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Permanent Buildings For The Farm.

AN authority on architecture said the American people were the only ones who, in spite of the advancing prices of lumber and labor, were still wedded to wooden structures. The old customs when timber was plentiful and the carpenters were used to lumber, and construction was along certain lines, still undoubtedly prevail where modern conditions demand a change.

In earlier days the locations of buildings, with reference to roads and villages, together with local conditions, were not certainly fixed. The first idea of farming was getting the land cleared up to make a home and with it the buildings, were a growth, not a fixed and permanent plan.

Modern buildings on the farm are not a good risk from a fire standpoint, and few of the old line insurance companies will write farm building policies, the reason being that when once a farm building fire is started, the loss is nearly always complete. The same residence in the city would, with fire protection, usually be saved. Then for a long time the lure of the west, with the opportunity for cheap lands and wider areas, made it easier for the sons to secure farms than in Michigan, and permanence of family interest and control was not inherent, as in older countries.

At the present time agriculture is permanent. The day of cheap land is a thing of the past and never to return. Building material, particularly lumber, is three or four times the value of fifty years ago. Labor has nearly doubled in price, while the lasting qualities of wooden structures are not in any way increased. Under these circumstances farm buildings offer opportunities for permanence, coupled with comparatively low cost of construction, as compared to lumber.

The cut of the farm residence erected by the writer last summer to replace a building destroyed by fire, illustrates one idea of permanent building well suited to locations where field stones abound.

This building is of balloon frame construction, with a ten-inch stone veneer, laid in concrete. The base wall stone may be boulders of any size. When the sill line is reached stones not to exceed ten inches in thickness are used. As the cut shows, many stones used are of considerable size. The scheme in laying being a large stone surrounded by a less size and grading down to stones as large as a man's fist. Toward the close of a day's

work, when the concrete is partially set, a considerable portion is cut away and later fine concrete mortar pointed in, smoothed with a brush and later painted. This gives the "projected" stone appearance which does not obtain when cut stone is used. Disc-shaped small stones are used for the arch work over windows and doors.

The porch pillars are concrete cast in a wooden form and raised in place by means of a winch. Each pillar, ex-

posed down with carborundum, so that the floor is practically marble. When rugs are used, or carpets, stiffened with glue on the under edge, a more desirable and permanent flooring than wood is obtained. There is absolutely no sound and no danger from fire, especially where an open grate fire is used occasionally for heat and always for ventilation.

The same scheme for mantel is used, only small fancy stones are cho-

is applied. The back porch, in addition to the cement floor, has also, as well as over the outdoor cellar, a cement roof plastered on expanded metal lath and painted. This cement roof is somewhat of an experiment, but apparently successful.

The window frames, cornices and porch ceilings alone require paint and but a few gallons of paint are used. Exposure and weathering improve the appearance of the stone, as may be noticed with the exposed top stones on a pile of stone.

It is doubtful whether this line of building would be economical otherwise than on the farm, since hauling and selecting the stone would be at enormous expense in the city or village. To the farmer, with stone on the farm and teams to haul them, together with the sand and cement, all heavy material, it especially appeals.

Furring strips are used on the sheathing so that there is an airspace, an inch of lumber and ten inches of cemented stone wall which makes both a warm house in winter and cool one in summer. Fern banks can grow on the north side of the house without injury to the walls, as well as climbing vines at other points.

All costs and permanence considered, including the freedom from wall painting, I am under the impression that such a house is little, if any, more expensive than an all-lumber house. During the last few years I have used five carloads of cement in permanent farm buildings, including barn and silos. There was used in the house as it appears here, one minimum carload of cement, or one hundred and forty barrels.

Shiawassee Co. J. N. McBride.

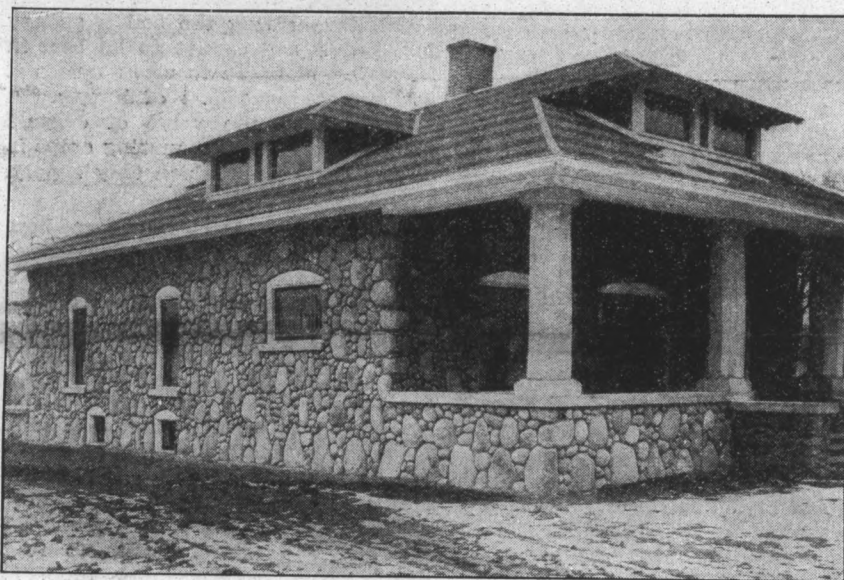
MAINTAINING THE PURITY OF FARM SEEDS.

The problem of maintaining pure varieties of farm seeds is one in which the farmer is vitally interested for upon the seed rests the crop. If the varieties of seed are impure, this will be reflected in the crop when it is harvested.

Prof. F. A. Spragg, plant-breeder of the Michigan Experiment Station, discussed this matter at a session of the Round-up Institute, which was recently held at the Michigan Agricultural College.

Farm Seeds Must be Kept Pure.

If the seed is not kept pure, what will the harvest be? We must expect to reap what we sow and if we sow seed from a lot of miserable and scrawny plants we must expect to reap undersized and shriv-



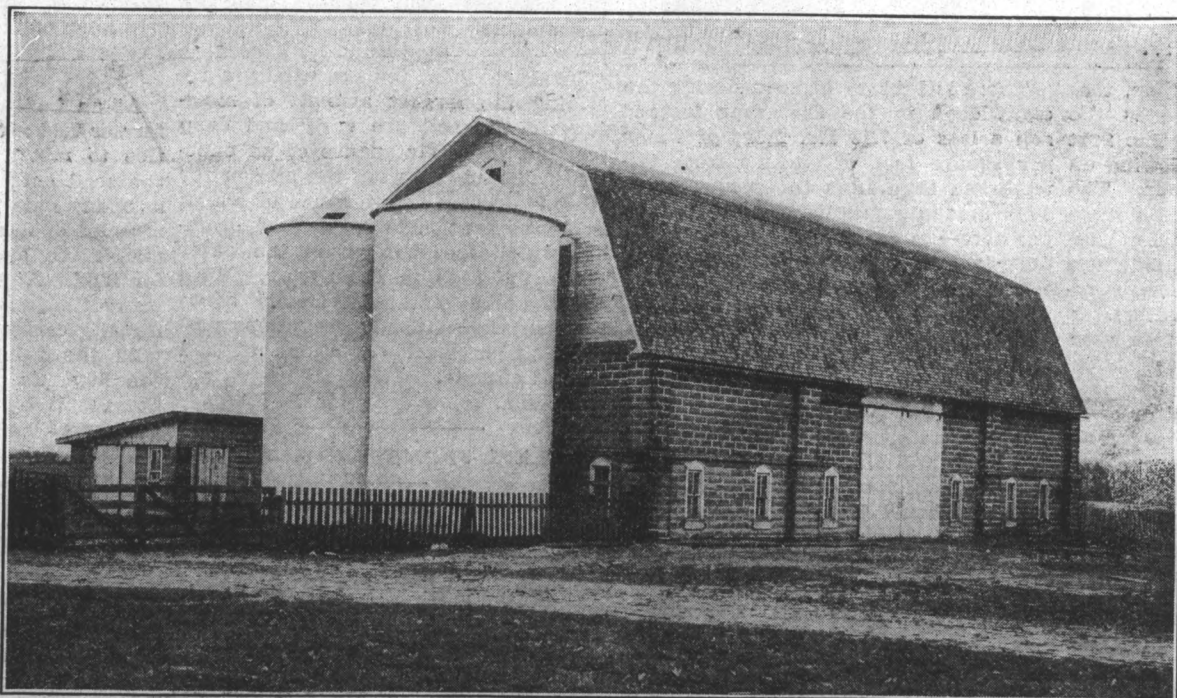
Modern and Permanent Farm Home of Jas. N. McBride, Shiawassee Co.

clusive of caps and base, weighs over a ton, and while massive are comparatively inexpensive and will last forever.

The porch floors, 8x36, are of concrete, with a hardening admixture used; also the steps are of the same construction. Terrazzo, or Venetian flooring, is used on a considerable portion of the house. This is marble chips embedded in cement (not concrete), the marble being the aggregate

sen. The fireplace thus made is antique and rustic in appearance and not over half the expense of the purchased article. A basket in the fireplace makes a pleasant fire for late autumn and spring use. Removing the fire basket allows the use of obdurate chunks of wood which accumulate on the farm.

The main roof is asphalt shingles which are fire-proof from falling sparks, although burning when flame



The Other Buildings on the McBride Farm are also of a Permanent Type of Construction.

eled grain. The problem of keeping the varieties pure on the average farm is not a very difficult matter but it does take a little time. The first thing which Prof. Spragg advised is that the farmer take a half-bushel measure just before harvest time, go into the field and make selection of a few heads. You will be surprised to find what a small amount of time it will take to make the selection and will also be surprised to find what good results may be obtained from this practice. Two or three of these baskets full of heads should be put in a gunnysack and stored away overhead in the granary so that mice or birds can not destroy them. Then, some time in the winter, the heads may be taken down and threshed and run through the fanning mill to take out the light kernels and chaff. This will furnish enough seed to plant quite a patch next year. This will furnish a nucleus from which seed may be kept year after year.

Clean Grain Separator Thoroughly.

There is probably no other agency which is more potent for the mixing

of varieties of farm seeds than the grain separator as it goes from farm to farm doing its work. If one will look at the sieves carried with the ordinary grain separator, doing commercial work, he will find that many of the screens have small and undersized grains still clinging to them when they come upon the farm. It is the mixing of these seeds with those which have been produced upon the farm which is undesirable. Very often each of two varieties is adapted to certain uses, but when the two are mixed, the mixture is useless for either set of conditions for which the varieties are adapted.

If the grain separator were allowed to run 15 or 20 minutes before the seed is saved, better seed would be secured. The separator gets cleaned out thoroughly in that time, and then the quantity desired should be set aside for seed. Since crop production is founded upon the seed as a unit, we cannot over-emphasize the importance of keeping the varieties of farm seeds clean and free from foreign varieties.

I. J. MATTHEWS.

Conserving Soil Moisture.

IT is almost impossible to overrate the importance of water as a factor in crop yields. Where the supply of water is large and uniform, large crops are always raised. Where water is scarce, small crops, or no crops at all, are harvested. Irrigated lands, from the time of the ancient Babylonians to the present, have been the best producing lands known. There is no other factor which exerts so large an influence on the crop as does the water. Soil which is only fair in productive capacity, or is even poor, will produce enormous yields when water is supplied abundantly. In the humid regions of the earth, crop yields fluctuate from year to year, according to the amount and distribution of the rainfall, except in those very restricted areas where irrigation is practiced to tide over dry spells. Such being the case, it is important that every practical means be taken to prevent the escape of water from the soil to the air except through the crop which is being raised. It is the purpose of this discussion to take up in order the following four factors which affect the retention of water in the soil: Plowing, after-cultivation, humus and drainage.

Plowing.

Plowing is universally agreed to be the most fundamental farm operation. In the final analysis, all crops depend upon plowing, and the success of all crops depends more on proper plowing than upon any other one opera-

The second requisite of plowing to conserve moisture is that it be done early—in the fall if conditions permit. When land is plowed in the fall and left rough, the small ridges and hollows tend to retain the snows and rains where they fall; and this insures a more even distribution of soil water on rolling land when spring comes. There is also another point. The winter is to be considered the time for the soil to store up water for the coming season's crop. It has been shown that in the spring, fall-plowed land contains more moisture than nearby unplowed land. In some cases where it has been measured, this difference has amounted to not less than six pounds per cubic foot of soil. In any case, it behooves the farmer to stir the soil in the spring as soon as it is dry enough to be worked without puddling. Water evaporates very rapidly from unstirred soil in the spring. In some cases the amount may reach as much as 20 tons per acre per day. The following brief table, reported by the late Prof. F. H. King, gives some idea of the amount of water lost by delaying plowing. On April 28 samples of soil were taken from two strips of soil which were very close together, and the amount of water present was determined. Strip No. 1 was plowed on the same day and No. 2 was left unplowed. On May 6 the water present in the two strips was again determined, with the following results:

	1st foot, lbs. water.	2nd foot, lbs. water.	3rd foot, lbs. water.	4th foot, lbs. water.
No. 1 (plowed).....	13.87	20.66	18.32	16.05
No. 2 (not plowed).....	10.58	17.98	17.28	13.94
Loss from unplowed land....	3.29	2.68	1.05	2.11

tion. It is very important, then, that the plowing be attended to in the very best manner possible. The first requisite of a good job of plowing on moist soils is that it be deep. The reason for deep plowing lies not so much in any added power for preventing the escape of soil moisture as in the formation of a larger reservoir for catching storm waters. It is a well known fact that rain does not percolate readily into hard, packed soil, nor does it go quickly into the subsoil unless it be sand or gravel. It is the top layer, the furrow slice, kept mellow by cultivation and by more or less regular additions of humus, which catches and holds the storm water, and delivers it gradually to the subsoil below and the plants above. When it becomes saturated, the excess of storm water must flow off. Obviously, then, the deeper the layer of soil, the greater will be the quantity of water absorbed before that layer will be saturated.

There is thus to be seen during the eight days in the first four feet of soil a loss of 7.13 lbs. more of water per square foot of surface from the unplowed than from the plowed land. This amounts practically to 200 tons per acre—an amount sufficient to produce in a crop almost two-thirds of a ton of dry matter. These results give force to the statement made above that the farmer should work his soil in the spring just as soon as danger of puddling is past.

After-Cultivation.

Another important consideration in the conservation of soil moisture is the after-cultivation. This after-cultivation should begin immediately after the soil is turned over. Not a day should intervene, because the furrow slice, and in many places the subsoil itself, is exposed to the free action of the air; and under such circumstances evaporation is exceedingly rapid. The harrow should go on at once. Afterward, throughout the sea-

son, the attempt should be to maintain a good soil mulch. What do we mean by a soil mulch? By such a mulch we mean a finely pulverized surface or layer of soil. This layer must have its capillary connection with the soil below thoroughly broken. The country abounds with farmers who run a cultivator through the corn and thereby scratch a few parallel shallow furrows with parallel ridges between. They then pat themselves on the back and congratulate themselves on the splendid manner in which they conserve the moisture. The fact is that they have not established a mulch. The ridges consist of unstirred soil, and under such conditions evaporation is actually more rapid than before. It is a valuable practice in very wet weather, because it encourages evaporation and lets the air into the soil; but as a measure to prevent evaporation, it is worse than useless. In establishing a soil mulch, all of the surface soil should be stirred.

A third requisite in retaining a large amount of water for the use of the crop is to have a large amount of humus in the soil. Humus works in two ways to increase the storage capacity of soils. In the first place, it has great water absorbing power of itself. This alone would largely account for the water holding power which it gives to soils. Moreover it adds further to the retaining power by holding the soil grains farther apart, thus giving the soil a spongy texture. A soil cannot do its best in supplying moisture to crops unless it contains a great deal of humus. A large part of the value of organic manures and green manuring crops is due to the humus which they supply.

Drainage.

The last topic to be considered here is that of ditching. It seems rather anomalous to think of ditching as a means of conserving moisture—and so it is. Ditching adds no water to the soil, and it prevents none from evaporating; but it does often prevent drouths from being destructive, and for that reason is discussed here. Ditching, especially tile ditching, lowers the water table early in the spring. This is an especially valuable action, as it permits early working of the soil and allows plants to root deeply. Where the water table is high, the roots of plants cannot extend downward to any great extent, because they must have air. When the dry weather of summer comes, the water table sinks rapidly, and the plants are left high and dry in the upper layers of soil. When the soil is properly drained, the plants grow rapidly from the start and root deeply, so that when dry weather comes they are prepared to draw on the moisture supply of the lower layers. It is by the lowering of the level of saturation in the spring, that ditching decreases the damage done by dry summer weather.

Summary.

In short, then, the essentials in retaining the largest amount of moisture in the soil are early and deep plowing, the maintenance of an effective soil mulch during the season for cultivation, the maintenance of a high humus content, and a system of drainage which does not permit the water to be too high in the spring. With these points carefully looked after, we may expect the largest crops possible under local conditions of soil and of climate.

Indiana.

H. E. MERN.

LILLIE FARMSTEAD NOTES.

The winter is going—practically gone. The sun's rays are getting so direct that one can feel the increased warmth. The days are much longer, and one feels the thrill and the joy of approaching spring. Winter has its pleasures but spring brings hope and real joy to the farmer and to all. We can have little complaint to make

about the weather during the past winter. It has been almost an ideal winter for enjoyment and for the farmer generally. There is no doubt but what the lumber business has suffered on account of the extreme warm temperature during the early part of the season, but the latter part of the winter has been such that they will get out of it much better than they thought at first. And so the ice man was nervous, but the first of February he had an ice crop that was all that one could wish for.

Our cattle and other live stock have wintered in better condition than normally. I think this is due somewhat to better quality of hay as well as to the moderate temperature.

We had so much fall plowing done last fall that I am anxious to get to work again on the farm, because it seems to me that we can get our crops in this year earlier and in better condition and that the promise for the future is brighter than ever.

An Emergency Ice House.

For several years we have not put up any ice on the farm, because we did not think it necessary. The cream was the only product that needed it and this was sent to the creamery twice each week, and by keeping it in cool water we did not have any trouble in keeping the cream sweet and in fairly good condition, at least the creamery made no particular objection to it. But now conditions have changed just a little bit. The cream now goes and will in the near future, at least, to an ice cream plant in the city. Cream must be in extra good condition for the making of ice cream, consequently I did not want to risk going through the summer without some ice, because we might need it in order to keep the cream in good condition, although we expect to ship it or haul it every day. But I had no ice house. This ice cream proposition is something of an experiment. We didn't have the time; we didn't like to go to the expense at the present time of putting up an ice house, still I wanted ice for the hot weather next summer. The old saying is, "necessity is the mother of invention," and so it seemed with us. Along about the first of February we had one of the silos empty. We have fed from this silo from the fall at the time of filling and have just emptied it. We conceived the idea that we could put ice into this silo and that the hot weather would be over with before we needed the silo to refill along the last of next September or first of October, and why not utilize the silo, and so we have put up ice in the silo. It was not very convenient to get sawdust, because we are just passing out of the sawdust era in this country and it is hard to get, and so we have used straw, leaving quite a space between the ice and the side of the silo, we have tramped in straw and also covered the ice with straw. How it will keep of course I do not know, but I expect it will keep fairly well.

Flax in Oats.

At an institute in Sanilac county a farmer told me it was a splendid practice to mix a little flaxseed in with the seed oats and you could get just as many oats and could raise quite a nice lot of flax. Flax in with the oats makes the oats much more valuable for feed. Now I have been bothered many times in getting flaxseed meal for the calves, young calves, to mix with the skim-milk. Sometimes you can buy this product on the market, but the last time I bought it on the market we had to pay about \$5.00 per 100 pounds. This is expensive, although flaxseed contains 30 per cent fat. Then I bought some flaxseed and ground it, but you can't always get flaxseed. And so I tumbled to this idea at once and bought a bushel of flaxseed and intend to mix it in with the oats. Then, by running the oats through the fanning mill we can separate the flax and have our own for grinding and be independent.

SOY BEANS IN CHEBOYGAN COUNTY.

About one year ago I saw an article in the Michigan Farmer on soy beans, by E. E. Evans, and it seemed so good to me that I made up my mind to try some myself. I sent for one bushel of seed and drilled three acres, drilling them in rows 28 inches apart. I did not get to plant them until the 21st of June. They began to come up in 92 hours from the time of planting, and grew very rapidly, as the ground was moist and warm at that time. I cultivated them three times and got very good results from them. I put half of them in the silo, mixed in with the corn, about one part beans to six parts corn, and I have very fine silage which the cows like immensely. I made some into hay, and the cows are very fond of the hay. I left one-half acre to get ripe, and have been feeding a small amount to three pigs each day; they are very fond of them and I never saw small pigs do as well in the winter time. I think they are the best feed I have ever fed. I have not fed my sows any oil or cottonseed meal, and they are in fine condition.

I treated the beans with pure culture, but drilled the first three rows with seed that was not treated, then

where gravel containing limestone has been applied to the road."

While at my home, which is at Grindstone City, Mich., during my vacation, I noticed a phenomena that seemed to me of greater moment than that seen on country roads.

You doubtless know that at Grindstone City is located the grindstone industries of the Cleveland Stone Co. In the process of the manufacture of these stones, a large area of the earth's surface is quarried, and there is a great deal of waste rock, which is put into the old quarries to fill them up. But when the firm first began the industry, about 40 years ago, they piled a lot of this refuse rock near the lake shore.

To understand what follows, you must know that this refuse rock is usually very small pieces of the stone that are too small to be made into grindstones or scythestones or are small pieces that have been broken, or chipped from the larger stones in process of manufacture.

One day I walked out over this large pile of refuse stone, which had eroded very little during its 40-year exposure to the action of the atmospheric agents, and I was surprised to find that it was covered by a rank and tall growth of sweet clover.

I could not determine how this tall,



Uninoculated and Inoculated Soy Beans Grown 28 Inches Apart.

went on with the seed that was treated, and you have no idea of the difference in the growth and color of the plants. The roots of the inoculated plants were loaded with nodules and such large ones, while those that were not treated had but one here and there, and those very small. I am sending you a picture with two specimens that grew just 28 inches apart.

Mr. Evans said in his article that soy beans would stand more heat and more cold, and more wet and more dry weather than corn, and that he really thought they did better on poor soil than they did on rich soil, which I find to be true. I planted some samples that I had in May, and they soon came up. We had a number of frosts after they were up, and I did not see any of them frosted, and in the fall my corn and potatoes were killed long before my soy beans were.

The ground that I planted was a good clay loam at one end of the field, and in the center it ran up to quite a sandy knoll, and right on the top of this knoll is where I had my best soys.

I did not harvest my soy beans that I let get ripe, until the middle of October. I shall sow more soy beans this coming season.

Cheboygan Co.

D. PIFER.

SOME OBSERVATIONS ON SWEET CLOVER.

I note in the issue of February 21, your reply to J. D. H., relative to "Sweet Clover as a Soil Builder and a Forage Crop."

I was particularly interested in that part of your reply which referred to the familiar phenomena "which can often be observed along country roads

rank growth of sweet clover could subsist on so little moisture; for, although the stone pile was close to the shore—being about 50 feet from the water's edge—it was at least 10 feet above the level of the water.

I resolved to find out; so I began to throw away the small stones that were around the roots of one of the smallest of these sweet clover plants. I worked at this for quite a long time but still I could see that small rootlets led downward.

Glancing over at the water I was at once convinced that all of this large patch of sweet clover was watered by the waters of Lake Huron itself. Each plant had sent its roots downward among these stones for ten feet to the lake level. Then, too, I realized the relationship which the sweet clover bears to alfalfa, remembering as I did that the latter plant often has a root, or set of rootlets that are from six to ten feet in length.

Where the seed came from, which seeded this stony tract of land, I do not know, unless it was due to the wind.

Huron Co.

C. B. WINTER.

WATCH FOR THE NEW THINGS.

It is not always the man who gets into the field at daylight and remains until dusk that gets ahead. Sometimes a man is so busy with his hands that he has no time to use his head.

Every implement or appliance that supersedes manual labor is a step toward a higher civilization and a more profitable agriculture.

Watch the advertisements in the Michigan Farmer for new and improved devices. You will at least keep yourself informed concerning them.



Studebaker wagon in five runaways—and still working

Mr. Andrew Kittleson, of Litchfield, Minn., bought a Studebaker Wagon in 1869. He is proud of his Studebaker, and his letter describing its long life of usefulness is so interesting that it would be difficult to write a better advertisement. Here is Mr. Kittleson's letter:

"I bought my Studebaker in November, 1869, at Litchfield from Flynn Brothers, and it has been continually used on my farm ever since. This wagon has given me perfect satisfaction. Never was there a lighter running wagon and it has been of no expense to me. It has hauled thousands of bushels of grain to market, over mighty poor roads.

"My Studebaker has been through five runaways. On one occasion the team ran half a mile and into some oak trees where horses and wagon hung until help came. Another time my team ran into a stone pile. One horse was killed but the wagon was uninjured. It seems to stand all it can get.

"When I built my home I loaded 5000 pounds of sand into my Studebaker. The carpenters were surprised that the wagon could stand such a big load. I am using this wagon at the present time and expect to use it for many years to come."

A 45 YEAR TEST IS PROOF ENOUGH

Don't let anyone sell you a farm wagon, at any price, with the claim that it is just as good as a Studebaker.

You can buy Studebaker Buggies and Harness that will give the same satisfaction.

STUDEBAKER

NEW YORK
MINNEAPOLIS

CHICAGO
SALT LAKE CITY

DALLAS
SAN FRANCISCO

KANSAS CITY
PORTLAND, ORE.

South Bend, Ind.

DENVER

Adv. 2005

Studebakers last a lifetime

Potash for Orchards

They need it. They draw more Potash from the soil than they do of nitrogen and phosphorus. Be sure you use enough

POTASH

to insure the maximum yield of large, well-flavored and good-keeping fruit, and strong buds for next year.

An army of orchardists have proved that **Potash Pays**. They use an orchard fertilizer containing 10% to 12% actual Potash—400 to 600 lbs. of Muriate or of Sulfate of Potash per ton of fertilizer.

Write to us for prices on Potash Salts, any amount from one 200-lb. bag up. Ask, too, for our fertilizer formulas for fruit—apples especially.

GERMAN KALI WORKS, Inc.

42 Broadway, New York
Chicago, McCormick Block Atlanta, Empire Bldg.
New Orleans, Whitney Central Bank Bldg.
Savannah, Bank & Trust Bldg.
San Francisco, 25 California St.

POTASH
PAYS

POTASH by Parcel Post

We will sell you 20 pounds Muriate of Potash or 20 pounds Sulfate of Potash for \$1.00.

DELIVERED FREE by Parcel Post—anywhere east of the Mississippi and north of Tennessee and North Carolina.

Send cash, stamps or money order to our nearest office

GERMAN KALI WORKS, Inc., 42 Broadway, NEW YORK
McCormick Block, CHICAGO, ILL. Continental Bldg., BALTIMORE, MD.

CLOVER \$5.00 Per Bu.
AND TIMOTHY
INVESTIGATE—Best and Cheapest Seeding Known.
Alsike Clover and Timothy mixed, Fully 1-3 alsike, a big bargain. Greatest hay and pasture combination grown.
Write for Free Sample and 76-page catalog and circulars describing this wonderful grass mixture. Beats anything you can sow and ridiculously cheap. We handle only best tested and cleaned seed guaranteed. Write before advance.
A. A. BERRY SEED CO., Box 631, Clarinda, Iowa



PUMP GRIND SAW

Made to Hard Use

Wood Mills are Best. Engines are Simple

Feed Grinders, Saw Frames, Steel Tanks

CATALOGUES FREE AGENTS WANTED

Perkins Wind Mill & Engine Co. Est. 1860

135 MAIN ST. Mishawaka, Ind.





BIG MONEY MAKING CROPS with A.A.C. Fertilizers

THE best is none to good for you. About a thousand tons of surface soil are cultivated to the acre, and it is hard to understand why an application of a few hundred pounds of good fertilizer will make such a wonderful increase in the crop, but it is a fact. Our fertilizers are quickly soluble and are so compounded that they thoroughly enrich the acre of soil, just as a few drops of bluing will color a large amount of water.

About seven million tons of fertilizers are used in this country every year. We supply a large portion of this from our factories, located from Maine to California.

We furnish a fertilizer with 34% available phosphoric acid; special grain fertilizer 2-12-3 and 20-4 analysis; also half potash fertilizer for muck land. We make the best goods most suitable for different crops grown on all kinds of soil.

