

MICHIGAN FARMER

AND
LIVE STOCK
PUBLISHED WEEKLY.

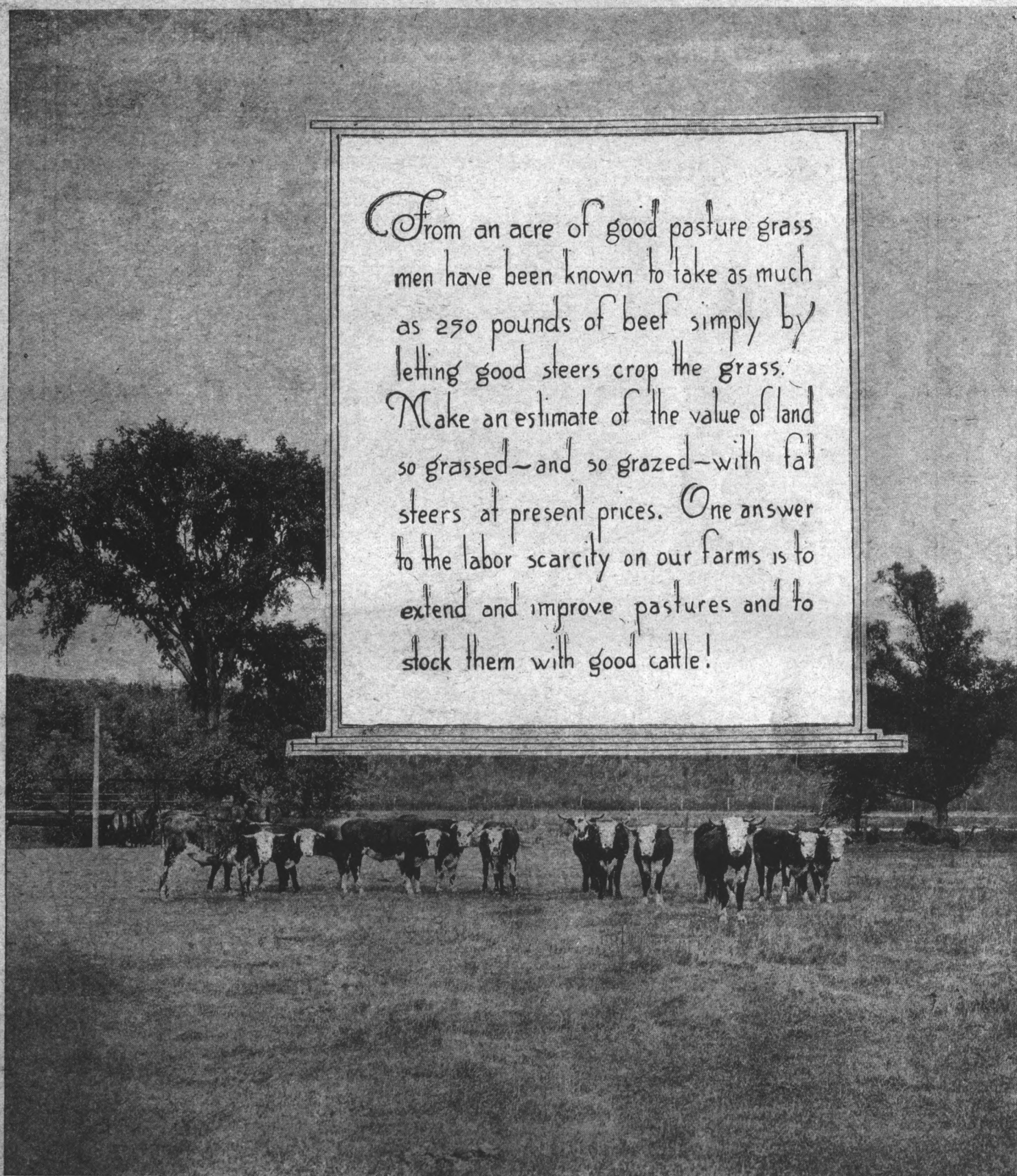
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DETROIT, MICH., SATURDAY, JANUARY, 18, 1919

\$1.00 A YEAR
\$3.00 FOR 5 YEARS

From an acre of good pasture grass men have been known to take as much as 250 pounds of beef simply by letting good steers crop the grass. Make an estimate of the value of land so grassed—and so grazed—with fat steers at present prices. One answer to the labor scarcity on our farms is to extend and improve pastures and to stock them with good cattle!





