as Apple Day my 'phone rang

"This is Mrs. C.—," came from the other end of the line. "I want to know if you'll loan your husband to my family for next Saturday evening. No, you aren't invited. We're going to celebrate Apple Day with just men folks. I'm asking eight men, besides my husband and two boys, for six o'clock supper and a long evening visit."

"Oh, I'll be delighted to loan my husband, but how ever will you and your sixteen-year-old daughter get ready for that many men? It's like having harvesters," I added, remembering my girlhood days on a big Nebraska farm.

"I dare you to offer to come and help," was the laughing response. "But you won't be company," she warned.

I went. Mrs. C. is my best and wisest friend. My family is younger than hers and I'm studying how she's gotten such good results with hers.

"What made you think of an Apple Day stunt?" I demanded, tying on a big gingham apron one minute after my arrival early Saturday morning.

"Because we have a great big orchard and wagon loads of apples that go to waste. Just peel these, please,

A Neighborhood Affair for Men

By GOLDIE ROBERTSON FUNK

while I make my crust. Pies? Yes, and dumplings. But the men aren't going to have both. I'm going to send a fat apple pie to the wife of each of the men. They're going to have the hot dumplings here because they'll like 'em with oodles of cream.

"Oh, yes, another reason. Since the boys went a year ago to the agricultural college they've been crazy to work the farm on shares with their father. They think it can be made to produce more money. They say the ten acres in orchard is a leak but they don't know how to stop it. We've always known it, of course, and I don't know why we ever set out ten acres to apples when both my father and my husband's father back in Iowa had less orchard than that and still had wagon loads go to waste every year just as we do.

"So, when I found the Department of Agriculture is thinking enough about apples to demand a national Apple Day I knew apple raising and apple marketing was going up a notch. Half of why I'm doing this," she smiled her warm house mother smile, "is to keep hospitable—and half is to let

cur boys and some of the neighbors profit from a real applefest by men who have studied apples."

"So you're going to use the magic of your apple cookery to get the men to give up what they know!" I accused.

"Exactly."

"And pray where did you get hold of eight men who have studied apples?"

"Well, first, there's a German farmer over west about two miles who is always experimenting with his trees. His son told my boys that he has a big old tree that has on it the grafts of nearly thirty varieties of apples. Old Mr. Passo searches the city markets for choice looking apples, buys two or three of a kind, the family try them both cooked and raw, and the seeds are planted. He writes notes in a book about each variety. Then from the seedling he grafts onto his old brood tree. They bear the second season and then he top grafts other trees from those branches till now he has the best stand of apples in the whole country. We've grafted but we haven't succeeded. I drove over Sunday and

asked Mr. Passo and his oldest son to come to this supper tonight. He agreed to tell us all about his orchard, the varieties he thinks best adapted to soil and climate, the best for the market, for winter and for early use, for cooking and for eating. He's going to make wax in a pan over a Rochester lamp on the table, and he's going to bring a branch of a tree and show the men how he grafts. He seemed so pleased that we've waked up about his hobby. Tomorrow we'll drive you over to see his orchard."

"I see. You've struck each man's hobby."

"To be sure. Would you call a dentist to set a broken leg?"

"Over north is a big Swede named Arnulf Lind. His farm looks like a well swept house. It was old and run-down when he bought it. There was five acres of apple orchard, the trees scaly and moss covered and overgrown. He's pruned and grafted and scrubbed and sprayed those old trees, replacing some diseased ones to be sure, till he's as fine an orchard as you'd wish to see. But in spite of all his work his children tell mine they don't market many apples, they rot on the ground. Anyway, he's going to tell all about how he doctored up that old orchard. I wasn't going to ask his twenty-one-year-old son till I heard he

WORLD EVENTS IN PICTURES



Her Son Destroyed a Zeppelin Single-handed.



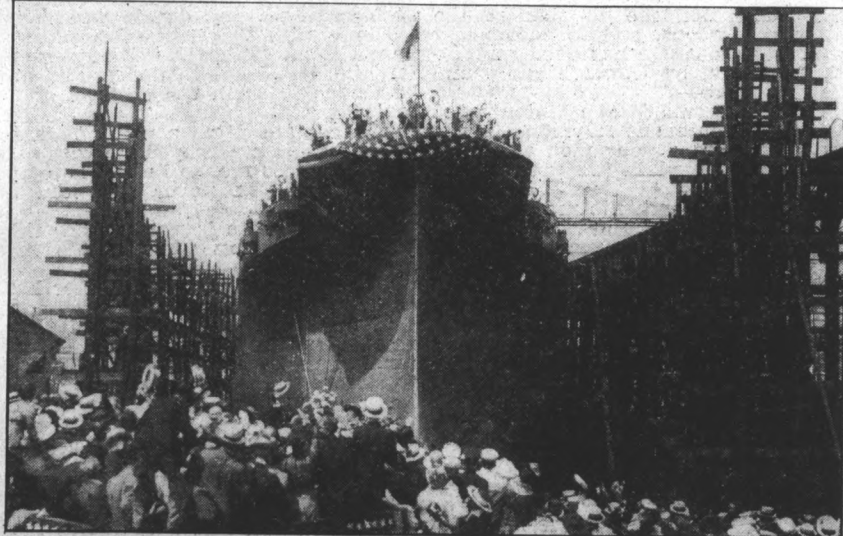
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King Alfonso at the Pigeon Shooting Range.

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was going to work his father's farm on shares next year—that means he's a fixture here the same as we hope our boys are. Besides, the old folks of the foreign families here have always kept aloof from the Americans, though the children and young folks mix more or less—and who knows, my Laura may fall in love with Eric Israelson a mile east, or Gus Hochenstrauss three miles south. They're both splendid boys and in her class in school and they're both going to agricultural college for a year.

"There now, if you'll stop peeling and chop up some and then empty that crock of warm clabbered milk in the strainer—yes, Dutch cheese—those town men don't often get it with thick cream on.

"Then a mile farther west Robert Bowne lives. He's a young married man from east of the mountains who claims he was the boss packer out of a class of thirty men who took one of the short courses given by a man from the demonstration farm. He's going to give us a demonstration."

"How can he demonstrate packing apples?" I queried, doubtful if I'd understood.

"That door," motioning with her elbow while she pierced an upper crust with a fork, "opens into the store room. It's big enough for them all to crowd into. Over in one corner are about twenty bushels of loose Wine-saps and Jonathans and Northern Spies and several empty apple boxes. Bob says packing for the market has to be learned and he was glad to come and tell us all he knows about it because, as he says, 'get the fellows around here to studying apples and it's only a year or so till we'll market in one form or another every bushel that's raised.

"Then a Mr. Harrigan, in town, we've heard sends to the orchards in another part of the state for carloads of culls to make into cider and vinegar. He has a big cider and vinegar business, now, built up in about three years. I talked with him last Saturday when I was in town. He says if our neighborhood wakes up about apples we can furnish him a good share of what he wants. He's going to talk cider and vinegar and urge the boys to 'get acquainted with the apple orchards,' as he calls it."

"You wonderful woman!" I exclaimed.

"But the best—the one that must inspire them all is Mr. Henry Talbert—the president of the Fruit Growers' Association in ——— county. He lives twelve miles away."

"Well, how did you get him?"

"I don't know how I dared. We never saw him but we read in the paper that he'd taken a carload of choice apples from the farmers in his district and went around the world with them. He talked apples and showed apples to dealers in every port and arranged to ship next year—oh, I don't know how many, but the boys are crazy to have him send some of ours. So I telephoned to him and just told him about my neighbors and their boys and our fruitful wasting orchards and would he come over and show us how to direct our energies into the market? I told him the rest of our program, too, and that each talk was coming from someone who knew his subject from experience."

"And what did he say?" I inquired, for I new Henry Talbert to be one of the busiest of men.

"Well, he said I was 'a true patriot.' I didn't just see the application but let it go because he said he would be glad to come in and tell us of his experience in helping to create a demand for apples in the markets of the world. He's going to bring his seventeen-year-old son."

"And my husband? What helpful thing can he say about apples?"

"Don't you see? These young folks are anxious to make money out of the

orchards, as one of our farm crops. Now the apples are wasted. If it wasn't for banks the money might be wasted. Don't you suppose a banker will have something to say to a crowd of folks bent on making money?"

After the lunch had been cleared away Laura and I fried six chickens to a light brown, laying them in dripping pans ready to put into the oven for a few minutes just before serving. The thickening for gravy was mixed ready to use.

Mrs. C. had had a hot bath and was napping. Then Laura and I set the table. The borrowed school globe was set in a dish in the middle of the table and encircling it were a dozen slatted little wooden apple boxes, Laura's own make from the thin tops of new apple boxes. Each box was fitted with two shining red apples. One was addressed to Moscow, Russia, from the Passo orchards. Another to Cape Town, from the Talbert orchards, etc.

"Must I label the whole thing?" asked Laura, who was so at one with her mother in spirit that her first thought of a centerpiece for these apple men had been to suggest the utmost possibilities for apples.

"Oh, no, it fairly shouts aloud that American apples belt the globe," I assured her. "Mr. Talbert will expect a

lot of a neighborhood that can produce that understanding of his ambition and assemble a dozen men and boys anxious to help to bring it about."

At six o'clock the men sat down to a table loaded with two great platters of fried chicken, creamy mashed potatoes, gravy, sliced turnips, hot biscuit, cottage cheese, and coffee. For dessert we served the dumplings and oodles of cream and more coffee. On a table in one corner were several baskets of shining apples of different varieties and on another table was a cask of cider with a wooden spigot and glasses. This was for later in the evening. On the sideboard, tied up in paper, were wooden plates holding a fat apple pie, one for each man to take home. Mr. Passo brought a flour sack full of specimens of his choicest varieties. Mr. Talbert brought a box. They were compared, advised about, and most of the men made notes.

After we women had cleared the table and brought a Rochester lamp and pan and spoon for Mr. Passo to show how he made his grafting wax we retired. At two o'clock my husband came up to our room. I was only half awakened, but I remember he said, "Best move yet. I wish there was a Mrs. C. in every neighborhood. The next time these orchards leak it's going to be into savings banks."

THE RED MIST.

By RANDALL PARRISH.

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CHAPTER XV.

Before Lieutenant Raymond.

THE headlong rush stopped in startled amazement at sight of us, and I stood there staring at them, unable to speak, my revolver lowered. In that instant of pause, an officer thrust the men aside and faced me, sword in hand.

"What does this mean, sir? Who are you?" he questioned, sweeping his glance over my uniform, and then beyond me at the two others.

"I would ask the same question," I returned, not yet assured as to who I confronted, and suspecting some trick. "We believed ourselves attacked by guerrillas. Are you soldiers?"

"Well, rather," with a short, grim laugh. "These are the Pennsylvania cavalymen. My name is Raymond, and I demand to know, first of all, where you got possession of that Third U. S. Cavalry uniform."

Perhaps in his excitement he had not really recognized her before; but these words were scarcely out of his mouth when the lady stood beside me, facing him. I caught one swift flash of her eyes as though warning me to silence. Whatever of fear she had formerly felt seemed to have left her in this crisis, for she stood erect, her cheeks flushed, her eyes frankly meeting those of the surprised officer.

"You will, however, recognize me, Lieutenant," she said pleasantly, and extended her hand, "and, if you will listen, I think I can clear up the mystery."

"Miss—Miss Harwood," he murmured, slightly embarrassed, but still beligerent, his glance wandering from her face to mine. "Certainly—we hoped to find you here. It was to rescue you we came—at least it was that hope which led me to request the sending of troops, and to accompany them. This outrage has been committed, I believe, by Cowan's gang, and this man here—"

"Is my friend," she interrupted quietly. "Lieutenant Raymond, if you will kindly order your men to retire, I will gladly explain his presence in the house."

"You wish to speak to me alone?" "Not necessarily; but I certainly prefer greater privacy than this. You are in command?"

"No; Captain Whitlock is below." He turned toward the crowd blocking the doorway, and I grasped the opportunity to breathe a hasty word of warning into the ear of Nichols. The girl never glanced again at either of us.

"Take the men back into the hall, Sergeant," the Lieutenant ordered, "and look through whatever rooms have not been visited. Request Captain Whitlock to join me here."

We waited motionless, the lieutenant's hand on the butt of his revolver, as though he half suspected treachery. Twice he endeavored to open

conversation with the lady, but her response was not encouraging, and he evidently did not feel safe except with his eyes on me. The sight of the uniform I wore perplexed and angered him; he would have greatly enjoyed the privilege of going over me roughshod, and was restrained only by the presence of the lady. She stood quietly between us, her lips firmly set, and I thought was struggling to retain control of herself, and grasp quickly some explanation of my presence. I could perceive only the contour of her face, but Raymond fronted me, a tall, well proportioned fellow, with incipient mustache, black and curled at the points; a rather long face, and eyes sternly serious. There was about him an appearance of force—a bit of a bully I should say—and his uniform was new, and carefully fitted.

A man stood in the doorway, bowing, his mild blue eyes surveying us nervously. He sported a light beard, closely trimmed, the top of his head scarcely reaching to the lieutenant's shoulder. Miss Noreen greeted him with a welcoming smile, and he stepped gallantly forward, bending low as he accepted her hand.

"So pleased, so delighted, Miss Harwood, to find you safe and well. We were, indeed, greatly worried at the thought of your being here alone," he exclaimed, a slight lisp in his voice. "You have not suffered, I trust?"

"Not seriously, Captain Whitlock; the guerrillas were outwitted."

"Ah! do not attempt to explain, I beg. We understand what you have passed through, as we have captured two of the villains. You sent for me, Lieutenant Raymond?"

"Yes, sir, I did," the younger officer's expression exhibiting clearly the contempt he felt for his superior. "I preferred that you decide what shall be done with this fellow," pointing a finger at me. "Miss Harwood vouches for him, but I fail to understand how he comes to be in the uniform of my regiment."

The captain fitted a pair of glasses to his eyes and surveyed me with care.

"Why, bless me, so he is," he ejaculated, "and you never saw him before?"

"No, and there is not another third U. S. cavalymen west of the Alleghanies."

The girl laughed, and laid her hand on Whitlock's arm.

"I told Lieutenant Raymond that I would explain fully," she said, pretending to be amused. "But I failed to understand then what it was which had so aroused suspicion. So it is the uniform my friend wears?"

Raymond did not answer, but the captain bowed respectfully.

"As to that I assume all responsibility," she went on quietly, "as I furnished it."

"You!" there was a sarcastic sneer in the lieutenant's surprised exclamation. "Why should you have in your

possession a uniform of the Third Regulars?"

"I did not," she answered sweetly, but looking at Whitlock. "That uniform belonged to my cousin, an officer of the Third Kentucky."