Write us for further information. We will send you a booklet on fertilizers, also a large handsome calendar.

We want agents for unoccupied territory under our Consignment Contract. Send your name and address. We are sure we can interest you.

The American Agricultural Chemical Co.
Detroit Sales Department, Detroit, Mich.

Also Cleveland and Cincinnati. Address nearest office.



SWEET CLOVER FOR PASTURE ON HILLY, SANDY LAND.

I have ten acres of hilly, sandy soil that I wish to seed and make into pasture land. What kind of grass would you advise for this soil for permanent pasture? This field has not been seeded for 10 or 12 years and for the last two years has laid idle. I have thought of sowing it to sweet clover. Would that be apt to catch well and should I sow a nurse crop with it? If so, what should I sow and what time in the season should I sow? If I should prefer, could I sow this field to anything that would furnish me pasture this summer for cows?

Genesee Co.

H. C.

Sweet clover will not make a permanent pasture any more than red clover. To my mind you can't get any better pasture on this land than common red clover. This is well rooted and perhaps more thrifty, especially on sandy land. If this land is quite sandy the sweet clover might be an improvement. Early this spring it probably would be better to seed it with a light seeding of oats or barley and then cut the oats or barley for hay, getting them off early and give the entire ground to the sweet clover. You couldn't pasture it until late in the season. Sweet clover will make quite a lot of pasture and would produce seed if not fed off and re-seed itself partially. It is just the same as red clover. Either one of them, if they are pastured down or if they are mowed often enough, so that they don't go to seed, will hold in the soil a much longer time than if allowed to go to seed. One can make quite a permanent pasture out of common red clover if he doesn't let it go to seed. To have a permanent pasture, one that endures for years, we should have a mixture of grasses. It is a splendid thing to mix clover seeds in with the seed, because they start quicker and you get more out of them and they are gradually run out by the other grasses. A mixture of common red clover, sweet clover, and alfalfa and some white clover, together with timothy, orchard grass, meadow fescue, and tall meadow oat grass, would be a good combination for a permanent pasture on this field. The fact is, the more grasses you get into a permanent pasture the better, so that you have something that is pretty good during the entire growing season.

We really know little about sweet clover as a pasture crop or as a hay crop or any kind of a forage crop for this country at the present time. In the south it is grown some and is now grown some, I understand, in the northwest. I experimented a little with sweet clover a few years ago, sowed it right along the side of alfalfa and common red clover, and it didn't do as well as either one of these plants, but it might next time. I believe that if this field was up in shape, was rich enough to get a good stand of alfalfa this would be an ideal place to put alfalfa, because alfalfa will remain down a good number of years without replowing if you keep it fertilized. The only trouble with the alfalfa proposition is that it does not make a good pasture plant. It ought not to be fed off indiscriminately. When the new shoot starts from the crown the alfalfa ought to be cut, the sooner the better, but it ought not to be cut until this new growth does start. Consequently it is not an ideal plant to pasture except for hogs.

If you want quick pasture, that is, pasture for this summer, I know of nothing any better than peas and oats. Sow this field to peas and oats as early in the spring as possible, using equal parts of peas and oats by measure, and sowing about two and a half bushels per acre. When they get four or five inches high, you can turn the cows on and have quite a considerable pasture this summer. The other crops will not furnish pasture until late in the season and

ought not to be pastured very much until the next season.

COLON C. LILLIE.

POWDERY POTATO SCAB IN MAINE.

A recent investigation has shown that the powdery scab of potatoes exists in portions of Maine adjacent to or near the Canadian border, which has been traced directly to seed potatoes brought over from the infected districts of New Brunswick. Thus far only a very small per cent of Maine farms have been found affected, the infestation being worst in the extreme northern part of Aroostook county, which is not as important a potato district as the southern end of the county, where also a few scattered cases have appeared.

The federal government in an advisory capacity is now co-operating with the state officials to insure that all potatoes that go out are inspected and certified to be free from powdery scab, while the Maine authorities are making a search for all cases of the disease. The action contemplated will not prevent the shipment of sound potatoes from this important district, but will safeguard the interests of other states that depend upon Maine for their seed supply.

Washington, D. C.

G. E. M.

FARM NOTES.

Cement Floors for Horse Stable.

I am going to build a horse stable against one end of my barn, 16x30 ft. What is the best floor plan for same and does it want any incline if built of cement? If built of cement does it need plank on top of cement?

Leelanau Co.

M. W. F.

Concrete makes the best floor for any stable. It is a satisfactory floor for a horse stable and is all right for the stalls except for a few horses that have the pernicious habit of pawing their bedding back. The writer has used cement floors in his stable, including the stalls, with entire satisfaction for some years, but one horse would remove all his bedding each night, and a plank floor was supplied in this case. The floors in the stalls should be given a slight fall toward the rear of the stall and if grooved, say one-half inch, will be more satisfactory for geldings.

Substitute Hay Crops.

I have seven acres of land, part clay and part sand, sod ground, that I would like to sow some kind of seed on that would make hay this year, as I have no other hay. What would you advise as best to sow and how much per acre?

Barry Co.

F. F. M.

There is perhaps no better substitute crop for hay than peas and oats where sown early on a suitable soil. If this sod ground is a clover sod and in a fair state of fertility this would be a good combination to sow. If it is a June grass or timothy sod it would be better to sow soy beans or even cowpeas in drills and give cultivation between the rows. Cultural methods best adapted to the growing of these crops will be published in these columns at an early date.

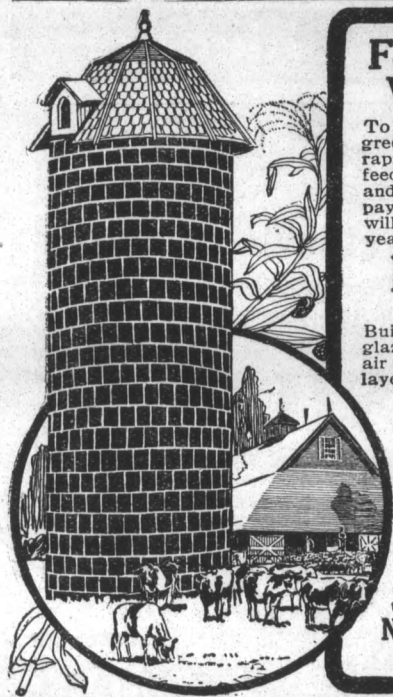
The King System of Ventilation.

Can you tell me anything of the King system of ventilating barns? We are building a basement barn 30x40 ft. We want to know how to install the system.

Van Buren Co.

W. H. A.

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each animal, where the outtake is 30 feet high. If higher the draft will be stronger and the flue can be made a little smaller, and vice versa. The theory of the system is that the main ventilating flue will carry the foul air from the stable and the intakes will admit fresh air without unnecessarily lowering the temperature of the stable, since the air of the stable is warmer than that outside and will not pass down through the intakes. These should, however, be provided with shutters as a strong wind may necessitate the closing of those on one side of the stable during very severe weather.

Peas and Oats on Light Land.

Would peas and oats be practical to sow for hay on light run-down land? Also would it pay on first-class land to thresh for grain?

Kent Co. G. S.

Under favorable conditions as to distribution of moisture, peas and oats will make a fair growth on rather thin land if gotten in early, but neither is a dependable crop on this type of soil. In many sections of the state soy beans and cowpeas are used as a substitute hay crop with far better success. The cultural methods best suited for success with these crops and the results secured from them on thin soils will be published in these columns at an early date. Peas and oats make a profitable grain crop for feeding, on good land.

Fertilizer for Timothy Meadows.

Would it pay to use nitrate alone on a field of timothy? I have a field sown to timothy and clover but the extreme dry weather killed most of the clover. I want to mow the field for hay. Would any fertilizer help the crop, if so how much would be about the right amount? If fertilizer is applied to the hills of corn after it has come up, about how much should be used to each hill?

Cass Co. P. A. K.

Nitrate of soda used alone on a timothy meadow would undoubtedly stimulate a better growth than would be secured without any fertilization. Whether it would be profitable or not on any given soil could only be determined by a trial. About 100 pounds per acre would be a maximum application, as there is danger of injuring the plants under certain weather conditions by the direct surface application of a concentrated fertilizer such as nitrate of soda. In a recent work on Fertilizers and Crops, one of the best authorities in the country recommends the early spring application of a mixture of fertilizing ingredients which will afford 5.5 per cent of nitrogen, six per cent of available phosphoric acid and six per cent of potash, using it at the rate of 400 to 800 lbs. per acre.

Applying Fertilizer to Corn.

If fertilizer is to be applied to corn in the hill it should be done at the time of planting instead of after the corn is up. The writer formerly used a fertilizer attachment and distributed the fertilizer in the hill at the time the corn was planted, but found it unsafe to use more than 100 pounds per acre in this way, as larger applications were likely to injure the germinating quality of the corn if the weather happened to be dry at the time of planting. Later, this practice was abandoned and about 500 pounds per acre sown broadcast and harrowed in when the ground is being fitted for the corn. The corn plant has an extensive root system and will make better use of fertilizer applied in this way than most cultivated crops.

Speltz as a Grain Crop.

What can you tell me about speltz as a profitable crop? Would it be advisable to sow it in place of oats for a grain crop to feed out to stock? How would it do to mix with oats and sow, say one-half of each?

Oakland Co. E. W. M.

While Speltz has been grown successfully in Michigan in an experimental way, it is better to experiment with it than to substitute it for oats as a main crop until it has been demonstrated that it is superior to oats on any given soil. Winter emmer, also

sometimes erroneously called speltz, has been more successful than spring sown speltz in some localities.

Varieties of Soy Beans for Michigan.

Having lost my clover crop I am thinking of planting soy beans. Which do you consider the best variety for hay, and would you advise using Michigan or southern grown seed? How many must I sow per acre, soil being fairly good, consisting of a sandy loam with clay sub-soil. Is it necessary to inoculate soil and seed?

St. Joseph Co. W. J. K.

Some of the varieties of soy beans which will ripen in Michigan make a rank growth, and the writer would favor the use of some of these rather than seed grown too far south, although some Michigan growers seem to favor southern-grown soy bean and cowpea seed where the crop is to be cut for hay. The Mikado is a favorite variety with some who have grown soy beans for this purpose in Michigan. The seed should be drilled in rows 28 to 30 inches apart at the rate of about one-half bushel per acre.

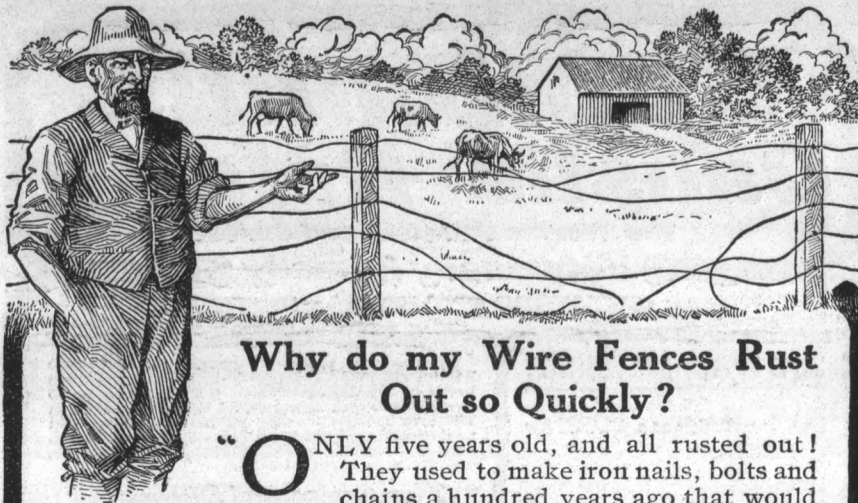
THE DREDGE DITCH.

The most potent factor in recent years, in the conversion of uncultivated land into tillable, fertile farms, has been the dredge ditch. Not since the axe of the pioneer changed the wooded hills and dales to cleared fields, has so marked a transformation taken place as that made by the coming of these dredge ditches. Thousands of acres of untillable marsh and swamp land have been converted into level meadows and pasture fields, or fields of waving grain. A marsh over which the writer skated in boyhood and which in time of high water resembled a lake rather than a marsh, now lies high and dry, its hundred acres being counted among the most valuable in the neighborhood. Meandering creek-beds lined on either bank by a yard or two of trees and bushes, have been straightened and the plowshare and harrow stir the rich earth where once the creek meandered and the willows stood.

With the dredge ditch, as with every other innovation, whether in rural communities or elsewhere, progress was at first slow, and many owners of land in the path of the new improvement, fought the proposition to the last. Often the enterprise meant greatly increased taxes, with no immediate benefit in sight. But experience has shown the benefits of this kind of draining and its advantage over the old-time, hand-made ditches which did not drain properly and were forever filling up with muck and other material. It is now admitted by all, that in most cases at least, the value of land drained by a dredge ditch, has been increased beyond all proportion to the extra ditch tax. From the immediate viewpoint of dollars and cents, therefore, the change has been for the better, adding thousands of acres to the tillable land and increasing greatly, the value of farms affected.

But while the results seem apparently, to be all of a beneficial nature, there is another side to the dredge ditch question, worth considering. It is held by those in a position to speak with authority, that deforestation has already been carried too far in this country. It is claimed that the terrible floods which inundated portions of Ohio and Indiana, last year, would have been impossible, had the headwaters of the rivers lain within thickly wooded regions. Torrential floods and suffocating droughts make up the weather conditions in countries totally deforested. In view of this fact, the question arises, is the dredge ditch only another method by which the land may be more certainly cleared of every vestige of wildness? The immediate effect is beneficial; but will this prove true in the long run, or will it be found that man has over-reached himself in his battle with Dame Nature?

Hillsdale Co. J. A. KAISER.



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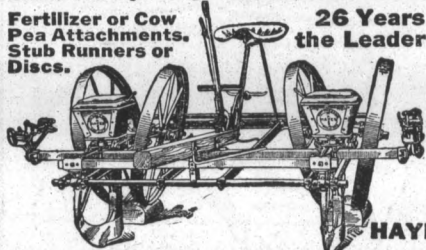
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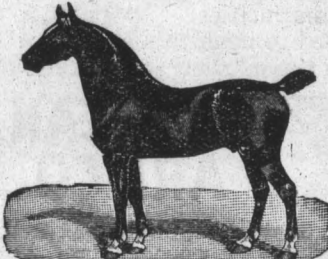
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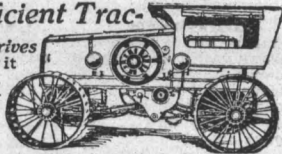
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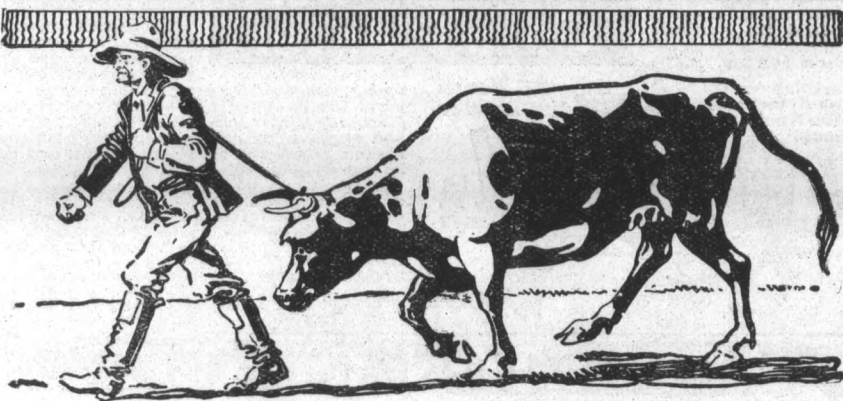
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Live Stock.

THE FEEDING AND CARE OF THE ORPHAN COLT.

Many farmers who lose the mare shortly after or during parturition are forced to raise the colt by hand. They are confronted with the problem of feeding such a foal to secure the best results. It is a tedious task and requires a great deal of patience, and great care in cleaning thoroughly all the utensils used in feeding.

Cows' milk is the only milk that can be fed to the colt satisfactorily. The less amount of butter-fat it contains the better suited it is as a food for the orphan colt. There is some difference in the composition of cow's milk and mare's milk. Henry gives the average composition of the two as follows:

Mare's milk, 72 tests: Water, 90.58 per cent; casein and albumin, 2.05 per cent; fat, 1.14 per cent; sugar, 5.87 per cent; ash, 0.36 per cent. Cow's milk, 705 tests: Water, 87.27 per cent; casein and albumin, 3.39 per cent; fat, 3.68 per cent; sugar, 4.94 per cent; ash, 0.72 per cent.

These figures show that the mare's milk contains more water but only about one-half as much casein and albumin and ash as the cow's milk. The cow's milk contains over three times as much fat as the mare's milk. This shows the importance of adding water and sugar to the cow's milk, as is the practice among the farmers who are successful in raising colts.

The first milk of the dam (the colostrum) acts as a laxative to remove the faeces from the bowels of the new-born colt. It is very important that the colt gets some of this colostrum. Some farmers even draw this milk from the mare thinking it dangerous to the colt. If the orphan does not receive the colostrum in a short time it should be given a dose of two ounces of castor oil and one ounce of sweet oil, in fresh cow's milk.

Digestive disturbances occur very readily in hand-fed colts and it is important that special care be given in preparing and feeding the colt. Add enough water to a tablespoonful of white sugar to dissolve it, then add four tablespoonfuls of lime water and enough fresh milk to make a pint. The lime helps to correct the digestive disorders and also keeps the organs in a healthy condition. Feed almost one-fourth of this mixture every hour for the first few days. Never feed the colt cold milk, always be sure that it is at blood temperature.

Some farmers feed the colt from a pan or bucket. This method is a good one if the colt will drink, but usually the quickest and most sanitary method is to feed him with a bottle and nipple. After feeding clean all utensils thoroughly, since milk is an excellent medium for the growth and development of bacteria. The intervals between feeding can be lengthened and more feed given as the colt grows older. The amount of feed given should be guided by the condition of the colt. If it scours cut down the amount of milk and give the animal two ounces of castor oil and one of sweet oil. After the colt is three months old give it all the skim-milk it will drink, three times daily, leaving out the sugar.

Encourage it to eat alfalfa, clover and grain. Feed it crushed oats and bran with the hand and it will form a liking for the material. As it gets older crushed corn and bran, equal parts by bulk, with a small amount of linseed meal makes an excellent ration. If the colt can be turned out on pasture in early spring so much the better. Be sure to feed the colt liberally, especially while it is young

and it will turn out to be as good a horse as if the mother had raised it.
Indiana. J. C. KLINE

STORY OF THE BREEDS.

Aberdeen-Angus Cattle.

Will you kindly publish in your paper a brief history of the Angus breed of cattle?

Tuscola Co.

C. H. K.

The origin of the Aberdeen-Angus breed, like that of most of the British breeds, is largely if not purely a matter of speculation. Authorities are divided in opinion as to whether the breed descended from the polled wild white cattle of Britain, or whether the breed is a "sport" from a black breed with horns which formerly existed in Scotland. The breed takes its name from the counties in northeastern Scotland where these cattle came into earliest prominence, namely: the counties of Aberdeen, Kincardine, and Forfar, also known as Angus. By some authorities this excellent breed is thought to have been developed by a combination of the blood of two polled breeds formerly common in Scotland, one sort of which were rather small and puny cattle, commonly kept by crofters, (small tenant farmers), and a larger and better developed kind of cattle which furnished the black color, while the small kind perpetuated the polled characteristic, and furnished a large element of the stamina for which this breed is justly noted; this is, however, as above stated, a matter for speculation.

The improvement of the Angus cattle first occurred, so far as it is a matter of recorded history, during the first third of the nineteenth century. The first really great improver of the breed, Hugh Watson, of Keillor, Forfar, commenced his work between 1808 and 1816, and by practically the same methods as were adopted by Colling and other great breeders in improving the other British breeds, he produced animals of improved type which won at all the great shows and did much to popularize the breed. Other famous early breeders, include Wm. McCombie, of Tillyfour, Aberdeen, and some half-dozen other noted breeders whose work was accomplished during the first half of the nineteenth century. The breed was first introduced into America in '73, the first importation being made by a Kansas breeder. A few were brought over in successive years, but importations were not numerous until the early '80's, since which time their distribution throughout the United States has been remarkably rapid, and that the breed has given a good account of itself is evidenced by its persistent winnings at the International Live Stock Exposition and other shows.

The characteristics of the breed are too well known to every person who has been a patron of even our state fairs, to make a description in this connection necessary.

Many stockmen are looking around for stock steers and well-bred feeders for refilling their feed lots, and buying orders in the Chicago market are increasing, this demand coming largely from Illinois and Indiana. Demand has centered in choice-bred yearling stockers and high-class 800 to 900-lb. feeders, with a much stronger demand for nice little yearlings than for other descriptions. A great many attractive lots of cattle have been shipped back to feeding districts that cost around \$7.50@7.75, with limited purchases of prime steers all the way up to \$8, while a commoner to fair class sold for \$6 and upwards, with inferior cattle selling below \$6.

A HOG CHOLERA CONFERENCE.

A conference on the hog cholera problem was held in Chicago by state and federal experts and officials, on March 3, 1914. A committee, composed of R. A. Pearson, President of Iowa Agricultural College; Ward Giltner, Bacteriologist, Michigan Agricultural College; Geo. R. White, State Veterinarian, Tennessee; W. H. Jar-din, Director Agricultural Experiment Station, Kansas, and W. B. Niles, in charge of the Federal Serum plant, formulated the following resolutions relating to the policy of state and federal authorities in the matter of the control of hog cholera:

Resolutions Adopted.

We regard hog cholera as one of the greatest questions before the public at this time. The disease has been prevalent many years, with losses fluctuating between wide limits. The heaviest losses, as shown by the best available data, were 120 and 130 hogs per thousand in 1887 and 1897, respectively. The estimates for 1913 are 100 loss per thousand, and the indications are that the disease is passing through another period of rapid increase. In view of the high cost of living, such enormous losses of a valued food product must be regarded as a calamity.

The main problem at this time is to control the disease. With progress now being made, both in science and practice, it may be expected that the question of eradication will come up later; but unquestionably, the matter of control will be uppermost for years to come.

For success, the first requirement is an honest and earnest purpose to co-operate as between all the interests involved, especially the scientists, the veterinary profession, farmers, common carriers and packing interests.

The control and final eradication of hog cholera will depend largely upon the education of farmers to the importance of observing sanitary principles.

The serum alone treatment may be given by anyone without danger of causing the hog cholera, the danger to those treated being due to ignorance of the use of serum or of sanitation. While it is preferable to have serum used only by competent veterinarians, it is not deemed advisable to require that laymen may not use serum alone.

The closest possible supervision of the manufacture and distribution of serum should be provided, to assure its purity and potency. It is believed that this should be in charge of federal authorities in such plants as may properly come under their supervision, and provision should be made in the different states to duplicate and supplement the federal efforts along this line.

It is desirable for the states to manufacture serum, but neither by the size of the plant nor by the price of the product should this effort be monopolized by the states.

The simultaneous treatment should be used only by those who have had special training. The ideal arrangement would be to allow its use only by federal and state veterinary officers. Other officers who have had sufficient training in the use of virus, and in sanitation, may use the simultaneous treatment with safety. Where it is not possible to restrict virus to official hands because of shortage of funds or lack of officers, or for other uncontrollable reasons, it should be used only by such other persons as have been given a special permit after receiving special instruction, which is as thorough and detailed as feasible, and who show that they understand the essential fundamental principles. But in any such case, the unofficial laymen should be permitted to use virus only in his own herd, and then only if the district is already infected.

The manufacture, distribution and use of virus should be rigidly controlled by federal and state authorities.

Quarantine and sanitary measures should be much more actively emphasized and enforced. Especially is it important that freight cars which have carried infected stock shall be promptly disinfected after unloading and infected premises should be rigidly quarantined.

The prevailing practice of rushing sick herds to market should be discouraged in every way possible and in lieu of such disposal of sick herds, the owners and other persons concerned should be advised and encouraged to treat them with anti-hog cholera serum.

That the promulgation and enforcement of all live stock sanitary regulations and other measures incident to quarantine remain invested in the live stock sanitary boards and state veterinarians of the various states.

Progress in combating hog cholera is being made. Special credit is due to individual efforts on the part of veterinarians and farmers. The intelligent interest of county agricultural agents is commended and it is believed that those agents should give chief attention to assisting farmers to secure the aid of competent veterinarians, and when that is not possible, they should assist the farmers themselves to take proper remedial measures, always emphasizing the importance of sanitation. There is recommended the temporary assignment of a competent veterinarian by the state government independently or in co-operation with the federal government to any district where difficulties on account of hog cholera are most acute, his services to be available to farmers without cost, for the purpose of demonstrating the best methods in different communities.

Work of the highest character is being done by the United States Bureau of Animal Industry, which Bureau brought out the serum treatment for hog cholera, a treatment which has been adopted in most states and countries where the disease exists. We acknowledge with appreciation the action of Congress, whereby far more liberal provision than ever before has been made to investigate and combat the ravages of hog cholera. Similar provision has been made in several states, but the legislatures are urged to make more liberal appropriations of this character.

There should be the closest co-operation between states and federal authorities and all persons concerned should be willing to suppress their own opinions on relatively unimportant matters, and follow the lead of federal authorities in the interest of the adoption of uniform methods throughout the entire country.

The wool markets of the country are displaying decided firmness in prices, with reviving speculation, whereas last year speculation was at low ebb. The fact may be accepted that those who have made contracts to sell wool yet on the sheep's back have given buyers too great an advantage, with scarcity developing all over the world, especially in the United States, and stocks carried over from last year well sold. As manufacturers are carrying extremely little wool, the new spring clip will be offered on a bare market, and strong prices are assured. There is already competition for grades of wool that have been wholly without demand for months past, and buyers are showing interest in grades that were actually unsalable only a few weeks ago. A prominent wool dealer in Chicago remarks that contrary to the expectations of a great many authorities in the textile industry, American mills are able to meet foreign competition and to hold their own.

There is going to be lively competition for southern stock cattle as soon as the spring opens, and the Pacific coast is sure to make heavy purchases for replacing the great depletion caused by the long drought of last year.

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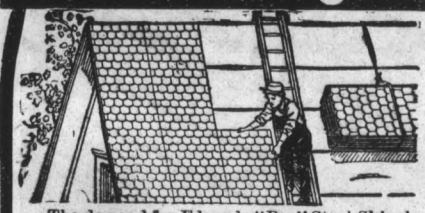
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Practical Science.

A SOIL FERTILITY PROBLEM.

(Continued from last week.)

Mr. Quarries' Letter.

Somewhere in his his agricultural chemistry, Liebig says that all soils, with but rare exception, contain really in plenty of every element of fertility necessary for the fullest crops; but that these ingredients are lying there in a latent and therefore useless state, and this simply for want of a solvent. Carbonic acid, he points out, is the proper solvent; and this the soil has to draw from the small percentage of that gas mechanically mixed with the atmosphere, and from slow processes of oxydation. In five thousand measures of air there are but two measures of carbonic acid.

Carbonic Acid as a Solvent.

Carbonic acid is not only thus useful as a solvent, setting free many fertilizing elements in the soil in a soluble state, and, therefore, available to plants; it also attracts nitrogen from the atmosphere, decomposing it and forming carbonate of ammonia, which is an invaluable constituent of the most nutritious parts of plants, such as their fruit and seeds. There is great abundance of nitrogen in the atmosphere. In five thousand measures of air there are four thousand measures of nitrogen. But plants cannot absorb nitrogen to any appreciable extent directly from the atmosphere. They can take it up in quantity, only through their roots, from the soil, and then only after it has been converted into ammonia through the agency of carbonic acid.

As Liebig and other agricultural chemists point out, the black earth, composed of decayed organic matter, called humus, is a very valuable ingredient of the soil. But it is by itself perfectly insoluble in water, and, therefore, is of no direct use to plants. Its chief use is as an absorbent of carbonic acid from the atmosphere. Carbonic acid, after it is thus absorbed, attracts nitrogen from the atmosphere, turning it into ammonia, as above stated, the most valuable of all plant foods. In this way only is humus a valuable constituent of the soil.