A Special Proposition to Lime Users During January and February

You remember that last year Solvay Pulverized Limestone was in such big demand that some farm owners had to plant their crops without it, in acid soil.

That was because many Michigan and Indiana farmers waited until they wanted to spread their lime before they ordered Solvay. Orders came in masses, naturally, and everyone could not be supplied at once.

This year, to make sure of getting *your* lime, *order in advance*, and we will co-operate with you.

Place your order for Solvay Limestone for January or February delivery *now*, and we will date your invoice April 1st and extend you our usual terms of 3% for cash if received before April 10th or ninety days net.

By this method you can order your lime *now—get it now—haul it during the winter*, when hauling will not interfere with other work—store it in safety, for any shed with good roof will keep bulk lime in good shape—we provide air-tight wrappings for the smaller quantities—and *pay for it when you use it.*

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Solvay lime is so finely pulverized that 95% of it will pass thru a 50-mesh screen. This means that every particle of it comes in contact with the soil—works on it—removes the acids—makes the soil sweet.

Another reason for the better results Solvay produces is the fact that we guarantee 94% carbonates.

All Solvay Limestone is furnace dried. It is shipped in bulk in box cars or in 100 lb. dry, air-tight paper sacks in box cars.

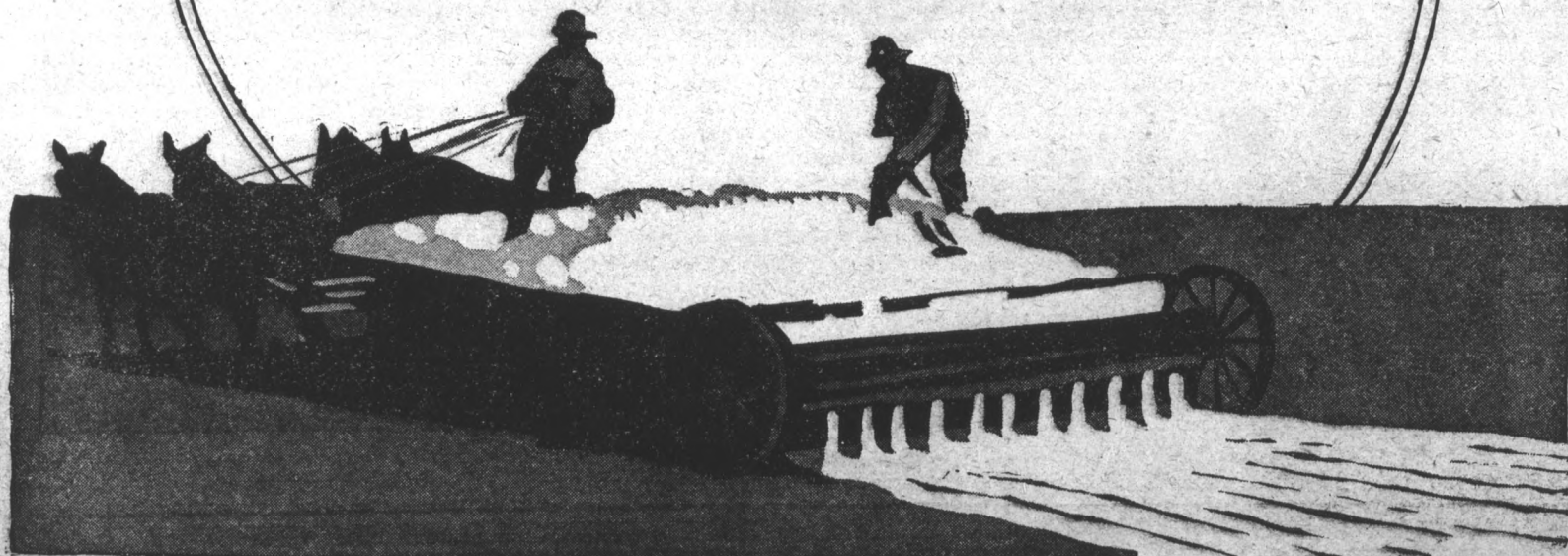
Remember that to make sure of getting your Solvay Limestone this year you should order it *early!*