Raymond uttered a smothered expression, stared an instant at her slightly averted face, and then, with one stride forward, swung me to the light.

"See here, Captain Whitlock," he exclaimed indignantly. "I cannot conceive what object Miss Harwood may have in desiring to protect this man, but this is not the uniform of any volunteer regiment."

"Do I understand, Lieutenant, that you dare question my word?" she asked proudly, her eyes gazing straight into his. "I am unaccustomed, sir, to such treatment."

"Wait a moment, Raymond," broke in the captain. "There is no doubt of Miss Harwood's loyalty. Let us hear her explanation first. You say, Miss Harwood, you know this man, that he is friend? May I ask his name?"

"Surely; I only desire an opportunity to answer any question. He is Thomas Wyatt, the son of the late Judge Wyatt, whose home was on the ridge yonder. We were children together."

"A rebel?"

"Really I never thought to ask," carelessly. "I was too glad to have his protection. We—we spoke only of our childhood days together, still I gathered the impression that Mr. Wyatt had never joined either side, and was merely here to look after his property. Of course he can explain all that."

"But how came he to be dressed in that uniform?" burst in Raymond.

"Will you be courteous enough to permit me to tell you? I have endeavored twice already to fully explain. Mr. Wyatt came here in midst of the storm last night. He had found his own home destroyed, and this was the nearest shelter to be found. He supposed the house deserted, and merely sought protection until morning. How I chanced to be here you gentlemen both know, and that matter requires no explanation. Mr. Wyatt arrived with his clothing muddy, and soaked with rain. I gave him the only change to be found in the house—a uniform belonging originally to a cousin of mine, Lieutenant Anton Harwood, Third Kentucky Cavalry."

"But this is not the uniform worn by volunteer troops. Captain Whitlock, I insist—"

"Really, Lieutenant Raymond," the girl said, fronting him, her eyes sparkling, "this is becoming most tiresome. What do I care what uniform it is! I have told you where it came from, how it chanced to be there, and the reason it was worn by this man. I cannot be expected to know all the petty distinctions of the service."

"But surely," spoke up the captain, plainly bewildered, "the suit he wore when he came can be produced. You know where that is?"

"I know where it was," she answered coolly. "Hanging before the fireplace in the dining-room. However, I cannot guarantee that it remains there now—this house has been gutted by Cowan's guerrillas and, from the sound, your own men were none too careful."

Whitlock fiddled with the tassel of his sword, evidently far from satisfied, yet unwilling to make final decision unaided.

"I hardly know just what to do," he confessed reluctantly. "Ordinarily, you know, a lady's word would be sufficient, but somehow, I—I—well, this looks just a little queer. What do you think, Lieutenant?"

"That the fellow ought to be taken before Major Hawes, and made to explain what purpose brought him here. I have no desire to question Miss Harwood; indeed, I am perfectly willing to accept her statement. But this man is not a civilian—he is a soldier; he has had military training. He should be made to account for himself, sir." The speaker's eyes fell upon the preacher, huddled back in the corner, now clearly revealed by the gray daylight which was stealing in through the windows. "Hullo! here seems to be yet another specimen we have overlooked. Who are you?"

Nichols shuffled forward, looking woe-begone and miserable, his cheek disfigured by Cowan's blow, sneak and coward written all over him. His shifting eyes met mine, and he must have read in my gaze a threat he dare not ignore. Twice his mouth opened and closed before he could make the words issue.

"One of Cowan's gang?"

"God be praised—no. Made to serve that human fiend by force. I am a minister of the Gospel."

"You!" the lieutenant burst into a laugh. "By Jove, you fit the part. Whitlock, did you ever hear of the fellow?"

The captain rubbed his glasses.

"Are you the Baptist preacher at

Cane Ridge?" he asked doubtfully. "For twenty years I have ministered to that congregation; the young woman can vouch for my labor."

"Then, I presume you are also acquainted with this fellow?" questioned Raymond impatiently.

Nichols turned his glance again in my direction, but his gray face was devoid of interest.

"I have no knowledge of the young man," he asserted solemnly, "but I knew the old Judge well. The resemblance is strong, and I have no doubt but he is a son. The father was a Christian, and a gentleman."

"And a rebel, I presume?"

"Judge Wyatt died before the breaking out of the war, sir, but was known throughout these parts as a Unionist."

There was a silent pause, Whitlock fumbling at his eye-glasses, Raymond, a perplexed frown on his face, staring first at Nichols, and then at me, as though more than half convinced he was being made a fool of. The girl had seated herself in a chair, and was leaning forward, her face hidden. The lieutenant turned and strode across the room, glancing out the window; then back again.

"Well, we cannot remain here discussing the matter," he said tartly. "If we do we may have a real fight on our hands before we are safely back in Lewisburg." He planted himself squarely in front of me. "See here, it is time you did some talking. You haven't opened your mouth yet."

"There has been no occasion," I replied pleasantly. "The others have told all you need to know without my even being questioned."

"I have a mind to search you," he retorted, completely losing his temper.

"At your pleasure, Lieutenant," I spoke coldly enough, although there was a catch in my throat at sudden memory of the paper I bore containing his name. "And there is no guessing what you might find in Lieutenant Harwood's uniform."

We were still looking defiantly at each other's eyes, and it began to occur to me that his evident dislike must have some other basis than a mere suspicion that I might be a Confederate spy. Did it arise rather because of my apparent friendliness with Noreen Harwood, and her swift words of defense? Could there be a personal motive urging this young West Pointer to determine my guilt? The suspicion that this might be the real reason for his conduct had scarcely flashed across my mind when a trooper appeared in the open doorway, saluted, and said something in a low tone to Whitlock. I failed to catch the words spoken, but heard the captain answer: "Certainly, Corporal, have him come up at once."

The soldier disappeared down the hall, and the lieutenant stepped back across the room, bending his head to whisper something privately into Whitlock's ear. My eyes followed his movement, and then sought the face of the girl; she sat motionless, the long lashes shading her eyes, the only visible sign of excitement the swift rise and fall of her bosom. Then a man came hastily into the room through the opened door. My heart leaped into my throat at sight of him—he was Captain Fox.

CHAPTER XVI.

A Prisoner.

THE captain was hatless, and a bloody handkerchief was wound about his head; his uniform was torn and black with mud. He saw Whitlock first, and gripped his hand warmly, his glance straying from the face of the little captain to the other occupants of the room.

"Gad, but it is good to see a blue uniform again," he exclaimed heartily. What was the row here, Fred—some guerilla work? Ah! by Jove! his eyes brightening as he recognized me. "Raymond, I am glad to see you again," and he strode forward, his lips smiling, his hand held out. "Old Ned swore to me you were dead, but the sergeant said you got away at the first rush. Not even a scratch—hey—"

"Just a moment, please," and the interested lieutenant interrupted him by a hand on the shoulder. "I believe we have never met before, but I presume you are Captain Fox?"

The latter turned, a trifle indignant at the other's manner.

"I am; what of it?"

"Only I am naturally somewhat interested in your identification of this fellow. To us he has claimed the name of Wyatt, but you address him as Raymond. What Raymond did he represent himself to be?"

Fox stared about in surprise at the faces surrounding him, scarcely able to collect his scattered wits.

"Why," he answered, as though half in doubt of his own words, "Lieutenant Charles H. Raymond, Third Cavalry, on recruiting service. I met him at Hot Springs, and he showed me his papers. Isn't— isn't he all right?"

"Well, you can draw your own conclusion," returned the lieutenant, his

thin lips curled in a sneer, "for I am Raymond, Third Cavalry. This man is a rebel spy."

Escape was impossible; I knew that, for I had considered the chances. Both Whitlock and the lieutenant—the latter with revolver drawn—stood between me and the windows. The hall without was thronged with troopers, and, although I might attain the open door, that would be the end of it. I saw Noreen rise to her feet, her startled face turned toward me, but I held my nerves firm, and managed to smile.

"I expect the jig is up, gentlemen," I acknowledged quietly, determined they should get as little comfort out of me as possible. "I know when I have played my last card."

"Is your name really Wyatt?"

"It is; I am a sergeant in the Staunton Horse Artillery."

"And Miss Harwood—she knew you, as she said, by that name?"

"She did; I was born in this county, and we were children together. If she has attempted to protect me from arrest, it has been because of no disloyalty, but a womanly desire to assist an old friend."

Raymond was far from satisfied, suspiciously glancing from my face to where she stood, white-lipped and silent.

"There is nothing else between you?" he asked roughly. "Do you mean to say she told that story of her cousin's uniform merely because of a girlhood friendship?"

"I am unable to say, sir."

"I hardly think, Lieutenant," broke in Whitlock, suddenly realizing his authority. "It is necessary to ask such questions now. The man confesses himself a spy, and a court-martial will probe into this matter. We must remember the young lady is the daughter of Major Harwood."

"And as Major Harwood's daughter," she said gravely, standing before me, "I desire to be heard, and to answer this gentleman's question. I sought to save Sergeant Wyatt because of our early friendship, and also because of the special service he has rendered me during the past night. I know nothing of his purpose, here—but I hold him friend whatever may be his uniform."

The lieutenant bowed, hat in hand.

"I intended no criticism of your motives, but a soldier must perform his duty. Under whose orders are you here, Wyatt?"

"Those of General Jackson, sir."

"Ah! the old fox is casting his eyes this way for his new campaign. What were your orders?"

"I refuse to answer."

"No? Well, Ramsay will get a reply out of you!"

"I hardly think so, sir. You hang spies, but do not torture them."

"True enough," and Whitlock stepped to the door. "Sergeant, bring a file of men, and take charge of this prisoner. There is nothing to detain us longer. We have extra horses, Captain Fox, and you will ride with us as far as Lewisburg; Miss Harwood, I presume you have no desire to remain here alone—indeed, I could not permit it. Better bind the fellow's hands, Harper; search him first for weapons, and whatever papers he may carry. Mount him on that old artillery horse, and wait for us."

Raymond watched the proceedings carefully, taking my credentials as a Federal recruiting officer from the hands of the sergeant, and reading them over with a grim smile. I gave small heed to the glance of satisfaction with which he regarded me, and only ventured to look once toward the girl, as the soldiers roughly bound my hands. She had turned away, and was staring out of the open window. With lips pressed tightly together I marched out into the hall closely surrounded by the guard, my thought less concerned with my own fate than with her feeling toward me. Suddenly the truth revealed itself to my mind that I loved the woman I had so strangely married. (To be continued.)

THE BETTER WAY.

BY SUSAN COOLIDGE.

He serves his country best
Who lives pure life, and doeth righteous deed,
And walks straight paths, however others stray,
And leaves his sons as uttermost bequest
A stainless record which all men may read:

This is the better way.

No drop but serves the slowly lifting tide,
No dew but has an errand to some flower,
No smallest star but sheds some helpful ray,
And man by man, each giving to all the rest,
Makes the firm bulwark of the country's power:
There is no better way.



"One", says Nature
"Three", says Cunning

Because demand far exceeds supply, man craftily splits each cowhide into several sheets. But—there can be only one sheet of grain leather. The rest are merely "splits"—coated and grained to look like the genuine article, and old as "genuine leather", but they do not wear like hand or machine buffed leather. Right here enters

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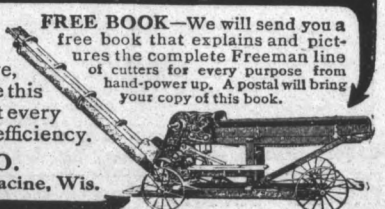
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Woman and Her Needs

At Home and Elsewhere

Play Is as Necessary as Work

CANNING VEGETABLES.

BY CHARLES H. CHESLEY.

ALL work and no play makes Jack a dull boy," is an adage whose origin is lost in antiquity. It might be amended to read, "All work and no play makes Jack a sullen boy," for the effect of too much work without relaxation is more often sullenness than stupidity. A look at the faces of the children doomed to factory imprisonment is all the proof one needs of the revised saying. Sullenness, irritation, even viciousness, is more often written there than stupidity.

Too much work unmixed with play has the same effect on all Jack's family. What is bad for the children is bad for the grownups, and father and mother find the unremitting grind bad for their nerves and tempers. Human nature is various, and demands variety to keep things moving smoothly. The play instinct is as natural as the work instinct and must find expression if we are to live well-balanced lives.

In the strenuous task of earning a living many of us forget the vital necessity of relaxation. Work becomes our master, or the chase for the dollar becomes so exciting we forget all else. With some the pinch of poverty is so insistent that it seems a sin to take time off for a play spell. With others, especially housekeepers, the worry bug looms large and shuts out all thoughts of pleasure. We are afraid if we stop grinding long enough to look about and enjoy ourselves a bit we will never get caught up again, and so we keep on at hard labor, shutting our eyes to every glimpse of play.

Nature resents this living in direct variance with her laws and punishes us with worn nerves, ugly tempers and

warped and one-sided minds which see only the sordid side of existence. We look about us and see our friends and neighbors "taking life easy," as we express it, and we become envious and sullen. We wonder why others can have a good time while we do nothing but dig and work.

The answer is easy, if we would only so see it. Others have a good time because they take it. They, wiser than we, see that "life is more than meat and the body than raiment," or in more modern words, that life means much more than satisfying the material needs. They see that the mind needs to be fed and they feed it by friendly intercourse, by music, by books, moving pictures and the countless little diversions that are theirs for the taking.

They find out that instead of being unfitted for work they come back rested and refreshed, in better shape to take up the burden again and able to accomplish twice as much. They have fresh heart for the daily routine and are able to put a new zest into their work which makes it a diversion instead of a drudgery.

The mother who makes a business of bringing up her children knows that she can get ten times as much work out of the children if she makes a game of the work or promises a treat for a certain amount done. So she could accomplish more herself if she had ahead of her a hint of a play-spell to come after the work was done. But when she sees nothing ahead but day after day of toil with no relaxation, work becomes a drudgery and life sinks to the dead level of animal existence.

DEBORAH.



A Novel Baby Bonnet.

A quickly made baby bonnet is ribbon is run. The ribbon draws up shown in the illustration. To make it and ties under the chin.

The bonnet illustrated is finished with a backward fold, the extra width being added to the semi-circle. Narrow with lace and finish the half-circle row val insertion and edging trim the with a half-inch hem through which a fold.

On many farms the effort has often been made to can vegetables by the same methods that are used in canning fruit, and because the beans, corn and peas have spoiled, housewives have given up trying to preserve these and other delicious summer products for the winter months. Vegetables cannot be successfully canned by the open-kettle method. Scientists tell us this is because the bacteria that do the mischief thrive best in products that are largely composed of protein. Beans and peas contain more protein than any other vegetable commonly grown on the farm, consequently they succumb most readily to the ravages of the germs.