Now, I found myself thinking this way: Ammonia is the most valuable of all fertilizers. Ammonia comes from nitrogen. The atmosphere is full of nitrogen. But the only way nitrogen can be used by plants is when it is changed to ammonia; and the only way to make that change is through the agency of carbonic acid. Then, why not promote that desirable change by supplying carbonic acid artificially and directly to the land? We are continually supplying nitrogen artificially to the land, as ammonia, while we know that four-fifths of the atmosphere resting on the land is nitrogen. Why not try the plan of artificially supplying the soil with carbonic acid; of which there is not a two-thousandth part as much in the atmosphere as of nitrogen?

Reasoning thus, it occurred to me that, if my conclusions were right, it ought, for instance, to be quite possible to gain all the advantages of "fallowing" land—that is, leaving it without any crops for one or two seasons—without all that waste of time. The chemical action sought, by leaving land idle as follow, according to Schoedler's Physics, is " * * * by frequent plowings in order that the oxygen of the atmosphere may unite with the carbon of decaying substances, and so form carbonic acid: * * * "Hence we consider carbonic acid as one of the chief nutritious constituents of the food of plants."

How the Experiment was Tried.

With this idea of artificial fallowing in view, I had a plot in a large garden, 40 feet square, spaded early in October. As each trench was dug across, it was charged with carbonic acid and then covered up with loose earth from another trench. To make sure of saturation of the soil with the gas, I wound a quarter-inch lead pipe along the bottom of each trench, with perforations a few inches apart, along the part covered by the soil; so that when the gas was forced into the pipe it would be free to escape into the soil. A small retort pipe for generating the gas was fixed on each end of the pipe, in which broken limestone, marble, or chalk, with dilute sulphuric acid were used as generators. Charging was repeated once, and sometimes twice, a month, till March, on the tenth of which the ground was spaded again, and on the 15th planted with potatoes, without any other fertilizer whatever.

On the adjacent plot, with soil the counterpart of plot 1, after the same cultivation that No. 1 plot had, it was planted with potatoes from the same bag, on the same day as No. 1. But this plot was given a full dressing of well-rotted stable manure. During growth the two crops were cultivated exactly alike.

And What Came of It.

Result: The vines of No. 1 were much taller and stronger than those of No. 2, and of a much lighter shade of green; the crop also matured earlier. At digging, the crop off No. 1 weighed about one-third more than that of No. 2. A great many potatoes of No. 2 were scabby, which often happens when farmyard manure is liberally used. There was no sign of scab found on No. 1 plot.

The potatoes were those known as "magnum bonums," an oblong, early variety. The tubers of No. 1 plot were longer in shape and much cleaner looking than those on No. 2. But in cooking, it must be admitted, they showed a somewhat coarser grain; though in flavor there was practically no difference observable.

I drew the conclusion that, if the stimulation of No. 1 had been balanced by the addition of some nitrogenous fertilizer—not more probably being necessary than a quarter of what had been given to plot No. 2—then the crop of No. 1 would have been much heavier still, the quality equal or better; or say double the crop of No. 2, at a cost of little or nothing more to produce it.

The principle involved in this novelty is almost identical with that actuating English cattle breeders some 40 or more years ago, when they decided in the matter of preparing beef for the market that it was just as much trouble and cost to feed a little beef as a big one. So they set about breeding cattle with more bone, bigger frames, to carry more beef when the animal was fattened. They found their conclusions well founded, and can now fatten their big two to three-year-old, loose-skinned, silky-haired, shorthorned Devons, etc., of great weights, just as easily and at no more cost than it used to be to feed little, hide-bound, cross-bred mongrels, of three or four years, and not weighing when finished more than half as much.

By the application of carbonic acid to the soil when idle, or directly to soil about plants while growing, the size of plants can be enlarged almost indefinitely. All that is needed is to maintain the proper balance of nitrogenous fertilizing, so as to cover the larger frames with what is the vegetable equivalent of fat and beef. And

this, to the end that, on the same square foot of soil, may be grown at little or no more expense, at least, a greater (possibly double) the weight that is now grown there.

A Gas that Can be Poured.

To those unfamiliar with such things, it may be mentioned that carbonic acid gas is so heavy that it can be emptied out of a vessel like water. Poured on loose earth, it sinks into every interstice exactly as water does. It is perfectly invisible, but its presence anywhere is easily detected by applying a lighted match, which is instantly extinguished. It mixes very slowly with the atmosphere, so that a vessel filled with it will stand intact, like water, for a long time. It is absorbed by water, without pressure, to the latter's volume; but under pressure water takes up great quantities, as evidenced in the manufacture of mineral waters. In combination with water, it is therefore quite practicable to apply the gas to the land.

Applied to the soil beneath growing cabbages, the effect of the gas was very remarkable. One row, so treated liberally, mounted up like giants over their neighbors and developed great leathery leaves, like young palm trees, the stalks being immensely strong. Another row, where the gas was introduced more sparingly, the cabbages developed good heads, about twice the size of their ordinary neighbors and quite equal in quality.

But the most remarkable and perhaps the most significant effect of any obtained was in the application of the gas to a young privet fence. So marvelous was the development of the plants of the part treated, in size and strength, over the others, that in one season they seemed to attain about three seasons' ordinary growth. Indeed, through the evidence of one's own eyes in this experiment, one is compelled to think that, in arboriculture alone, the possibilities of gain by artificial carbonization of the soil are very great indeed.

Editor's Note.—Read Dr. Robison's criticism of this interesting theory in the last issue.

CATALOG NOTICES.

"The Chatham System of Breeding Big Crops," is the title of a large, handsomely illustrated booklet published by the Manson-Campbell Co., Detroit, Mich. This fine art catalog not only describe the Chatham line of fanning mills, grain graders, cleaners and separators, but also contains much valuable information with regard to the profit to be derived from the use of carefully graded grains, seeds of all kinds as compared with indiscriminate planting of ordinary seeds. Write at once for this book, mentioning the Michigan Farmer.

The Cypress Incubator Co., of Buffalo, N. Y., have issued a 1914 catalog and year book more complete and interesting than any previously issued. The title of the book is "Poultry Keeping in all Branches," and its contents are as complete as the title indicates. It contains 244 pages, 7 1/2 x 10 inches in size, and is an encyclopedia of poultry information. This book is sent free postpaid upon request. Mention the Michigan Farmer when writing for your copy.

"The Food Value of Fresh Vegetables," by Henry Leffman, A.M., M.D., Professor of Chemistry and Toxicology, Women's Medical College of Pennsylvania, Honorary Professor of Chemistry, Wagner Free Institute of Science, is a new booklet published by W. Atlee Burpee Co., Philadelphia, Pa. Write for a copy, mentioning the Michigan Farmer, and get the benefit of the valuable information on the matter of balancing human rations which it contains.

Practical feeding in a manner to make the most economic results depends not only upon the makeup of the ration, but also the character and condition of its different ingredients. This fact and information of value in securing the desired character and condition in the home-grown ingredients of the ration for live stock is contained in illustrated literature which will be sent upon request by the D. N. P. Bowsher Co., South Bend, Ind., which literature also describes the all-around feed grinder manufactured by this well known company.

Dairy.

CONDUCTED BY COLON C. LILLIE.

HOW FINE TO CUT SILAGE.

I have read a great deal in The Farmer in regard to silos and silage, and have been feeding silage for the first time, this winter. I had my silage cut half-inch, and wondered if there is more value in the feed if it is cut quarter-inch. Would like to hear, through The Farmer, from some one that has tried it both ways, so as to know which is best.

Lenawee Co. J. A. P.

If silage is cut into half or three-quarter-inch lengths, it will pack into the silo much better than when cut in longer lengths, consequently there will not be so many air spaces and the ensilage will not heat up so much. I suppose that the silage would pack in a little bit firmer if it was cut in quarter-inch lengths than it would if it was cut in half-inch lengths, but in half-inch lengths it is cut pretty fine. Some people cut it three-fourths of an inch or an inch. Now this, I am positive, is coarser than it ought to be, but when it is cut in half-inch lengths it packs very nicely. If you cut it into quarter-inch lengths you couldn't fill as fast, and taking everything into consideration I believe that the most profitable length to cut the corn is in one-half inch lengths.

PEA MEAL ALONE AS A CONCENTRATE FOR COWS.

Can pea meal alone be fed to dairy cows? If so, how much should be fed?

St. Clair Co. D. D.

Pea meal can be fed alone as a grain ration for cows, but I think you would get best results if you fed it in connection with oats, bran or corn meal. In fact, I think it would pay you to buy corn meal or oats, or both of them, and mix the pea meal with them. But pea meal alone would be safe to feed in connection with corn silage and other roughage. With clover hay and corn silage, all the cows will eat up clean twice a day, it would only take a few pounds of pea meal to balance the ration. I should say a half a pound of pea meal a day for every pound of butter-fat the cow produced in a week, or a half a pound of pea meal for every three or four pounds of milk produced in a day. On the other hand, if you would get corn and oats and mix them and pea meal, equal parts by weight, I would increase the grain ration to a pound a day for each pound of butter-fat produced in a week.

CORN AND COB MEAL AND SWEET CLOVER.

Is corn and cob meal harmful to horses? This is the only grain I am feeding. How much grain should a cow get to do her best? I would like to know the feeding value of sweet clover hay as compared with alfalfa. Some farmers here say stock will eat it better than alfalfa.

Wexford Co. E. A. M.

The amount of grain to feed to a dairy cow depends somewhat on the roughage part of the ration, and, of course, one must take into consideration the capacity of the cow. No two cows should be fed exactly the same amount unless they yield the same amount of butter-fat. The Danish or the Wisconsin rule is to feed a pound of grain a day for every pound of butter-fat produced in a week, and is a good one. For rather small cows that are heavy producers this would be an abundance of grain, and perhaps three-fourths of a pound would be better.

I don't think that corn and cob meal fed to horses would injure them. I would want to feed them some clover or alfalfa hay if they had nothing but corn and cob meal as a grain ration. It would be better to mix the

corn and cob meal, equal parts by bulk, with bran than to feed it alone, or mix it equal parts with ground oats. If you feed clover hay or alfalfa hay you could get along very nicely with just the corn and cob meal.

Sweet clover hay is even richer in protein than alfalfa, therefore would be more valuable to balance up a ration on the farm. The general complaint about sweet clover hay is that it is not as palatable as alfalfa hay; that is, no kind of stock will eat it as well, especially at first. They usually have to learn to like it. But in this case where the stock seem to relish the sweet clover hay better than they do the alfalfa, there would be no trouble from that score. If you feed sweet clover hay to the horses I think they can get along nicely on the corn and cob meal if you gave them a sufficient amount of it.

WHAT TO MIX WITH OATS FOR COW PASTURE.

I have a field that I seeded last spring but it was killed out by the drouth. Am thinking of sowing it to oats for cow pasture in the spring. Is there any other forage crop that I can sow with the oats to improve the pasture?

Kalamazoo Co. C. W. D.

If you will mix Canada field peas equal parts by weight, with your oats and add about a quart of rape seed per acre, you will get a good deal better pasture than you will with oats alone. The peas are richer in protein and make a better food, and so is the rape. If you turn them in too early and pasture it pretty close, of course the rape will not amount to much, but if you don't the rape, later on, will furnish more pasture than either the peas or the oats. However, the oats want to be pastured enough so that they will not form joints because, if they do, when they are eaten off they will not grow again. If they are pastured just fairly close they will keep growing up and make a continuous pasture, but the peas and the rape certainly should be added to get the most out of the land.

PEA PICKINGS FOR COW FEED.

How valuable do you consider pea pickings as a cow feed?

SUBSCRIBER.

Ground peas or pea meal is a splendid cow feed. It contains about 22 per cent digestible protein and is equal in value, pound for pound, to good gluten feed. It is more palatable and the cows will do better on the same number of pounds per day of pea meal than almost any other food you can feed them. Pea meal mixed with ground oats, about one-third pea meal to two-thirds oats, makes one of the best dairy rations that you can feed, and this, with corn silage and clover hay, will make a balanced ration for the dairy cows. If a cow does not give a full flow of milk on this feed she is not a good dairy cow, and you cannot expect to get her to do well on any kind of a ration.

It is impossible to say just how valuable pea pickings are because one does not know the quality. They are not as valuable as good ground peas would be, but still are well worth consideration. Take the dirt, if any, out of them and the balance is worth nearly as much as good peas for feeding.

ALL COWS SHOULD NOT BE FED THE SAME.

In answer to a question you said once that you would not feed over two pounds of cottonseed meal to a cow. Would you feed a cow which made only six pounds of butter-fat a week, two pounds, and one which made ten pounds, the same amount?

Midland Co. C. M.

I would feed only the best cows in the herd two pounds of cottonseed meal per day. I think that is a sufficient amount of this rich food. For those that did not give so much I

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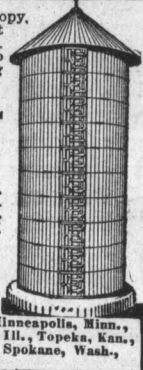
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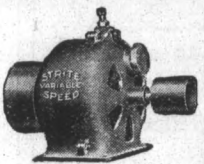
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is made so good in my factory that I will send it anywhere in the United States without an expert to any inexperienced user for a ninety day free trial to test against any make or kind that even sells for twice as much and will let the user be judge, because it's the most modern—the most sanitary—the most scientific—the cleanest skimmer—the most beautiful in design of any tell you how to make money in the dairy business when the pastures are dried up in summer. I did it on my own farm and know. Get my proposition now. It's so good that no dairyman who owns two or a hundred cows can afford to be without it. All I ask you to do is to first get my proposition before you decide to purchase any cream separator of any make, kind or at any price. Just drop me a postal. Address:

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would reduce the amount. For instance, a cow producing six pounds of butter-fat in a week I would feed no more than one pound of cottonseed meal a day and would make up the balance of the ration by feeding five pounds of corn and oats. This would make six pounds, or as many pounds per day as she produces pounds of butter-fat in a week. Feed the other cows in proportion. This, I am sure, would give them a sufficient amount of protein for the milk they are producing, and would be all the grain that you could afford to feed them.

MILK FROM SILAGE-FED COWS FOR BABIES.

We supply our local town with milk. One of our patrons, with a very delicate four-weeks-old-baby that they are trying to change from mother's milk to cow's milk, has been advised by physician to get milk from a dry-fed cow rather than get milk from our cows that have ensilage. It is not a question of purity or amount of butter-fat, but only that the doctor says he has heard that milk from ensilage-fed cows was not suitable for infants. How about this?

St. Joseph Co. R. A. W.

I think the doctor is entirely wrong. A cow is fed corn silage in the ration is much more liable to be in the pink of condition than if she had no succulent food at all. If the cow was fed entirely on roughage, with no grain or other forage, that would be wrong. But with corn silage as one food in the ration, the cow will be in better condition and more liable to give pure, normal milk.

A large percent of cows are fed silage now days, and thousands and thousands of babies, as well as invalids, are using the milk, and there is no complaint. The healthfulness of our market milk is better now, on the average, than ever before, and silage is one of the things that has brought it about. Silage in the ration makes conditions more like June, or grass conditions, which are as near ideal as we can get.

THE BEST STALL FOR COWS.

We contemplate elevating our barn, which is 32x62, out to out, and turning it with end to the road and putting a 7-ft. basement under it with two rows of cow stalls running lengthwise, giving 3½ ft. feed alleys on each side, 8 ft. driveway and 12-in. manure ditch or gutter. We can accommodate 30 cows with 3½x6½ ft. stalls; this includes feed rack of 2 ft., allowing 4½ ft. for cow to gutter. I am somewhat at a loss what kind of stalls to put in. Can you give me any light on the stall question? The floor will be concrete. Do you know the dimensions of the model stall recommended by Ex-Gov. Hoard? Any information you can give will be gratefully received. We have ten acres sown to alfalfa, if it goes through the winter all right. We limed the land and inoculated the seed from cultures obtained from M. A. C., but the drouth was very hard on it.

Jackson Co. T. E. M.

I want to congratulate T. E. M. on the plan of remodeling his barn, turning it so that it will end towards the road and arranging his cows in two rows of stalls facing the outside with a driveway between so that he can remove the manure, the worst job on the dairy farm, with a minimum cost and labor. It is too bad your barn isn't just a little bit wider. Thirty-two feet is just a little bit narrow, but I think probably you can get along. Three and one-half foot feeding alleys are just a trifle narrow for an ensilage car and yet one can make the car a little narrower and get along very nicely. The best width of a barn for this arrangement is 36 feet.

I like the model stall. There are objections to it which some think are serious, but it has good qualities also and I think that the good qualities predominate. The bottom manger, the manger that holds the ensilage and grain, should be two feet wide and run the whole length of the row of cows. This can be a continuous manger and need not be over four inches

deep. Above this, 18 inches from the top of the grain manger you will start the bottom of your hay manger, which will be narrow at the bottom. A 2x4 or a 2x6 will make the bottom and the side towards the cows should be made out of slats sloping back at an angle of about 45 degrees. There should be a space four and one-half feet from the back of the grain manger to the gutter, making the stall six and one-half feet long. Three and one-half feet is wide enough for moderate-sized cows.

A cut of the model stall has appeared several time in the Michigan Farmer. Perhaps you didn't notice it. If you look over your les you may find this cut, which will assist you very much. Or you can send to the Dairy and Food Department at Lansing and get a bulletin explaining this stall and giving a cut of it. In this cut, however, there is a movable manger for the ensilage and grain. Gov. Hoard made his mangers as I have suggested, on the bottom extending the whole length of the row of cows. Some, however, prefer this movable manger, which can be drawn into the alley and all the grain and ensilage deposited in there and then fed to all of the cows at the same time.

I am of the opinion that your alfalfa will come through all right. It is barely possible that the drought, which did not allow it to make a very big growth, compelled it to root deeply, and if it did it may be fully as well prepared to stand the winter than as though it had been plenty of moisture. This is an interesting point which I shall watch with a great deal of interest because I have some alfalfa that has got this same condition.

PUT THE SILO ON THE BANK SIDE OF THE BARN.

My barn is on a basement. Would like to put my silo on the upper side. I would have to dig down to a level with the feeding floor which would be about five or six feet, and build to the surface of the ground with cement. Or would you advise me to build on the other side of the barn? This side gets all the drainage from barn as the barn has cement floors. If the cement for five or six feet in bottom of the silo will give good satisfaction, I shall be glad to build on upper side of barn.

Eaton Co. S. S. G.

The silo will be perfectly satisfactory on either side of the barn. I would put it where it would be the handiest. You can excavate into the bank, as you say, down to the level of the basement floor, and put a grout wall up to the top of the bank, or you can build a wall out of cement blocks. You couldn't put the lath and plastered silo in this bank down to the level of the basement floor because the dirt coming in contact with lumber would soon decay it. There is one thing that you must remember if you use grout, stone or cement blocks for the base of your silo, and that is that you must plaster the wall on the inside. This rough grout work or stone will not keep silage unless it is plastered with a rich coat of cement mortar. Put a circular sill on top and set your studding so that the lath will just come out even with the wall below. Then when you plaster, begin at the very bottom and plaster over the stone wall and up onto your lath so that it will be a smooth surface all the way up. Make this mortar two parts clean, fine, sharp sand to one part of cement.

VENTILATING SHAFTS FOR COW STABLE.

If you have two ventilating shafts they will cause a draft, as the cold air will come down one of them and the warm out of the other. If your ventilating shaft is too large you may have two currents of air in the same shaft, which, of course, will also cause a draft. My cow stable is 36x100 and I have a ventilating shaft that is two and a half feet square on the inside.

WHAT PRICE TO CHARGE CREAMERY PATRONS—VALUE OF BUTTERMILK.

In a co-operative creamery where profits go to patrons, what would be the right way to do, charge full retail price for creamery products or charge say, one cent above price of butter-fat for butter sold to patrons. What do you consider the better practice, especially where the creamery is hard up. How much is buttermilk worth as pig feed at the creamery? Where can I get blanks for keeping complete records for creamery?

Leelanau Co. O. H. P.

Most creameries charge the creamery patrons wholesale prices for butter, rather than retail prices, and I think this is right. If the farmers had to pay a retail price they could keep their cream out once a week or, often enough to make their own butter. Of course, if it is a purely co-operative plant and the profit distributed to the patrons, it doesn't make so very much difference, and yet all the patrons will not buy the butter from the creamery and some of them will buy more than others, so a fixed price must be established. If they sell the butter to farmers at wholesale the same as they sell to other people, it is fair to everybody.

Buttermilk is worth fully as much as skim-milk for feeding purposes. Much depends upon how you feed buttermilk or skim-milk, as to whether you get their real value or not. The farmer who understands that these foods are rich in protein and will feed corn, barley or similar grains with them, to balance up the ration, will get very much better results than the man who attempts to feed them alone. Fed alone they make too narrow a ration to give the best results. At the present price of feed there isn't any question but what either of these feeds is worth 25 cents a hundred pounds if fed to common stock. For high-bred stock their value would be considerably more as it is impossible to have as nice young animals without skim-milk or buttermilk as a part of the ration, as it is with it and the farmer could afford to pay an extra price for these things for that very same reason. As high as 50 cents per 100 lbs. could be paid for these foods to properly balance a ration for this purpose.

CORN, RYE, AND CULL BEANS FOR GRAIN PATION FOR COWS.

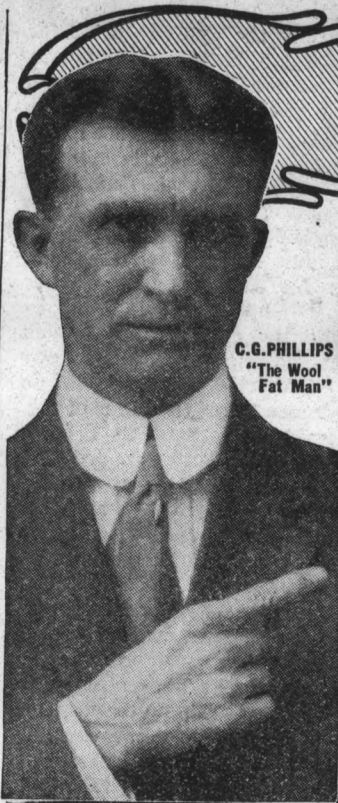
We have alfalfa and clover hay, bean pods, corn fodder and silage, also corn, rye and cull beans. Please advise as to how to make a balanced ration for milch cows.

Oceana Co. S. G. A.

Here are a number of foods that will furnish plenty of variety, both in roughage and concentrates, and they are of such a nature that they can make a good balanced ration without purchasing any other food. You can't very well feed the different kinds of roughage all in one day. I would feed clover hay once a day as long as the clover lasted or as long as I wanted to feed clover, and then I would switch over and feed alfalfa once a day as long as it lasted. I think the cows would eat it better than they would to feed alfalfa at one feed and clover at the next.

If I had plenty of bean pods I would want to feed them all out, and would feed them once a day. On the other hand, if you haven't got enough bean pods and want to get rid of your corn fodder, I would feed corn fodder one day and bean pods the next until these feeds were gone. After that you could feed clover or alfalfa twice a day, as the case may be, and, of course, I would feed corn silage all they will eat up clean morning and night.

For the grain ration I would grind the corn, rye, and the cull beans, equal parts by weight, and feed as many pounds of grain per day as the cow produces pounds of butter-fat in a week.



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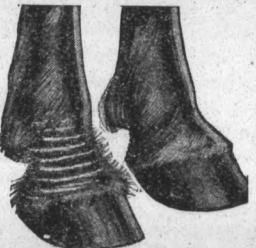
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CURRENT COMMENT.

The Rural Organization Service of the United States Department of Agriculture has conducted during recent months an investigation into rural credit conditions in the several states of the Union. The investigation in Michigan was made by Prof. W. O. Hedrick, of M. A. C., whose report recently filed with the federal bureau, contains information and conclusions which should be of interest to Michigan Farmer readers. In gathering the data upon which his report is based, Professor Hedrick visited a score of country banks located in typical agricultural communities so distributed as to fairly represent the varied agricultural conditions and industries of the state. From the information thus received, Prof. Hedrick found that these twenty banks averaged doing 83 per cent of their total business with farmers. In no case was it found that less than half of the total business of any of these banks was transacted with farmers, while in some cases practically all of the business of the banks was with their farmer patrons. The average proportion of deposits received by these banks from farmers equaled 80 3/4 per cent, upon which was paid an average of 3.55 per cent interest. Prof. Hedrick states it as his belief, however, that on account of the penalties imposed by banks upon patrons for disturbing their deposits that this rate of interest could be safely shaded down to three per cent or less.

With regard to the loans made to farmers the report states that the proportions were almost exactly even upon the average as between those made upon real estate mortgages for a considerable length of time and those made upon chattel, collateral and name securities for a short time, 49.8 being the figures for the first case and 51.2 for the latter. The average length of time for the mortgage loans approximated 5.7-12 years, with renewals common. The average rate of interest on this class of loans was 6.1-3 per cent, with the tendency strongly toward a rise in this rate. Short time loans to farmers were made for an average period of 4.4 months and at a rate of interest which averaged 7.85 per cent.

As a means of determining the approximate aggregate of deposits in and loans from banks in the state made by farmers, Prof. Hedrick applied the averages secured from the compilation of the data derived from the 20 banks visited to the total of

rural banks in the state as shown by the report of the State Bank Commissioner, including such a proportion of the city banks as he estimated to represent the percentage of business done with farmers by those banks and the national banks located in small towns whose business would naturally be similar to that of the state banks which he visited. As a result of this computation he estimates that the amount of deposits received by the banks of this state from farmers approximates roughly \$117,520,638.20, and that the amount of loans made to farmers approximates similarly \$116,739,447.41. Similarly estimated the amount received by farmers in interest upon their deposits equals, at the average key rate, \$3,613,222.34, and the amount of interest paid by them for loans equals, at the key rates above given, \$8,171,161.50.

In addition to this source of credit, the report mentions the manufacturers of agricultural implements, the retail merchants and individual wealthy farmers who loan their money direct to other farmers but no attempt is made to analyze in detail the extent and comparative importance of these sources of credit. In this connection it is interesting to note that the bankers who contributed the information upon which this report was based were generally inclined to minimize the importance of such sources of credit to farmers as compared with that afforded by the banks. The report also states that all of the bankers visited expressed the opinion that the farmers of Michigan were amply cared for in the matter of securing credit. While some of them were not opposed to government assistance to the farmers in this respect, all said that the farmers of the state are now receiving at as low a rate as possible as much credit as they could use. A few of the bankers visited defended the rather wide margin between the interest paid to farmers on deposits and the rates charged them for loans by asserting that farmers were expensive patrons to deal with; that, while they were safe enough so far as actual risk is concerned, they were extremely indifferent as to keeping up their credit, paying their indebtedness to the bank promptly or in making renewals, and that on this account higher interest charges were necessary than would otherwise be the case.

These are the more important features of this report on rural credit in Michigan, although no attempt has been made to follow its rather comprehensive detail in this brief comment which is submitted to the reader without remark as to its significance, as is the report itself to the Rural Organization Service of the federal government.

Several Department of Agriculture publications have recently been issued with the object in view of stimulating potato production in the United States. One of the most recent of these is a bulletin of "Lessons for American Potato Growers from German Experiences," which is largely devoted to data relating to the manner in which the German farmers dispose of their potato crop.

If the effect of the removal of the tariff on potatoes had not been counteracted by the necessity of imposing a rigid quarantine on potatoes from foreign countries, including Germany, there would probably have been need for the potato growers of the United States to study these methods for the disposition of the crop other than for human food, since less than 30 per cent of the German crop is used as human food in that country and the balance of their immense production might properly be designated as "surplus" potatoes from the standpoint of the American grower. Of these, something like 40 per cent is fed to live stock and an item of about 100,000,000 bushels is distilled into alco-

hol. According to Department of Agriculture figures the average price for potatoes used for distilling alcohol in Germany, between 1906 and 1910, was 18.3 cents per bushel. As the price of the surplus will quite accurately reflect the price received for the entire crop, it will at once be seen that open competition with the farmers of that country in the production of potatoes for our market would mean low prices for this product of our farms.

The temporary elimination of such competition, not only from Germany but other countries as well, is no doubt one reason for the administration's attempt to stimulate greater production in this country in order to avoid the possibility of short production and high prices which would not tend to reduce the high cost of living. But it is doubtful whether the farmers of our important potato producing states would care to increase production to an extent which would place the commodity on the same price basis as that which obtains in Germany. One of the methods mentioned for the disposition of the surplus potatoes in Germany is drying the potatoes for stock feed, in which form they are fed to horses and cattle as a substitute for corn. This may be an attractive proposition in Germany where corn is not a staple crop, but the situation is quite different in our principal potato growing states, the major portion of which lies well within the northern boundary of our great corn belt.