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Write us for a free envelope of litmus paper for testing the acid in your soil. Ask for Solvay from your dealer.



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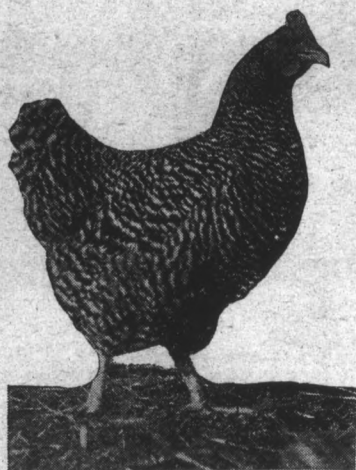
MICHIGAN FARMER

AND *LIVE STOCK* JOURNAL
PUBLISHED WEEKLY. ESTABLISHED 1843.
A Practical Journal for the Rural Family

QUALITY
RELIABILITY
SERVICE
NUMBER THREE

Are Egg-Laying Contests Worth While?

Not all the Practices of Those Handling High-Producing Hens are Safe for the Average Person to Follow. Read What E. C. Foreman Who Selected Winners at this Year's Contest Says About Methods.



Laid 238 Eggs in 10½ Months.

IN a recent publication of one of our leading poultry journals the question was asked: What conclusions are being reached in Egg Laying Contests that are of value to the poultry public? What can the public safely follow, after all these years of experimenting?

The paramount lesson which concerns all, and which is repeatedly discussed as to which breed of poultry is "best," has been definitely solved. Most modern breeds and varieties of poultry have great egg laying possibilities inherent, nearly all of our common breeds, such as Rocks, Reds, Wyandottes and Leghorns being represented in the "hall of fame" as contest winners. We may conclude that no one breed of poultry has a corner on egg production, but that higher fecundity is a question of developing an early maturing family or strain, regardless of breed, the variation of individuals of the same breed being just as great as the variation between different breeds and varieties of poultry.

The choice of a breed then resolves itself into a question of personal "likes and dislikes." In every case the breed you favor will prove the most satisfactory, regardless of color, or comb, so long as one breeds, for quick feathering and early maturity.

Contests have also proven that two-hundred-egg hens are a very substantial present day reality. In the Seventh National Egg Laying Contest just completed at Mountain Grove, Missouri, thirty-one per cent of all hens entered laid two hundred eggs or more, during the year. All hens entered averaged 171.8 eggs each, making a profit over feed of \$3.11 per hen—this attrac-

tive financial record was made on a strictly war ration, which only goes to show that most available grains can be properly balanced for egg production, and that it is not necessary to feed high-priced wheat in order to secure a profitable production.

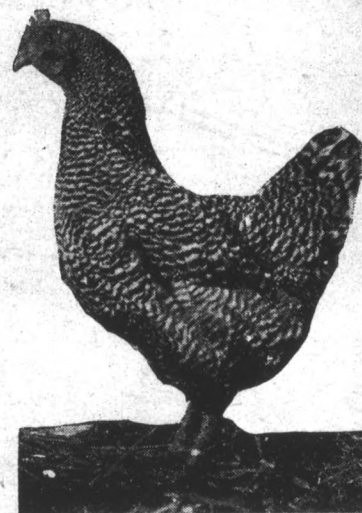
On the other hand, ten per cent of all pullets hatched and matured are either slackers or constitutionally poor layers, incapable of breaking even in the feed bills. When we find such a high percentage of hens unable to pay for their keep, under perfect environmental conditions, is it any wonder that under average farm conditions with damp, dark, filthy houses, irregular attention and unbalanced rations that thirty per cent of our hens are unprofitable.