Boiling until the vegetables are cooked will not kill these germs as is the case with fruits, or if the parent bacteria are killed, the spores remain to germinate and cause more mischief. The organisms that cause canned products to spoil are unlike both yeasts and molds in that they are capable of developing without air. It is said that one of these bacterium plants can produce, under favorable circumstances, something like 20,000,000 more plants in a single day.

We have had uniform success in canning such products as green corn, string and shell beans, peas, tomatoes, carrots, beets, kohlrabi, squash, pumpkin and cauliflower. Of course, the best method is to use a canning outfit. With this it is possible to obtain a greater degree of heat. Yet we have had good success without the outfit, and of enough canned last summer to insure an abundant supply all winter for a large family, not a single jar was lost.

We use only jars with spring tops and first of all ascertain that the rubbers are the best obtainable. Never use an old rubber. A common wash boiler is used. For the bottom we make a rack to set the jars on when they are subjected to the heat. Below are given detailed directions for various vegetables:

Corn.—Blanch the corn in boiling water for 15 minutes. Cut from the cob and cool in cold water, then fill the jars and add one level teaspoonful of salt to each pint. Fill the jars with boiling water and boil for two hours. See that the water in the boiler is at the boiling point when the jars are set in place, and keep the temperature at least at the boiling point all through the process. Put on the rubbers and tops, with spring over the cover but do not press down the lever until the boiling process is completed. Set the jars with the tops down and allow them to cool. If no bubbles appear the next day, they may be set away on the pantry shelves. Those which show any signs of bubbles should be boiled again. Some prefer to boil them again anyway, as by so doing the second generation of bacteria is destroyed. When putting them back in the boiler, be sure to loosen the springs, otherwise the cans may burst. Test each can before putting it away by loosening the top and lifting the whole by taking hold of the cover. If this can be done, the product is safe.

Peas and Beans.—Pack these vegetables in the jars and boil as directed above for two hours. Repeat the process the second day and again the third if any signs of bubbles appear. As these are considered the hardest garden products to keep, the two or three

cookings are advisable. We have canned both string and shell beans, also limas, always with uniform success. The smaller wrinkled varieties of peas make the sweetest product and are preferable to the ranker-growing varieties. It is important that peas be picked from the vines and shelled while they are still young and tender.

Tomatoes.—These are easy to handle. Scald and peel, dip in cold water, then pack whole in the cans. Fill the cans with the juice obtained in this process. Boil 45 minutes and it is not necessary to repeat the next day.

Carrots, Beets, Etc.—Use only young tender vegetables. Scald for ten minutes in very hot water, then plunge into cold water. Remove the skins and slice. Add one teaspoonful of salt to each pint. Boil for two hours and it is not necessary to repeat the process unless some show signs of spoiling. A mild pickle, half water and half vinegar, sweetened as desired, may be used to fill the cans of beets.

Squash and Pumpkin.—Cut these vegetables into small pieces, pack into the cans and cook for two hours. It is not necessary to repeat.

Cauliflower.—This is one of our most delicious canned vegetables, especially desirable during the spring months. Cut up the heads as for cooking, pack in the cans, and cook for one hour on two successive days.

Succotash.—This mixture is especially difficult to keep, hence it should be boiled one hour or two, and perhaps three, successive days.

Many other products may be put up for the winter in the manner described above. One of the important points to remember is to carefully sterilize all jars in hot water before putting in the vegetables. Keep a kettle of boiling water at hand to fill up the boiler as it lowers. The water should come up to the necks of the cans.

HOME QUERIES.

Household Editor:—Would you be so kind as to tell me why it is that my bread cracks when it is baked? No matter what I do, let it raise very light or not, it cracks on the top of the loaf. The bread isn't bad, it seems to be all right, only I know something is wrong and it spoils the looks of it. Also, I would like to ask what is a good tonic for a person that is run down from sickness, is weak and easily tired. Also, what is the value of olive oil? Would you consider that a good tonic?—H. A. M.

Too much flour will cause bread to crack. Try using a little less. I could not prescribe a tonic for anyone, as what might be good in one case would not do in another. The only safe thing to do is to go to a reliable physician. The woman may need iron, or arsenic and strychnine preparations, or perhaps an emulsion of some fats. As I do not know any of the circumstances, I could not say what would be best for her. Olive oil is good for anyone who needs more fat than they are taking. If the person is eating little butter, cream and fat meats it might help.

Household Editor:—Will someone please give reliable recipes for canning peas and green beans, also one for canning beets? The kind of canned beets I mean seem to have spice on them.

I saw a request in your paper for a tested recipe for jelly roll, so am sending one I have always had success with. **Jelly Roll:** One cup of sugar, three eggs, one cup of flour, half a teaspoonful of soda, one teaspoonful of cream tartar, flavor with vanilla. These are all level measures. Spread thin on square pan and bake in moderate oven. Spread with jelly and roll in cloth while hot.—Cloverland Reader.

To can pickled beets wash one-half bushel in several waters. Immerse in boiling water until done. Remove the skins, slice into a syrup made of four quarts of vinegar, one cup of sugar and two quarts of water. Boil up and can quickly. You can add spices to the syrup to suit your own taste and more sugar if you wish.

To can beans: Wash, string and

cut in inch pieces. Cook in boiling water a half hour, then drain, pack in sterilized jars, fill with cold water, adjust rubbers and tops, set in boiler on a false bottom, pour in cold water to cover the cans, cover boiler and boil two hours. Let stand until the water is cold, then remove jars and seal at once.

To can peas: Shell the peas and boil a half hour. Then proceed as with beans, cooking twice as long in the boiler.

KEEPING CREAM COOL.

Now that warm weather is approaching, every possible means must be taken to get cream on the market in good condition. The warm days that have already passed have had a marked effect in lowering the quality of cream now being made into butter.

Attention must first be paid to cooling the cream just as soon as separated. However, the greatest exposure to heat usually comes when the cream is hauled to market, and the cans are left uncovered, and exposed to the hot sun and dust.

It has been found by experiment that the temperature may be kept more than twenty degrees lower when dampened blankets are thrown over the can or dampened blankets are used than when the cans are left uncovered. In addition, the dirt and dust are kept away from the cans and cream.

It is not only to the advantage of the producer to help in keeping up the quality of the cream so that good prices may continue, but low grade cream cannot be allowed to come upon the market in the future.—Colorado Agricultural College.

MICHIGAN FARMER PATTERNS.

No. 1332—Girls' Dress with or without over blouse. Cut in 4 sizes, 10, 12, 14 and 16 years. It requires 8 yds. of 24-inch material for a 14-year size. Price 10c.

No. 1310—Ladies' Dressing or Lounging Robe. Cut in 3 sizes, small, medium and large, and requires 6 3/4



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Nos. 1313-1256—Waist 1313, cut in 6 sizes, 34, 36, 38, 40, 42 and 44 inches bust measure. Skirt 1256, cut in 6 sizes, 22, 24, 26, 28, 30 and 32 inches waist measure. It requires 3 1/2 yds. of 48-inch material for bolero and skirt, and 2 3/4 yds. of 36-inch material for the underwaist for a medium size. The skirt measures about 3 yds. at the foot. This calls for two separate patterns which will be mailed on receipt of 10c for each pattern.

No. 1312—Girls' Middy Dress with Skirt attached to a separate waist. Cut in 4 sizes, 6, 8, 10 and 12 years. It requires 3 yds. of 44-inch material for a 10-year size. Price 10c.

The above patterns will be mailed to any address by the Fashion Department of the Michigan Farmer, on receipt of ten cents. Please be careful to give correct pattern number and size when ordering.

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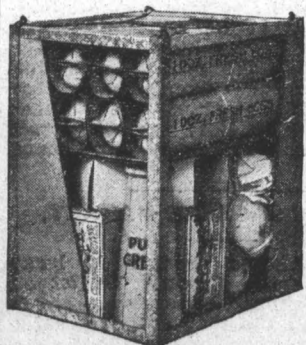
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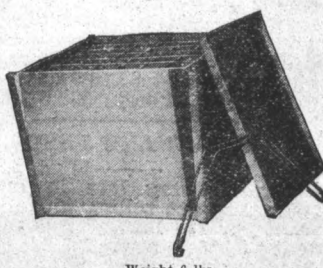
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Markets.

WEATHER FORECAST.

Weekly weather forecast for week beginning Wednesday, July 7, for the region of the Great Lakes. Weather will be partly cloudy with normal temperature until the latter part of the week, when there will be showers with lower temperature.

GRAINS AND SEEDS.

July 6, 1915.

Wheat.—Although there has been a reaction from the high point reached by wheat values during the past week, the average prices for the week rule nearly a dime above those of the previous week for cash grain, while September is a fraction stronger. Weather conditions have been the dominating factor in the deal. It was anticipated early in June that the date for harvesting the wheat would be earlier than normal, but weather conditions have made the maturing of the crop slow and delayed ripening perhaps a week or ten days beyond the expected time. This necessitates a larger demand upon cash wheat before the new crop can be marketed, and resulted in the squeezing of those who were short and the consequent advance in values. By Monday, however, the shorts had pretty well covered, which with a decline in values at Liverpool allowed prices to sag, as indicated by the quotations below. There is still some report of damage from insects and too much rain in the wheat producing sections of the southwest. Export demand is easy. One year ago No. 2 red wheat was quoted at 87½¢ per bu. Quotations are as follows:

	No. 2	No. 1	Sept.
Wednesday	1.25	1.22	1.04½
Thursday	1.27	1.24	1.04½
Friday	1.30	1.27	1.06
Saturday	.....	.....	.....
Monday	.....	.....	.....
Tuesday	1.28	1.25	1.03½

Chicago.—July wheat \$1.05½; Sept. \$1.01; Dec. \$1.04 per bushel.

Corn.—While values have fluctuated the market on Tuesday was steady with that of the week previous. There has been very little improvement in conditions for the new crop, and complaints are being made in practically all the corn producing states that the stand is unusually poor. There is some buying of the crop at seaboard, with a normal domestic call. One year ago No. 3 corn was quoted at 70¢ per bushel. Quotations are as follows:

	No. 3	No. 3
	Mixed.	Yellow.
Wednesday	77	78
Thursday	77½	78½
Friday	77½	78½
Saturday	78	79
Monday	.....	.....
Tuesday	77	78

Chicago.—July corn 74¢; Sept. 72.4¢ per bu; Dec. 63.7¢.

Oats.—Notwithstanding the favorable crop reports on this cereal, prices have held their advance better than did those of wheat. The demand is good with foreign inquiry encouraging to sellers. One year ago standard oats were quoted at 39¢ per bushel. Quotations are as follows:

	Standard.	No. 3
	White.	White.
Wednesday	51½	51
Thursday	51½	51
Friday	51½	50½
Saturday	54	53½
Monday	.....	.....
Tuesday	53½	52

Chicago.—July oats 44.5¢ per bu; Sept. 37.1¢; Dec. 38.4¢ per bu.

Rye.—There is practically nothing doing in this market with No. 2 cash quoted at \$1.12 and August rye at 94¢ per bushel.

Beans.—The demand for beans is light and prices are down 5¢ since last week. Detroit quotations: Cash \$2.85; Aug. \$2.95. Chicago trade quiet and steady. Pea beans, hand-picked choice, quoted at \$3.18@3.25; common \$3@3.15; red kidneys \$3.25@3.65.

FLOUR AND FEEDS.

Flour.—Jobbing lots in one-eighth paper sacks are selling on the Detroit market per 196 lbs., as follows: Best patent \$6.30; seconds \$6; straight \$5.90; spring patent \$6.50; rye flour \$6.40.

Feed.—In 100-lb. sacks, jobbing lots are: Bran \$25; standard middlings \$29; fine middlings \$32; cracked corn \$22; corn and oat chop \$30 per ton.

Hay.—Market is steady. Carlots on track at Detroit are: No. 1 timothy \$18.50@19; standard \$17.50@18; No. 2, \$16.50@17; light mixed \$17.50@18; No. 1 mixed \$16@16.50; No. 1 clover, \$14@14.50.

New York.—Steady. No. 1, \$24; No. 2, \$23@23.50.
Straw.—Rye straw \$8@8.50; wheat and oat straw \$7@7.50 per ton.

DAIRY AND POULTRY PRODUCTS.

Butter.—Market is steady and unchanged. Extra creamery 27c; firsts 25c; dairy 21c; packing stock 19c.
Elgin.—Market unchanged. Offerings liberal but quality only fair. Quotation for the week 27c per pound.

Chicago.—A quiet and easy feeling exists. Price for extra creamery unchanged; other grades slightly lower. Quality only fair. Extra creamery 27c; extra firsts 26c; firsts 24@25c; seconds 22@23c; packing stock 20c.
Poultry.—Market steady with prices for broilers and ducks lower. Live.—Broilers 20@22c; hens 14½@15c; ducks 16@16½c; young ducks 17c; geese 10c.

Chicago.—Market quiet with prices on fowls and springs lower. Fowls, good weights 12½c; spring chickens 18@19c; ducks 13c; young ducks 15@16c; geese 8@9c; spring geese 14@15c; guinea hens \$2.75@3 per dozen.

Eggs.—Market is steady with prices ½c lower than last week. Fresh stock sells at 17½c per dozen.

Chicago.—Feeling steady at prices slightly lower than last week. Market is well supplied. Miscellaneous lots, cases included 14@16½c; ordinary firsts 15@15½c; firsts 16@16½c.

Veal.—Quoted steady at 13½@14c for fancy, and 10@11c for common.

FRUITS AND VEGETABLES.

Strawberries.—Market fairly active. Supply good. Quoted at \$2.50@3 per bushel.

Chicago.—Market dull. Other berries are taking attention of trade. Main run of Michigan berries go to peddlers. Those from the north bring best prices. Michigan 16-qt. cases 60¢ @ \$1.15.

Potatoes.—Market is dull and weak. Quoted at 15@20¢ per bushel in sacks. At Chicago there is nothing doing in old potatoes; are quoted at 17@20¢.

Gooseberries.—Are in fair demand and sell at \$2 per 24-qt. case.

Chicago.—Supply is ample and the market is a shade easier. Downings, 16-qt. cases 90¢@1; others 60@75¢.

Red Raspberries.—Were in fair supply and were selling at \$2.75@3 per 24-pt. case.

Chicago.—Michigan berries are quoted at \$2@3 per 24-pt. case.

WOOL.

Boston.—Manufacturers are needing wool to fill orders and are willing to pay the price. Brokers are firm in the belief that values will continue to advance, and are therefore not anxious to dispose of their holdings. There is a shortage in the American clip, foreign markets are advancing, the war will probably continue over another winter necessitating large orders for army goods; all of which point to an unusually good market for the coming year. Fleeces have advanced in price in the producing states, and offerings are meagre. They are paying 38¢ for three-eighths and one-quarter combing in Missouri. Boston quotations for Michigan unwashed delaines are 26@27c; do. combing 29@34c; do. clothing 24@30c.