Crop production is an economic, rather than a sentimental proposition with the American farmer, and the area which he will devote to the production of potatoes in the aggregate will doubtless continue to be in accord with his previous experience as to profit from the crop as compared with other cash crops which may be grown upon the farm, until circumstances place such automatic regulation of supply and demand under normal conditions beyond his further control, after which the result is problematical. In the meantime, however, it will be decidedly to his advantage to lower the cost of production as much as possible, to the end that he may still get a small profit above the cost of production in seasons when there is a surplus of domestic potatoes, which is quite as likely to occur as is a shortage for domestic needs in any given season.

In another column of this issue will be found the resolutions adopted at a recent meeting of federal and state officials charged with the control of hog cholera, so far as that may be possible, which declarations reflect the most advanced ideas upon this subject. It is to be noticed that the control of this destructive disease is given precedence to its eradication in recent official utterances on the subject. It will also be noticed that the necessity for the co-operation of farmers in infected districts is considered absolutely vital to success in the control of this disease, to say nothing of its eradication. Such co-operation should be accorded in every case, regardless of our personal opinions on the disease and its spread. Certainly the scientists who have devoted years of study and research as well as experimentation to the solution of this problem are better qualified to direct its control and ultimate eradication than is the layman who is sometimes inclined to scoff at scientific opinions because his own experience does not seem to substantiate them.

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HAPPENINGS OF THE WEEK.

National.

Formal announcement has been made of the engagement of Miss Eleanor Wilson, youngest daughter of President and Mrs. Wilson, to Hon. William Gibbs M'Adoo, Secretary of the Treasury.

The United States fish hatchery at Northville, Mich., is furnishing 55,000 speckled trout for planting in Penoyer Creek and its tributaries.

The battleship New York, the most formidable of the American navy, is practically ready for the sea. It cost about \$12,000,000 and is equipped with 14-inch guns.

The International tribunal of arbitration for Great Britain and the United States began its second session in Washington, March 9, and will consider 16 English and 10 American cases. The tribunal is composed of Henri Fromaget, of France, Chas. Fitzpatrick, of Canada, and Chandler P. Andrews, of the United States.

Food prices reached their highest level in 24 years, in November, according to a report recently issued by the United States Department of Labor. Since then there has been a slight decrease, although they are still higher than a year ago. The prices for eggs were higher than ever before; corn meal and milk also reached their highest point.

Arrangements are being made to hold the International balloon race in this country next July. St. Louis, Portland, Oregon, and Oakland, Cal., are bidding for the event.

Investigation by a federal grand jury into what are known as "book frauds," conducted by swindlers in New York city, has resulted in charges aggregating over \$3,000,000. The government will probably begin prosecution of the alleged swindlers this month.

A successful campaign against the tent caterpillar was waged in the northwestern part of the state last week. This insect has been doing serious injury to apple and forest trees in that part of the state. Through the efforts of Prof. M. A. Cobb, of the Michigan State Normal, the school children were enlisted to gather the egg masses of this pest.

Following the order issued by Gov. Ferris, that cock-fighting should be stopped in the several counties of the state, 50 men attending such a gathering were taken in a raid made by Sheriff Rimmelle, of Saginaw county early Sunday morning.

Foreign.

The Chinese Republic has appointed Hsia Chia-Fu as their diplomatic representative at Washington. While not experienced in diplomatic affairs, it is expected that the new minister of the youngest republic will handle the delicate problems arising between the two great republics with credit to himself and his country.

Reports are that the Mexican rebels are about to attack Torreon, a movement that has been anticipated for some weeks. On Sunday both armies were on the move and small encounters between skirmishers have resulted. Means of communication are being closely watched by the participants.

A disastrous earthquake occurred at Akita, Japan, a small town 300 miles north of Tokio, April 15. It is reported that 300 houses collapsed and 60 persons were killed, while 300 others were trapped in a mine. The volcano Asama-Yama simultaneously became active.

The destruction of six villages and the killing of 1,500 persons is the toll of a hurricane that swept through the province of Kupan, southern Russia, Saturday. Along the eastern coast of the Sea of Azov waterspouts and the severe winds caused floods that did much damage to property.

France will give a medal in commendation of the late Charles Tellier, inventor of the cold storage process now in use all over the world.

The situation in Mexico still seems to be a deadlock. General Huerta refused the combined mediation of Brazil, Argentina and Chile to settle the Mexican problem, on the grounds that the relations between those countries and Mexico were not of the best. Many of our conservative senators now believe that the restoration of peace lies with the United States and that conflict will be necessary. The matter which has heretofore been avoided will be brought up in Congress for discussion.

Magazine Section

LITERATURE
POETRY
HISTORY and
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The FARM BOY
and GIRL
SCIENTIFIC and
MECHANICAL

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

The Indian Play of Hiawatha.

DURING much of the year Wayagamug, like many other places in Northern Michigan, ceases to be. When summer draws near and thousands of weary city toilers begin to long for the lake and the woods, the place is roused from its winter hibernation. Then it comes to be a regular station on the summer suburban train out of Petoskey and a flag station on the through trains.

It was an afternoon late in July when we boarded a northern-bound train at Bay View. Fifteen minutes later we left the car at Wayagamug.

By HOPE DARING.

ing us that the Indians of that region had long looked for the coming of a prophet who was to be to them a Deliverer. During the scenes this man, hidden in the undergrowth, reads aloud, in a sing-song manner, the passages from "The Song of Hiawatha" which describes what is going on on the stage. All the songs, cries, exclamation and the few words of the Indian actors are given in their own language.

The play as given has ten scenes,

smoke the calumet of peace. At the same time they receive the promise of a coming Prophet,

"A Deliverer of the Nations,
Who shall guide you and shall teach you."

In the next scene the infant Hiawatha appears. He is a sturdy Indian baby, and his faithful nurse, "wrinkled old Nokomis," carries him on her back in the typical cradle of the papoose. Incidentally it may be said that Nokomis, ugly, awkward, is one of the best of the actors, playing her part exceptionally well. Later comes on the second one of the three Hiawathas that appear on the stage—the boy. This scene was realistic and charming—all the tribe were devoted to the child. Chibiabos taught him to sing, lagoo to shoot, and Hiawatha proudly slays a red deer. Pau-Puk-Keewis, who is the embodiment of mischief throughout the play, teaches the boy to dance, and it is said that this dancing never fails to bring rounds of applause.

Soon the young chief Hiawatha comes on the scene. He dreams of a mate, and, notwithstanding Nokomis' injunction that he wed "a maiden of your people," he departs to "the land of the Dacotahs." With a simplicity that out-Shakespeare's Shakespeare he makes the most of the journey in our sight, much of it in a canoe. The teepee of the arrow-maker is visible, although at some distance. The old man and his daughter are seated at the doorway, she "plaiting mats of flags and rushes," when the young chief arrives. The wooing is direct but romantic. Minnehaha brings food and water and accepts the deer Hiawatha offers. Soon, with her father's consent, the pretty Laughing Water crosses to her lover's side, saying in



Minnehaha.

acts, while the concealed reader says in words for her, "I will follow you, my husband." The journey to Hiawatha's home, in the poem, "through interminable forests," on the stage is quickly accomplished in the canoe.

"The Wedding Feast" is a long scene, containing some things not given in the book and some that, in sequence of time, come later. Nokomis welcomes the young couple; many guests gather to do honor to Hiawatha and his bride. Chibiabos, "the sweetest of all singers," sings, and Pau-Puk-Keewis gives a wonderful exhibition of dancing. Other dances, some of them symbolic, are introduced here, also songs. Then comes the gambling scene when Pau-Puk-Keewis wins from his fellows all that they have staked in play. He is driven from the village but a little later returns, to find it deserted, and throws things round in confusion.

"As an insult to Nokomis,
As a taunt to Minnehaha."

In the anger that this causes he is pursued by his infuriated fellows and takes refuge on Nanabozh's Rock. Seeing that he is about to be captured he makes a spectacular leap, disappearing in the water. There he is changed into a beaver, and the beaver is slain by the Indians. The Scalp Dance is given. Later Pau-Puk-Keewis is restored to life and, after due repentance, to his tribal rights.

"The Death of Minnehaha" might be more effective to the student of Longfellow if "the long and dreary Winter" could be portrayed. However, Minnehaha does her best acting in this scene and soon lies "cold and dead" before the spectators. She is lifted on a stretcher and borne away, for burial. Not long after this the Black-Robe arrives. He wears a priestly garb and brings to the Indians a message of peace and a prophecy of wonderful things to come. Also he tells them of

"the Virgin Mary,
And her blessed Son, the Savior."

The last scene, "The Departure of Hiawatha," is the most impressive of all. He bids old Nokomis a tender farewell, then says good-bye to his people, bidding them listen to the Black-Robe's words of wisdom. Accompanied by his people he goes to the narrow strip of land near the rock, where a canoe is in waiting. This he enters, pushing off on the farther side. Straight across the water floats the canoe, propelled by some



Chibiabos, "the Sweetest of all Singers."

The sold building in sight was a long rustic affair which contains a curio store, a restaurant, rooms for some of the Indian actors and for the manager of the play, and the tier of seats for those who attend the performance. We immediately took our places. Notwithstanding that the scene had been many times described to us, we leaned forward, to gaze at it with eager interest.

The seats were elevated. Directly in front, with a railing between us and it, lay a stretch of water, sparkling in the sunlight. Across this is a pebbly beach, cleared for a little way inland, and then bordered by a growth of scrubby native trees. At the right hand the land receded to a narrow strip with a wide expanse of the blue lake beyond it. On this strip stood a towering rock with a few shrub-like pines near its summit. This is Nanabozh's Rock and plays an important part in the rude drama. At the left hand of the spectators is a stretch of lightly-wooded, level land whereon were several wigwams and one log hut. The small boy who sat at my side, and who had seen the play before, told me that this region was "the land of the Dacotahs," while the wooded region that bordered the water on the farther side of the great rock was "the land of the Hereafter."

The play is given by a band of Ojibway Indians. During the winter some of them give a representation of it in various cities, but here there is no scenery and few stage accessories save the sky, water, and woods. It is given crudely, but in that crudeness lies its charm. Students of Indian life find that the old customs and habits are faithfully reproduced.

The manager, a white man in modern dress, appears on the beach and explains the play's significance, tell-



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unseen force, the young Indian standing proudly erect.

"Thus departed Hiawatha, Hiawatha the Beloved, In the glory of the sunset, In the purple mists of evening, To the regions of the home-wind, To the islands of the Blessed, To the land of the Hereafter."

When the play was over, a train was in waiting to convey the spectators back to the near-by resorts. The small boy persuaded me to wait for one, which would be due an hour later. This enabled us to inspect the scene of the drama. We visited "the land of the Dacotahs" where, in pots suspended over outdoor fires, savory-smelling stews were simmering. The Indians talked freely with us, but their conversation served to dispel the romance; the mother of the baby Hiawatha told us proudly that his name was Willie Jones. The rock

was of great interest to my companion, and he was allowed to examine it. It was a wooden frame covered with coarse-meshed wire netting, and on that was spread a coat of gray plaster. We also learned that Hiawatha's dramatic departure was effected by a rope or wire attached to the boat under the water. Some person on the farther shore wound this on a windlass, thus propelling the canoe over the water straight to "the Land of the Hereafter."

However, it was an afternoon that lingers long in the memory, and our advice to fellow tourists would be, to go and see the play of Hiawatha. "Ye who love a nation's legends, Love the ballads of a people, That like voices from afar off Call to us to pause and listen, Speak in tones so plain and childlike, Scarcely can the ear distinguish Whether they are sung or spoken."

Why Mankind Should Study Nature.

By HATTIE WASHBURN.

P RIMITIVE man had every need to be a close student of nature, for he was dependent upon her direct resources for subsistence, for clothes and shelter, and only through a knowledge of the ways of her creatures could he insure his life from the many dangers which best him.

With the advance of civilization, mankind became more and more independent of the direct resources of nature. Though he gets his subsistence from the soil as surely as did his remote ancestor, it generally passes through many hands, undergoes a number of changes, is examined and labeled before it comes to his table. Unlike primitive man, he of today need give no thought to the plants and animals which produced that food, if indeed, he knows. He need not learn through careful study the kind of soil in which such plants flourish, the season in which they develop, their appearance, that he may not mistake them for others that are unpalatable or poisonous. He may know nothing of the ways or even the habits of the animals whose flesh he eats. Circumstances do not require that he track some beast to its lair and by skill, strength and cunning, make it his prey. So it is with modern man's clothes and shelter, his light and fuel, his means of transportation, his every need and enjoyment. Though they must come from nature, they may all be so indirect that he himself has no close contact with the universal mother, no need to make a study of her ways and mysteries. He may be one of the producers, one of the transporters or one of the manufacturers who transform the crude products, but whatever his part in the great turmoil of civilized life, he is but a cog in the vast machinery and his needful contact with nature is but slight.

The agriculturist lives nearest to nature, but even he is seldom one of her students, save to such an extent as is necessary in the production of the plants he chooses to cultivate or the animals that multiply and flourish under his protection and care.

Thus with the advance of civilization mankind has wandered farther and farther from contact with nature and knowledge of her ways, and left to a chosen few the study of her laws. A small and ardent band who, from love and appreciation of nature's wonders and beauties would devote their time and energy to her cause and seek to teach to others the lessons they learn from the book of nature, which all may read but none shall finish.

And is not this general neglect of nature study unwise and impracticable for many reasons? Has not mankind, through ignorance and neglect, allowed many of nature's greatest resources to be wasted?

Her forests have been felled or burned faster than she could produce

others, while a scarcity of lumber and fuel and a less uniform distribution of moisture has been the result. Unlearned agriculturists have robbed the virgin soil of its fertility, while with knowledge of nature's laws they could have made those same fields produce more instead of less, year by year.

Many of nature's harmless dumb creatures, like the bison, the antelope, the mountain sheep and others, have been ruthlessly slaughtered until they exist only under the protection of those who awoke almost too late to a knowledge of their needs, or awakening in time, were powerless to stay the tide of human ignorance that swept our virgin country from coast to coast.

Once the land was teeming with bird life but through ignorance we have allowed our feathered friends to be slain till birds are comparatively scarce. There has been a corresponding increase in insect life and the trees that fire and ax have spared are threatened with ruin. So great have become the encroachments of insects upon agriculture that it now costs the United States more to feed her insects than to maintain her government. Birds of prey have been condemned and killed without redress and a great increase in the numbers of harmful rodents follows.

These are but a few of nature's lavish gifts that have been wasted because of the general ignorance of mankind.

Nor should we think of the material benefits alone resulting from nature study. Perhaps the greatest benefit to be derived from a close contact with the universal mother, a study of her laws and moods and an appreciation of her beauties, is the influence upon the individual.

No soul communing with nature, with love and understanding, can fail to perceive that the works of nature are in truth the Manuscripts of God, whereon are written truths that everyone may read with at least some degree of understanding if he but exercise the faculties with which his Creator has endowed him.

How wise the advice of Bryant, one of nature's poets, to those who are sick at heart, "Go forth under the open sky, and list to nature's teachings." There, indeed, will the sad and weary find peace, joy and wisdom, for, "To him who in the love of nature holds communion with her visible forms, she speaks a various language."

Every normal mind, from the day of intelligence in the babe to the last glimmer of memory in the aged, craves knowledge of some kind. When that craving is pure and wholesome, to wantonly deny it either to oneself or to others is an outrage against the individual and society in general. The study of nature would seem to be the first and most natural demonstration

of the craving for knowledge. Many of the first questions asked by the child are in regard to the objects of nature it sees. We can all recall how the visible forms of animals impressed our childish minds with endless interrogation as did nothing else. Perhaps many of the questions that presented themselves and seemed so simple then, are as far from solution in our minds now as when we gazed into the vaulted sky and wondered if it were the floor of heaven.

It has been said that the school boy's most valuable lesson is that which he learns on his way to and from school. Some of that lesson he may acquire from his fellows or from observation of the works of man, but it is safe to believe that the greater part of it comes from his contact with nature. The normal child who is not denied his birthright by the narrow confines of the city, revels in the lore of field and stream, of wood and plain.

Knowledge which one can not use for profit or pleasure, either to himself or others, is not education any more than a material which the healthy body can not digest, is food. When the most natural, the pleasantest, the most profitable and inexhaustible study for mankind, the study of the Creator's works, is thrust aside and ignored while the misguided student pores over misty volumes of dead languages and stocks his brain with facts, he will not use in after life, he is but wandering farther and farther from the goal he seeks.

All book learning is not useless knowledge nor can anyone, however gifted, go forth and learn much without the guidance of those who have gone before. Books that have withstood the test of time are the choicest thoughts of the greatest minds, but a perusal of them alone will make no one wise and all other subjects of which they treat are quite insignificant as compared with the study of nature.

Nature study includes the study of everything which our Maker has created, from the farthest star in the universe to the soil beneath our feet. It includes the painstaking, all-embracing observation of every plant and creature, whether found in unexplored wilds or in close contact with the habitation of mankind. It includes the study of man himself in every phase of life.

AN APPLE-GUESSING GAME.

BY L. M. THORNTON.

Guessing apples is an amusing game for a small party. The winner may receive either a basket of bright red apples or an apple-pincushion. An apple limb switch makes a good "booby prize."

Provide each guest with a sheet of paper and a pencil and ask each to write the answer to the following questions in order:

- 1, What apple is a month?
- 2, What apple was put to death during the Civil War?
- 3, What apple is a sovereign?
- 4, What apple is a drink and the juice of the maple tree?
- 5, What apple do contestants seek to win?
- 6, What apple do we get in winter?
- 7, What apple is a state and color?
- 8, What apple is verdant?
- 9, What apple did King David love?
- 10, What apple is a crustacean?
- 11, What apple is a lady of rank?
- 12, What apple is used for coats?
- 13, What apple is a fruit?
- 14, What apple is a color?
- 15, What apple is an animal and a feature?

The answers in their order are: 1, Mayapple; 2, Northern Spy; 3, King-apple; 4, Wine Sap; 5, Prize; 6, Snow; 7, Arkansas Red; 8, Greening; 9, Jonathan; 10, Crabapple; 11, Duchess; 12, Astrakhan; 13, Strawberry; 14, Russet; 15, Sheep Nose.



Jack as a Champion of the Helpless.

By ALTA LAWSON LITTELL.

WITH his skates thrown over his shoulder and swinging from side to side at every movement of his vigorous young body, Jack Ryan strode through the woods on snappy February morning on his way to the mill-pond to meet the boys of the Eaton school. His usually laughing face was clouded and he slashed viciously at the underbrush with his hockey stick as he hurried along.

"I'd just like to give him one good punch, anyway," he muttered. He made such a ferocious lunge at an oak sapling as he spoke, that, his aim missing fire, he plunged headlong into a snowbank.

Some weeks before Jack's father had promised Jack and his sister Peggy \$5.00 each if they would bring home from school perfect marks in deportment. On the very day of Mr. Ryan's promise Jack had got into trouble in school with Harold Wilson, who deliberately planned to get Jack a black mark. Jack might have explained the situation and cleared himself, but he had just been reading about the winter at Valley Forge, with the Conway cabal, and, flushed with hero worship, had refused to tell on Harold or to allow any of his friends to tell. Like many a hero of larger growth he had since learned that it is one thing to be a hero on the spur of the moment, when your friends stand around to cheer, and quite another to keep right on at the hero business after the impulse has cooled and the shouting has died out. Many a time since the incident he had been inclined to wonder if it wouldn't have been more practical, to say the least, to have straightened matters out and got his \$5.00. But he had always dismissed the thought.

This morning, though, it was different. Peggy had just got her \$5.00 and had already spent it, in imagination, in 50 different ways. Jack had tried hard not to care, but it was a little too much to expect a fourteen-year-old boy to be altogether heroic under the circumstances. If he had \$5.00, Jack knew exactly how it would be spent. Before night he would have that twenty-dollar, six-shot pump gun which Mr. Stevens kept in his hardware store window just to aggravate boys with only \$15.83 in their banks. With the \$5.00 added to his savings Jack could have the gun and a box of shells, too, and the one wild dream of his life would be realized. Over and over and over the thoughts of what

he might have done raced through his mind, always with the accompaniment of Harold's meanness. And as Jack hurried to the pond he longed to give Harold one good punch just by way of relieving his feelings.

His sudden tumble into the snow bank, however, somewhat cooled his temper. He picked himself up with a grin, fished his skates out of the snow, threw them over his shoulders and started off briskly again.

"See here," he remarked severely to himself, "You decided to let that affair go unnoticed, and now it's time to stop thinking about it. Just you march on to the mill-pond and pretend you don't care." And whistling, "Hark from the Tombs a Doleful Sound," as the most unwarlike air he knew, he trudged along.

Suddenly just ahead of him a rabbit hopped across his path, and sitting down by the side of the road, looked at him as impudently as though it knew he couldn't possibly buy a gun. "You wouldn't sit there with that saucy grin on your face if I had my gun," threatened Jack, stooping down to scoop up a snowball as he spoke. The rabbit darted away with what Jack vowed was a malicious wink, and Jack let fly the snowball at the bith of vanishing fur.

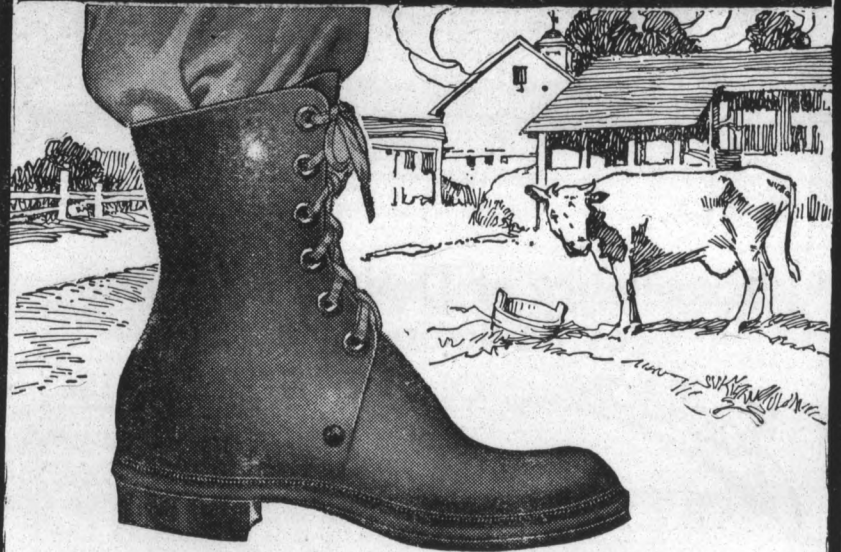
As he turned to go on a sound came to him and he stopped to listen. Was it a kitten, or a child? He could not tell which. Clearer now on the frosty air, since the sounds of snow creaking under his feet had ceased, it came again. It was both child and kitten, a little girl crying and a kitten mewling piteously. Though he had been anxious a moment before to shoot a rabbit, Jack could not bear the sounds of suffering and he hurried along to see who was in trouble.

Coming to the edge of the woods he saw eight-year-old Milly Brown across the clearing, standing by the stone wall on top of which stood a boy swinging her pet kitten by the tail. Jack knew at once that the boy was Harold. There wasn't another lad in the Eaton school mean enough to do such a thing.

His heart thumped madly and his voice was almost joyous as his, "Hi there, Hal, drop it," cut into Milly's cries, scoldings and beseechings.

Harold's song of "Ding, dong, bell, pussy's in the well," which he had been illustrating by swinging the kitten back and forth just out of Milly's reach, stopped instantly, and he quickly reversed the kitten, though

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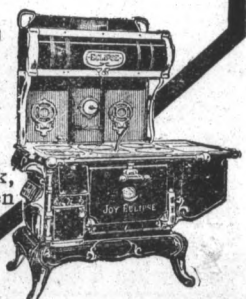
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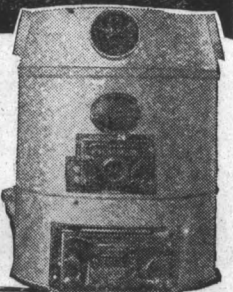


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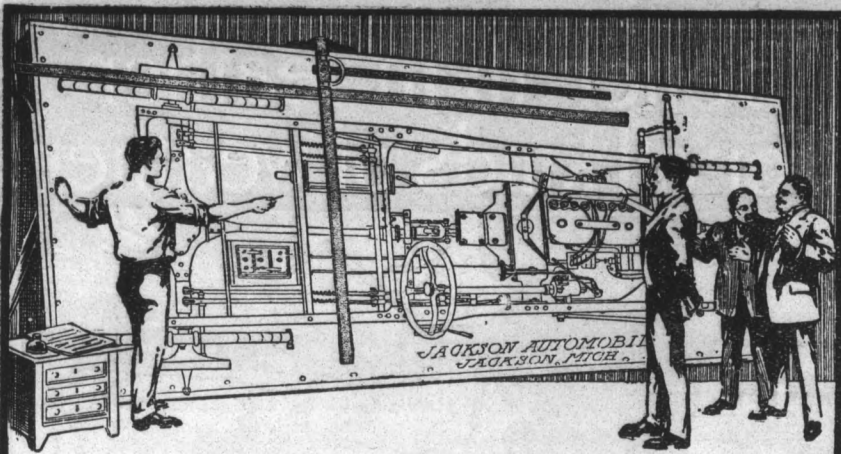
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he still held it tightly in his arms.

"Make him give it to me, Jack, pleaded Milly tearfully. "My poor, dear, little kitten. He's made it all dizzy and hurt it dreadfully."

"Give her that kitten, Hal," Jack commanded. "You ought to be ashamed of yourself."

"Oh, is that so," sneered Harold. "Maybe I had and maybe I'll give her the kitten when I get ready. I don't have to be bossed by you."

"You'll get ready now or wish you had," threatened Jack. "You needn't think I'm afraid of you because I let you off at school. Get down from there and give Milly her kitten."

Although a half head taller than Jack, Harold had no desire to fight him. He much preferred fighting boys of his age by trickery, and reserved his fists for little children and animals which he was sure would not turn on him. Besides, Jack was the acknowledged champion of the Eaton school, and kept constantly in training with boxing gloves and a punching bag in his father's barn, though he never went about seeking a battle. On the other hand, Harold objected to being dictated to by anybody.

"If you want her to have the kitten come and get it for her," he jeered, suddenly jumping to the ground on the other side of the fence and starting across the field on a run.

Quick as a flash Jack threw his skates and stick to the ground and vaulted over the wall, while Milly danced up and down on the other side screaming, "Oh, my poor kitten, my poor kitten. Kill him, Jack, kill him. I want my kitten."

Across the meadow flew the boys, Harold still clinging to the kitten. Ordinarily it would have ended with Harold's escape for he was the champion sprinter of the school as Jack was the champion boxer. But this morning he was hampered by a long overcoat, while Jack in a sweater had nothing to hinder him. A stone, hidden by the snow, aided the cause of justice and Harold stumbling over it, went down.

The kitten, released by the inglorious fall, scampered to the top of a tree which stood near, as Jack came up, panting and exultant. Not on his own account could he touch Harold, but here was a cause which would satisfy even George Washington. As the defender of woman and the protector of helpless animals, surely no one could object if he gave Harold what he deserved.

Harold scrambled to his feet and assumed an air of bravado.

"Oh, of course you can beat me," he sneered. "I've got on this big coat and you know I can't do a thing."

"Take it off," Jack said amiably, "and I'll take off my sweater. We're on to the pond."

going to settle this thing right now." He had his sweater off even before he finished speaking. "Hurry up, I'm due at the pond in just five minutes and I don't want to be late."

Harold tossed his coat on the ground and bent over on the pretence of tying his shoe-lace. By raising himself suddenly he hoped to take Jack off his guard and pitch him over backward, for he knew that if he fought fairly he had no chance. Jack, however, was too well acquainted with Harold.

"No you don't Hal," he said firmly. "I've seen you fight before. Stand up here and take your medicine like a man, because I'm going to give it to you."

And he did. The fight which followed was so short and decisive as to be scarcely worthy of note. Jack was glad, on the whole, that it was witnessed only by Milly, perched on top of the stone wall, and by the kitten, which sat smoothing its ruffled fur in the tree top. It was too tame and one-sided an affair for boys to witness.