The American or general-purpose breeds, generally carry off the honors for highest production, during the winter cycle, December, January and February and usually finish strong at the

vidual. Mass or flock selection in the past have proven futile but males from high-record females of known ancestry, mated to average flocks, show immediate results of higher fecundity of the daughter.

Of recent years many poultrymen have been working on different so-called systems and secrets, that would enable one to select high producers without the use of trap-nests. As a result of this investigational work the "Potter and Hogan" systems have been evolved as the sure "short cut" to production. The "pigmentation test" was developed and emphasized, the "egg type" faddist was heard from and many others of lesser importance.

To say that they were all wrong would be an injustice, each and all have merits. Enthusiasm in utility poultry breeding as a result of egg-laying contest, and the ever present literature, or "dope" on selecting the layers has swept the country from coast to



Record of 268 Eggs in 10½ Months.

legs and beaks, very late to moult, October or November. She would usually drop all her feathers at one time and if properly nourished would moult and be ready for business again in six weeks.

The general custom on the farms is to market the old fowls during these months, October and November, to make room for the pullets. The method for weeding out the market hens is based on either age or appearance, which generally results in marketing a large number of good hens, while in this moulting condition. The big fat, yellow leg hens appeal to the eye and are retained—these are the poor producers whereas the so-called "scrubs" have been the profit producers, they are consigned to the butcher.

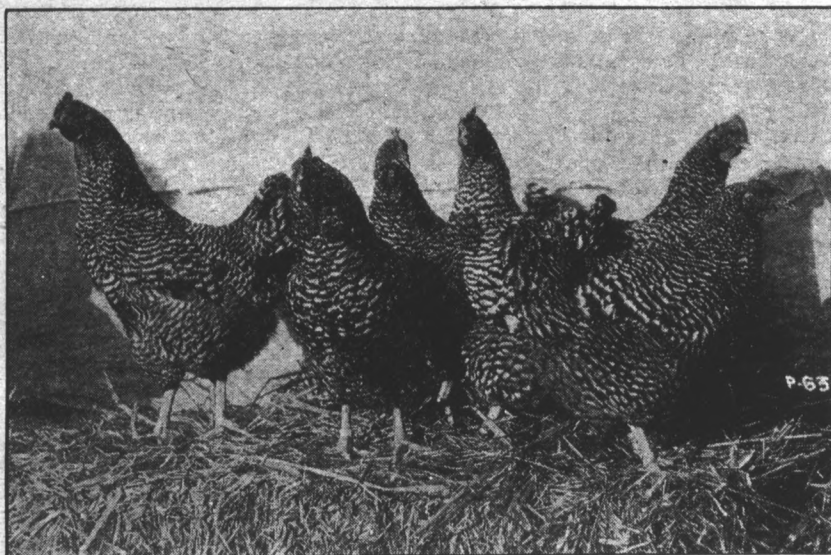
The subject of "egg type" in poultry has been widely discussed. Most practical breeders insist it is possible to select the heaviest layers according to type or body conformation but their extreme demands included in this type such as high tails, beefy combs and long bodies open up the breach through which the opponents of this theory train their guns and open fire.

Whether the shape of a hen's body influences egg production or egg production influences her shape, the fact remains that egg types exist.

The accompanying illustrations of heavy-producing hens in Missouri contest were selected on type alone, before a single egg was laid.

In referring to egg types in poultry we are thinking more particularly of the heavier breeds, and in them we demand the elimination of size and coarseness, to almost the point that

(Continued on page 102).