GRAND RAPIDS.

First red raspberries are in and the crop promises to be large. Cherries will probably move slowly this week on account of large supply, sour selling at 60¢@1.40 per case. Gooseberries are worth \$1 and currants \$1.50. The peach supply in this section promises to be large, also plums and grapes, and there will be an abundance of apples. The Grand Rapids Fruit Growers' Association is planning to get out fruit circulars and to advertise this market for the purpose of bringing the buyers here. Prices for garden stuff on the market are as follows: Asparagus 90c; spinach 25c; peas \$1@1.25; pieplant 50c. Wheat has advanced to \$1.17 for No. 2 red, with oats at 68c; corn 75c; beans \$2.45.

DETROIT EASTERN MARKET.

Farmers offered produce in large quantities at the Eastern Market on Tuesday morning. Buyers were out in force making the market fairly satisfactory. Strawberries are about over, with 32-qt. crates selling at \$3@4; currants 10@12c per qt; gooseberries \$1.75@2.25 per 24-qt. case; cherries, sour \$2.75@3 per bu; peas 45@60c per bu; lettuce 20c; cauliflower \$1.25; cabbage 50c; turnips \$1@1.25; onions seven bunches for 25c; eggs 25c per dozen; asparagus 50@60c per dozen. No hay in sight.

LIVE STOCK MARKETS.

Buffalo.

July 5, 1915.

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

Receipts here today as follows: Cattle 155 cars; hogs 93 d. d.; sheep and lambs 12 d. d.; calves 1400 head.

With 155 cars of cattle on the market here today and 16,000 reported in Chicago, all the good dry-fed cattle sold fully 25¢ per cwt. higher than on last Monday, and the quality considered this week on the tops was quite a bit better than last week. However, there were several loads of cattle sold at \$9.90@10, but they were superior to anything shown here last week. The common and grassy kind sold only about steady to strong, but the grassy cattle that had been fed corn on the grass sold about 15@25¢ per cwt. higher. Cows sold about steady with last week. We would caution our shippers to be careful about these grassy cattle that are not getting corn, as they are bad sellers and make a bad appearance here on the market.

Our receipts of hogs were some higher than generally expected today and with good demand for all light weights, market was active and higher on this kind and generally 5@10¢ higher on the good weights and mixed grades, although trading on anything but light stuff was rather dull and a few hogs on the mixed order going over unsold. Packers bought their hogs at \$8.10@8.15, and shippers paid as high as \$8.25 for lots that run light with a good number of pigs among them. Extreme heavy hogs were very dull and quotable from \$7.75@8; roughs \$6.50@6.75; stags \$5@5.50. All light weights sold today but seven or eight loads of heavy and mixed that are going over unsold.

The market was active today on lambs and sheep, with prices 50¢ higher than the close of last week; most of the choice lambs selling at \$10.50. Look for steady prices last of week with moderate receipts.

We quote: Spring lambs \$10.50@10.75; cull to fair \$6@10; yearlings \$7.50@8.50; bucks \$3@4.50; handy ewes \$6@6.25; heavy do \$5@5.50; wethers \$6.50@7.25; cull sheep \$3@4.50; veals, choice to extra \$10.75@11; fair to good \$7@10.50; heavy calves \$6@8.

Chicago.

July 5, 1915.

Cattle. Hogs. Sheep.
Receipts today...15,000 24,000 10,000
Same day 1915...10,967 19,055 7,795
Last week.....44,267 141,525 63,707
Same wg 1914...39,683 116,404 86,647

Shipments from Chicago last week were: Cattle 8676; hogs 24,741; sheep 130; comparing with 17,505 cattle; 14,711 hogs and 6181 sheep for the same week last year.

Cattle were active and higher today, prime lots selling 15@20¢ higher, with sales at \$10.10@10.15. Cows were slow. Hogs were steady, the best selling at \$7.80 and prime pigs at \$7.50. The hogs received last week averaged 234 lbs. Lambs were steady, with choice spring lambs selling at \$9.75.

Cattle were in active general demand last week, with a fair eastern shipping inquiry, and as the receipts were not over large, prices pursued an upward course, further good advances taking place, especially on the choicer class of beefs. Top prices were higher than at any previous time this year, with the bulk of the steers selling on Wednesday at \$8.60@9.65, while the choicer class of heavy steers sold at \$9.65@9.95 and the better class of yearling steers at \$9.50@9.75. Distillery fed beefs reached a new high mark by selling for \$9.75, and free sales were made of good steers at \$9.15@9.60, while a medium class sold at \$8.75@9.10 and an inferior to fair class of grassy and warmed-up steers brought \$6.50@8.70. Yearlings sold all the way down to \$7.50@8.50 for the poorer offerings, while butchering cows and heifers went at \$5.30@9.50. Cutters at \$4.65@5.25, canners at \$3.50@4.60 and bulls at \$5@9. Calves were in active demand, so far at least as the choicer offerings were concerned, with sales all the way down from \$9.50@10.50 for light-weight vealers, to \$5@8.50 for the common to good heavier lots. Now that \$10 cattle are in sight, no one thinks that that is going to be the limit, for the scarcity of cattle in the country is such that there is little doubt that we are going to see the highest prices ever recorded, and even the fair to middling kinds will undoubtedly sell relatively high. But at such a time owners should not cheat themselves out of the greater profits to be derived from careful feeding, and no matter how high corn may sell, it should be fed to stock in suitable amounts. Fortunately, grass is abundant everywhere, and

what better use can good pasturage be put to than to grazing well-bred cattle? The foreign demand for our live cattle and beef for army purposes is enormous, and it will last as long as the war continues without any doubt. It is this demand in great part, that explains the fact that prime weighty steers are selling higher than the best yearlings.

Hogs were in good eastern shipping demand, as well as in active local request, last week, and there was very firm undertone to the market on the whole. It is true that the market declined at times, but quick recoveries usually followed, and the prevailing tendency was to place the best class of hogs close to \$8. Eastern shippers wanted this class, as well as prime heavy hogs, and the top prices were paid for light, with prime heavy going at a discount of about 15@20¢. Recent receipts have averaged in weight 231 lbs., comparing with 238 lbs. one year ago and 242 lbs. two years ago, and the offerings have averaged very fairly in quality for this season of the year. Sentiment of the trade is that hogs are going to sell higher in the not distant future. Late in the week hogs soared to \$7.10@7.92½, with pigs selling mainly at \$6.25@7.60.

Spring lambs are marketed in moderate numbers, receipts consisting in the main of natives, with a limited number of consignments from Idaho. Oregon has contributed a few big bunches of clipped wethers and yearlings, and fair numbers of clipped native ewes have arrived. The aggregate receipts of all kinds of live mutons were meager, and early last week insufficient offerings caused the best Idaho spring lambs to sell up to \$10.90, but later in the week sharp declines in prices occurred, as packers refused to pay early values. Late in the week sales took place of spring lambs at \$6.75@10.35, clipped flocks selling as follows: Lambs \$6@9.25; ewes \$3@6; wethers \$6@7; yearlings \$6.25@8.

Horses were in the usual good demand for foreign army purposes, and prices were firmer for the best "gunners," with sales to the British government as high as \$210. Otherwise trade was not especially active, with prices usually unchanged, and sales of farm chunks at \$60@200.

CROP AND MARKET NOTES.

(Continued from page 36).

pects not so good, as we had a late frost. Spraying somewhat neglected. Most of the wool was sold at 20@30c; butter-fat 29c; eggs 19c; hogs 6½c; wheat \$1.10; oats 60c; old potatoes 15@20c; beans \$2.75@3.10; loose hay \$12@14.

Indiana.

Elkhart Co., June 28.—Weather has been cool with plenty of rain. A good part of the corn had to be replanted, due to poor seed and cold weather, also damage by worms. The first crop of alfalfa has been cut, yielding well. Wheat and rye are filling well and soon will be ready to cut. Cherries and strawberries are a good crop. Only a few farmers sprayed after blossoming.

Ohio.

Crawford Co., June 28.—We are having fine weather. Wheat is filling out nicely and is looking better than for a number of years. Harvest will soon be in progress. Hay making has begun and is in general a small crop. A large acreage of corn had been planted, and farmers are busy cultivating the second and third time. About the average acreage of potatoes. Cherries are good and prospects are fair for the apple crop. Not much spraying done after blossoming. A large amount of wool has been raised and is all marketed at 25@31c; butter-fat 28½c; milk \$1.30 per cwt.

Wisconsin.

Jackson Co., June 26.—Fine growing weather at present; clover is about ready for cutting; meadows and pastures looking well. Small grain very promising, but corn and hoed crops are small for the season; a large acreage of contract beans and cucumbers planted, or being planted. Some early planted cut down by frosts June 15-17. Strawberries selling at \$1.50 per 16-qt. case. Blueberries at \$2.40 per 16-qt. case. Apples promise a fair crop. Butter-fat 27c; eggs 15c.

George Dick, of Sycamore, Ill., marketed 17 prime 1,667-lb. steers recently in Chicago at \$9.35, grossing \$155.86 per head, the highest price that any cattle of such heavy weight have brought during the last four months. They were dehorned, branded Wyoming Herefords, that were bought in Omaha last October, when they averaged 1150 lbs. They were fed twice daily a mixed ration of ensilage, ground shelled corn and oil meal, having access to clover hay. During one period of 65 days of feeding they made an average gain of five pounds per head daily.

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 MARKETS.

Thursday's Market.

July 1, 1915.

Cattle.

Receipts 1642. There was another heavy supply of cattle on sale at the local stock yards this week and following the heavy run last week made a dull draggy market. Owing to the local meat trade being very dull and wholesalers being well filled up, nearly everything on sale was of the grassy order, only one or two loads of dry-fed being on hand. The farmer is advised to hold on to his stockers as prices for beef will undoubtedly go higher and stockers should be fed. No use sending them here as they cannot be sold for feeding purposes and go cheap when sold for beef. There is no telling when the yards will be released so they can be shipped back to the farm, and farmers not having pasture should try and dispose of them to their more fortunate neighbors. Still nothing doing in milch cows. The close was dull, as follows: Best dry-fed steers \$8@8.50; best handy-weight butcher steers grass, \$7@7.75; mixed steers and heifers, grassers \$7@7.50; handy light butchers, grass \$6.50@6.75; light butchers, grass \$6@6.50; best cows \$6@6.25; butcher cows \$5@5.50; common cows \$4@4.50; canners \$3@4; best heavy bulls \$6@6.25; bologna bulls \$5.25@5.75.

Roe Com. Co. sold Thompson Bros. 5 cows av 1164 at \$6, 10 butchers av 823 at \$7.10, 3 bulls av 1160 at \$5.75, 1 cow wgh 980 at \$5.25; to Hammond, S. & Co. 2 cows av 1200 at \$6; to Sullivan P. Co. 7 butchers av 981 at \$7, 1 heifer wgh 670 at \$6, 4 bulls av 1072 at \$5.50; to Kull 4 steers av 840 at \$5.25, 4 do av 732 at \$6.85; to Applebaum 2 do av 515 at \$5.60; to Kamman B. Co. 11 butchers av 800 at \$6.90, 2 cows av 815 at \$5.10; to Newton B. Co. 14 steers av 1088 at \$7.50, 1 do wgh 970 at \$6.50; to Thompson Bros. 13 do av 1120 at \$8, 3 bulls av 1063 at \$5.50, 3 butchers av 777 at \$6.75; to Bresnahan 8 do av 800 at \$6.60.

Reason & S. sold Kull 3 butchers av 787 at \$5.25, 2 do av 880 at \$7; to Hammond, S. & Co. 3 cows av 1113 at \$6.25, 1 do wgh 1010 at \$6.50; to Thompson Bros. 4 steers av 800 at \$7.65, 2 bulls av 850 at \$5.40; to Hammond, S. & Co. 5 cows av 1094 at \$6, 8 steers av 860 at \$7.50; to Buck & S. 2 steers av 1105 at \$7.50, 3 do av 937 at \$7.10; to Golden 1 cow wgh 780 at \$4.50; to Sullivan P. Co. 2 do av 910 at \$5, 1 do wgh 940 at \$4, 5 butchers av 824 at \$6.30, 19 do av 985 at \$7.55, 6 do av 843 at \$7.25.

Veal Calves.

Receipts 768. Veal calf trade was active from start to finish and good grades were 25c higher than last week. Best \$10.50@11; others \$7@10.

Sandel, S., B. & G. sold Hammond, S. & Co. 22 av 160 at \$10.50, 2 av 150 at \$9, 2 av 125 at \$8.50; to Sullivan P. Co. 5 av 145 at \$10, 2 av 180 at \$10; to Mich. B. Co. 4 av 155 at \$10, 3 av 200 at \$8.50, 3 av 175 at \$10, 1 wgh 230 at \$11, 1 wgh 270 at \$7.50, 2 av 170 at \$10, 6 av 150 at \$10.50.

Sheep and Lambs.

Receipts 1411. The sheep and lamb trade was active and choice springers 25c higher than last week. Heavy sheep are dull and hard sellers at \$4@4.25; medium and light weights are steady. Best spring lambs \$10.75@11; fair lambs \$7.50@8.50; light to common lambs \$6@7; yearlings \$7@8; fair to good sheep \$4.25@5.25; culls and common \$3@4.

Reason & S. sold Sullivan P. Co. 3 lambs av 58 at \$10.50; to Parker, W. & Co. 98 do av 60 at \$11, 16 do av 65 at \$11, 10 do av 66 at \$8, 14 sheep av 105 at \$5.

Haley & M. sold Parker, W. & Co. 4 lambs av 70 at \$10.50, 7 sheep av 115 at \$4.50.

Bishop, B. & H. sold Hammond, S. & Co. 19 lambs av 50 at \$10, 4 yearlings av 75 at \$7.50; to Thompson & Bro. 8 lambs av 60 at \$10.75, 31 do av 65 at \$11, 6 yearlings av 95 at \$7; to Mich. B. Co. 9 sheep av 80 at \$5, 9 lambs av 60 at \$10.50; to Fitzpatrick Bros. 16 lambs av 50 at \$9.50, 14 do av 70 at \$11; to Mich. B. Co. 14 sheep av 110 at \$5.25; to Parker, W. & Co. 19 lambs av 58 at \$10.50; to Sullivan P. Co. 11 yearlings av 80 at \$8.50, 15 sheep av 100 at \$5; to Mich. B. Co. 10 yearlings av 74 at \$8, 4 sheep av 120 at \$4.

Hogs.