"It's really no satisfaction to fight you, Harold," Jack complained, as he sat on his foe's chest and rubbed his face vigorously with handfuls of snow. "You don't offer enough resistance. Just see how peacefully you lie there and take this and this and this." He emphasized each word with a hearty scrub. "I'm never going to fight you on my own account, you aren't worth noticing. But every time I see you tormenting anyone younger than you are or hurting an animal, I'm going to give you a good drubbing." He slipped a bit of ice down Harold's neck as he spoke. "If you want to fight me you've got to learn how to handle your fists. Come around nights after school and I'll give you boxing lessons free. Maybe you'll know how to fight in a year or two. Now get up and march."

Jack arose, and Harold, red and rumped, scrambled to his feet, and, picking up his overcoat, walked off, muttering threats, while Jack threw his sweater over his shoulder and went back to recover skates and hockey stick.

"I'd climb up and get your kitten, Milly," he explained, "but it would be afraid of me. Leave it alone and it'll come down after awhile."

"Oh, Jack," gloated Milly, "Didn't you scrub his face good and hard, though! I just wish I was a boy so I could fight him, too."

"Never mind, Milly," laughed Jack, "I guess he won't touch your kitten again. If he does just let me know. I'm sure he'll never bother me any more."

And as he whistled, "See the Conqueror," Jack hurried, quering Hero Comes," Jack hurried "and I'll take off my sweater. We're on to the pond."

The Making of Pottery.

By DEMAREST GLENTWORTH RUBINS.

FEW people have any idea how our dishes are made or have ever visited a pottery, with its roof, adorned with queer, bee-hive-like objects—the tops of the kilns.

It is a most interesting experience, even to the uninitiated, to walk through the many rooms, noisy with the rumble of machinery and the movement of many feet, and watch dishes grow under skilled fingers; where the walls are lined with work benches and the middle of the rooms filled with drying-racks, and it would seem that the workers, busy as bees, would get in the way of each other as they turn this way and that. But everyone knows his place and work, and there is no confusion as the work is carried forward with machine-like precision.

The clay of which our dishes, and all earthen-ware vessels are made, is brought to the potteries from different parts of our country—some from the Southland, some from the eastern

coast, while still other kinds must come longer distances, being brought over the water from foreign shores, for each ware requires its particular kind of clay.

This clay is first thinned with water until it is liquid enough to run through pipes, from which it drops down between heavy sacks and the water is squeezed out by machinery, leaving the clay in a plastic condition. The making of these peculiar "sacks" is quite an item of expense, but by wise management and a little care they can be made to last some time. A contract is given for a certain number of sacks whenever needed, and as their construction is very simple, it is an easy matter for the sewer to make large wages. One woman who has contracts from three or four potteries averages \$5 a day. Out of her earnings she has built a beautiful home and is helping her two boys through college.

When the soft clay is removed be-

tween the sacks it is distributed to the workers on the different floors, each of whom has only certain dishes or vessels to make. They will pinch off a small lump of clay, flatten it into a thin sheet by hand, slap it over a mould, trim the edges a little and set it away to dry, in less time than it takes to tell it. If there is to be a raised design on the piece the mould having that design is selected, and the dried clay will show the same. Perhaps, instead of setting it away to dry, the clay-covered mould is handed to a second man, who trims it off with sponge, knife and wheel, before it is handed to an attendant to be set on the drying racks. Most of these men are piece-workers and so fast do they work the attendant must move quickly to keep the green dishes out of the way and a fresh mould beside the first worker.

After the clay has dried, the mould is removed, and, if the dish or vessel is to have knobs, handles or ears, it is turned over to another department where it is rapidly turned around and around and every little roughness trimmed off with a knife, washed inside and out with a sponge, the additions stuck on in the proper place, and it is again set away to dry. After the second drying it is ready to go to the first kiln, which is fired to a white heat for about fourteen hours.

Almost before the contents are cool enough to handle, the kiln is opened and the brown pottery removed. It is then carefully inspected for cracks or other imperfections, then turned over to the glazier, who immerses each piece separately in a tank filled with a liquid, the making of which is the factory's secret, it being the aim of each potter to find a preparation that will not craze or crack. But there is something very unhealthy about it, and the men who dip do not live long, consequently are paid enormous wages. After the glazing the pottery is taken to a second kiln where it is again subjected to an intense heat, from which it emerges, plain white ware seen in the stores.

If it is to be decorated, it is taken to the decorating department where nimble fingered girls sit at long tables with piles of white ware before them, rapidly putting the design on each piece, using transfer patterns for the purpose, each factory making its own designs and patterns. The pottery is then immersed in big tubs of water that stand beside the workers which removes the pattern but leaves the design in color. If flowers or color is not wanted, the raised design left by the mould is picked out in gold, or perhaps a gold band is placed around the edge, the work being done with a tiny brush. Shaded colorings are blown on, a rubber tube and compressed air doing the work, the operator afterward rubbing off all surplus color with the ever present sponge. For his skill and speed he receives very high wages. After all the decorations are on, the pottery is burned a third and last time, and is then ready for shipment.

The sample room is the climax of the visit, for there is displayed the finished product in all its beauty and wealth of color and design. The traveling salesman carry samples of all stock patterns, from which the merchant may order, or he may have a peculiar pattern or design of his own which the pottery will develop and make for his exclusive trade.

Not a single "sample" piece is for sale, and with a sigh and many a longing look the visitor reluctantly takes his leave, stepping into the outer air with an increased respect for such common things as dishes.

RUBBER FOOTWEAR NOW MADE LIKE AUTO TIRES.

Although few of the readers of this journal have had the opportunity of witnessing the manufacture of rubber footwear, the manner in which the

rubber and the fabric are put together is universally known. But new methods are constantly being brought into practice in this as in other industries, and for this reason a recent announcement that a new way of uniting the fabric and rubber used in the making of rubber boots and shoes into a single unit, will be interesting.

The motor car industry during the past 15 years has influenced a tremendous development in the manufacture of tires, bringing out new methods, new processes and remarkable possibilities never before dreamed of in the manufacture of rubber goods.

And higher development has been attained from the standpoint of toughness and durability in the manufacture of automobile tires than in any branch of the rubber industry.

The process of making rubber footwear, up to the present time has been to lay the rubber upon the fabric by hand and vulcanize without pressure.

Tire manufacturers have realized for years that if a boot or lumberman's shoe could be made of the same stock and by the same process which made it possible for motor car tires to travel 10,000 miles or more, over the roughest roads, they would have a boot far and away beyond anything in the way of rubber footwear heretofore produced. But up to the present time it has been regarded as practically impossible to produce such rubber footwear. Therefore, the announcement that these goods can be made by the well known unit-construction, high-pressure process, is regarded as a master stroke in the rubber industry.

The tremendous pressure under which the rubber and fabric are welded together and vulcanized into a single unit makes each actually a part of the other, so that it is impossible for this footwear to crack or peel, leak or come apart.

This great achievement will likely be a tremendous incentive and impetus to further accomplishment in the rubber industry. It reflects credit upon the entire rubber manufacturing world.

OUR ROADS ARE CRITICIZED.

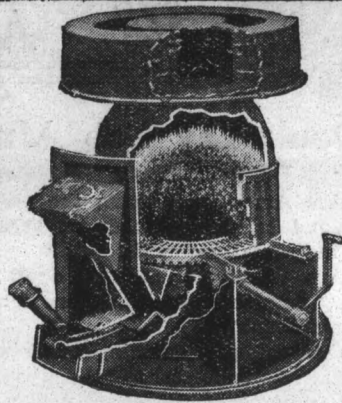
Joseph R. Drake, vice-president of the Hupp Motor Car Company, of Detroit, who returned recently from a round-the-world trip of a year and a half duration, most of which time was spent in the Orient and the Antipodes, is moved by patriotic admiration when he discusses his experiences.

The topic which moves Mr. Drake to real emotion is good roads. When he discusses that matter, however, his enthusiasm is somewhat tempered by the realization of this country's sad deficiencies in the way of adequate highways.

"Tasmania, a small country with about 250,000 people, has miles of good roads. Ceylon, an oriental country that we Americans who have not been there, think of as more or less a jungle, has hundreds of miles of magnificent roads, as fine as any boulevard. They run over hills and mountains, through the jungle and everywhere. The natives are working at them constantly and all the work is done by hand. These countries are small and poor. Of course, they are older than our country and labor is cheaper, but we have many times as much money as they have, besides greater energy and greater resources in every way.

"Recent demonstrations by the unemployed in New York and other cities have made me think that it would be a good thing if these poor fellows could be put at road making and thus earn money. Some men say it is humiliating to be put in a road gang, but I think the most of them would prefer this to storming churches or standing in bread lines."

Heats 10-Room House for \$28 With an Underfeed!



Cut-out view of Underfeed Furnace showing Underfeed method of coal burning.

Here's the Proof!

Youngstown, Ohio.
The Peck-Williamson Co., Cincinnati, Ohio.
Dear Sirs: In regard to the Underfeed, I can not speak too highly of it, as I have had different kinds of hot air and hot water heaters, and have found nothing to equal the Underfeed in every way. You are safe in saying the Underfeed will save one-half of coal bills. Last winter I heated our house with an Underfeed, ten large rooms and open hall, bath and a great many windows, which always take more heat, at a cost of \$28.00—sixteen tons of slack at \$1.75 a ton, and our home was always warm and comfortable.
Yours truly, EDWARD POWELL.

"The Farmer's Furnace"

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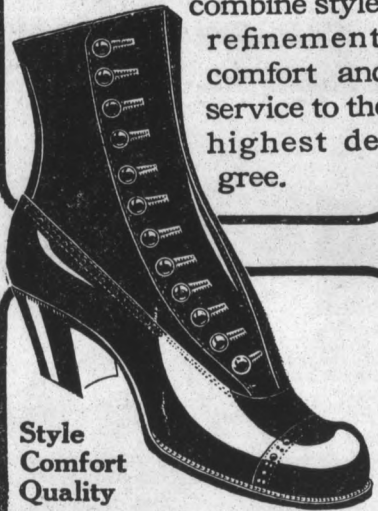
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Wonderful new invention—turns dim red flame into big brilliant, white, steady light. As good as gas or electricity. Works on any lamp. No smoke, no smell. Makes one lamp do work of three. Prevents eye strain. Saves oil. Fine for all night use. Guaranteed. Price 20c, for No. 1 or No. 2 lamp, or No. 2 Cold Blast lantern, by mail prepaid. Agents Wanted. Write quick. Perfect Burner Co.
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Woman and Her Needs At Home and Elsewhere



Don't Lay Too Much Stress on Specializing.

"Are Americans losing the skill of eye and hand that made us great as an industrial nation?"

"Are American factory operatives today degenerating into mere tenders of machines?"

"One thing is certain, the trend of industrial training in the technical high schools of the country is not in the direction of the development of those powers of inventiveness and ingenuity that was the foundation of our national greatness."

"When I go through our technical high schools the boys at work impress me as being mere tenders of machines."—Ella Flagg Young, Supt. of Schools, Chicago.

A GREAT deal is being said nowadays about vocational training. Fit the child for some special work, and do not litter up his mind with a lot of stuff he is not going to use in his work, is the cry of the hour. While it is good in its way, I often wonder how we are going to tell just what the child will use and what he will not.

I was educated in the old-fashioned way, which we are now told was almost criminal. My mind was stored with a "mass of unrelated facts," as our present-day educators say, and yet out of that jumble of facts I don't believe there is much I haven't used some time or other. So that when we begin weeding out the unnecessary, who is to say where to begin?

But I started out to wonder if we are not training our boys and girls a wee bit too much along one line. I have in mind a young man who has been trained most carefully. In public school he had several years of manual training, when he learned to make all sorts of fearful and wonderful things with tools bought and paid for by the board of education. He followed this up by four years at a college, where he studied engineering and did shop work with other expensive tools. Theoretically he should be able to do all sorts of odd jobs about a house. And he can if—he has the proper tools.

Really, it is a joke to watch him work. His mother asks to have a shelf put up in the kitchen. He first sits down with pencil and paper and figures up the stress. Then he makes a diagram of the side wall of the kitchen, carefully indicating each screw hole and the size of the screw. This takes a day, usually. Next morning if his mother can furnish saw, plane, hammer, tool for making holes to fit the nail head, screws and nails of a certain size, and a few other implements he proceeds to put up the shelf. I will say this for him, when he has finished the job is a real work of art. No high-priced cabinet maker could improve on it. But was it worth all that time and expert work?

To me the lamentable thing is that he can't work without proper tools. Everything must be to his hand just as he had it in school or college, or he is lost. My brothers, with a broken saw, a jack knife and a good sized stone for a hammer, would tackle any job of home carpentering and get it done satisfactorily. While this highly trained expert would stand helpless and dejected unless you give him a kit of tools. Why, I've seen women with a hairpin, butcher knife and monkey wrench, educated in the old style, with a "hodge-podge of ideas," which at least they knew how to use,

do a job in a half-hour that this chap would take a day to do with the proper tools, and couldn't do at all without them.

Is it the young man himself who is at fault? Is it because he does not know how to utilize the things at his command, or is it the educational system. Perhaps it is the boy's fault, that he has no conception of anything outside of the way he has been taught to do things. Give him the proper tools and he can do anything. But show him the work and leave it to his initiative to find a way to do it, and he is lost.

Vocational training is a fine thing, no doubt. But to my way of thinking the world has too many specialists. Every boy and girl should know a little about every other line of work, unless they expect to spend all they earn hiring each other to do the bits

of work which come up about a house.

The farm boy, and girl, too, should know how to drive a nail straight, and how to use a saw, chisel and plane. And the boy and girl in town should know how to make and care for a garden. The person trained to do just one thing is helpless. It is this knowing but one thing which has kept the foreign working classes down, while the versatility of the American toiler has made him the wonder of the world. It will be a sorry day for the American laborer if he comes to a time when he, too, becomes a machine to do but one thing. Let us do one thing better than any other if you like, but be able to do all the others well enough to pass if emergency arises.

DEBORAH.

Lest the author of the foregoing article be accused of plagiarism, she wishes to state that it was written before Mrs. Young's speech, parts of which are quoted.—Ed.

The New Hats are Conservative and Becoming.

THE advance guard of spring hats seems to indicate that if our frocks must be freakish, at least our chapeaux may be sensible and becoming. Small and medium-sized hats are the thing for early wear, and the latest importations show none of the large garish effects which have sometimes been perpetrated upon suffering womankind. Especially becoming to youthful fresh faces are these new hats, small, close-fitting, and rolled up at one side, or neat low-crowned sail-

boats, their absence. Maline is much used in pom-poms, folds and bands. Everything is good, say the trimmers, so no matter what you use you will not be a back number.

Of course, there must always be a new color, even if it is new only in name, and this spring it is tango. Tango looks exactly like our old friend, burnt orange, but don't make the mistake of calling it that lest you show you are not quite up with modern nomenclature. Blue in every



ors, though these sailors must be trimmed. The more matronly hats are close-fitting, many without the rolled brim, the high effect being gained by bows of ribbon, or "stick-ups," as the milliners say, of maline, ribbon or other materials.

Both back and front trimmings are good, the majority favoring a front or side-front effect. The Mercury bows, which have enjoyed a short vogue, are already fading. Flowers in abundance are seen and ribbons of all hues, textures and widths, but plumes and feathers are most conspicuous by

shade is good, especially peacock blue. For the more sober folk are taupe and black, while white for the younger women is seen a great deal.

Very smart for either the young woman or the matron, is a hat of Milan rolled high off the face on the left side, but fitting closely down over the hair, which, by the way, must be drawn down about the ears, covering them if you wish to be right up to the minute. The brim of the aforementioned hat is filled in with black maline and has a band of jet. A hand-some black Paradise feather com-

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MONTGOMERY WARD & CO.

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pletes the trimming. This is an especially good model, and is becoming to almost any woman who can wear all black.

For girlish wear a plaque of white horsehair is shown. This is transparent and shows beneath the braid, stiff clusters of autumn foliage, the foliage being inserted between the braid and the inner lining. Beneath the brim are clusters of flowers and a knot of ribbon.

Sailors to the uninitiate are sailors in name only, as they little resemble in shape our friend of other years. Who would suspect that the much-trimmed hat in the illustration was a sailor? But the milliner solemnly vows it is. It is of fine brown straw, trimmed with ribbon of the same shade and a wreath of tiny roses and forget-me-nots. The ribbon around the top of the crown is pinked and pleated, and the hat was a jaunty effect when poised about a piquant face.

Of white ribbon is a helmet hat which promises to be good for spring wear. The entire hat is made of ribbon, yet it has the effect of the police or fire laddie's helmet. Trimming it are Mercury wings, poised ready for flight, on the brim.

A peacock blue hat for girls' wear takes the form of a small, close-fitting turban, the brim turning up at the left front into a high point. The trimming is a tall "stick-up" of peacock ribbon, fastened to the high point of the crown.

Quite a little fancy braid is shown just now, but the finer braids promise to supplant them before the season is far advanced. For the woman who wants something neat, serviceable and unobtrusive, is shown a close-fitting hat of black fancy braid with medium crown and plain brim, trimmed very simply with loops of black ribbon on the left side. Some flowers are used on these black fancies, but simply trimmed with ribbon or ribbon and jet, they are neat and smart appearing.

YOUR NEW CURTAINS.

BY A. L. L.

IF you are going to buy new curtains this spring for any room in your house, unless you have that abomination of desolations, a parlor, you will make no mistake in buying scrim. Scrim for living-room, dining-room and sleeping-rooms, is offered you when you enter a drapery department and ask for something new. Of course, other things are shown, madras, voile and marquisette, but scrim seems to be the leader, either in ecru, ivory or white.

And, when you stop to consider, there are good reasons for this popularity. Scrim is transparent, it lets in plenty of light and does not obstruct your view of the street; it is soft, so that it hangs in the soft, straight folds just now demanded; it is as easily laundered as your dish-towels, and, best of all, it is durable. In this last respect it is a better investment than madras, which does not wear nearly so long, though it is undoubtedly pretty curtain material.

You can buy your scrim as plain or as fancy as you like. It is sold by the yard with narrow or a wide lace edging either on both sides or on one; with plain hemstitched edges; with a narrow border of drawnwork; with drawnwork borders three and four inches wide; with drawnwork striping the whole width of the curtain, and with borders of colored floral wreaths. So you may have curtains beautifully plain or very much fussed up, just as you desire.

As to price, you can buy it anywhere from 15 cents to 50 cents the yard. The 25-cent quality is a good bargain, the scrim is fairly fine, though, of course, not so fine a weave as the more expensive variety. Voiles and marisettes come at the same prices, while the madras retails at from 19 cents the yard to \$1.00.

For the living-room plain straight curtains of ecru or ivory scrim, hung close to the glass, would be pretty, with over-drapes of some sun-fast fabric in dull green, brown or maroon to suit the general color scheme of the room. The drapes may hang simply from the side of the windows, or you may use side drapes and a valance across the top, from a foot to a foot and a half wide.

In the bedrooms, cretonnes and chintzes are used for the over-drapes, pink, blues and yellows being in great demand.

Lace curtains for state rooms are, of course, always good. But the busy housekeeper is turning more and more from lace, which is so hard to "do up," to the cloth curtains which may be put in with the week's wash any time she thinks of it, and quickly and easily gotten out of the way.

THE LAUNDRY ROOM.

During the winter months housewives find that, of all household tasks laundry work is the most taxing not only on strength, but also on health.

The need of a laundry room is extreme at this season of the year. It is not possible to do washing without the house becoming somewhat damp from the steam which arises from the hot water, and in case there are little ones in the family, they are almost sure to contract colds on each wash-day and thus suffer from such local congestion during most of the winter. This should not be regarded lightly. "Nothing but a cold" is an expression too commonly heard. A cold reduces the vigor while nature is trying to make both growth and daily repairs, and prevents that perfect development which might otherwise take place during childhood—not to mention those dangerous gatherings in ears and mastoid bones, so common to childhood, which are almost invariably caused by colds.—Juanita L. Shepperd, University Farm, St. Paul.

FASHIONS BY MAY MANTON.

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



No. 8185—Middy blouse for Misses and small women, 16 and 18 years.

No. 8195—Fancy blouse, 34 to 40 bust.

No. 8200—Semi-Princess gown, 34 to 40 bust.

No. 8174—Seven-gored skirt, 26 to 36 waist.

No. 8194—One-piece skirt, 22 to 30 waist.

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



Advantages that show!

When you see the advantages that show in a Majestic, you'll want it!

1. Body lined with extra heavy, pure asbestos, held in place by open grating so that asbestos can reflect heat onto oven.
2. Oven top curved—heat hugs closer than with ordinary square top, and is braced by heavy bolted beam.
3. Patented plate around base of pipe adds double thickness where ordinary stoves are weak.

Majestic oven is cold-riveted

(4) to heavy L-shaped frame of malleable iron—iron that can't break. Heat can't escape; stays tight and bakes right always. Partition in bottom flue guides heat to front of oven; no need to turn bread in a Majestic. Ordinary ranges of cast iron or steel, can't be cold-riveted because hammer blows break cast metal. Such ovens are bolted loosely to thin body metal, without oven frame. This leaves cracks that must be filled with putty, which soon falls out, allowing heat to escape. The hotter fire then required buckles the unbraced oven and burns out the range. Other Majestic advantages: Hot water movable reservoir of pure, nickel-plated copper. Pocket pressed from one seamless piece—can't leak. When water boils, reservoir and frame can be moved away from fire by shift-

ing lever. No wear on bottom of reservoir. (Flush top reservoirs have aluminum top.) Unbreakable iron braces on oven door. Oven rack slides out easily and stays rigid and level under heavy weight. Cup catches falling ashes when emptying pan. Open end ash pan scoops up ashes inside as you slide it in. Ventilation under pan—floor can't scorch. These Majestic advantages show; but quality only shows with use. Majestics are made entirely of malleable and charcoal iron. Charcoal iron looks like ordinary iron or steel but resists rust three times as long. That's why you can't judge quality by actual appearance, much less by pictures. The Majestic Reputation should be your guide.

The men-folks won't use worn out farm machinery. Why should you "get along" with an old cookstove that wastes fuel, ruins baking and requires frequent repairs? A new range would save its cost; but get a good one. A cheap range is never cheap. A Majestic Range always requires less fuel and repairs, bakes best and outwears 3 ordinary ranges. See the Majestic before you buy any. Majestic dealers are in every county of 40 States.

If you don't know the Majestic dealer near you, ask us; and write for "Range Comparison" explaining other Majestic advantages. Majestic Mfg. Co., Dept. 21 St. Louis, Mo.

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Try This for Cookies

3 eggs.
1½ cups granulated sugar.
1 cup butter and lard mixed.
4 tablespoons water.
2 rounded teaspoons baking powder.
Enough Aristos Flour to roll.
1 teaspoon any flavoring.

Farmers' Clubs

Address all communications relative to the organization of new Clubs to Mrs. C. P. Johnson, Metamora, Mich.

Associational Motto:

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

THE RURAL HELP PROBLEM.

Paper prepared by Miss Nora Braun, of Webster Farmers' Club, and read by Mrs. E. N. Ball, before the State Association of Farmers' Clubs.

I have chosen this subject because, having lived in a rural community practically all my life, I have found ample opportunity of becoming acquainted with farm problems. According to my observation and consideration, the problem of sufficient and efficient help is one of the greatest before the farmer and his wife today, for upon it the others in great measure hinge. The problem appeals to me because of the direct relation between it and the social condition of our rural population, and further, between it and the high cost of living that is bearing so heavily upon our urban population. If in writing this, I can reach any of the fundamental underlying causes of present conditions and add even one worth-while suggestion to their solution, I shall feel amply repaid for the effort.

Printed information bearing directly upon this problem seems to be decidedly meager, and I can speak from direct personal experience of but a limited territory, most of which lies in the eastern half of Washtenaw county, Michigan. Yet that the conditions of this section are typical seems evident from the reports of acquaintances representing many widely separated districts of the middle states. And what are these conditions?

When I think over a long list of acquaintances living on farms and check off those that have the necessary help to carry on their business in such manner as to leave a margin for profit and yet have opportunity for self-culture—in less words, who can get the best out of life—I find these favored individuals pitifully few. We may not be able to tell why, but the fact remains that the farmer and his wife are handicapped, and seriously so, by the lack of help. They may have all sorts of labor-saving machinery, and this is surely essential under present conditions, but as yet this machinery has not become sufficiently automatized to give efficient results without a level head and a pair of capable hands to manipulate it; and when there is but one such head and one such pair of hands, these bear an unnatural strain. Under these conditions, the victims of present rural conditions see their long-boasted independence sweeping away, for how can a man feel independence when work is his master? Whichever way the farmer—and the term includes his wife as well—turns, he is confronted by tasks which must be done if the farm is to be kept at a high standard of productivity, such tasks as tiling, fertilizing, spraying, fencing to make pasturage possible, cutting out dead timber, etc. In the spring and early summer, he is confronted by the necessity for spraying when the oat land should be plowed, by corn-planting when late potatoes are demanding the same attention, by cultivation of these crops when the haying should be done, and so it goes. Many a time during the season his patience and faith are tried as he sees the dollars literally slipping out of his pockets as the grain or other crop is over-ripening and wasting for lack of a harvester. This is especially true of him who mixes agriculture proper with horticulture.

(Continued next week).

CLUB DISCUSSIONS.

Membership Growing.—The Somerset Farmers' Club is still growing in membership. The Club met at the Congregational Church in Somerset for the February meeting on the 28th ultimo. The noon hour found a good-sized company assembled. After dinner was served, the meeting was called to order by Mr. F. R. Smith. After singing of "America" by the Club and prayer by the chaplain, Rev. Vanbuskirk, business followed, part of which was the voting into membership of several families. A committee was appointed to draft resolutions on the death of our highly esteemed sister and former secretary, Mrs. Mary Carney. The topic for discussion was then opened by the chairman, Mr. Smith, followed by others giving their personal experience on the topic, "Is it profitable for the average farmer to use commercial fertilizer?" The discussion seemed to prove that where there is a lack of barnyard manure the commercial fertilizers are very necessary and profitable, and a great advantage in starting the young and tender crops, such as corn, etc., ahead of weeds and getting it well started towards a vigorous growth. An excellent program then followed. Club adjourned to meet March 28 at the home of Mr. Lewis Walworth Jerome.

—Mrs. Zoa E. White, Cor. Sec.

Discuss Taxation Problem.—The Hadley and Elba Farmers' Club held its February meeting with Mr. and Mrs. C. P. Johnson, 75 enjoying a very pleasant day. The meeting was called to order by the president B. L. Snook. Song by the Club, "Sweet Ble-and-Bye." Mrs. Branch gave a fine paper on conducting the finances of the household, which was well discussed. W. E. Ivory and L. G. Selby gave a fine talk on "Taxation Reform," which met with a very lively discussion. Mr. A. H. Nalor, county superintendent of schools, gave a short talk on the "Boys' Corn Club."

—Cor. Sec.

Three Good Meetings.—The East Otisco Farmers' Club has held three large and interesting meetings this year. January 8, the first meeting of 1914, met at the home of Mr. and Mrs. E. M. Wooldridge. Sixty sat down to the bountiful dinner served, after which the annual election of officers was taken up. The following were elected: President, Clarence C. Chickering; vice-pres., J. D. Strain; secretary, Mrs. Cora Kohn; corresponding secretary, Mrs. Mabel Chickering; treasurer, Mrs. Charles Johnson. A selection of music was given then E. M. Wooldridge, delegate to the State Association of Farmers' Clubs at Lansing, gave a very interesting report. The February meeting met at the home of Mr. and Mrs. M. L. Howe and J. D. Strain, February 5. Here 75 partook of the usual dinner. At 2 p. m. meeting was called to order by the president. Two selections were read by Mrs. William Wilson. Then a short business meeting was held, after which a discussion on the resolutions passed at the State Association of Farmers' Clubs at Lansing was led by E. M. Wooldridge. The president appointed as a committee to make out programs for the remainder of the present year. The regular monthly meeting of March 5 was held at the home of Mr. and Mrs. Wm. Beach. Fifty-two were present at dinner, after which the meeting was called to order by the president. A short business meeting was held, then an excellent program was given. A discussion on the question, "Are conditions favorable for a young man acquiring a farm at the present time?" If not, how may they be bettered?" was led by Fred Currie, Ernest Chickering and Anthony Kohn. Then all joined in singing, after which some current events were given by Clyde Beach. After the literary and musical program which closed the program, Club adjourned to meet at the home of Mr. Wm. Leach, April 2.—Mrs. B. A. Chickering, Cor. Sec.