Leading Pen in Barred Rock Division in Missouri Egg Laying Contest.

close of the contest, whereas, the lighter breeds such as Leghorns, maintain a higher production during the summer cycle of intense heat. The American breeds are not so susceptible to sudden changes of temperature and can withstand a more rigorous winter but their inclination to broodiness is developed to a more marked degree than is found in the lighter breeds although this trait can be entirely eliminated by breeding and selection.

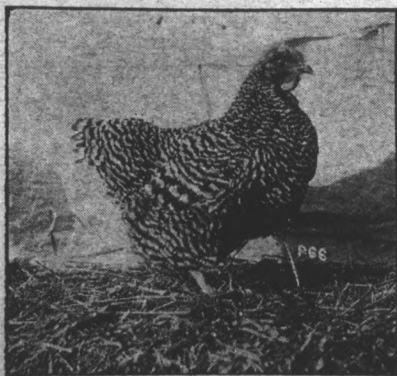
Contrary to general belief, the male bird has no influence on egg production. After the hatching season is over, either dispose of him or separate from the flock, thereby producing the highest quality market eggs.

Probably the greatest good derived from trap-nest breeding, is the attention given to the individual. Increased production of the flock is more quickly and surely brought about by raising the standard of production of the indi-

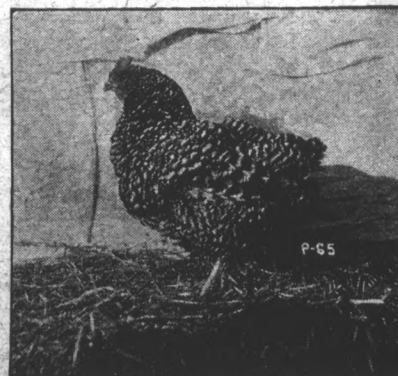
vidual. The "slacker" hen is forever doomed. The poultry fanciers have also seen the light, they realize now as never before that the "Ideal" hen not only combines color and type but that she must also carry efficient machinery to produce eggs in large numbers and for a long period of years—this means she must have strong constitutional vigor.

The earlier contest reports decided that three types of birds existed, namely, egg type, dual-purpose type, and beef or slacker types of hens.

The egg type, or highest producers, were generally characterized as being below standard weight (denoting quick maturity), with a cheerful, fidgety disposition, nervous yet docile, very industrious, seeking food at early dawn and retiring late. Rain or shine her work went on. Towards the end of the laying season, her appearance was pathetic, soiled, broken plumage, bleached



Laid 105 Eggs in Four Winter Months.



Record of 212 Eggs in Ten Months.

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CURRENT COMMENT

Educating the Consumer

RECENTLY the writer of this comment overheard a conversation on the train between a traveling salesman who sold an important raw material and a manufacturer who was a large user of this material. The talk centered about the question of production costs and the future trend of prices for manufactured products. These men, whose judgment may well be considered excellent in their line, were agreed that prices could not be materially cheapened until labor costs were lowered. The salesman was equally positive that labor costs could not be materially lowered until living costs went down. In this connection he voiced a common error among urban people that the farmers were getting more than they should for their products. In this instance the farmer found an earnest defender present, and these representatives and typical business men were quickly disabused of this false impression.

This instance is cited merely to again emphasize the need of a wider dissemination of facts relating to production costs of food stuffs. The average consumer is essentially a fair-minded man and will be willing to pay a price which will cover the cost of production plus a fair profit and a reasonable cost for distribution. But it is only by a better determination of actual production costs and wider publicity on this point that the consumer can gain accurate knowledge of what constitutes a fair price. At the same time such knowledge will show him that distribution costs are far too high and interest him in evolving or helping to evolve some plan of distribution which will make possible a marked reduction in distribution costs.

The interests of producers and consumers are not widely at variance in this matter. The consumer's first interest should be an adequate supply of essential food stuffs, and an adequate supply can be insured only when producers have the assurance or hope of

a compensatory price. Both producers and consumers are interested in economical distribution, since this will at once serve the double purpose of assuring a more compensatory price to producers and cheapening the cost of living to the consumer. This is a case to which we can apply the old maxim that "one-half the world little knows how the other half lives."