Receipts 6436. In the hog department the market was steady with Wednesday; all grades selling at \$7.90@7.95. Swift & Co. have a buyer on this market now and it looks as though he was to become a permanent fixture.

Friday's Market.

July 2, 1915.

Cattle.

Receipts this week 2110; last week 2361; dry-fed canners steady; all other grades 15@25c lower than Wednesday. Best dry-fed steers \$8@8.35; best handy weight butcher steers, grass, \$7.25@7.65; mixed steers and heifers \$7@7.35; handy light butchers \$6.25@6.50; light butchers \$6@6.25; best cows \$5.75@6; butcher cows \$5@5.50; common cows \$4@4.35; canners \$3@4; best heavy bulls \$5.50@6; bologna bulls \$5@5.50.

Veal Calves.

Receipts this week 1040; last week 979; market dull. Best \$10@10.50; others \$7@9.50.

Sheep and Lambs.

Receipts this week 1883; last week 1026; market 50@75c lower than the opening Thursday. Best lambs \$10@10.25; fair lambs \$7.50@8.50; light to common lambs \$6@7; yearlings \$7@8; fair to good sheep \$4.25@5; culls and common \$3@4.

Hogs.

Receipts this week 9275; last week 9944; market 5c lower or \$7.85@7.90.

Veterinary.

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

Shy Breeder.—Bull ten months old in apparently perfect health fails to get cows with calf. Was not used for breeding purposes until eight months old and has not been over-worked since. J. R. M., Plainwell, Mich.—Your bull should have a change of feed and perhaps more exercise; however, it is possible that he is in some way abnormal and may never be a sure calf getter.

Congested Udder.—Have a cow that came fresh a short time ago which has congested udder and gives very little milk. A. L. S., Grand Rapids, Mich.—Foment udder with warm water and massage it gently two or three times a day. Milk her clean each time and also give her ½ oz. of fluid extract phytolacca at a dose three times a day. If her bowels are costive give her enough epsom salts to clean her out.

Cow Leaks Milk.—My eight-year-old cow leaks milk between milking times and I would like to know how to stop it. L. O. C., Deford, Mich.—Milk her three times a day, or use teat plugs.

Obstructed Teat.—I have a cow with a hard bunch in teat which obstructs milk flow and I have applied remedy to absorb it, but failed. F. J. L., Akron, Mich.—Employ competent Vet. and have him remove it. Drugs will not dissolve it or absorb it.

Rheumatism.—Have litter of pigs nine weeks old which our local Vet. says have worms in muscles. Two of them dropped down in all four legs; besides, I believe their back is affected. Several of my young pigs have sore ears and their nose swells. These pigs formerly ran in rape pasture, but I have taken them out. Two of them that had back trouble appear to soon get well when living on rape. O. T. S., Unionville, Mich.—Hog raisers must understand the importance of keeping pigs clean and out of damp filthy places; besides, they should be fed a balanced ration. Your hogs suffer from the effects of improper feeding and I would suggest that you feed less corn, more green food and apply a two per cent solution of coal tar disinfectant to your hogs twice a day; besides, use the same preparation freely for disinfecting purposes. If your hogs are kept in a shaded place that is damp, remove them. How did your Vet. find out that your pigs suffer from trichinosis?

Diseased Hogs.—My hogs are dying from some contagious disease other than cholera and swine plague. Last May I bought a young male pig in apparently fine health. In about ten days this pig refused to eat, then would eat a little and vomit; also his eyelids became stuck together. These I cleaned and later he went blind. He also developed a diarrhea of a greenish black color, became very emaciated and died; before he died five other pigs running with him were taken with the same disease and developed nearly the same symptoms, except that they did not all go blind after the crust was removed from the eyes and only two of them showed any diarrhea, and they had better appetites before they died. Please advise me as to the nature of and treatment for this disease. L. I. S., Trenton, Mich.—If your hogs do not suffer from cholera or swine plague I am at a loss to know from the symptoms you give how to diagnose the trouble. Kindly understand, several of the symptoms you give are characteristic symptoms of cholera. It being contagious and pretty fatal would indicate a viru-

lent active infection. As you are familiar with the preventative measures that must be taken to prevent the spread of cholera infection and what constitutes immunity against well pigs taking the disease, it is needless for me to say any more. I might add that I do not believe your diseased hogs can be cured by giving them drugs.

Infected Food.—My hens are affected with lameness first, after a few days they are helpless and soon die. I wish you would tell me what to do for them. J. T., Gagetown, Mich.—It is what your chickens eat or drink that is killing them or else they are not housed in proper place. A complete change of feed, pure water, a new clean run on land that has not been used for a chicken run, also plenty of sunshine, is what they need. Give each hen 5 grs. bicarbonate of soda daily. Understand the importance of a clean and thoroughly disinfected roosting place.

Shy Breeder.—I read with interest the veterinary columns of the Michigan Farmer but fail to find a case like mine. I have a six-year-old mare that fails to get with foal. Last year I had the same trouble and on examination found the womb closed, but after putting it in proper condition, she got with foal; however, three months later she had miscarriage and this spring we find her with neck of womb opened, but fails to get with foal. I do not believe she has contagious abortion. What treatment do you advise? C. H., Allegan, Mich.—When the neck of womb was dilated your mare was perhaps injured or infected, which resulted in an improper sealing of opening leading into uterus and on account of this the neck of womb stands open. Therefore, if she does get with foal, she will abort. Without a physical examination I could not tell, this condition often follows the use of too much force in opening neck of uterus. Good care and frequent breeding of your mare may get her with foal and it is possible she may not abort; however, it is doubtful.

Chronic Incurable Lameness.—Have a 12-year-old mare that has been lame for four years, but shows little lameness when walking, and I seldom require to drive her faster than a walk. She also has an itchy condition of the skin. M. J. M., East Jordan, Mich.—Your mare is perhaps incurable. See treatment for itchy skin, this column.

Chronic Indigestion.—Heaves.—Have a 14-year-old mare that has heaves and does not thrive, and might add that she does not chew her food, especially grain. G. L., Shelbyville, Mich.—Her teeth may require floating. Dampen her hay, feed less bulky food; grass is better than dry-cured fodder. Give her 1 dr. fluid extract lobelia and a dessertspoonful of Fowler's solution at a dose three times a day. Also give ½ oz. hyposulphite of soda at a dose two or three times a day.

Stifle Lameness.—Loss of Appetite.—Have a two-year-old colt that shows lameness in left hind leg and when lame always drags toe on ground. I also have an 11-year-old horse with poor appetite; eats grain, but drinks little water. L. A. T., White Cloud, Mich.—Apply equal parts turpentine, aqua ammonia and olive oil to stifle three times a week and he will get well. Give your other horse 1 dr. of ground nux vomica, ½ oz. of ground gentian at a dose three times a day.

Opacity of Cornea.—My two-year-old filly bumped eye, causing film which I would like to have removed. S. W. H., Conklin, Mich.—Give her 1 dr. of potassium iodide at a dose night and morning. Blow a small quantity of calomel on to eyeball once a day. Fomenting eyes with hot water will have a good effect.

Bursal Swellings.—Bacterial Infection.—I have a colt nine days old with a soft puffy bunch on each knee and both of these bunches were on colt at birth. I might also add that same colt is weak in fetlock and knee. A. B., Hillman, Mich.—Apply alcohol to weak and puffed joints twice a day. Also feed the mare well.

LIVE STOCK NEWS.

There is a great falling off this year in cattle feeding near distilleries, and this will help owners to obtain better prices for well matured corn-fed beefs of heavy weight than would be paid otherwise. Late reliable advices from Kentucky state that the supply of distillery fed cattle below the Ohio river is unusually small, less whisky than in other years having been manufactured, and the Illinois and Indiana output of "stillers" is estimated as about 30 per cent below normal, owing to the spread of the foot-and-mouth disease and quarantines. It is stated that Canada has about 8,000 such cattle for marketing during the present month.

that makes a specialty of Hampshire. The packers are using the large spring pig crop of this country as a bear argument for hog prices, more pigs having been saved than ever before, according to reliable reports from all parts of the country. The owners of hogs are not disposed to take such a view, however, taking the stand that the unprecedented scarcity and consequent unusual dearthness of beef and mutton cannot fail to create a correspondingly increased consumption of fresh and cured hog products. Of late hogs marketed have ran largely to medium weights, with prime light hogs the best sellers. At this season of the year, when hot weather is likely to develop suddenly, it is of the greatest importance that country shippers should not only endeavor to select the best weather for shipments, but should also avoid overloading the cars, for a few dead hogs cut greatly into profits.

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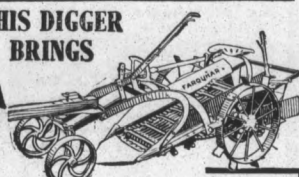
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Farm Commerce.

Factors In Cost of Milk

Some Inefficient Methods Prevalent at the Distributors End
of the Milk Business Which Compel Dealers
to Cut Prices to Farmers.

MILK-WAGON routes in large cities retrace and "criss-cross" one another, thus adding to the cost of distribution; this duplication of effort has a direct bearing on the retail price of milk, as it increases the expenses of the milk dealers. On the other hand it is also a tax upon the farmer, for it tends to keep down the price paid for milk on the farm. It must be understood, however, that much of the waste in milk delivery, under the present system, can not be entirely prevented, because there are so many dealers in each locality, and competition is keen. According to the dairy experts of the United States Department of Agriculture, efforts should be made, nevertheless, by the dealers, to concentrate their business as much as possible so as to lessen the distance traveled by the wagon for each quart of milk delivered, by securing a large number of customers in a small area.

Expensive Delivery.

In the District of Columbia 98 routes were measured. The shortest distance traveled by any wagon was 10.4 miles, and the longest was 30, showing a considerable variation. The average distance for the 98 wagons was 19.1 miles. When these measurements were made there were approximately 510 miles of streets in the district and 250 wagons were making the retail deliveries of milk. Figuring that each of these wagons traveled 19.1 miles, they all covered 4,775 miles each day, or 9.3 times the sum of all the streets in the district. Thus the time of about eight of every nine wagons was used uneconomically. More than 80 dealers were making the deliveries.

Consumers Want Smaller Bottles.

The present trend in retail business seems to be toward the small package. A few years ago many kinds of food were sold in bulk which at present are purchased, to a large extent, in small packages. The same trend is noticeable in the retail milk business, there being a greater demand for pint bottles than for quart, in the five large cities recently studied by the department—Boston, Washington, Pittsburgh, Philadelphia and Baltimore. Seventy-four dealers in these cities handled daily about 260,000 quart bottles and 361,000 pint bottles. About 41 per cent of the total bottled milk of these dealers is handled in pints.

It takes considerably longer to wash and fill two pint bottles than one quart; moreover, it costs nearly as much to deliver a pint as it does a quart bottle of milk. One dealer, who handles quarts only, says it would take the profit from one quart of milk to make up for the loss on one pint, yet, as the figures show, there is a surprisingly large number of pints handled by some dealers.

Where do the Bottles Go?

The loss of bottles is a perplexing problem to all dealers and, in the aggregate, the total amount of money lost reaches great proportions in a year. The life of a pint bottle is much shorter than that of a quart, which is computed to last from six to 50 trips, the average being 22.5 trips. If the dealer delivers 10,000 bottles daily, and they cost him three and one-half cents each, his daily expense for replacing bottles would be \$15.55, or \$5,675.75 a year. It is necessary to use small bottles for some kinds of trade, as, for instance, the hotel or

restaurant trade, where the guests are served milk in the bottle, but the cost of delivery and the loss of bottles in connection with trade is usually small. In some sections of the cities, customers often feel unable to buy more than a pint of milk at a time; this has a tendency to cut down the consumption of milk. Other families are so small that they do not require more than a pint.

If a pint sells for more than half the price of a quart, as is often the case, then buying by the pint is the more expensive method for the consumer, as he pays the extra cost of delivery. If there is no difference in price, then the extra cost of delivery comes out of the profits of the dealer. The small, local community stores often handle large quantities of milk and here, too, the greatest demand is for pint bottles.

On account of the convenient size there is also more temptation for the customers to appropriate a pint bottle instead of the quart, for the preserving of vegetables and fruits, and for other purposes. Although in most places this is contrary to law, yet it is often done without any feeling of guilt on the part of the housewife. Not all bottles, however, are lost or broken, large numbers being simply mislaid. Some get into the hands of other dealers, some are dumped into the ash barrel by persons ignorant of their value, while others are lost.

Keep the Milk Cold.

The city consumer of milk can greatly aid the dealer by cleaning and returning promptly every bottle received. The bottle should be washed in clear, warm water, then in very hot water, and stood wrong side up in a clean place to dry. This, done by the housewife, is particularly a saving when the dealer or dairyman operates only a small plant and does not have the outfit for rapid cleaning. When milk is left in bottles to get sour or to putrefy, it adds to the dairyman's cost for cleaning them, and the same is true when a little milk is allowed to dry in the bottle, especially in the angle around the bottom.

Another way in which the consumer can co-operate is by quickly removing the milk from the doorstep or porch where the heat from the sun is likely soon to affect it. The farmer and the dealer, if they have done their part in keeping the milk cold, can not be held responsible if the consumer fails, immediately upon receipt of the milk, to put it into the refrigerator. A few hours' exposure to the summer heat soon brings the temperature up to above 50 degrees F., where the bacterial content increases rapidly. The department's experts advise keeping the milk, as much as it is practicable, in the original receptacle in which it is received, and at a temperature of between 40 and 50 degrees F., thus aiding in keeping down the great summer waste caused by the souring of milk before it can be used.

OPPORTUNITIES FOR THE WIDE-AWAKE FARMER.

The live, alert business farmer never follows the groove as made by preceding generations; instead he carves his way into new unapplied methods, and generally he is well repaid for his trouble.

The opportunities offered today by

the parcel post system and express companies to ship eggs, butter, chickens, fruit, and vegetables direct to the consumer, if taken advantage of will increase the cash income from 10 to 20 per cent. It is much easier to hand your shipments to the mail man at the door than to be obliged to go to town and make deliveries. Don't stop to wonder if the consumer will pay you more money, he is paying more money today for less satisfactory products. Do you not think that good fresh, palatable products, direct from the farm will tempt him to pay a little more and at the same time you can promote his trade by charging considerable less than he has been paying. To the producer who has been taking his pay for butter and eggs in groceries, this method of marketing should make a strong appeal.

There are many ways that a farmer can get in touch with consumers. He can correspond with friends who live in nearby cities; he can go and solicit from the homes or in shops or offices where "consumers' clubs" can be organized; he can write the postmaster of the following cities: Detroit, Mich., Chicago, Ill., Toledo, Ohio, Cleveland, Ohio, Indianapolis, Ind., requesting to be put in touch with consumers; he can address the Farm Commerce Department of the Michigan Farmer, giving name, address and list of products for sale and they will have same delivered to consumers in Detroit who will be asked to write looking toward an arrangement for making shipments of farm products direct; or he can taken the matter up with his local postmaster.