Have Big Meeting.—Ceresco Farmers' Club, to the number of 125, held a delightful meeting with Mr. and Mrs. Jacob Paul, coming in sleigh-loads of eight and ten. To appreciate one of these meetings one must be there. One lady said "I like to come to the Club for everyone knows everybody else. There is no formality, just a monthly reunion of one family." As usual the dinner played an important part in the success of the meeting. Professor Crosley, like everyone else, was in his jolliest mood. Called to order, we sang a Club song written by J. H. Brown. George Reese gave a fervent prayer. Mrs. Hall read the minutes of the last meeting. A paper by Florence Blake was fine, and a recitation by John Woodruff was greatly enjoyed. P. M. King presented the topic for discussion, "How will legumes benefit the farmer?" Adjourned to meet March 25 with Mr. and Mrs. George Smith.—Mrs. P. M. King, Cor. Sec.

Grange.

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

APRIL PROGRAMS.

State Lecturer's Suggestions for First Meeting.

Opening song, "Grange Melodies." Roll call of officers, responded to by each telling of some notable progress in any line.

The Torrens land title system, a paper.

Surprise feature, in charge of the young people.

What is your progress: 1, in government reforms? 2, in care of children and young? 3, toward fuller co-operation?

Dialect recitation.

Music.

Master assists lecturer in securing above program.

HESPERIA GRANGE AND TEACHERS' INSTITUTE.

The Twenty-second Annual Union Grange and Teachers' Association Institute of Oceana and Newaygo Counties, began on Thursday, February 12 and ended Saturday evening, February 14. It was the greatest intellectual feast the association has ever known. These meetings have been held in Hesperia, a village of 700 inhabitants, and 12 miles from a railroad, which may well be proud of the way it has taken care of the crowds which come from all parts of the state. This last Chautauqua involved an expense of about \$100 a night for talent, and also a good sum for the day programs. But few towns of its size could pay that amount and still have money left. Four hundred and fifty dollars worth of tickets were sold and after all expenses were paid there was a good sum left for a starter for next year.

The program was surprisingly good and furnished entertainment, education and inspiration in a pleasing variation. The first lecture was "Jean Valjean," by Rev. Frank Luce, of the First M. E. Church of Cleveland. This lecture was a dramatic narrative delineating the leading character of Victor Hugo's masterpiece, "Les Misérables," and gave one a due appreciation of this famous character of the fiction world. The Walkerville Orchestra furnished the music at this, the first evening meeting.

The popular Mr. H. R. Pattengill was the first one on the program Friday morning. His talk was on "Tuebor," and he soon made his listeners understand what this motto of our commonwealth stood for. He brought out the value of our state and by doing so made those who heard him feel proud that they lived in Michigan. His talk was interspersed with his usual good humor and wit.

Mr. H. B. Blandford, of Newaygo county, farm adviser, gave a good address on "Dairying and Fruit Growing." He said that with the proper knowledge both of these branches, of farming could be carried on with profit.

Judge Van Wickle, of Hart, gave a splendid talk on "Lincoln." He said that Lincoln was a diamond in the rough among the rocks, and that he was an example of the fact that ability, no matter where it is, will be recognized.

"Fads and Fundamentals" was the subject handled by Mr. Otwell, Asst. Supt. of Public Instruction. He said that fads in education did harm, while fundamentals were very essential. Prof. Davis, of the U. of M., also spoke on education, having as his subject, "Vocational Education." He suggested that the prime purpose of education was to help the individual to help himself.

A Grand Rapids High School Quintet, with Mrs. A. E. Ewing as reader, furnished the Friday evening entertainment. They furnished an excel-

lent evening's program.

Opening the program on Saturday morning, Prof. R. D. Hollister, of the U. of M., gave a splendid address on the "Oral Interpretation of Literature." He believed that we could get much more out of our reading if we read aloud. He gave short readings, which were well rendered, to illustrate his points.

Our friend Pattengill again appeared on the program, this time talking on "Lessons from the Big Ditch." He told of the magnitude of that famous work of engineering, of which all Americans are proud. In this talk he also brought out strongly the fact that riches will not make a nation successful; it needed vision, education, industry and Yankee ingenuity to do big things.

John C. Ketcham, Master of the State Grange, was warmly welcomed when he appeared on the program. He gave things in his right-from-the-shoulder manner, which drove home many important things and gave one an optimistic feeling in his endeavor to help to overcome some of these things.

Prof. Hollister next gave a recital-lecture on "The Rivals," in which he showed himself an excellent interpreter of literature and an impersonator.

Closing Saturday afternoon's session J. I. Gibson showed stereopticon views and talked on the good features of Western Michigan.

Saturday night the hall was packed to its limit, some even sitting on the stage. The occasion of this crowd was Hon. J. Frank Hanly, ex-governor of Indiana, who talked on "The Government of the Fathers." His pleasing and eloquent manner won the hearts of all who heard him. He made a strong plea for upholding our country's constitution. He said that it had no parallel in human history, and that its preservation was worth while. We, the children of our fathers, must not raffle away our heritage. He told no jokes or stories and help up his hands to stop applause, but still he held the attention of everyone there.

Thus ended the great meeting. Half has not been told. The orchestral music, the singing, led by that man, Pattengill, and many other things too numerous to mention, were of the highest order. This Hesperia Chautauqua is certainly a world unique affair.—M. R.

PROSPECTIVE GRANGES.

The organization of new Granges at Chester, in Eaton county, and at Middleville, in Barry county, is given serious consideration.

At Middleville, C. F. Keiffer, a State Grange organizer, finds considerable interest, as the people there realize the value of a well organized and active Grange to the community. They know it to be a potent factor in the moral, social and educational advancement of the country.

At Chester preliminary steps have already been taken. A large number of local people and a delegation from the Charlotte Grange, held a meeting recently with E. C. Pray, Master of the Eaton County Grange, in charge. After informal remarks by Mr. Pray, F. C. Curtis, who has been active in getting this Grange under way; W. L. Huber, Master of Charlotte Grange, and others, the following temporary officers were elected to hold office until the next meeting:

Master, Mr. Holmes; secretary, Lyle Ryan; treasurer, Lafe Davis.

County Deputy Pray has arranged to spend some time in the locality and a large delegation is promised when the new organization starts on the road of effective and comprehensive work.

COMING EVENTS.

Pomona Meetings.

There is to be a County Grange Rally at Pontiac, March 25, at Grange Hall, 9 Lawrence street east, at ten o'clock a. m. Banquet at noon in the Armory on Water street. Free to all farmers. Lecturers' and Masters' conference at 10:00 a. m. After dinner regular Pomona Grange to which all members are invited.

Eaton Co. at Charlevoix, April 9, with Ironton Grange.

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Farm Commerce.

Argentine and Our Corn Markets.

MUCH is being said of the probable influence of the importation of corn from Argentine on the prices of that cereal in this country. A few comparisons will help us to better understand the situation. Argentine has a population of nearly seven millions of people. It is about 5,700 miles from New York to Buenos Aires, the chief city and capital of the country. Buenos Aires is a fine city of 1,314,000 people, and the largest city in South America. You will observe that over one-fifth of the country's whole population live in this one city. The present rate on corn from Chicago to New York is 21 cents per hundred pounds, or about 123-5 cents per bushel.

Argentine is the second largest corn producing country in the world. In 1911 it produced 260,000,000 bushels of corn, and in 1912, 240,000,000 bushels. Iowa produced 432,000,000 bushels in 1912, and 323,000,000 bushels in 1913. So you see in 1912 Iowa overtopped the whole of Argentine by 192,000,000 bushels, or she raises more corn than any nation on earth, except the United States. In 1912 Missouri produced 243,904,000 bushels of corn, or about 4,000,000 bushels more than Argentine. Now suppose Missouri had been 5,700 miles away from New York and you had heard that the great state of Missouri was pouring its immense corn crop into the United States. What then! Would you stand and tremble? In the past Missouri and Argentine have stood about equal in the production of corn. Europe would not take one bushel of our corn if it was cheaper in Europe than in the United States. It requires about one day's extra sailing to reach Europe over the distance to New York. If it is worth more in Europe why bring it here?

Of course, this being a corn famine

year they can afford to bring a little as our prices are higher than usual. Now can they afford to pay ocean charges, elevator charges at New York, railroad freights, and the charges again where it is consumed, and knock our market all to pieces? As soon as our corn declines to the usual price how about Argentine? It is said we only export two per cent of our corn crop in general and use the rest at home. Where is the two per cent to export this year? We are now short on our last crop over our bumper crop by 678,000,000 bushels, and we did not have corn then to throw at the birds. If Argentine could throw every ear and nubbin it has into the United States and not save one for seed, we would then be a whole lot short of our bumper crop. The whole world produced 4,152,000,000 bushels of corn in 1912 and the United States produced 3,125,000,000 of it, or about three-fourths of the whole world's crop. In the same year Iowa, Illinois and Kansas together raised more corn than was raised in all the rest of the world.

Now we have Chile and Uruguay to deal with and they both raise corn and border on Argentine. In 1912 Chile raised 6,000,000 bushels and Uruguay 8,000,000. Now the whole population of South America is about 50,000,000 and these three countries must feed all the rest of South America and all the West Indies and part of Europe and have enough left to swamp the United States. The rest of South America and the West India Islands are tropical countries and do not export corn. They ship a little corn to parts of Africa besides. You have heard of the "Big Stick," this is a Big Stick being used by the grain men to frighten the farmers into selling their corn as cheaply as possible.

S. A. V. HARTWELL.

Community Production Simplifies Marketing.

COMMUNITY planning can do much to increase the profits in farming. The community that produces a good deal of one kind of product, and that of good quality, can market to much better advantage than can the community that produces a little of everything and not much of anything. The unit of marketing is the carload—and a train load of one product can be marketed better than the carload. The locality that can market a train load of hogs at a time will secure better prices than can be secured where it is difficult to scare up a carload. The former place will have a market at all times as there will be no trouble in making up a carload. In the latter place it will not be possible to market whenever one wants to, even though the market be the best.

The market comes to the place that has much of one thing to sell. By a community working together the quality can be improved and this brings a better market, a more discriminating market. In time this community that has worked together in producing a lot of one thing, and that of good quality, will build up a reputation. This will result in a premium being paid for the products. This means that a reputation is worth money. It will bring dollars and cents.

This is work that can be started by a Farmers' Club or Grange, or by some members of it. Potato raising is one line of work. The point would be for all to grow the same kind of potatoes and to plant and care for the

crop so as to secure quality and uniformity. Pork production is a good line. Egg production can be worked out well. Use one breed of poultry. Feed and care for them so as to secure a good production of eggs the year round. Have some means for having the eggs gathered, packed and shipped at least once a week, or better, twice a week. Guarantee the eggs. Have some way of marking so that each egg can be traced back to the farm it came from. A heavy penalty should be imposed on the farm that sends out a bad egg. It is spoiling the market for the whole community.

Many ways will suggest themselves in which a few farmers or a community can plan together and in that way bring a good market to them.

SELLING PRODUCE ON DETROIT MARKETS.

Can you inform me how to get a stall on the Detroit city markets? Also, to whom to pay the fee?

Wayne Co.

G. R.

There are two classes of stalls on the Detroit markets—one class is rented day by day, while others are rented for the season. The season stalls are leased at \$50 for the year. The other stalls are charged for at the rate of ten cents per day. The practice in regard to stalls of the latter class is for the farmer to drive his rig into a vacant one, after which the superintendent collects the fee.

One of the rules of the Detroit market is that the produce sold thereon

must be offered by the person who grows it, or by his employe. This rule is to prevent dealers from selling purchased goods through these markets. To make the rule effective it is necessary for the seller to make affidavit that the goods brought upon the markets are grown by himself, or by his employer. It appears that the city does not issue pamphlets containing the rules and regulations of the markets, as is done in many places. However, a little experience, observation and inquiry will supply one with the necessary knowledge to market his goods through these institutions.

SHIPPING BUTTER IN SUMMER.

I have been shipping my butter all winter wrapped in paper, but when warm weather comes I shall have to stop shipping and take the low prices offered at our local markets; or else I shall have to find some way of packing the butter so it will not soak through.

Leelanau Co.

SUBSCRIBER.

It is possible to ship butter to consumers during the warm months. The writer has received shipments throughout the summer of 1913 and not a single consignment appeared to have been injured during transportation. The shipments were made by express. Of course, the butter must be handled with dispatch and the usual precautions taken of keeping it cool before delivering to the common carrier and after it has been placed in the hands of the consignee.

It will be found practical to use crocks for shipping the butter in summer. If the crocks can be enclosed in a crate that will accommodate the number to be shipped at a time, it is possible to protect the butter considerably from extreme temperatures due to holding on station platforms carrying in open delivery wagons, etc. But if such a crate is made it should be so constructed that the crocks will not strike against each other. We have used one that holds six five-pound crocks, and when properly packed the crocks have always arrived in good condition.

Plan to have the butter enroute during the night. If it can be delivered at the station in the evening so as to be shipped to arrive at its destination in the night or early morning, and be delivered the following forenoon, less trouble will be found in keeping the shipments in good shape. Most producers will find it convenient to do this, but where it is impossible, then the delivery should be made near train time with the butter kept cold by wrapping with heavy cloth or carpet and at all times kept from the direct rays of the sun. Where the shipments do not require to be sent on a certain day, one can often avoid shipment on an extremely hot day to the advantage of the butter.

WHERE CO-OPERATION PAYS.

The South Jersey Farmers' Exchange has just given a practical demonstration of the business advantages of co-operative marketing of farm products and purchasing of farm supplies. The exchange has been operating for five years. Its capital is about \$28,000. This last year it did a business of over \$700,000, and made a profit of 52 per cent. Its stock shares have doubled in value and its members have received good prices for their products. The 600 men who make up its membership are prosperous and well satisfied with their business.

There could be no better refutation of the widespread idea that farming is profitable only for the middleman. Farming is profitable for the farmer, provided the farmer is alert enough to resort to the methods of modern business. This is one phase of agriculture that the agricultural press and the marketing experts of the Department of Agriculture are trying to teach to American farmers.

Crop and Market Notes.

Michigan.

Berrien Co.—There are more sales here than usual, and stock of all kinds is selling well. There are not many hogs going to market. The first carload of potatoes has been loaded to ship, the price received being around 50c. A large amount was held over for spring delivery with the probability of not being much higher than that. Ice dealers have been very busy and have filled their houses with the best ice in years. It is a little too early to be certain about the condition of wheat and meadows, after the snow has gone.

Sanilac Co.—There was good sleighing throughout February; ice men have had a good harvest. Apparently the wheat and meadows have suffered little as yet, but we hope to see the snow remain as long as possible. Not much marketing done, and prices are not very attractive. Farmers have about 10 per cent of their beans left. There will be a large amount of building of silos, barns and houses the coming season. Prices are: Wheat 89c; oats 36c; beans \$1.65; hay \$7@11 baled; eggs 22c; butter-fat 28c.

Arenac Co.—The first few days of March were cold, with quite a blizzard. All grains seem to have stood up well, also new seeding is better than anticipated. Stock is wintering fine and bringing high prices. Hens are laying well, and price of eggs is good. Some beans, potatoes and hay are being marketed. Beans \$1.55; potatoes 50c; loose hay \$7@10 per ton. There are a great many auction sales, and there seems to be plenty of buyers.

Mecosta Co.—Signs of spring are now appearing. Some sleighing yet. Fall seeding appears to be in good condition. Farmers who held their hay find they have missed the best market. Quite a quantity of potatoes were marketed the past month for 45@50c.

Branch Co.—Farmers made good use of the sleighing during February to draw farm produce and logs. Most of the snow is gone, and roads are quite muddy. Wheat, rye and seeding looking fine, and promise a good crop. Hens are laying better now. Wheat 95c; corn 65c; buckwheat \$1.70 per cwt; oats 37c; potatoes 60c@1; butter 23c; eggs 22c. Most of the stock that was in feeding has been sold.

South Hillsdale Co.—Snow is nearly gone, though there is some ice on the fields. Wheat, rye and meadows are in fine condition. Stock is all looking well, and there is plenty of feed of all kinds. There is quite a number of auction sales, and everything brings good prices. Eggs are not plentiful as yet. Stock of all kinds is nearly all sold, and good prices were procured. Milch cows are in good demand, and high prices are paid for good producers. Beans and potatoes are not raised here in large enough quantities to supply the demand.

Washtenaw Co.—The severe weather of February does not seem to have had any injurious effect on wheat and meadows, and prospects are for a more than average crop, should conditions continue favorable. The milder weather is bringing out a good many potatoes, and the price is 50c per bushel. There is probably 25 per cent of the crop yet to be marketed. Shipping day every Wednesday seems to bring out a big bunch of cattle and hogs. Cattle \$6@7; hogs \$8. Hens are beginning to lay, and eggs are coming to market quite freely. A great many auctions are being held, and prices, especially for milch cows, are high, from \$60@100. Feed of all kinds is plentiful. A good quantity of hay is being sold at \$11@12 at the barn.

Shiawassee Co.—Wheat and rye are still covered with snow and are in good condition. There isn't much grain moving now, and prices on grain are dull. There seems to be no demand whatever for hay. There are plenty of auction sales, and everything is selling fairly well. There are some sugar bushes being tapped. There will be quite a number of barns built this spring. Beans are about all marketed, the price received being \$1.70; wheat 95c; oats 37c; potatoes 50c; corn 64c; hogs \$8; cattle \$7; cows are selling at auction at \$75@125; horses \$150@300, according to size. Hens are beginning to lay, and price of eggs has dropped to 24c; butter 28c.

Ottawa Co.—There is still some snow on the ground, so the wheat and meadows are well protected. A considerable quantity of wheat has shipped from different places. A considerable quantity of wheat has been marketed lately at 95c per bu. Eggs have dropped to 22c, and the market is well supplied. The average price of beans is \$1.60, and some

are holding for higher prices. The price of potatoes is about 60c.

Hillsdale Co.—The winter has been favorable in this section for wheat and clover. Wheat, however, shows signs of the ravages of the Hessian fly. Bean growers in the writer's locality are holding last year's crop for the most part, but few having sold. Most of the potatoes were disposed of in the fall, and the surplus from the winter's supply will be about all that will be available for the spring market. Owing to the colder weather, hens did not lay so well as a rule, in February, as during the previous months, but the output is now increasing. Cattle, hogs and sheep are selling well at auction, while there is a marked decline in the price of horses over the price in recent years. Cows bring at auctions from \$50@100. Young cattle of all kinds are scarce and sell well. Eggs and butter are bringing around 25c in the local market. Apples are very scarce and bring from \$1.25@1.50 per bu. Hens are selling at auctions at 75@80c each.

New Jersey.

Monmouth Co.—The ground has been covered with snow for some time, but it is feared that winter grains have been hurt, as there is a thick coating of ice under the snow. Grass is not likely to suffer so much. Poultry and milk are about all that is being marketed. Eggs are very scarce on account of the cold weather, and sell at 30c. There are several public sales in this section. Cows are selling at \$70@140; hogs \$35@40. Stock is not looking very well. A blizzard began March 1 and continued two days, and snow accompanied by high wind drifted the roads badly, there being no mail service for a week. Wagon roads were all blocked, trains were tied up and considerable damage done to telephone and telegraph lines.

Pennsylvania.

Montgomery Co.—On March 2 we had one of the worst blizzards in many years. The ground is now covered with snow, which is a good protection for grass and grain. There has been no material change in the markets. Milk at creamery \$1.70; in city 4½c per quart; eggs 28c; dairy butter 24c; chickens, live 16c; dressed 18c; hogs, dressed \$11; veal calves \$11; good fat cows 6½@7c. Horses are scarce and high, not many being raised here.

Erie Co.—Everything in this section looks favorable for farmers. Meadows and winter grains have been covered with snow through the coldest weather. There is not much produce being marketed. Hens are beginning to lay. Farmers are getting ready for sugar making. Eggs 24c; butter 35c; cheese 17c; hay \$10; straw \$6; potatoes \$1; apples \$1.25; cows \$90; veal 8c; horses \$200@300.

Lancaster Co.—Meadows and wheat not in good condition. Grain has all been sold. Steers and bulls 7½@8½c; tobacco is dull, 6@8c per lb; eggs 31c; poultry 14@17c; dairy butter 35c; creamery 40c; potatoes 85c.

Ohio.

Wayne Co.—The weather has been cold and the ground is covered with snow and ice, but there is no sleighing. We have had about a week of good sleighing. The wheat and meadows looked fairly well when the snow fell, but is still covered with snow and ice. Some wheat and oats being marketed; wheat 93c; oats 38c. There are not many cattle fed for market in this section, and not much dairying done. Hogs are going to market at 11c per lb. Hens are laying moderately; eggs 25c; butter 28c. Farmers are not doing much but chores, hauling a little manure, cutting wood and attending sales.

Darke Co.—On February 23 we had one of the most severe storms for many years; snow drifts closed the roads, and railroads were out of commission for several days. Temperature 16 below zero. Snow protected the crops from cold weather. Butter 27c; eggs 25c; hogs \$8.50; corn 55c.

Brown Co.—The past month was the coldest we have had this winter, with temperature around zero, but the wheat and rye have been well protected by the snow. There are quite a number of spring pigs, but fat hogs are hard to find. There are a good many young lambs. There is a large number of public sales, and feed is selling well. Fodder is scarce (Continued on page 345).

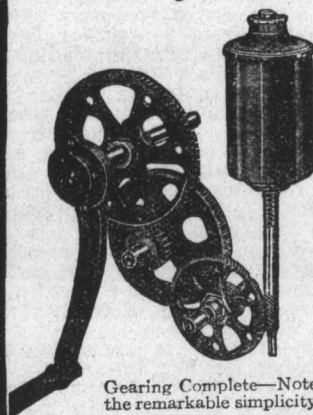
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Markets.

GRAINS AND SEEDS.

March 17, 1914.

Wheat.—Although the price decline of last week was recovered Monday, a bearish turn on Tuesday lost to the trade all the gain and more. Just now the news favors lower prices. The outlook for America's growing crop was never better. In practically every section of the country where winter wheat is grown the plants were covered with snow whenever the temperature was low enough to do damage and now as the snow leaves reports are coming in of the crop's ideal condition. Added to this are letters reporting the promise of an unusually large acreage of spring wheat, because of much fall plowing having been done and the splendid way in which the spring season is opening up. But the bulls realize that the changes will be in their favor, and are content that prices are holding up so well in face of these adverse conditions. The price one year ago was \$1.06 per bushel for No. 2 red. Quotations for the week are:

	No. 2 Red.	No. 1 White.	May.
Wednesday	98½	98	1.01½
Thursday	98	97½	1.00½
Friday	98½	98	1.00½
Saturday	98½	98	1.00½
Monday	98½	98	1.00½
Tuesday	97¾	97½	99¾

Chicago, (March 17).—No. 2 red wheat 94½c; May 93c; July 88c per bushel.

Corn.—In spite of the easier feeling in wheat circles, corn is improving in strength and price. There appears to be a good general demand from feeding districts of the country, although the visible supply shows an increase of over a million bushels. One year ago No. 3 corn was selling at 50½c per bushel. Quotations for the week are:

	No. 2 Mixed.	No. 2 Yellow.
Wednesday	63	65
Thursday	63½	65½
Friday	63½	65½
Saturday	63½	65½
Monday	64	66
Tuesday	64	66

Chicago, (March 17).—May corn, 68c; July 69½c; Sept., 66½c per bu.

Oats.—Fractional changes have occurred in oat values, with the prices at the opening this week identical with those of the week before. The volume of business is small. Visible supply decreased 762,000 bushels. One year ago standard oats brought 34½c per bu. Quotations for the week are:

	Standard.	No. 3 White.
Wednesday	41½	40¾
Thursday	41½	40¾
Friday	41½	41
Saturday	41½	41
Monday	41½	41
Tuesday	41½	41

Chicago, (March 17).—May 39½c; July 39½c; Sept., 37¾c.

Beans.—Market is dull and steady. The local board of trade quotes immediate and prompt shipments at \$1.80; May \$1.85 per bushel. Chicago reports a steady trade. Pea beans, hand-picked, choice, are steady at \$2; common \$1.75@1.85; red kidneys, choice \$2.90@2.95.

Rye.—This cereal is higher. No. 2 is quoted at 68c per bu.

Barley.—At Chicago barley rules a little more active and is quoted at 49¢ per bu., while Milwaukee quotes the malting grades at from 53¢@68c.

Timothy.—Prime spot is steady at \$2.40 per bu.

Alfalfa.—Steady at \$7.25 per bu.

Cloverseed.—Values are lower again. Prime spot and March \$8.40 per bu; alsike at \$10.50; Toledo prime cash is quoted at \$8.35 and prime alsike at \$10.60.

FLOUR AND FEEDS.

Flour.—Jobbing lots in one-eighth paper sacks are selling on the Detroit market per 196 lbs. as follows: Best patent \$5.30; second \$5; straight \$4.75; spring patent \$5.10; rye flour \$4.40 per bbl.

Feed.—In 100-lb. sacks, jobbing lots are: Bran \$27.50; coarse middlings \$27.50; fine middlings \$29; cracked corn \$29; coarse corn meal \$28; corn and oat chop \$25 per ton.

Hay.—Steady at last week's advance. Carlots on track at Detroit are: No. 1 timothy \$15@15.50; standard \$14@14.50; No. 2 \$12.50@13.50; light mixed, \$14@14.50; No. 1 mixed \$12.50@13; No. 1 clover \$12@12.50.

New York.—Market is higher and firm. No. 1 timothy \$21@21.50; No. 3 standard \$16@20.50; light clover, mixed \$18@19.50; clover \$17@18 per ton for the large bales.

Chicago.—Offerings are more limited

ed and demand good. Choice timothy is quoted at \$16.50@17.50 per ton; No. 1 \$14.50@15.50; No. 2, \$11@12.50.

Straw.—Steady. Rye \$7.50@8; oat straw \$7@7.50; wheat straw \$7@7.50 per ton.

New York.—Rye straw \$17@18; oat straw \$11 per ton.

Chicago.—Rye straw is quotable here at \$7.50@8; oat straw \$6.50@7; wheat straw \$6.50@7 per ton.

DAIRY AND POULTRY PRODUCTS.

Butter.—Market quiet with prices ½c lower. Extra creamery 26c per lb; firsts 25c; dairy 19c; packing stock 16c.

Chicago.—Market rather dull and conditions are not encouraging. This market is receiving more butter than usual from the west, mostly centralized creamery stock. Prices are lower than last week. Extra creamery 26½c per lb; extra firsts 25½@26c; firsts 24@24½c; seconds 22@23c; ladles 20@21c; packing stock 16c.

Elgin.—Market quiet at 26½c per lb., which is ½c lower than last week.

New York.—A sharp decline of about 3c was experienced here and has caused unsettled conditions. Quotations: Creamery extras 25½@26c; firsts 24@25c; seconds 22@23c; packing stock 15½@16c per lb.

Eggs.—Warm weather has brought greatly increased receipts and much lower prices, there being a decline of 8½c. Current receipts of fresh stock quoted at 18c per dozen.

Chicago.—There is considerable trading going on but the supply is more than equal to the demand. Most of the buying is for immediate use as lower prices are looked for. Prices are about 6c lower than last week. Miscellaneous lots, cases included 19@20½c; ordinary firsts 19½@20c; firsts 20½c; seconds 18c.

New York.—The demand here is good, and the receipts light. On account of the break in prices in other places prices have dropped here. Fresh gathered extras 31½c; extra firsts 31c; firsts 30@30½c.

Poultry.—Local market holds firm. Very little poultry coming in. Prices unchanged. Live—Springs 17½@18c; hens 17@18c; turkeys 18@19c; geese 15@16c; ducks 17@18c.

Chicago.—Conditions still continue steady. Spring chickens are ½c lower and geese are lower but otherwise prices are the same. Quotations on live are: Turkeys, good weight 15c; others 12c; fowls, choice 15c; spring chickens 16½c; geese 12c; ducks 16@17c per lb.

FRUITS AND VEGETABLES.

Apples.—Market firm with prices unchanged. No. 1, \$5@6; No. 2, \$4@4.50 per bbl. In Chicago the market is somewhat quiet but steady. Holders are still firm in their views although the quietness gives them some anxiety. Barrel stock is quoted: No. 1 Jonathans \$6@7; Spies \$5.50@6; Baldwins are \$5.50@6. In New York fancy Baldwins are selling from \$6@6.50.