Any and every agency which will better acquaint the consumer with the producer's problem and give him a greater personal interest in the problem of distribution will benefit both classes. Such a mutual understanding is, however, most vital to producers, and they should take the initiative in bringing it about so far as may be possible.

War vs. Peace Economy

ECONOMY in public expenditures should be the watchword in both state and nation with the transition from war to peace conditions. The first billion dollar congress is still fresh in the memory of Michigan Farmer readers. While such a vast expenditure of money for governmental purposes marked progress which contributed somewhat to national pride, yet the apparent extravagance of such an expenditure for government purposes was the subject of common remark.

Yet for the preservation of our national honor and to insure perpetuity of our liberty we have viewed the expenditure of approximately twenty times that vast sum for war purposes without criticism if not with complacency. Likewise, we can well remember when our expenditures for state governmental activities reached a grand total of \$3,000,000. In like manner we have not vigorously disapproved of the appropriation of \$5,000,000 for war purposes in our own state by the last legislature and the expenditure of a very considerable proportion of that sum for purposes related to the war by the State War Preparedness Board.

Of necessity, these greatly increased expenditures for both state and national purposes have involved the use of the public credit to a degree which will impose an unwonted burden upon the present and perhaps upon future generations. Unavoidably the expenditure of such large sums of money on the public account has involved costly mistakes and serious wastes. It is not our purpose at this time to criticize such expenditures nor to encourage such criticism on the part of our readers. The great object for which our boys were fighting and for which every one of us was working and hoping has been attained. The battle has been fought, the victory has been won, and the result is well worth its cost, no matter what figures the final footing may reach.

But with a return to peace conditions, retrenchment must be the watchword, and good public economy must be the basis of governmental expenditures, both state and national, if our future welfare is to be conserved.

The task confronting congress and our legislature is not a simple one. The determination of what is and what is not a wise expenditure of public funds is not a simple matter under present conditions. What governmental activities or public improvements should or should not be undertaken during the reconstruction period is at best difficult of determination, but there is little doubt that the tendency will be toward extravagance rather than toward parsimony in the appropriation of public moneys which must be provided by the imposition of some form of taxation on the people of the state and nation, since habit is a very strong factor in the shaping of state and national policies which will to a very considerable degree determine the extent of public expenditures on national and state accounts. The ideal condition to be aimed at in this regard is that the people of the nation and state shall receive the equivalent in needed service or material for every dollar expended on the public account under peace conditions, an ideal which manifestly could not be even approached under war conditions.

If this very desirable result is to be attained, retrenchment must be the watchword all along the line, and public retrenchment is only to be attained through public interest and the expression of public sentiment on this point. It is the moral duty of every citizen to make a close study of reconstruction policies, and to advise his members of congress and the legislature regarding his views on these public issues, to the end that the burden of taxation may be lessened and the public interest conserved.

State Police Costs

NOW that the war is over and we are getting on a peace basis, it is good business to take into account the cost of public service in making sound plans for the future. Under war conditions this is not always possible, but under normal peace conditions it is quite as essential that public expenditures be carefully scrutinized and be made to yield their value in either service or material as it is that our individual business be conducted along similar lines. It is for this reason we have sought information with regard to the cost of the State Constabulary.

This organization was created by the War Preparedness Board when the National Guard was mustered into the service of the United States as an integral part of the regular military establishment. This left the state without a military force of any kind at a time when there was likely to be urgent need for such a restraining influence on account of prevalence of German propaganda and I. W. W. activities. Something of the history of the activities of this police force has been given in our columns in recent issues. As previously noted a portion of this force has been maintained in the Upper Peninsula and its principle activities have been in the apprehension of draft evaders and liquor smugglers, although

arrests were made for a wide range of crimes, from simple larceny to highway robbery. In answer to our inquiry the Auditor-General advises that the total cost of maintenance of the state constabulary from its organization to date has been \$661,422.58. This sum includes the initial cost of supplies, equipment, etc., as well as the expense involved in the entire activity of the force. The present expense of maintenance is approximately \$30,000 a month. It is a reasonable assumption that under war conditions the benefits derived from such a State Police Force were not wholly confined to their punitive activities. The restraining force of such a body under war conditions is an influence which should not be overlooked. But this influence is of far less public value under peace conditions than under war conditions, hence the desirability of maintaining this State Police Force should be measured largely by the public service which it is likely to be able to render under such conditions.