The main draw-back to the shipment by parcel post has been the inability to get satisfactory containers; but this is not a factor at the present time, as very satisfactory boxes are to be had at reasonable prices. These boxes are strong, durable and light and will carry eggs safely by mail. Some of these are known to have carried a consignment every week for over a year and are still in the service and dozens of shipments of eggs have been made without a single broken one.

With such a field for action you will not conserve your best interests unless you do go after all the profits that would naturally accrue to you from the use of this service. A. S.

Crop and Market Notes.

Berrien Co., June 28.—Corn planting was very late on account of wet weather, and many had to replant and a poor prospect for a crop is the result. Timothy meadows are very poor; clover fair; pastures fair; oats looking good. Wheat several points below the April report, due to the Hessian fly and rust. Early potatoes good; late potatoes all planted and average smaller than usual. Potato market is demoralized, only 15¢@20¢ per bushel. Wheat \$1.35; corn 75¢; hogs \$6.50; butter 22¢; butter-fat 28¢. Roads are good.

Genesee Co., June 25.—Continued cold and wet weather does not seem to hinder the growth of vegetation, for with the exception of old seeding, crops in this county are fully up to the average. Wheat is spreading out and is an excellent stand. Oats generally fine growth. Corn a little backward. Sugar beets looking well and the usual heavy acreage planted. Many new farm buildings going up, including houses, barns and silos. This county has a fine system of good roads, and more building.

New Jersey.
Monmouth Co., June 26.—Grain is looking unusually well. Prospects for an extra good crop of wheat, rye and oats. Meadows looking good. About the usual amount of corn planted. Acreage of potatoes not so great. Fruit prospects are good; spraying all done. Milk 4¢ per quart; butter 20¢@30¢ per pound.

New York.
Genesee Co., June 28.—Wheat has developed splendidly, but too cool and dry for meadows and other crops. But we have sufficient moisture at present. The usual amount of corn, and perhaps more beans, and less potatoes have been planted. Fruit prospects (Continued on page 34).

Grange.

STATE GRANGE OFFICERS.

Master—John C. Ketcham, Hastings.
Overseer—C. H. Bramble, Tecumseh.
Lecturer—Dora H. Stockman, Lansing.
Secretary—Jennie Buell, Ann Arbor.
Treasurer—Frank Coward, Bronson.

NEWAYGO POMONA MEETING.

(Continued from last week.)

Fremont Grange gave music and a lot of fun, and good things were gotten out of "Summer Suggestions for Facilitating Work in the Field and in the House." Brother Kimbell believed in being prepared, have everything ready for your spring work. Sister Phoebe Hall believed in systematic housekeeping, have a place for everything and keep it there. Pick things up in your bedroom in the morning, put your bed to air. Some of the sisters did not believe in hewing so close to the line, that if you got a chance to go to Pomona, to go and let the cobwebs wave, sweep them down when you get back, and think about all the good things you heard while there, while you are doing it. Don't let system and cleanliness hinder you from a kindly act or stopping to look at the beautiful things that God has provided for your enjoyment; stack the dishes and chase the birds, you will come in and go at those dishes with keener zest and renewed vigor. We believe in system and cleanliness, but we must not become slaves to it nor let it overshadow the joys of living.

James Caldwell ably handled the "Cultivation and Care of Corn." He believed in having the ground right and the very best seed to plant. Different viewpoints were taken. Some believed in disking the ground.

Keats K. Vining, Superintendent of Agriculture in the Fremont High Schools, spoke on "Agriculture in Our Schools." He said the tide was turning farmward, that the boys were going back to the farms, girls were more proficient in the work than the boys, that it was a girl who won the highest score in the corn contest, that the home grounds are going to be made more beautiful, more interest is being taken in gardening, and he told of the plots of ground being set out to tomatoes, which these boys will raise for the canning factory.

Mr. Blandford was last but not least on the program. He told of the many fine things of which he was thinking for the benefit of Newaygo county, among some of which were a fair at White Cloud, an apple show, and he said he had noticed in his travels up and down the county that the farmers were keeping better horses and stock, and that this encouraged him, and he wanted a show of yearling colts in Fremont next fall.

Dr. McNabb was called upon to speak. He made a plea for the swamps. He said we were destroying the beauty spots by digging canals to drain them, and all we would have in their place would be a sour, barren waste. "Leave them alone, the swamps have a mission to perform; leave them alone."

We talked until we were called down stairs to partake of a sumptuous dinner prepared by the Fremont Grange women, and it was worth while, so were all the meals they put up. Fremont gave us a royal welcome through its master, Carl Kimbell, and we felt it all the time. We were delighted with everything we saw and heard and tasted, and came away with the feeling that even though we did have to make an effort and neglect something to go to that meeting, that it was good to mingle with such people and that we were ahead in the long run—yes, a thousand fold.—Mrs. Wm. Robertson.

Farmers' Clubs

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

A PLEA FOR CO-OPERATION THROUGH THE CLUB.

We are living in an age of big business and the farmer's is the biggest of them all; and he is awakening to the fact that, the sun of individualism has set, and to be successful in these days of concentration and organization the farmer must multiply his power by uniting with his brothers, following the example set by "big business." Agriculture is moving forward and co-operation is necessary to reach the goal of successful farming. Why not make the Farmers' Club the means of securing it?

MRS. J. S. BROWN.

Secretary.

CLUB DISCUSSIONS.

The regular June meeting of the Howell Farmers' Club was held at the home of Mr. and Mrs. S. M. Yerkes. At the conclusion of the opening exercises Mrs. Webster Childs read a selection entitled, "Rural Parent Teacher Associations, how the Country Schoolhouse may be Converted into a Community Center." This reading provoked quite a discussion and a comparison of past methods with those of the present. Mrs. Nina Brown read a selection entitled, "What Farmers' Wives Want." This was a comparison of conveniences as furnished by the farmer for the farm and the farm home and showed that the major share was given to the farmer and closed with the statement that some remedy should be devised that would secure for the country woman the same conveniences that her city sister enjoyed. In the discussion of this topic the women were inclined to deal gently with those in authority and thought the men were really better at heart than surface conditions would indicate and attributed their apparent causes, such as lack of funds and lack of knowledge of woman's work, etc. The question box contained nine questions. The president then appointed the committees and the Club adjourned to meet the first Thursday in August at the home of Mr. and Mrs. Webster Childs. The August meeting is given over to the young people as that is held during vacation.—Mrs. R. R. Smith, Cor. Sec.

A Good Evening Meeting.—Clover Leaf Farmers' Club held their monthly meeting at the home of J. I. Buzzard, the evening of June 22. We expected to have County Agent Cook with us, also Mr. Brody, who was going to talk on water supply for farm homes, but something prevented their coming so an impromptu program was given. Refreshments were served, consisting of ice cream and cake, and the remainder of the evening was spent in games on the lawn and visiting. About 70 were present and all appeared to be having a very good time. Our worthy president was with us once more with words of appreciation for kindnesses received during his recent bereavement.—Mrs. S. F. Fenner, Cor. Sec.

Give Auto First Place.—The Wells-Dayton Farmers' Club met in June at the home of Mr. and Mrs. Alfred Walks at East Dayton. Although the day was stormy there was a nice attendance. There was roll call, with a response from the members, and the first on the program was a discussion on "which deserves the first place on the up-to-date farm, the old family horse or the automobile?" The question was handled by four ladies, Mrs. C. Ross, Mrs. Mary Daily, Mrs. C. Riley and Mrs. J. Werden. The question was quite thoroughly discussed and was finally put to a vote and the old family horse will be dispensed with. Mrs. Edgar Ross gave two recitations. Several were absent who were on the program. The question box brought out several discussions, one being, "Will we have but one telephone?" It was decided there must be competition in order to have good service and the merchant must cater to the farmer's wishes to a certain extent. Mrs. Albert Hunter served a fine supper to which all did justice. Mr. and Mrs. C. Hunt will entertain the Club in July.—Mrs. S. G. Ross, Cor. Sec.

Meets Every Demand



Deep tilling plowing 15 inches deep, disc plow in California.

For Power on the Farm

In plowing will finish dead furrow and headland, back in corners better than horses. Then hitch it to any implement on the farm.

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Plowing Gumbo Stubble in Illinois. Note depth of cut.

Friction clutch pulley for all stationary work. This staunch, strong motor plow and tractor is making money for farmers all over the country by cutting down farm labor costs and a big slice off of all feeding bills. One man and a Steel King easily do as much as two or three men and four to six horses.

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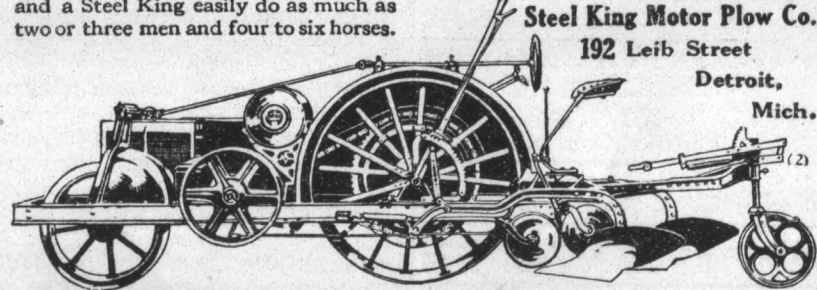
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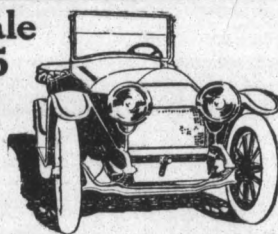
Detroit,

Mich.

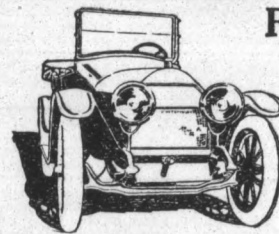


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BOYS WATCH.

Every boy, young or old, would be proud to carry one of these watches. It is 16 size, with a nickel case. Stem set and wind. Regular watch movement with hair spring. Guaranteed by the makers and repaired free of charge for one year, if given ordinary care. Any boy who really wants a watch can easily earn one in one afternoon.

The watch alone free for sending three subscriptions to the Michigan Farmer.

CHICKEN MITES.

Prof. A. H. Hunter states that the chicken mite, may be styled "the wolves of the insect parasites of fowls." Instead of feeding upon the body excretions, feathers, etc., of the fowl, as do the lice, the food of mites is blood. It is only when engorged with blood that they are red. Their natural color is a light gray. The mites hide in crevices and under objects in the hen-house during the daytime, while the chickens are outside, and lie in wait for their return. They are worse than lice and for this reason one should do everything in their power to destroy them. They remain upon the fowl only long enough to secure a meal.

The poultry raiser well knows how unpleasant it is to become covered with mites when entering a house to spray any liquid preparation, to say nothing about the hard work. This is no longer necessary as there is an effective and positive way of killing these mites by fumigation which is play, and not work. These fumigators are sheets of paper, six by eighteen inches, saturated with material that is volatilized when slowly burned. Two fumigators will fumigate a ten by twelve foot henhouse. They are put up in packages of two fumigators for twenty-five cents, five for fifty cents, and twelve for one dollar, and are manufactured and guaranteed by F. A. Thompson & Company, 527 Trombley Avenue, Detroit, Mich.

\$\$\$ IN BELGIAN HARES: Start raising Belgian hares for market and breeding purpose. Big demand. We teach you, supply stock, and buy all you raise. Write now for particulars. Belgian Hare Distributing Co., Box 512, River Rouge, Mich.

POULTRY.

BARRED PLY. ROCKS

First prize winners at Chicago, Cincinnati, Indianapolis, etc.
Eggs from fine Utility Matings that are bred to lay. \$1.50 per 15, \$4 per 50, \$7 per 100. From best exhibition pens \$10 per 15, \$25 per 50. Prompt delivery and good hatch guaranteed. G. Earl Hoover, R. 7, Matthews, Ind.

Barred Rock Hens \$1.50 each, eggs with the kick in them \$1.50 per 15, \$4 per 50, \$7 per 100. Baby chicks 100 \$15. W. C. COFFMAN, R. No. 6, Benton Harbor, Mich.

Barred Rock Eggs—Start right with your Barred's with eggs from a pen direct from Bradley Bros. Yards. A. A. Pattullo, Deckerville, Mich.

BARRED ROCKS. Parks 200-Egg strain. A strain with Egg records to 271 eggs a year. \$1.50 per 15. Delivered by Parcel Post. Fred Astling, Constantine, Mich.

BARRED Rock eggs from Barred Rocks that are barred to the skin, also eggs from S. S. Hamburgs, R. C. White Leghorns, White Runner Ducks, White Holland Turkeys. Circular free. Riverview Farm, R. 8, Vassar, Mich.

Bull Rocks, 3 out of 4 firsts Chicago, 1914. Eggs bal. of season \$1.50-15, \$4-50, \$7-100. S. C. Buff Leg. horn eggs \$1.50-15, \$4-50, \$7-100. Pen of 12 Buff Leghorns \$10. 20 Buff Rock Hens, 75 cents to \$2.50, including Chicago and Minneapolis first prize winners. Bird Lawn Farm, Lawrence, Mich.

Half Price from Now On

Eggs from some of the best Barred and White Rocks in Michigan. \$1.50 per 15. Heavy laying strains. Riverview Poultry Farm, Box 798, Union, City, Mich.

LATE SEASON PRICES on R. C. and S. C. Rhode Island Red eggs from fine stock, \$1 per 15, delivered at your door by insured parcel post. JENNIE BUELL, Ann Arbor, Michigan.

MADE IN AMERICA S. C. W. Leghorns only—large, great layers, pure white. Strong day-old chicks now \$5 per 100. Guaranteed delivery. Hatch every week. Everfresh Egg Farm, Box F, Ionia, Mich.

Pine Crest White Orpingtons—bargains in stock—large, great layers, eggs half price through June. Belgian hares and Collie puppies. MRS. WILLIS HOUGH, Pine Crest Farm, Royal Oak, Mich.

RINGLET BARRED ROCKS—the winning and R. laying strain. Eggs \$1.50 per 15, from mated pens also M. B. Turkey eggs from choice birds, \$2.50 per 10. Charges prepaid by parcel post. PLAINVIEW STOCK FARM, Romeo, Michigan

RHODE ISLAND REDS and PLYMOUTH ROCKS. Males 5 to 12 lbs. according to age \$2 to \$5; P. H. hens weights to 9 1/2 lbs., eggs 15 for \$1.00; P. H. eggs \$5 per 100. Mammoth Bronze Tom Turkeys, 8 to 38 lbs. according to age \$3 to \$25, 10 eggs \$3. A. E. Cramp ton, Vassar, Mich

ROSE COMB BROWN LEGHORN EGGS from Mad. Sq. winners. \$1.00 per setting, \$5.00 per 100. M. Pekin ducks \$1.00 per setting. CLAUDIA BETTS, Hillsdale, Michigan.