Potatoes.—Market continues firm; prices unchanged. Quotations: In bulk 58@60c per bu; in sacks 63@65c per bushel for carlots. At Chicago the market was oversupplied last week and prices are about 2c lower.

Many cars could not be disposed of even at the reduced prices. Good Michigan white stock is quoted at 53¢@63c per bu. In New York good Michigan stock is selling for 74¢@76c per bushel in carlots. The market there and in other eastern cities is weak and has a tendency toward a lower basis. It is reported that in Nebraska and other western states where the drought ruined the last crop, there is a good demand for seed potatoes.

Onions.—The local market is steady with prices unchanged. Quoted at \$3.25@3.50 per sack for yellow and \$1.75 per crate for Spanish. At Chicago the demand is increasing for fancy sound onions and the prices are holding up strong. Sacks 65¢@70 lbs. Michigan grown, sell at \$2.

Cabbage.—Steady with prices unchanged. Good quality is quoted at \$3@3.25 per bbl. At Chicago the supply on hand exceeds demand. Prices are lower. Holland or Red \$1.50 per bbl, \$15@18 per ton, according to quality. In New York good stock of Danish or Holland sold at \$22@24 per ton by shippers, while in Cincinnati New York Danish sells for \$30@33 per ton.

GRAND RAPIDS.

Reservations of stalls on the city market opened this week and patrons of the market will have until April 1 to secure their old places. Heavy receipts of eggs makes the market weak at 21¢@22c with prices subject to change daily. No. 1 dairy butter is quoted at 20c. The poultry market is firm and advancing. Hay is slow. No special change in potatoes or beans

is noted. Grain prices at the mills are: Wheat 91c; rye 58c; oats 39c; corn 65c. Greenhouse growers are selling lettuce at 6c, a price that does not yield much profit.

DETROIT EASTERN MARKET.

For the time of year there was a fairly good market Tuesday morning, with a respectable number of wagons and buyers present. Prices continue good. Potatoes are being offered in moderate quantities with the price ruling around 80c per bu; cabbage is firm at 80¢@1 per bu; lettuce 75¢@80c; parsnips 75¢@80c; apples scarce at \$1.50@2; carrots 40¢@50c; horse radish 75¢@1; some chickens were sold at \$1.40@1.50 per pair while others were asking 20c per lb; egg prices ranged from 30¢@35c per doz. Hay is coming a little more freely and the market is dull with values ruling from \$13@17 per ton for loose.

THE LIVE STOCK MARKETS.

Buffalo.

March 16, 1914.

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

Receipts of stock here today as follows: Cattle 161 cars; hogs 85 d. d.; sheep and lambs 55 d. d.; calves 1000 head.

With about 160 cars of cattle on our market here today, and only 17,000 reported in Chicago, our market was dull and draggy and lower from start to finish. Cattle weighing from 1300 lbs. up sold about 10c per cwt. lower than last week. Cattle from 1200 to 1300 lbs. sold a strong quarter lower than last week, and at the finish of the market some loads sold 35c per cwt. lower than last week, and the butcher grades of all descriptions sold fully 15¢@25c per cwt. lower up until noon, and after this from 25¢@40c per cwt. lower than last week. At the close of the market, there were several loads of undesirable cattle left over, and the market closed in only a fair condition, with prospects no higher in the immediate future.

Our hog market suffered a 10¢@15c break on all grades but pigs today, owing to fair supply here and liberal run at Chicago. All good grades sold at \$9.25 generally. Pigs and lights from \$8.90@9.10; roughs \$8.25@8.40; stags \$7@7.75. Market fairly active and a good clearance was made, with prospects about steady for the next few days.

The market was active today on handy lambs and sheep, but dull on heavy. Prices steady with the close of last week. Choice handy lambs selling mostly at \$8. Heavy lambs selling from \$7.25@7.50. We look for slow trade on heavy and coarse lambs all the season. Most of the orders calling for lambs weighing from 75 to 83 lbs. Look for steady to shade higher prices on lambs last of week.

We quote: Choice lambs \$7.90@8; heavy do \$7.25@7.50; cull to fair do \$6.50@7.85; yearlings \$6.50@7.25; bucks \$4.50@5; handy ewes \$5.75@6; heavy do \$5.50@5.75; wethers \$6.15@6.40; cull sheep \$4@5; veals, choice to extra \$10.25@10.50; fair to good \$9@10; heavy calves \$5.50@8.

Chicago.

March 16, 1914.

Cattle. Hogs. Sheep. Receipts today..17,000 54,000 25,000 Same day 1913..17,036 28,783 21,715 Last week47,289 118,892 115,687 Same w'k 1913..48,250 152,065 82,960

Today's cattle receipts look small for a Monday, but buyers got so well stocked up last week that they are indifferent, and prices are no more than steady. Some fat butcher stock sold early at stronger prices, but the trade in steers was late in starting. Hogs broke a dime on the exceptionally liberal offerings, with sales at \$8.45@8.85. Hogs received last week averaged 232 lbs., or 5 lbs. more than a week earlier. Sheep and lambs are steady to a dime lower, with buyers slow in taking hold. Top lambs brought \$7.85.

Cattle prices were on the downgrade last week because of the marked increase in the receipts over the preceding week, there being no corresponding growth in the local and shipping demand. Pretty much everything under the head of cattle sold off sharply, females included, and calves too, went much lower, as did the bulk of the stocker and feeder cattle. The Monday market was a very unsatisfactory one, with receipts aggregating 24,765 head, or a big share of the offerings for the whole week, the fall in cattle for that day being 15¢@25c. The bulk of the steers sold during the week went at \$8@9.15, with the best class of heavy steers going at \$9@9.65 and the commoner light lots that were merely warmed-up on a short feed taken at \$7@8. Fair and medium lots brought \$8.10@8.50 and good fat beeves \$8.60 and upward, with sales of medium to prime yearlings at \$8@9.35. Cattle selling at \$8.25 and under were discriminated

against by killers, but steers adapted for feeding had a good outlet, with average prices decidedly lower. Sales of butcher cows and heifers took at \$5.20@8.50, while cutters brought \$4.70@5.15, canners \$3.65@4.65 and bulls \$5.50@7.80. There was considerable trading in stockers and feeders, sales ranging at \$5.50@8.15 and some fancy yearlings that averaged but 677 lbs. taken at \$8.25. The demand centered largely on good to choice yearling stockers, which were apt to go as high as the best fleshy feeders. Stock and feeding cows and heifers had a fair outlet at \$5@7.25, while good to choice heavy stock calves brought \$7.50@8.25. The calf market sustained a big decline in prices, with heavy ones selling at \$5@8.50 and fair to prime light vealers going at \$9@10.50. Milch cows sold slowly at \$55@85 each. The week's close saw beef steers and female cattle largely 25¢@35c lower than a week earlier and stockers and feeders irregularly lower. Late calf sales were at \$10.15 for the best.

Hogs have continued to show a firm undertone for still another week, and following declines in prices on days of fair receipts and moderate buying by eastern shippers, receipts fell off so much that good recoveries took place. Stockmen owning hogs are optimistic regarding the future and expect to see higher prices later on. Small weekly gains in average weights of hogs marketed here are shown, as is usual at this season of the year, and this results in sales of prime light hogs that weigh around 185 to 195 lbs. at about as high prices as those paid for the best hogs of heavier weight. Fresh pork is having a big sale everywhere, prices being lower than for other meats, and there is a fair demand for provisions. On March 1 aggregate stocks of provisions in the five principal western packing points amounted to 243,604,000 lbs., comparing with 252,201,000 lbs. a year ago and 237,408,000 lbs. two years ago. Today's market was a notable one, as the former high record of \$8.90 for the present year was broken, hogs selling at \$8.50@9. Light weights sold the highest by 5c, with pigs at \$7.80@8.85.

Sheep and lambs were in good local and shipping demand on the whole last week, owners getting good prices although the market declined at times under too liberal offerings, supplies being much larger than a week earlier. Native lambs were marketed very much less freely than fed westerns and Colorados, with fair offerings of hay-fed Montanas. The inquiry for feeding lambs continued in excess of the moderate offerings, and firm prices prevailed. On the high spot of the week prime lambs brought \$8, with a later moderate reduction in prices, although they closed 10¢@15c higher than a week earlier, sheep of the better class closing 15¢@25c higher. Lambs closed at \$6@7.90, yearlings at \$6.25@7, wethers at \$5.65@6.35, ewes at \$3.75@6, bucks at \$4.50@5.25 and feeding lambs at \$6.50@7.15.

Horses were marketed in normal numbers last week, and the recent dullness and weakness was followed by a large attendance of buyers from various points and much better buying at advancing prices for the better class. Farm horses had an especially free sale on the basis of \$140@210 per head for geldings and \$150@225 for breedy mares of ordinary to prime grades. Inferior animals were slow at \$50@125, while wagoners were wanted at \$170@240. Fair to good drafters sold for \$235@270, while better and heavier ones sold to the limit of the light offerings at \$275@325. A few pairs of nice livery horses brought \$550.

LIVE STOCK NEWS.

Argentine beef is selling in eastern markets about two cents per pound cheaper than the domestic beef, it being a much poorer kind than is generally sold in the markets of this country.

The average weight of the hogs marketed in Chicago during February was 224 lbs., being eight pounds heavier than during the previous month, but six pounds lighter than in February last year.

Charles Shurte, the well-known Chicago sheep seller, says the sheep and lambs fed in the states east of that city have been largely marketed, and he expects a larger eastern demand in the Chicago market than heretofore. The territory tributary to Chicago, including Indiana and southern Michigan, from whence that market usually receives a good many consignments, has been a liberal contributor to the Buffalo market this year and is reported as pretty well cleaned up by this time. Recently Colorado has been furnishing the Chicago market with much increased numbers of lambs, and the have shown marked improvement in quality over earlier offerings from that state.

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Horticulture.

Hints on Spraying for Scale.

It will be but a short time when the hum of the spraying rig and the odor of brimstone will again prevail in well-kept orchards. These will also be present in orchards where they have never been before, where the process of rejuvenation has been started. It is more for those who are having their first experience along this line that this is written, as there is nothing especially new that can be presented to experienced growers on scale spraying.

The first thing to give consideration is the material to use for scale spraying purposes. There is no doubt as to the value and popularity of lime-sulphur as a scalecide. It has become a common and staple commodity for those dealing with fruit growers' needs. Where the best quality of this material can be bought the cheapest, should determine the source from which we get it. It has been just a matter of a few years that the home-made lime-sulphur was popular and considered the most efficient, but with the improvement in making the commercial, the home-made hardly stands a show, either from the standpoint of efficiency or economy.

Buying Lime-Sulphur.

In buying the commercial article we should take care to ask the company's guarantee with reference to what percentage of soluble sulphur the mixture contains and what the specific gravity or Beaume test is. A good product ought to have about

should be mentioned. The directions, generally given on the barrel, allow for a one to eleven dilution. This is not enough, as mixtures testing 32 degrees should be diluted one to eight or nine for best results.

There is no better time for spraying for the scale than in spring, just before the leaf buds open. At this time it is supposed that better results are had in controlling the scale, but the real purpose of spraying at this time is because of the fungicidal value of this application. Many of the winter spores of scab are killed at this time. For scale killing purposes fall spraying is also good, and is of especial value if the trees have been badly infested. Then a fall spraying should be followed by one in spring as one spray will not clean the trees of scale very thoroughly.

Thoroughness in Spraying Essential.

There is no one factor in the control of the scale more important than thoroughness. This matter can not be too strongly emphasized as the scale is not killed until it is covered with spray. These minute insects get in the cracks and creases of the bark and up in the smaller limbs, because the bark is thinner there; being a sap sucker it naturally does the best where the sap is the closest to the surface.

To make thoroughness easy, one must have a good spray outfit with plenty of power, and all the rest of the equipment, such as nozzles, hose,



The Spray Days will soon be Here.

25 per cent of soluble sulphur, and test about 32 degrees Beaume. There are a few companies who make an attractively low price but do not especially call your attention to their guarantee which is required by the pure-food law.

Occasionally growers will seriously consider something other than lime-sulphur for scale spraying purposes. This is a good thing, as we should always be on the lookout for improvements, but unfortunately we have nothing yet which is any better than lime-sulphur. Some are getting good results with a certain brand of oil spray in the eastern part of the country, but Michigan experience shows that it has no advantages over lime-sulphur. Other forms of sulphur combinations and mixtures which have fancy names, should be avoided as one will usually get more name than anything else for money expended.

Diluting for Scale Spraying:

The matter of diluting the lime-sulphur may seem of little importance, but, due to the fact that often the directions given with the commercial article allow for too much dilution for best results, it is a matter which

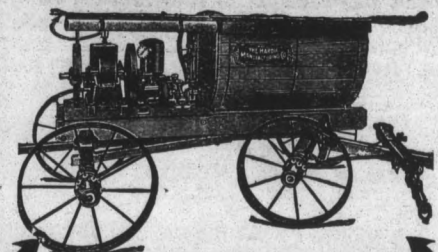
etc., in good shape. Some attention given to the keeping of the outfit in order will often make the difference between good and poor work. Scale spraying at its best is no pleasant task, and with things out of order it becomes decidedly disagreeable.

Thorough work can not be done from one side of the tree as with the best care in spraying in that manner, there will be a narrow strip of the limb on the farther side which will not be covered. It is absolutely essential to spray from at least two sides to do thorough work.

How the Scale is Killed.

Spraying should not be done while the temperature is below freezing for the best results can not be had then, as the chemical change the lime-sulphur goes through is hindered at low temperatures. It was not until a few years ago, when Dr. George Shafer, of the Agricultural College at East Lansing, carried on some experiments, that we knew how the scale was killed. He found that the lime-sulphur has the power of absorbing oxygen from the air, and when it covers a scale it softens the waxy scale covering, causing it to seal fast to the bark

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and then by absorbing the oxygen in the air it suffocates it.

Spraying will never entirely rid an orchard of scale, but it will keep it in check so that it will cause no trouble. If you have scale in the orchard it is therefore advisable to spray for it every year.

As to how serious an infestation one should endeavor to clean up, depends upon how long he desires to wait for a crop. As long as the trunk of the tree is all right it can have a large share of its top dead from scale and still be brought back to usefulness. All of the dead limbs should be cut off and a good, thorough application given the tree at least twice during the dormant season. The new limbs which come out should be trained for the new top. It is certain that an old tree can put on a new top and bring it to bearing quicker than it takes a young tree to come into bearing.

Protecting Yourself Against Spray.

The action of lime-sulphur on the skin is injurious to most people. There are a few who are not affected by it, but it is advisable for most all to keep their hands out of the mixture as much as possible, and to frequently grease their hands and face with vaseline. The common canvas glove, well oiled, is the best to wear. There are a few makes of rubber gloves which are quite serviceable, but they usually cost quite a little. Any leather which is liable to come in contact with the spray should be protected, or frequently oiled. Harness and shoes can easily be spoiled by spray if they are not taken care of.

Give due consideration as to whether you did a very thorough job before you put the blame on the material you used. Some seasons the scale will spread faster than others, and may show up considerably in sprayed orchards. Thorough work, however, will keep the scale from doing harm even in such seasons.

RETURNS FROM A FARM GARDEN.

So much has been written about the farm garden that it seems there is not much more to say, but in these times of so much talk about "high cost of living" I wish to tell how we met this cost with the farm garden and earned a nice little bit beside.

I live in the Michigan fruit belt and little attention is paid here to anything but fruit. Many of the farmers even buy their winter potatoes.

If they do plant a garden it is forgotten until some future time when they happen to think of it and because it is overgrown with weeds they will say it did not pay for the time it took to plant it.

There is no bit of ground on the farm that will give so much value for the space it occupies as this garden if someone will just spend a few hours in it with a hoe and keep the weeds out.

As the following account will show, our farm garden paid very well for time and money spent, and this is only half what it would have made in a reasonable year. The dry, hot weather spoiled the second planting of sweet corn and the lima beans. The corn never had an ear on it and lima beans were only picked once.

The radish seed made the most money for the amount invested, and sweet corn the least. I planted Scarlet and Rosy Gem radishes in three different plantings.

I will tell you how I kept worms out of my radishes. I made the rows then covered the seed white with air-slaked lime before I put the dirt on, and as the result we got beautiful, crisp radishes with not a sign of a worm about them.

There is great demand for all kinds of garden vegetables all summer for we have a great number of summer resorters here from June until September.

We have a horse and wagon and

father went early in the morning three times a week and sold the vegetables to the resorts. Here is the account of vegetables sold, besides we had fresh vegetables very day all summer and enough put away for winter use, which I value at quite a sum.

Radishes	\$20.00
Lettuce	2.00
Onions	2.00
Green beans	14.00
Wax beans	6.00
Beets	5.00
Turnips	3.00
Carrots	1.00
Sweet corn	12.00
Lima beans	7.00
Tomatoes	1.00
Cucumbers	1.00

Amount for vegetables.....\$74.00
Sweet corn fodder..... 6.00

Total80.00

The seeds cost me \$4.75. I had 250 brussels sprouts but the lice spoiled them all and I am feeding them to chickens. They like them better than cabbage.

I have 250 heads of cabbage buried and a barrel of sauer kraut to sell yet and 20 bushels of dried sweet corn.

The garden, not including sweet corn and lima beans, covered one-fourth acre.

I hope this may encourage more of the farmers' wives to coax John to make a garden for them next year and see if it does not pay.

Van Buren Co. M. E. O.

PRUNING POINTERS.

Pruning is not a practice which can be followed according to set rules, but it needs good common judgment and a knowledge of the principles of tree growth to make it a success. Improper pruning has done untold damage in lowering the bearing efficiency of the trees. Each kind of fruit needs certain pruning and often there is variation in pruning varieties of fruit. The character of growth and the way in which the tree produces its fruit buds, do much to determine the proper manner of pruning the tree.

The peach, in normal conditions, produces considerable new wood each year. An overabundance of fruit buds is formed on this new growth. Left to itself the tree will bear a large amount of small fruit and will soon become long and spindling, on account of its tendency to make upward growth. Therefore the pruning should consist of cutting out all of the weak last season's growth and the main upward growths, and then cutting back about one-third to a half of the remaining annual shoots. The bearing depth, or the vertical diameter of the head of the tree, should not be over six feet; if more than that the lower limbs will die out on account of the lack of sunshine. Much of the pruning should be from the top down and not from the bottom up.

The plum and the cherry produce their fruiting wood on the older growth and therefore would not be beneficially affected by cutting back the annual growth. In fact, that practice would tend to make the trees grow to wood.

The cherry needs less pruning than any other fruit tree, in fact, many do not prune it at all. However, if the cherries should blossom full each year and fail to set to fruit it will undoubtedly be beneficial to thin out the top. In doing this see that a large share of the wood cut out is older than the past season's growth so as to cut out some of the fruit spurs.

In pruning any tree do not prune out all of the small laterals in the endeavor to let sunlight in the tree. The object in pruning is to have the head as low as possible and still have as much bearing surface as the tree can use to advantage. A low-headed tree is not necessarily one on which the scaffold limbs start close to the ground, but one which has the bearing wood low on the scaffold limbs.

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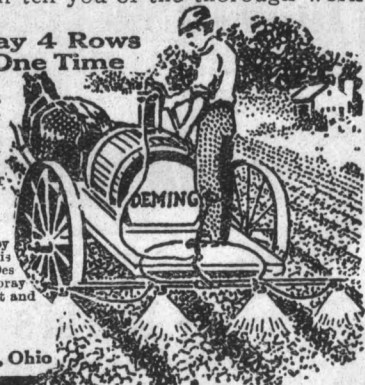
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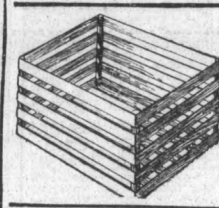
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Every farmer should have capons to sell; yet we find that only a small percentage have them, although they may have any number of roosters to sell at ordinary market prices. Turn this surplus into profit. Capons have brought more dollars into the pockets of men who raise chickens than any other end of the meat supply business, and they are a better investment than any other side, save the production of eggs. So take care of your roosters properly this year. Do not allow any more dollars to roll away from you.

The problem to be solved in keeping poultry is how can we best dispose of the meat so that we shall be able to make up for the fowls that are a dead weight upon our feed bill? Capons is the answer. And the way in which we answer this question will decide for failure or success with poultry.

No Profit in Selling Friers.

The best of chicken men will tell you that they have half as many cockerels as pullets. This being true, if we desire 200 pullets we are obliged to hatch 400 chicks. It will take just as much equipment to care for and as much time and money investment, to raise these surplus cockerels as it would the same number of pullets. We shall, therefore, desire to get the most from them.

We may rush them to the meat market just as soon as they weigh from one to two pounds, and sell them for friers. But there are thousands of other men doing this same thing, so let us be practical and do something different, and get our pay for doing it. Selling cockerels for friers is selling for less than cost of production, any way you figure it. Young cockerels will average 25 cents a head, and we would get just \$50 for 200 head. This will about cover the entire cost of production, throwing your time in gratis.

But selling these same 200 cockerels as capons we will receive eight times as much money, or about \$400, just \$350 more than friers sell for a few months earlier in the season. Add this to the profit of the farm pens and the annual income will be surprising; it will be a profitable proposition.

Caponizing Easy.

Caponizing is a very easy task. It is best to perform the operation on two or three dead birds at first, which will teach the pertinent facts. Just follow the directions as given with the instruments you have bought. They are simple rules that anyone can master. At first I thought that this would be one of the most terrible things I had ever witnessed; but I found different. I was afraid of the market, too. But I soon got over that matter, for when I took a hundred head of cockerels to market and received a measly check for all my work, I got good and mad at that buyer, and said to myself, "See here, Gage, we won't make and more Christmas presents to the meat men." And to my utter surprise, it was a meat man who first advanced the proposition to me. He said that it was impossible to get enough capons for Christmas and winter trade, and he added, "I hate these little roosters just as much as you do. I wish that you egg men would stop killing them so young." So I stopped, just as ordered.

Care must be made not to make "slips." These are neither roosters nor capons and will not develop. This is caused by not taking all the testicle from the male. But after you

have caponized a few you will not make many "slips," nor will you kill many male birds. The science of caponizing is simple from start to finish.

Leghorns as Capons.

The Leghorns, which usually weigh two to three pounds, when ready for market, may attain 10 to 11 pounds as capons. The price reaches as high as 25 cents per pound, while the average would be 21 cents. This means more than \$2 per head for these surplus cockerels. Let every farmer get this for his roosters.

It will not cost more to raise a capon than a pullet; it will cost twice as much to feed a rooster as a hen. Therefore, \$50 will fatten the 200 cockerels nicely, which will leave a clean profit of \$325, if we pay ourselves for the time and care, allowing \$25 for this. It will take about nine months from hatching to prepare them for market. Isn't \$36 a month pretty good profit from capons? I should say so.

Time to Market Capons.

Capons are placed on the market when other birds are all sold off as friers and are the market flooders earlier in the season. This insures a high price. Capons sold any time from Christmas till March will bring a good price, as hens are laying during these months, and no one will care to sell their layers. So just try a few capons this year, and you will be just as pleased with the result. It will serve to swell the yearly profits up to the point you desire them, and will give one more good reason why poultry is really profitable on the farm.

New York. **EARL W. GAGE.**

THE RELATION OF BEE-KEEPING TO FARMING.

The most vital link in the chain that binds bee-keeping to the other branches of farming is the fertilization of fruit and clover blossoms particularly, and in a general way nearly all other flowers by the bees. Let me digress right here enough to say that while I am speaking of bees, it does not necessarily mean honey-bees alone but also the common bumble-bee and some other insects. But as the bumble-bees and other insects would be entirely inadequate to fertilize enough of the blossoms of either the fruit or clover to make them commercially possible, it is after all, the honey-bee on which we must depend. As there are very few bumble-bees hatched out before fruit blooms, we must depend almost entirely on the honey-bee for the fertilization of these blossoms.

The Fertilization of the Blossoms.

Suppose that, just for a minute, we look at the principals that govern the fertilization of flowers. Flowers are composed of petals, stamens and pistils. The pistils are the female organs and in these are the seed-bearing organs of the plant. Stamens are the male organs and produce the pollen which fertilizes the pistils. The petals make up the outside of the blossom usually and serve the double purpose of furnishing beauty to the flower and making a receptacle for the honey. And now, how does it happen the honey is there?

This is one of the wise provisions of nature, for by this means the bees are called to the flower and in digging down to the honey they get the pollen on their legs and it is thus scattered from blossom to blossom and the plants fertilized. Many plants have only the male organs on one

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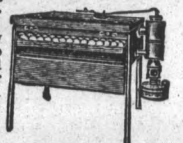
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J. C. Reefer, the poultry expert of 1604 Main St., Kansas City, Mo., is giving away free a valuable book entitled "White Diarrhoea and How to Cure It." This book contains scientific facts on white diarrhoea and tells how to prepare a simple home solution that cures this terrible disease over night and actually raises 85 per cent of every hatch. All poultry raisers should write **MT. REEFER** for one of these valuable FREE books.

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POULTRY.

Pure Bred Barred Rock Cockerels—Now is the time to buy at reasonable prices. Also eggs for hatching in season. MRS. EARL W. BARNARD, Saranac, Mich.

Standard Bred R. C. & S. C. R. I. Reds Heavy winners at Ludington 1914 show. Best pens \$2 per 15; good ones \$2.25 per 30. T. & W. I. R. duck (all first prizes) eggs \$2 per 13. All eggs sent free by post, and 1 year's sub. to Mich. Poultry Breeder given to each customer. FRENCH FRUIT & POULTRY FARM, Ludington, Michigan.

SINGLET BARRED ROCK COCKERELS FOR SALE. The N. Y. winning and laying strain. Two for \$5, one for \$3. Eggs from the noted strain \$1.50 per 13. PLAINVIEW STOCK FARM, Romeo, Michigan.

FOR SALE—Eggs for hatching from M. Pekin Ducks and R. C. Br. Leghorns, two best lines in America, also a few okras, at \$1.50 each, and two Jersey bull calves elig. to reg. Claudia Betts, Hillsdale, Mich.

PLYMOUTH Rock cockerels 5 lb. to 11 lb., according to age. Price \$2 to \$3. Mammoth Bronze Tom Turkeys 8 lb. to 35 lb., according to age. Price \$3 to \$25. Eggs in season. A. E. CHAMTON, Vassar, Mich.

EGG-A-DAY—Barred Plymouth Rocks, Bred-to-Lay. Eggs, \$1.50 per 15; \$2.75 per 30. EGG-A-DAY Poultry Ranch, Marshall, Mich.

Barred Rock Eggs, 15 For \$1.50, 100 For \$7. W. C. COFFMAN, R. No. 6, Beaton Harbor, Mich.

BARRED ROCK EGGS FOR HATCHING—\$1.50 per 13, \$10 per 100. J. A. BARNUM, Union City, Michigan.

CHICKS—We ship thousands each season. Booking orders now for spring delivery. Prices always right. Free booklet, Freeport Hatchery, Box 12, Freeport, Mich.

BUFF PLYMOUTH ROCKS—Heavy winter layers. Eggs \$2.00 per setting. Write wants. GEO. W. WAGNER, Ann Arbor, Mich.

LILLIE FARNSTEAD POULTRY B. P. Rocks, R. I. Reds, and S. C. W. Leghorn eggs for sale. 15 for \$1.25 for \$1.50; 50 for \$2.50. COLON O. LILLIE, Coopersville, Mich.

Eggs For Hatching—From white Indian runner and Pekin ducks. White African guineas. H. V. Hostetler, Route No. 1, St. Johns, Mich.

PRIZE WINNING BARRED ROCKS, S. C. Reds, Pekin and Indian Runner Ducks. Stock for sale, eggs \$1 up. Circular free. EMWOOD FARM, R. R. 13, Grand Rapids, Mich.

Pine Crest White Orpingtons—As good as the best. Eggs. Write for catalogue. MRS. WILLIS HOUGH, Pine Crest Farm, Royal Oak, Michigan.

BARRED P. Rocks—Cocks, Hens, Cockerels & pullets for sale. Also trios and pens mated right. Guarantee to satisfy you. Ostrander Bros., Morley, Mich.