S. C. White Leghorns, breeding cockerels and yearlings, ling hens for sale. Also young white Pekin breeding ducks and drakes. Write for prices. Sunnybrook Poultry Farm, R. 3, Hillsdale, Mich.

CULVER Laced Golden and White Wyandotte Eggs for hatchling. Ten cents each or 30 for \$2.50. I pay parcel post charges. C. W. BROWNING, Portland, Michigan.

White Leghorns Day-Old-Chicks. We guarantee satisfaction to all our customers. MAPLE CITY POULTRY PLANT, Box C, Charlotte, Michigan.

White Wyandotte Eggs—50c for 15, \$4.00 for 100. My two best pens \$2.00 for 15, \$3.75 for 30. DAVID RAY, 202 Forest Ave., Ypsilanti, Mich.

WHITE WYANDOTTE EGGS HALF PRICE NOW HOWARD GRANT, Marshall, Michigan.

WHITTAKER'S Red Chicks, both combs, \$10 and \$12 per 100. Hen \$12 per doz. The most popular Reds in Michigan. Interlakes Farm, Box 39, Lawrence, Mich.

White P. Rocks. Pekin and white runner ducks, White guineas, eggs and day old ducks and chicks. H. V. HOSTETLER, St. Johns, Michigan.

WHITE Orpington Cockerels. S. C. Kellerstrass 8-wk. 4 or more. 75c each, single \$1. 8-wks. pens cheap. Yearling hens and cks. Eggs 1/2 price. M. E. Thompson, Redford, Mich.

DOGS.

Trained Running Fox Hounds—30 Fox and Coon hound pups, Ponies. Send stamp. W. E. LECKY, Holmesville, Ohio.

FOX, COON AND RABBIT HOUNDS Broke to gun and field. Prices right. Fox and Coon hound pups \$3 each. Stamp for reply. H. C. LYTLE, Fredericksburg, Ohio.

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to represent a reliable concern canvassing among farmers in your own neighborhood or elsewhere. No experience necessary. Liberal pay, and supplies furnished free to right parties. Reference required. Address,

ADVERTISER, CARE THE MICHIGAN FARMER, Detroit, Michigan

Poultry.

GRASS RANGE FOR HENS.

I have kept hens in close pens with very good success, but there is no doubt in my mind that the free range of enough grass to prevent their destroying it will give much better results. It does not take so great a range, but some is almost a necessity for the best results.

One year I had a flock on a small lot that was seeded to blue grass. I had no doubt that they would destroy it in short order, but I soon saw that the blue grass had the best of the contest. Long before the summer was half over they had given up fully half the lot and was trying to keep down the grass on the remainder. Like all animals that feed on grass they like the young tender growths, and they will eat them in preference to the older growths. While this is so, they will not eat it close enough to destroy it if there is plenty of room to supply them without. As near as I could judge, it would take about 40 square feet to the hen. Of course, the season will have a good deal to do with the amount of space they will be able to keep the grass eaten down on, for the grass will grow much faster during some seasons than others. The season I had tried them on the pasture mentioned was a fairly good one and it might be necessary to make a little allowance for that, but I believe I have taken that into account.

Amount of Range Necessary.

At this rate a lot a hundred feet square would pasture a flock of 250 hens. This must not be taken to include the space occupied by the henhouse or the shade or places they dust themselves. This space should be devoted to grass alone. If there are trees to shade it there should be an allowance of space to balance the effect they will have on the growth of the grass.

If you have no pasture for the hens, divide the lot into two parts and sow one to wheat, oats, or some grain, and let it get a good start, then turn the hens in on it and sow the other lot. I think oats will be the quickest growing grain for the summer, but in the fall sow them to wheat, and be sure you do not leave the hens in either until they have destroyed the wheat, but change often. If you sow wheat in the spring you can sow some blue grass and white clover with it, so that when the wheat is gone they will be ready to take its place. By supplementing this with some sprouted oats during the summer you can get a heavy enough growth to keep over winter pretty well. Blue grass is green almost all winter; my hens have been feeding on it all winter this year. Last winter, for a period, it was killed down so much they could get none, but it has never been killed this year.

Keep Hens Contented.

Besides the benefit the hens get from it for food, the pasture keeps them contented, and that is a great factor in getting results. A discontented flock is not a paying flock. When all nature is freshening up in the spring the hens want to get to the fresh green food, too, and if they cannot it will cause them to fret, and they take revenge on the egg basket.

I have kept hens penned and fed them all the mash with alfalfa meal and meat meal they would eat, and yet the hens that were restricted but had sufficient blue grass pasture have produced the most eggs and the strongest chicks.

I do not like the free range where they are allowed to range all over creation. Rather, I would choose to call it a hen pasture. If I were to choose between the free range and a small lot I would choose the lot. It is

not entirely because I think they would do better, though I believe they would do almost if not fully as well, but the inconvenience counts much with me. I want to know where the eggs are likely to be laid. I want to know where the hens are and whether they are destroying things they should let alone.

L. H. COBB.

CHICKENS AND MILK.

According to tests and observations of specialists of the Storrs Agricultural Experiment Station, the feeding of milk to young chicks has a most favorable influence on the growth and on the lessening of mortality of the chicks. It tends to prevent mortality from all causes, and if fed soon enough and for a sufficiently long period, greatly reduces the death-rate caused by bacillary white diarrhea.

Sweet and sour milk are apparently of equal value in their relation to growth and mortality. Furthermore, different degrees of souring do not alter the results of milk feeding. The value of milk as a food for chicks does not depend upon any acids that may be present, nor upon any particular types of micro-organisms; but upon one or more of the natural constituents of the milk.

When milk is supplied freely to chicks, it becomes all the more important that they have abundant exercise. This applies more particularly to early hatched chicks that are brooded wholly or for the most part indoors. The feeding of sweet or sour milk has in no instance been found to be in any way injurious to the chicks employed in the numerous experiments made by the Storrs Station. If the milk is clean, and not too old, none but the most favorable results should accompany its use as a food for chicks. There is no preference in the choice of sweet or of sour milk, except from the standpoint of convenience. The use of the one or the other should be determined by the circumstances. However, it seems very desirable that the same kind of milk be supplied throughout the milk feeding period. If the choice is that of sour milk, sour milk should be fed to the end.

FEATHERLESS CHICKS.

What is the reason for chickens not having any feathers? I have two chickens which were hatched two months ago, that are as bare as though they had been picked. G. W. S.

The probable cause of your chickens not feathering out is that they are not strong, or rather have not vitality enough to form feathers as fast as they should. It may be that you are

BREAKING UP THE BROODY HEN.

The best method I have found for breaking up the broody hen is to sentence her to a short sojourn in the "jail." This is nothing more or less than a crate-like coop, suspended from a rafter in the hen house or the limb of a tree outside. As the broody birds give the most trouble in late spring and early summer, the outside location is most used. The jail is so hung that the least motion of the incarcerated bird will cause it to tip slightly. This tends to discourage the sitting posture. Suspended above the ground, the hen gets the benefit of plenty of fresh air. In this position the sitter can see what is going on around, and her attention is diverted, so the maternal idea is more quickly forgotten. Feed plenty of good egg-making food. Hens rapidly lose their good condition when they become broody. Force the bird to keep up to the laying condition. If treatment is commenced at once, she will seldom need to be kept in confinement more than a day or two. Cruel treatment with the setters are utterly useless. The only way to break up the desire without hurting the bird, is by confinement, and the "jail" is the best for this purpose. Profit from the layers depends on getting them back in the harness with little delay.

New Hamp.

C. H. CHESLEY.

WHITE DIARRHEA.

What is the trouble with my young chickens? They have a diarrhea.

SUBSCRIBER.

The cause of the death of your chickens is white diarrhea, a very common cause of death among chicks. This is a bacterial disease and is considered quite contagious. It is sometimes transmitted through the eggs from infected fowls which had the disease when they were chicks but recovered, or it may be taken by healthy chicks by picking at the droppings the first day or two of their life. If the chicks are hatched by incubator, it is advisable to keep the nursery part dark so as to keep the chicks from picking around. This disease is not thoroughly understood by our poultry experts and to date they have not found any real satisfactory remedy. It has been found, however, that the feeding of sour milk during the first few days after the chicks have been hatched has had a very beneficial effect. There are also commercial remedies some of which are advertised in our columns, which are giving very good results.

We would suggest that you thor-



Feeding the Young Turkeys.

not feeding them correctly by giving them too much starchy food and not enough containing protein.

If you are feeding considerable corn meal, I would replace a large amount of this with cracked wheat, and also have at hand a dish of bran so that the chicks may pick at it when they wish. Sour milk will also be very beneficial. The chicks should also have access to plenty of green food, and great care should be taken to see that all their food and water is clean.

oroughly disinfect any incubators or brooders in which chicks have died of this disease, and also if indications lead you to believe that the infection is through the egg, to endeavor to find the cause of the trouble in your mature flock.

A uniform product looks better and will bring a better price than one that is not uniform. Pure-bred poultry will produce a uniform product both in the eggs and the surplus stock.

BREEDERS' DIRECTORY.

CATTLE.

ABERDEEN-ANGUS

HERD ESTABLISHED IN 1900.
TROYAN-ELIAS and BLACKBIRDS only. A few young bulls and cows for sale. Also breeders of Percheron, Hackney and Saddle Horses.
WOODCOTE STOCK FARM, Ionia, Mich.

Aberdeen-Angus Bulls.

We are offering 12 extra good bulls, among them prize-winners at the Michigan State Fair 1914. Some of them by Black Monarch 3rd, Grand Champion Bull of the State 1914. Others by the Great Sir Blackbird, sire of prize-winners, ages from 9 to 20 months old. Prices from \$300 to \$250 each. Come and look them over; they will please you. U. L. Clark, Hunters Creek, Mich. Sidney Smith, Manager.

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

THE VILLAGE FARM,
Grass Lake, Michigan,
GUERNSEY CATTLE.

MILO D. CAMPBELL CHAS. J. ANGEVINE

BEACH FARM
GUERNSEYS

Combine the blood of the following great producing sires and dams:

Masher Sequel	57 A. R. Daughters
Galaxy's Sequel	37 A. R. "
Glenwood Boy of Haddon	25 A. R. "
May Rose King	21 A. R. "
Dairymaid of Pinehurst	110 lbs. fat
Dolly Bloom	885 "
Imp. Ickon Daisy	714 "
Selma of Pinehurst	762 "
Stanford's Princess	725 "

Bulls for sale only.
A Dairy Show Every Day.
CAMPBELL & ANGEVINE, Coldwater, Mich.

Perched Guernseys. 2-year-old bull from A. R. stock, good individual, not registered, 1200 lbs. Beef price. Also registered females and bred heifers. G. A. Wigent, Waterford, Mich.

REGISTERED GUERNSEY BULL CALVES for sale cheap at Windermere Farm, Waterford, Mich. May Rose breeding. Address: J. K. BLATCHFORD, Auditorium Tower, Chicago, Ill.

For Sale—Reg. Guernsey Cattle and BERKSHIRE PIGS. JOHN EBELS, R. 10, Holland, Michigan.

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

GUERNSEYS—Write for prices and particulars. 2 bulls 1 year old. Several bull calves, all from A. R. cows and cows on test. Geo. N. Crawford, Holt, Mich.

GUERNSEY BULLS FOR SALE, ready for service from A. R. Dams. If you want the right kind write for price and breeding. BYERS & BARNES BROS., Coldwater, Michigan

FOR SALE—Six high-grade 4-year-old Guernsey cows and four heifers coming two years old. Price reasonable. A. J. BROSEAU, Albion, Michigan

HEREFORD; Three bull calves and one two year old. ALLEN BROS., Paw Paw, Michigan.

Do You Want A Bull?
Ready For Service.

From a grand daughter of The King of the Pontiacs. Sired by a bull that is more than a half brother to the Champion Holstein Cow of the World, and whose dam is a 30 lb. 6 1/4 fat daughter of Pontiac Aggie Korndyke who has more 30 lb. daughters than any other living bull. If you do write for pedigree.

EDWIN S. LEWIS, Marshall, Mich.

ESPANORE FARM,
LANSING, MICHIGAN.

Home of the great Holstein Bull "PLEDGE SPORFORD CALAMITY PAUL" with 33 A. R. daughters, including a 5-year-old with a 35-pound record. Others from 20 to 32 pounds.

FOR SALE—A Bull Calf sired by this Great Bull.
CHASE S. OSBORN,
ADAM E. FERGUSON, Owners.

HATCH HERD
YPSILANTI, MICHIGAN

Registered Holstein-Friesian sires, grandsons of World's greatest dairy sire, out of choice A. R. O. dams and King Pontiac Jewel Korndyke. Brother of K. P. Pontiac Lass 44.15; average record of 50 dams in three nearest dams 4.37; of his own dam 4.93. Sires in first three generations already have over 600 A. R. O. daughters. A few females bred to "King". Prices reasonable.

1 4-YEAR-OLD BULL

by a 31-lb. son of Pontiac Korndyke, and out of 27-lb. dam. 2 two-year-old and three yearling bulls. The above bulls have breeding and individuality to spare. Also a few richly bred bull calves. These will be priced right. This is a chance to get a valuable bull for little money. Get busy, as this ad. will appear but twice.

L. E. CONNELL, Fayette, Ohio.

The Two Greatest Bulls
KING OF THE PONTIACS
DE KOL 2d's BUTTER BOY 3rd

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

BIGELOW'S HOLSTEIN FARMS,
BREEDSVILLE, MICH.

JULY 28 | MUMFORD'S DUROC SALE | JULY 28
Brookwater Farm, Ann Arbor, Mich.
50 Head, Including Bred Sows and Gilts. Herd Boars and Spring Pigs

This offering is fully up to the high standard established in our former sales. The offering is bred to or sired by prize winning boars at the Michigan State Fair. This will be an unusual opportunity to buy choice Durocs. You cannot afford to miss it. Send for our catalog and plan to spend July 28 profitably at

JULY 28 | BROOKWATER FARM, | JULY 28
R. F. D. 7, ANN ARBOR, MICHIGANFOR SALE, A. R. O. HOLSTEIN COW
AND TWO CALVES

5-year-old cow, 16.24 as a junior 4 years old. Tested last June. Her heifer calf 2 mo. old about 1/2 white, also bull calf 1/2 white. King Segis breeding on both sides—a good large straight fellow, not akin to above females. Both calves sucking above cow and are top notches. Wish to sell all together. Price \$350 with all papers. I broke my arm and cannot milk.
LEWIS J. BENJAMIN, R. No. 1, Chio, Michigan.