R. C. RED EGGS, 13 FOR \$1.50, POSTPAID. BUELL BROS., Ann Arbor, Michigan.

S. C. White Leghorn Cockerels—Fine utility birds. Price \$1.50 and \$2. ALFADALE FARM, R. 8, St. Johns, Michigan.

S. L. WYANDOTTE EGGS—From great laying strain of Blue Ribbon Birds. Satisfaction guaranteed. F. E. Cowdrey, Ithaca, Mich.

WHITE Wyandotte Cockerels, a few nice ones to close out at \$2.50 and \$3.50 each. Vigorous and fine breeders. A. Franklin Smith, Ann Arbor, Michigan.

SILVER, GOLDEN and WHITE WYANDOTTES. White Stock Especially good, send for circular. Brownings Wyandotte Farm, R. 30, Portland, Mich.

WHITE LEGHORNS DAY-OLD-CHICKS—Wyckoff Strain. Maple City Poultry Plant, Box C, Charlotte, Mich.

DOGS AND FERRETS.

Fox and Wolf Hounds



of the best English strain in America 40 years experience in breeding these fine hounds for my own sport. Save your pigs sheep and poultry. Send stamp for catalog.

T. B. HUDSPETH, Sibley, Jackson County, Mo.

HOUNDS FOR HUNTING Fox, Coon, Skunk and Rabbits. **FERRETS** Send 2c stamp. W. E. LECKY, Holmesville, Ohio.

plant and the female organs on the others, and the pollen must be carried from one to the other. Then again, there are plants like the raspberry on which the pistils mature before the stamens and consequently they must be fertilized by the bees carrying pollen from some of the earlier blossoms to the later ones where the pistils are ready to receive them.

Experiments Show the Value of Bees.

Extensive experiments have been carried on to find out just how much benefit the bees are to fruit and clover. I could give you a lot of these but consider it unnecessary. I will, however, sum it up by saying that with the fruit trees, branches that were shut away from the bees but left exposed to the wind, matured from two to five per cent of the blossoms, while those exposed to the bees matured an average of about 20 per cent.

With the clover the difference was more striking as no seeds were found at all on plants screened from the bees, although all about them the heads were well filled. This was not only in one trial but was tried over and over with the same results. Will it pay the average farmer to keep bees himself or would it be better to depend on the bees of the specialists for the fertilization of their fruit? Well, of course, that depends somewhat on circumstances such as whether there are plenty of bees close by and whether you care enough for the honey to wish to put in a very little of your time for the sake of a supply of that delicious table delicacy.

Keep Bees in the Orchard.

Certainly, unless there are other bees in a short distance from your orchard, it would be economy to install a few colonies there, and by learning just a few of the general principles of bee-keeping you can produce a lot of honey from one or two colonies of bees. There is just one item, in my opinion, which might cause the average farmer to hesitate about investing in a few bees in this way. This is the prevalence of disease which is spread very largely by people handling bees who haven't a thorough knowledge of how to handle them in such an emergency. In a neighborhood where disease is too rampant, I should advise to keep out of them or have a neighboring specialist look after them for you.

The Pierce Method of Keeping Bees.

You might be afraid of bees and would not handle them for twice what you could get out of them. This is not a very serious handicap for I can tell you briefly of a system of handling bees, which does not include stinging in the category and needs but very little handling. This method, known as the Pierce Method, after its founder, Mr. Pierce, of Grand Rapids, is briefly described as follows: The hives are not kept out of doors as is the usual custom, but are placed in the attic or overhead in some out-building where they will be out of the way. An entrance is cut through the side of the building through which they may take their flights. Instead of leaving the bees with a single story for a brood nest, they are given two, which gives them lots of honey for wintering and plenty of room for the queen to lay in through the summer. This, in connection with plenty of storeroom above, will almost entirely do away with swarming. In case you want some increase it is very easily secured by simply picking up one story of the hive and setting it on a new bottom, and when you have put on another hive of combs and the necessary supers the bees will do the rest. If you do not want the increase, put on about five or six supers filled with sections and foundation in the spring, and forget all about the bees until fall. When it begins to get pretty frosty nights, go to your hive and open up the top. You will find the bees have all clustered down in the brood chambers below and all you will have to do is pick off your four

or five cases of comb honey, pack a few old quilts or something else around them to keep them warm until spring, and your work is done. Not very hard, is it? I promised you there would be no stinging. Well, there won't, for bees, when they find they are inclosed in a building, when they fly out of the hive will have no thought of stinging as a general thing, but will make for the first crack of light they can see to make their escape. Of course, if you were so careless as to pinch one in your fingers they might probably sting.

Mecosta Co. L. C. WHEELER.

BREEDS AND BROILERS.

Kindly advise as to the best kind of poultry to keep for early marketing purposes, and at what age or weight to sell to best advantage. It would be quite convenient for me to get R. I. Reds but have been told they do not weigh up good, but appear large on account of having loose and fluffy feathers.

SUBSCRIBER.

Your question is hard to answer for several reason. First, no man has had experience with all breeds so as to be able to judge on that matter, and second, it is very hard to tell as to the time or weight to sell, because the broiler or roaster market is a very precarious one.

It is stated by authorities that the light, or egg breeds, will grow as fast up to a pound and a half, as the heavier kinds, but beyond that weight the heavier breeds will have decidedly the advantage and two months later they will often weigh a half more than the light breeds. A cross between the Leghorns and one of the heavier kinds is said to make a very fast growing bird for broiler purposes.

It is doubted very much if it would pay to go into the broiler or roaster business alone, unless one has a very special market for them. It is more often successful as a supplement to the egg business, and if used in that connection, one of the American breeds would be best as it would not be advisable to cross on account of affecting the egg production. Any of the American breeds would do. It must be a mistaken impression that the R. I. Reds weigh light for their size, as their standard is equal to that of the other popular American breeds and it is claimed that they produce a good lot of dressed meat for their weight.

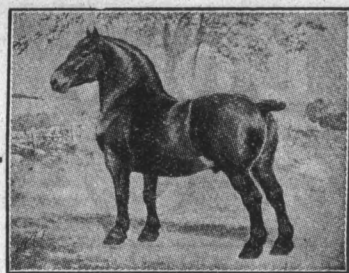
The difference in strains in breeds may often be more than the difference between breeds. It greatly depends upon the purpose to which the particular strain has been bred.

The matter regarding marketing weight is a thing which has to be studied with reference to your special market. Time is also a great factor in marketing. A pound and a half bird may bring a good price early in the season but would be sold low later. Usually a pound and a half to two pounds fowl sold as early in the spring as possible will bring the best profits.

HOPPER FEEDING.

All of our chickens are fed their seeds, grains, dry mash, oyster shells and grit in self-feeding hoppers. These hoppers are partitioned off into four compartments, to feed the previously quoted feeds. The oyster shell and grit is that which can be bought from any poultry supply store. The grains consist of an equal mixture of cracked corn and whole wheat. The dry mash is made as follows: 50 lbs. of wheat bran; 50 lbs. of wheat middlings; 50 lbs. of hominy; 50 lbs. of beef scraps; 15 lbs. of ground bone meal. This always before them, and these hoppers are large enough to hold a week's supply for two of these houses, or about 200 chickens.

Be sure to see that the hen coop is clean and dry; otherwise, the dirt and dampness may produce disease conditions when mild weather comes.



HEWO BELGIANS They Are Here!

H. & H. Wolf, importers of Belgian Horses exclusively, advise old and prospective patrons that their new 1913 importation is now in their barns. It is in all respects by far the most select lot of horses of this breed that have ever been stabled in their barns. Big, weighty, typey drafters of quality all through, that challenge comparison with the Best Anywhere. A select lot of mares, too. Get our terms and Guarantee. This will interest you as much as the horses.

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Wabash, Indiana
More than a quarter century
with the breed.

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STALLIONS.**

Come and see them.

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JNO. CRAWFORD,
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70 Head for Sale
Percheron, Hackney and
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Also Some Fine Percheron & Hackney Mares with foal. Now gentlemen I am going to sell. Be sure to get my price before you buy.

**15 BLACK
Percheron
Stallions**

**MUST BE SOLD
\$250 and up.**

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Of horses and mules every Monday. Private sale daily. From two to five hundred head always on hand, farm mares and chunks, delivery and wagon horses, pavement sore city horses, and drafters and work mules of every kind. South ST. PAUL HORSE AND MULE CO., Union Stock Yards, South St. Paul, Minn.

REGISTERED PERCHERON FOR SALE Brood mares and Fillies. Two Stallions coming one year old, one 3-yr.-old stallion. Prize winners at farmers prices. L. C. Hunt & Co., Eaton Rapids, Mich.

FOR SALE—Four year old Percheron Stallion Colt, white star on forehead, American born, registered, he is all right. ARTHUR CHANT, R.F.D. No. 12, Merlebeach, Mich.

REGISTERED PERCHERONS—FOR SALE. Two two year old Stallions. Also Some mares, all ages at farmers prices. Visitors always welcome. F. L. King & Son, Charlotte, Mich.

FOR SALE—1 big, heavy boned, Reg. Percheron Stallion, 1 yr. old past. Also 2 Reg. Percheron mares in foal. M. A. Bray, Okemos, Ingham Co., Mich.

Gates In 30 minutes and SAVE BIG MONEY.

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Each board double bolted between 4 pairs of ANGLE STEEL uprights and 6 TRIANGULAR TRUSS BRACES. Patent reinforced SELF-LOCKING HINGE. Gate swings easily both ways—always hane square and plumb. Elevating Attachment furnished at slight additional cost. Gate goes to be raised over deep snow or allows small stock to pass under. Write for Free Catalog and FREIGHT PREPAID OFFER TODAY. Address

A.V. Rowe, Pres. Rowe Mfg. Co. 666A James St., Salesburg, Ill.

Almost ideal weather has prevailed over the greater part of the northwestern ranges during the past winter, and cattle enter the spring in much better average condition than in most former years. Owners are expected to hold back their cattle until they are good and fat, for they realize the good profits to be made by following such a course, knowing the cattle shortage both on range and farm throughout the country.

Veterinary.

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

Advice through this department is free to our subscribers. Each communication should state history and symptoms of the case in full; also name and address of writer. Initials only will be published. Many queries are answered that apply to the same ailments. If this column is watched carefully you will probably find the desired information in a reply that has been made to someone else. When reply by mail is requested, it becomes private practice, and a fee of \$1.00 must accompany letter.

Incipient Bone Spavin.—I have a mare that shows lameness in barn and for a short distance after taking her out, but there is no swelling or soreness that I can find in hind leg. W. M. H., Estey, Mich.—She shows symptoms of incipient bone spavin and will be benefited by rest and blistering hock with one part red iodine mercury and four parts fresh lard every week or ten days.

Weak Tendons and Ligaments.—I have a colt ten months old that must be weak in fetlock joint, because the joint sags down low and never straightens up to natural position. E. K., Mayville, Mich.—Very little can be done to assist nature in strengthening the tendons and ligaments of your colt's leg; however, I would suggest that you feed him well and rub joint and tendons with alcohol twice a day.

Loss of Appetite.—My 11-year-old cow which came fresh last August, seems to have almost entirely lost her appetite and her bowels do not act free. I have thought of having her tested for tuberculosis, but the nearest Vet. is 14 miles away. B. G. Interlochen, Mich.—Her liver is not acting; give her 1 dr. of calomel and 1 oz. of bicarbonate soda at a dose night and morning for two days, then give her 1 lb. sulphate of magnesia dissolved in 3 pts. of warm water as a drench daily until her bowels move freely. If one dose acts fairly well, don't repeat. Also give her 1 oz. of ground gentian, 1 1/2 drs. ground nuxvomica, and 1 oz. of ground ginger at a dose in feed three times a day. Give her a dessertspoonful of salt twice a day.

Partial Loss of Power.—We have two pigs six months old that have poor use of their hind legs and remain down behind most of the time. When they were six weeks old, we commenced feeding them ground barley and oats and furnished them all the milk they would drink. P. K., Harbor Beach, Mich.—Your shoats will perhaps never strengthen enough in hind quarters to walk well; therefore, all things considered, I believe you had better fatten them for the butcher. Feeding an unbalanced ration and want of sufficient exercise is the most common cause of loss of power in hogs, but your cases are now chronic and their food supply has been fairly good; that is why I advise you not to try to effect a cure.

Tuberculosis of Liver.—I have lost a few hens this winter and on examination after death, find their livers enlarged and covered with white spots. My hens have good care and are well fed. T. M., Pontiac, Mich.—Your chickens die of tuberculosis of liver, an incurable ailment. You may have on your farm cattle or hogs that suffer from tuberculosis and the chickens may become diseased by picking in the diseased animals' excrement; or being fed milk from tubercular cows.

Diseased Teeth—Weak Stomach.—I have a little dog that is the pet and companion to a very old man. He is a small lap dog and is fed the best of food at meal time; his dishes are kept clean and he has as good care as a child requires. He had what we thought a light attack of mange, but we got him over that. Now his mouth is sore, teeth nearly all loose, some of them gone, and when he drinks cold water it doubtless causes toothache. His bowels act fairly good, but his stomach is very weak. By prescribing for him you will confer a favor on my grandfather and also the writer. G. H. L., Hart, Mich.—Give your dog 20 drops of liquor-pepsini, or 40 drops of essence of pepsin three times a day; or, you may give him one-third of a teaspoonful of bicarbonate of soda three times a day. In canine practice and in these kind of cases, I have found great benefit by giving them black coffee three or four times a day and well toasted stale bread makes a good food. His loose teeth should be extracted and tartar removed from sound teeth. This will aid in preventing future decay of remaining teeth.

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disk harrows are especially popular among farmers who understand the soil and intensive tillage, and who appreciate the big difference in the value of disk harrows. They are made in styles and sizes to meet the requirements of every farmer, whether he uses a large tractor or one small horse for power. Ask your dealer to show you a CUTAWAY (CLARK). If he doesn't sell CUTAWAY (CLARK) harrows, write us. Don't accept a substitute. We ship direct where we have no agent. Send for catalog, "The Soil and Intensive Tillage." It shows the many advantages of CUTAWAY (CLARK) disk harrows over others and contains valuable information about the soil and tillage.



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Makers of the original CLARK disk harrows and plows

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Raise mules and get rich. 18 Jack and Mule farms under one management, where can be seen 260 head fine large Jacks, Jennys and Mules, 14 to 17 hands high. Good ones. Stock guaranteed. Write for prices today. Address KREKLEW'S JACK FARM West Elkton, Ohio. Branch barns, Clinton, Ind.

AUCTION SALE

Wednesday, March 25th

I will sell my entire herd of Registered Holstein Friesian Cattle consisting of 20 head. My farm is 2 miles south and 1/2 mile west of Powers Sta. on D. U. R. All trains will be met at Plymouth, Mich. day of sale. GEO. HAKE, Northville, Michigan. FRANK BOYLE, Auctioneer.

FOR SALE—Reg. Percheron Stud Colt, 2 yrs. old next month. Color grey. Prospect for a ton horse. ALFRED ALLEN, Mason, Mich.

BREEDERS' DIRECTORY.

CATTLE.

ANGUS CATTLE FOR SALE

We have on hand several choice pure-bred Angus bull calves which can be sold for immediate delivery. These calves are sired by Louis of Viewpoint, a Grand Son of Lucy's Prince, the International Grand Champion bull for three years in succession. We also have for sale a few choice heifers from this herd bull. Will make a price on Louis of Viewpoint as some of his heifers are old enough to breed. Address GLENWOOD FARM, Addison, Michigan.

ABERDEEN-ANGUS

HERD FOUNDED IN 1900. Strains represented consist of Trojan Ericas, Blackbirds and Prides, only. Black Quality Itto, a bull of rare individuality and merit, heads the herd. WOODCOCK STOCK FARM, Ionia, Mich.

ABERDEEN ANGUS.

Two extra registered BULLS FOR SALE. The best of breeding. The kind that grow out and get large with quality. Nine months old, price \$75 and \$80. If taken soon. Inquire F. J. WILBER, Ohio, Mich.

AYRSHIRES

One of the foremost dairy breeds. Bull calves for sale. Write for description. Michigan School of the Deaf, Flint, Mich.

HEREFORD BULLS

2 six months old 1 15 months old. ALLEN BROS., Paw Paw, Michigan.

For Sale—Choice Guernsey Bull calves, Sired by Im'p Deane's Sequel 14630, out of Dams second to none. EDWIN MILLER, Birmingham, Michigan.

GUERNSEYS

Reg. Tuberculin Tested. Windsor Farm, Watervliet, Mich. J. K. BLATCHEFORD, Auditorium Tower, Chicago, Ill.

ESPANORE FARM,

LANSING, MICH.

Register'd Holsteins

Bull Calves \$50 to \$200.

An absolute guarantee with each purchase. CHASE S. OSBORN, Owners. L. M. HATCH, Supt. ADAM E. FERGUSON, Owners.

HOLSTEIN BULLS AT FARMERS PRICES

Sired by one of the best bulls of America. LONG BEACH FARM, Augusta, Kalamazoo Co., Mich.

REG. HOLSTEINS

4 months old bull, by 33-lb. sire. Dam, a 14-lb. granddaughter of Pietertje Hengerveld's Count De Kol (88 A. R. O. daughters.) \$85 delivered. HOBART W. FAY, Mason, Mich.

SQUARE DEAL HOLSTEIN FARM

offers you this bull calf to improve your herd. Born Jan. 22, 1914. His grandsire has 11 A. R. O. daughters. His grand dam made 21.94 butter as a 3-yr.-old. His dam made 19 lbs. butter, ave. 82.47 lbs. milk. If interested write. R. G. Brown, R. 3, Fowlerville, Liv. Co., Mich.

HOLSTEIN FRIESIAN CATTLE BREEDERS

of high record cows. Young bulls at farmers prices. JONES & LUTZ, Oak Grove, Michigan.

A FEW CHOICE

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

The Michigan Home and Training School, Lapeer, Mich.

Offers Choice Purebred Holstein Bull Calves, 1 to 7 mo. old. Also choice grade Holstein heifers out of good milk producing dams. List furnished upon application.

HOLSTEIN BULL CALF—Born Feb. 4. Sire, Albina Bonte Butter Boy No. 93124, and from dam with A. R. O. record 16.64 lbs. at 3 years. With first calf. W. B. READER, Howell, Mich.

Holstein Females—Also 3 bull calves from dam with records from 15 to 25 lbs. Wm. Griffin, R. 5, Howell, Mich.

ITHLEA STOCK FARM

Offers for sale a 5-month old son of KING SEGUS PONTIAC HOWELL, grand son of King of the Pontiacs. Dam is a grand-daughter of Pontiac Korn-dyke. Price \$100, delivered. Write for particulars. HERBERT L. SMITH, Shiloh, Michigan.

"Top-Notch" Holsteins.

Choice bull calves from 1 to 3 mo. old, of fashionable breeding and from dams with official milk and butter records for sale at reasonable prices. McPHERSON FARMS CO., Howell, Michigan.

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Bigelow's Holstein Farms

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Breeder of High Class

Registered Holsteins.

A Fine Foundation Holstein Herd For Sale

Minuta Butter Boy 4th. No. 71404. Dam, Pauline DeKol Pride. Butter in 7 days, 25.53 lbs. fat 4.22%. Sire Minuta Butter Boy, No. 23808, with 11 A. R. O. daughters, he by Pontiac Butter Boy, with 57 A. R. O. daughters, May Hartog Beauty, A. R. O. No. 219731. Kekke Hengerveld DeKol 4th. No. 17968 A. R. O. Anna DeKol Mechthilde, A. R. O. No. 157734. Canful Mechthilde DeKol, A. R. O. No. 151571. Kenilworth Duchess, A. R. O. No. 16334. These cows are three years old, all with good A. R. O. records, from A. R. sires and out of A. R. O. dams, and all bred to A. R. bulls. I never have offered as good a lot for sale as these. Price \$3000 for the six. I also have bulls and bull calves that will please you. L. E. CONNELL, Fayette, Ohio.

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On the northwest coast of California there is a rainfall of from 50 to 100 inches per year. There land is worth \$500 per acre, but grade Jersey herds are paying interest and dividends on that land, averaging 400 lbs. butter fat per year.

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CRYSTAL SPRING STOCK FARM, Silver Creek, Allegan County, Michigan.

JERSEYS

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

JERSEYS

—Two yearling bulls, well bred and well grown. We invite personal inspection. SMITH & PARKER, Howell, Michigan.

MAPLE Lane Register of Merit Jersey Herd—Tuberculin tested by the U. S. Bureau of Animal Industry.

Bull calves from cows of R. of M. test. No females less than \$100. Average of R. of M. herd, 526 lbs. of 8% butter in one year. IRVIN FOX, Allegan, Mich.

Lillie Farmstead Jerseys

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

For Sale Jersey Bull

—1 yr. old, also 2 yearling heifers sired by a grandson of Imp. Interested Prince. The Dams are large healthy high producing cows. Newman's Stock Farm, Marlette, Mich. R. 1.

FOR SALE

—Six head of strictly high class Polled Durham cattle at a bargain if taken soon. Two cows will calve soon. Head of herd cost \$500. W. E. MAXWELL, R. F. D. No. 7, Allegan, Mich.

FOUR Shorthorn Bulls For Sale, roans, eight to ten months old

Also two registered cows, due in March. W. E. MORRIS, Flushing, Michigan.

FOR SALE

—4 Shorthorn bull calves 6 months old. All reds and good ones. W. O. OSBURN, Hillsdale, Michigan.

SHORTHORN CATTLE

W. W. KNAPP, Howell, Michigan.

SHORTHORN BULLS, 12, all ages. Best of breeding. Prices right. Also P. C. hogs and Oxford Sheep. C. W. CRUM, Secy., Cent. Mich. Shorthorn Breeders Ass'n, McBride, Mich.

DAIRY BRED SHORTHORNS

25 years a breeder of Shorthorns. J. B. HUMMEL, Mason, Michigan.

YOUNG SHORTHORN BULLS

—Strong in Bates blood \$100 to \$150 each. WARNER BROS., Almont, Michigan.

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IT PAYS TO BUY PURE BRED SHEEP OF PARSONS

"The Sheepman of the East." I sell and ship everywhere and pay express charges. Write for club offer and price list. Oxford, Shropshire and Fokled-Delaine. PARSONS, Grand Ledge, Mich. R. 1.

HOGS.

Durocs & Victorias

—A few extra Sept. Boars and bunch of Gilts for 1st of April farrow. M. T. STORY, Lowell, Mich., Citizens Phone 55.

BERKSHIRE SOWS

—Bred for April farrow. Boar pigs soon ready for service \$15 each. B. B. REAVEY, Akron, Michigan.

BERKSHIRES

Choice spring boars and gilts. priced to move quick. Farmers stock. ELMHURST STOCK FARM, Almont, Mich.

BERKSHIRE For Sale—Sow bred for April farrowing

and a choice lot of fall pigs either sex. A. A. PATTULLO, Deckerville, Michigan.

O. I. C.

—Sows bred for June farrow. We are also taking orders for spring pigs. JOHN BERNER & SON, Grand Ledge, Mich.

O. I. C.'s

—Fall pigs, either sex at a bargain. Booking orders for March & April farrow. MAPLE LEAF FARM, Deford, Michigan.



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.

O. I. C.'s.—I HAVE A NICE LOT OF HAND, OTTO B. SCHULZE, One-half mile west of Depot, Nashville, Michigan.

O. I. C. SWINE

—Bred gilts all sold. have a No. of Spring pigs on hand. Will book orders for Sept. pigs, get my price on pairs and trios not akin. A. J. GORDON R. No. 2, Dorr, Mich.

O. I. C.

—18 months and 4 months boars. Also taking orders for spring pigs. Oak View Farm, N. H. Weber, Prop., Royal Oak, Michigan

O. I. C.

—16 sows bred for spring farrow, 30 fall pigs, large and growing. Write your wants. GLENWOOD STOCK FARM, Zeeland, Mich.

O. I. C.'s

—Bred gilts all sold. Summer and fall boars weighing 125 to 160 lbs. All of right type. I pay express. G. P. Andrews, Dansville, Ingham Co., Mich.

O. I. C.

—Extra choice bred gilts, service boars and spring pigs, not akin. From State Fair Winners. AVONDALE STOCK FARM, Wayne, Michigan.

Chester Whites

—Fall pigs, either sex, orders taken for spring pigs. Write your wants. Price & quality right. Meadow View Stock Farm, Holland, Mich.

Chester Whites—Reg. Bred Gilts—Orders taken for

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—Fall pigs of the large heavy boned type, pairs not akin. F. J. DRODT, Monroe, Michigan, Route No. 1.

Duroc Jerseys

—Choice fall gilts, Sept. farrow at reasonable prices. S. O. STAHLMAN, Cherry Lawn Farm, R. 2, Shepherd, Mich.

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farrowed Sept. 7, 1911, two Aug. 1913 boars. Write for price, etc. J. H. Banghart, Lansing, Michigan.

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Good individuals at reasonable prices. John McNicoll, Station A, R. 4, Bay City, Mich.

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now offer Duroc Jersey pigs of either sex at reasonable prices. E. R. CORNELL, Howell, Michigan.

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—Spring boars from prize-winning strains. Sows at sale. Brookwater Farm, R. F. D. No. 7, Ann Arbor, Mich.

LARGE TYPE P. C.

—Largest in Mich. Bred gilts left. Watch this space for something large and good, they please where ever they go. W. E. LIVINGSTON, Parma, Michigan.

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

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POLAND CHINAS

—Bred sows all sold. Some good growing fall pigs. Prices right. G. W. HOLTON, R. No. 11, Kalamazoo, Mich.

Poland China Boar; Sows Bred, All of the Big Type.

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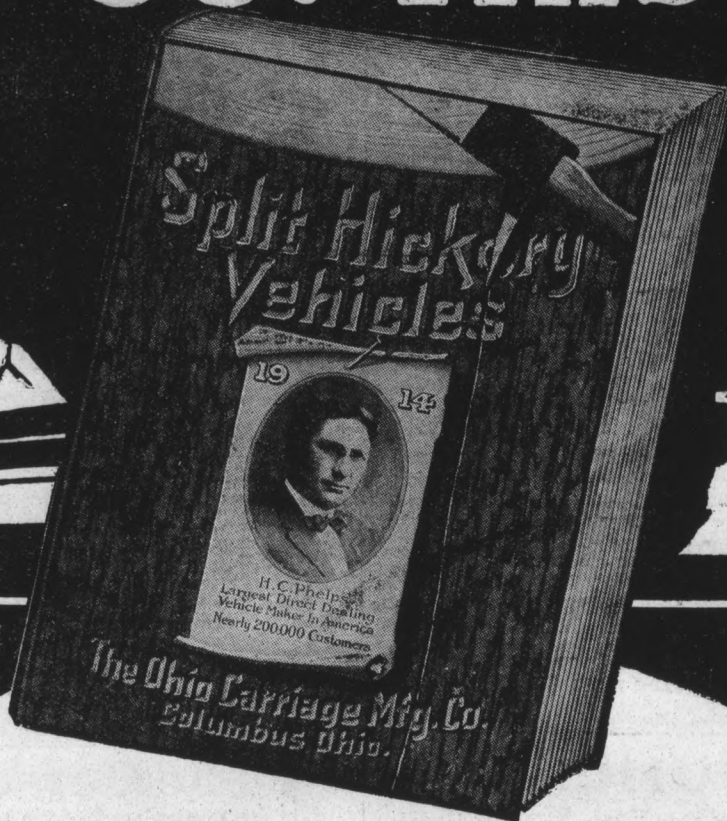
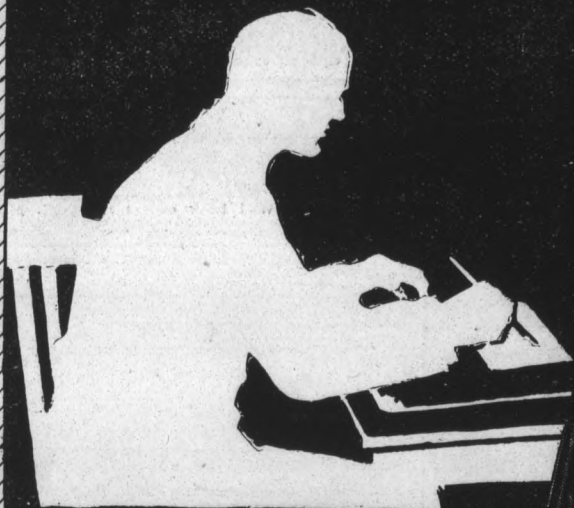
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