REGISTERED Holsteins—Hard headed by Albino Bente Butter & Boy. His dam has A. R. O. records as follows: at 2 yrs. milk 430, butter 18.85; 4 yrs. milk 604.8, butter 27.03; at 6 yrs. milk 620, butter 28.55 lbs. W. B. READER, Howell, Mich.

FOR SALE—Reg. Guernsey Bull 6 years old, sure and a good stock getter. Yecksa Farmwood breeding. JAY D. RUSSELL, R. 1, Gobleville, Mich.

\$100 Gals 5 mo. 1/2 white grandson of Friend Hengerveld De Kol & Maplecrest Pontiac Flora Hartog, 30 lbs. butter 7 days, 1232 lbs. in 1 yr. M. L. McLAULIN, Redford, Mich.

FOR SALE—REGISTERED HOLSTEIN BULL born Feb. 26, 1915. Mostly white. Dam has A. R. O. record, also Chester White Pigs. CHARLES L. COOK, Box 438, Fowlerville, Michigan.

REG. HOLSTEIN BULL CALVES good A. R. O. breeding, and plenty of 30-lb. blood in their pedigrees. Dewey C. Pierson, Hadley, Mich.

REGISTERED HOLSTEIN BULL, 6 months old. 2 nearest dams average 25 lbs. of butter in 7 days. \$50 brings him to you with all papers. Safe arrival guaranteed. ROBERT W. FAY, Mason, Michigan.

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

MAPLECREST De Kol Hengerveld, an own brother to a World's Champion heifer out herd. Choice Bull Calves for sale, or will exchange for registered heifers or cows. HILLCREST FARM, Kalamazoo, Mich.

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

HOLSTEIN BULL CALVES—Don't buy until you write us. No better breeding in Michigan. Long Beach Farm, Augusta, Kalamazoo Co., Mich.

Holstein-Friesian Breeder—The best families of the breed represented. D. D. AITKEN, Flint, Michigan.

HOLSTEIN CATTLE and Duroc Jersey Swine. Choice pigs of both sex now ready to ship. Prices reasonable. E. R. CORNELL, Howell, Michigan.

\$40.00 DELIVERED Handsome Holstein bull calf, half black. Registered and all papers. A. R. O. Sire and Dam. ROUGEMONT FARMS, Detroit, Michigan.

MICHIGAN HOME AND TRAINING SCHOOL LAPEER, MICHIGAN Breeder of High Grade Holstein Cattle. Lists and prices upon application.

HOLSTEIN CATTLE and O. I. C. SWINE ELMER E. SMITH, Redford, Michigan.

NIXON FARMS
Brooklyn, Mich.

Have Some Registered Jerseys For Sale.

Maple Lane Register of Merit Jersey Herd. Tuberculin tested by U. S. Government. For sale bull calves and heifer calves from R. M. dams and grand dams, and Hood Farm Sire. IRVIN FOX, Allegan, Michigan.

THE WILDWOOD JERSEY HERD Registered Jersey Cattle of Quality. Tuberculin tested. Majesty's Wonder No. 90717 heads the herd. Bull calves for sale, also a two-year-old bull that is right. For prices and description write or come. ALVIN BALDEN, Capac, St. Clair Co., Michigan.

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

Jerseys. Bulls ready for service, extra quality sired by Jacoba's Fairy Emanon. No. 107111 heads the herd. Bull calves for sale, also a two-year-old bull that is right. For prices and description write or come. ALVIN BALDEN, Capac, St. Clair Co., Michigan.

JERSEYS—THE REGISTER OF MERIT KIND. BROOKWATER FARM, R. No. 7, Ann Arbor, Mich.

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

FISHERTON FARM JERSEYS—Some fine grandsons of Hood Farm Pogie 9th. from Register of Merit dams. FISHERTON FARM, Pontiac, Michigan.

BIDWELL SHORTHORNS

For "Beef and Milk" Registered Bulls, Cows and heifers Scotch-topped roans, reds and whites for sale. Farm at L. S. & M. S. Decot, also D. T. & L. R. Y. BIDWELL STOCK FARM Box B, Tecumseh, Mich.

Shorthorns For Sale, farm 1/2 mile east of Davis crossing on A. A. R. R. W. B. McQUILLAN, Chilson, Liv. Co., Michigan.

MILKING SHORTHORNS—Young bulls sired by a Grand May & Otis bull for sale. DAVIDSON & HALL, Tecumseh, Michigan.

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

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

Dairy Bred Shorthorns of best Bates Strains. Young bulls 7 months old for sale. Price \$100 each. J. B. HUMMEL, Mason, Mich.

\$60 Bays choice breed BROWN SWISS BULL CALF; six months old. W. B. COLLINS, Gregory, Michigan.

HOGS.

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

REGISTERED BERKSHIRE SOWS to farrow soon at \$20 each. B. B. REAVEY, Akron, Michigan.

FOR SALE—Berkshire hogs, both sexes and different ages. Bred gilts for fall farrowing. Polk Angus Bull Calf, not registered. Price right. Chase's Stock Farm, R. 1, Mariette, Mich.

Royalton Bred Berkshires—Boar pigs ready to ship last of July at 12 weeks weeks age with registry papers. Write for pedigree and prices. D. F. VALENTINE, Supt., Temperance, Mich.

HAMPSHIRE Swine—Breeding stock of all ages from most popular strains. Write for breeding. Inspection invited. Floyd Myers, R. 2, Decatur, Ind.

Hampshire Swine, the kind that wears the belt. Spring pigs and two serviceable boars. Prices right. Papers furnished. S. O. MONT, Elsie, Mich.

WEST WINDS HAMPSHIRE SWINE. Booking orders for sow pigs immediate shipment. No males to offer. E. P. Hammond, owner, N. A. Wisner, manager, Pontiac, Mich.

Chester Whites—Gilts bred for Aug. and Sept farrow. March pigs, either sex. F. W. ALEXANDER, Vassar, Michigan.

Big Type, O. I. C's and Chester White Swine. 400 fall pigs either sex, special prices for the next 30 days, also bred gilts and service males and we are booking orders for spring pig all our stock is good enough that I will ship C. O. D. and reg. free in the O. I. C. or Chester White Asso. We won, more prize than all other breeders put together, at Ill., and Wis. State Fairs. Write for Show record.

ROLLING VIEW STOCK FARM Cass City, Michigan.

O. I. C. PIGS of March and April farrow and Red Polled Bulls. Write JOHN BERNER & SON, R. 4, Grand Lodge, Mich.

JEWETT'S REGISTERED BLUE RIBBON O. I. C's Growthy type. Photos. J. Carl Jewett, Mason, Mich.

O. I. C's—Sows bred to farrow last of June and July. Prices reasonable. G. P. ANDREWS, Danville, Michigan.

O. I. C.—Gilts bred for Aug. and Sept. farrow. Will take orders for March and April pigs. H. W. MANN, Danville, Michigan.

O. I. C's—Spring pigs, pairs and trios, not akin to state fair winners. AVONDALE STOCK FARM, Wayne, Mich.

O. I. C's—STRICTLY BIG TYPE Gilts bred for Sept. farrow and March pigs now ready to ship. Extra good ones at prices that will move them. Pairs not akin. I will be pleased to ship them C. O. D. and record them free in purchaser's name. NEWMAN'S STOCK FARM R. No. 1, Mariette, Mich.

O. I. C. SWINE—Are you on the market for a choice bred sow to farrow the last of Aug. or fore part of Sept? If you are, write me. I have them. A. J. GORDON, R. No. 2, Dorr, Michigan.

O. I. C's—Two good boars 12 months old, good last fall pigs, either sex, and this spring boars. 1/2 mile west of depot. OTTO B. SCHULZE, Nashville, Michigan.

O. I. C's—Service boars, gilts, sows, spring pigs—none better. Satisfaction guaranteed. A. R. GRAHAM, Flint, Michigan.

O. I. C. Pigs, 8 to 10 Weeks Old \$10. Pairs not akin. C. J. Thompson, Rockford, Mich.

O. I. C. Choice Sept. pigs, either sex. Will take orders for March, April and May pigs, not akin. ALVIN V. HATT, Grass Lake, Mich.

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

DUROC JERSEYS—A few fall boars and 12 bred gilts for sale. CAREY U. EDMONDS, Hastings, Michigan.

FOR SALE—Fancy bred gilts, fall males, spring pigs, of the large, smooth kind. Price to sell. JOHN McNICOLL, Station A, R. 4, Bay City, Mich.

Canitol Herd Duroc Jersey Swine. Established 1888. Spring pigs for sale, satisfaction guaranteed. Express prepaid. J. H. Banghart, East Lansing, Mich.

HEAVY BONE Duroc JERSEYS FOR SALE. Some extra nice spring pigs ready to ship. M. A. BRAY, Okemos, Ingham Co., Michigan.

DUROC JERSEYS—Spring pigs either sex. Gilts bred for Duroc Jersey to a son of Volunteer Grand Champion at Internat'l Stock Show Chicago. F. J. Drott, R. 1, Monroe, Mich.

DUROC Jersey bred gilts, bred for Aug. and Sept. farrow from leading blood lines; also a few good boars. Write for circular and prices. W. C. Taylor, Milan, Mich.

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

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

MY OH MY!
What an Opportunity.

Starting May 1st, we are going to give to the farmers and breeders an opportunity to get started right in the breeding industry. We are going to give you a chance to get hold of foundation stock that will give you a nucleus for one of the finest and best herds in your community. We are going to show you as we have others, that you will have greater success with our big type

POLAND CHINAS than with any other breed. We want to place at least one pig, or a pair in every community. To advertise our herd. If interested, write for our plan and prices. HILLCREST FARM, Kalamazoo, Mich.

Duroc Jersey—March pigs either sex, sired by a son and Chicago Show in 1912. E. H. Morris, Monroe, Mich.

DUROC JERSEYS—Fall and spring pigs either sex, from choice strains. S. O. STAHLMAN, CHERRY LAWN FARM, Shepherd, Michigan.

SOLD POLANDS as far south as Miss., north and west as far as Washington. Every customer satisfied. I can satisfy you. Breeding stock for sale at all times. FRANK KRUGER, Ravenna, Michigan.

POLAND CHINA Spring Pigs from heavy boned prolific stock. Sows bred for Summer and Fall pigs at close prices. ROBERT NEVE, Pierson, Michigan.

BIG TYPE P.—Head boar, Hoosier Giant, also pigs sired by him, a few bred sows, 1 young boar by Big Smooth Jumbo. Mrs. J. E. Braithwaite, Brant, Mich.

Poland Chi as, either sex, all ages. Something good at a low price. Bargains in boars ready for service. P. D. LONG, R. F. D. 8, Grand Rapids, Mich.

POLAND CHINAS of the big type. Boars ready for service. Sows bred for spring farrow. A. A. Wood & Son, Saline, Mich.

LARGE TYPE P. C.—Either sex, pairs and trios, not bred gilts. W. J. HAGELSHAW, Augusta, Mich.

Big Bred Poland Chinas. Fall gilts bred weighing from 260 to 300 lbs. ROBERT MARTIN, R. F. D. No. 7, Hastings, Mich.

Large Strain P. C. Boars ready for service and sows with pigs. Am breeding sows for fall farrow of the best breeding, to be had at bargain prices for the next 30 days, must have the room for others. H. O. SWARTZ, Schoolcraft, Michigan.

Poland China—Am booking orders for male pigs to be shipped at weaning time. G. W. HOLTON, R. No. 11, Kalamazoo, Michigan.

BIG TYPE POLAND CHINAS. We won more prizes in 1913 and 1914 than any other Poland breeder in Michigan. Fall stock for sale. BEAN CREEK FARM, Addison, Michigan

FALL PIGS AT HALF PRICE

Bred from the largest strain of Poland Chinas on earth, none bigger. If you ever expect to own a registered Poland China, this is your opportunity. Get busy and order at once. Pairs and trios not akin \$15 each. J. O. BUTLER, Portland, Mich. Bell Phone.

BIG Type boars by Big Smooth Jumbo. Greatest boar in State, 748 lbs. at 17 mo. These boars are long, tall, big bone sold at farmers prices, shipped C. O. D. Call or write. Wm. Waffle, Coldwater, Mich.

FOR SALE—A few thoroughbred Poland China Pigs six weeks old of the 1st breed. They will be registered if desired. Price upon application. G. T. HINES, Bradley, Michigan

50 YORKSHIRES—All ages. Red Polled Cattle. Oxford Down Sheep. W. P. Rocks, I. R. Ducks. E. S. CARR, Homer, Mich.

YORKSHIRE SWINE. Boars ready for service. A gilt bred for June farrow. Weanling pigs 6-10 weeks old. GEO. S. McMULLEN, Grand Lodge, Mich.

For Sale—Yorkshire Gilts from large litters, bred for fall farrowing. Waterman & Waterman, Ann Arbor, Mich. Meadowland Farm.

Mulefoot Hogs.—Weanling pigs, pairs not akin. Bred sows and gilts for fall farrow, two service boars. C. F. BACON, Ridgeway, Mich.

Lillie Farmstead Yorkshires. Boars ready for service. Lillie bred for Sept. farrow. Spring pigs, pairs and trios, not akin. Colon C. Lillie, Coopersville, Mich.

REGISTERED YORKSHIRES Imported Strain. Both sexes. Prices Reasonable. Hatch Herd, Ypsilanti, Michigan.

REGISTERED YORKSHIRES—MARCH PIGS fine boars. JOS. H. BREWER, Belmont, Mich.

YORKSHIRES

Bred gilts, service boars, September and October pigs. Prices reasonable. W. C. COOK, R. 42, Ada, Mich.

Pure Bred Mule Foot Hogs FOR SALE—Reduced prices on service boars. R. FRANK SMITH, R. R. 3, Merrill, Michigan

BERKSHIRES Choice spring boars and gilts, priced to move quickly. Farm stock. ELMHURST STOCK FARM, Almont, Mich.

SHEEP.

Registered Oxford Down Sheep—Write your M. F. GANSLEY, Lennon, Michigan.

HORSES

FOR SALE—Registered Percheron Stallion Mares and Fillies at reasonable prices. Inspection invited. F. L. KING & SON, Charlotte, Mich.

Pigeon Pony Farm—Reg. Shetland Ponies, mostly spots, 1 spotted stallion and young stock for sale. Dr. W. T. Morrison, Pigeon, Mich.

Registered Percherons Brood mares, Fillies and Young Stallions. Priced to sell. Inspection invited. L. C. HUNT & CO., Eaton Rapids, Michigan.

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