The cost of this State Police Force to date is doubtless greater than its cost would be for a like period in the future for the reason that the original cost of equipment is included in this sum, but as the depreciation in equipment is comparatively high, this item of possible future saving may be more apparent than real. From the date of organization the report of its commanding officer published in December, shows a total of slightly less than three thousand arrests, giving an average cost per arrest of something over \$225 each, which we believe the people of Michigan will think is rather high when it is considered that the greatest number of arrests were for crimes of a military rather than a civil nature. Of the civil arrests the great majority were for violation of the state liquor law. When it is considered that the majority of these arrests were made on the Ohio line and that Ohio will also be a "dry" state within a few months, and that national prohibition of liquor traffic will be enforced from July 1 until the final demobilization of our troops, it is a reasonable conclusion that the public value of this activity will be greatly lessened in the not distant future.

It is a reasonable conclusion that from the standpoint of general service as peace officers, the state constabulary would not be worth its cost to the public generally after this exigency has passed along with the war need for such a force. It is equally true that the safety of the state in case of riots or other internal disturbances is greatly enhanced by an available military force to preserve public order under such conditions. It is, we believe, true that our old National Guard when mustered out of the United States service will be disorganized so far as any further use for state purposes is concerned. Provision for some other emergency military force should be made by the legislature in case the state constabulary is discontinued. The so-called home guards or state troops organized for home protection after the National Guard was mustered into the federal service, should form a satisfactory basis for such a force and should prove more efficient in the suppression of riots in case of need than a small state constabulary maintained at a probably far greater cost.

This question is one for settlement by the legislature, since the authority of the War Preparedness Board to continue the organization for long under present conditions is doubtful. It is a question upon which public sentiment should find free expression, and if so expressed such sentiment will undoubtedly prevail to influence the action of the legislature. At least, it will insure a careful consideration of the relative merits of the two plans from the standpoint of public economy, which is the desirable end to be attained.

¶ The relation of the land-owner and tenant and its reciprocal effect on the soil is one of the foremost problems confronting Michigan agriculture.

¶ What must the land-owner do to get fair returns and keep up the fertility of his farm? What must the tenant have in the way of a lease in order to accomplish the land-owner's wish? In next week's issue appears the first of a series of articles on "Cooperative Farm Tenancy."

¶ We would like to hear what land-owners have to say, what form of lease and kind of tenant suits them. Also what tenants have to say on this question of leases, rents, improvements, etc.

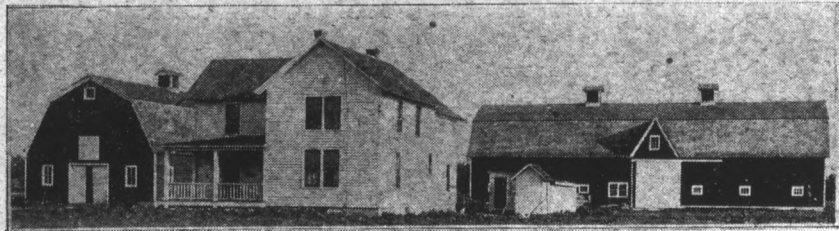
Farmers Facing New Problems

By I. J. Mathews

THE present year will be full of things which never were before and unless we are greatly mistaken, it will be a most momentous year as far as the farm and farm folk are concerned. This year we have been most insistent upon production and saving. Next year we shall see other things emphasized. No doubt, management and efficiency will come in for a large share of treatment and community life will be expanded and more pregnant with meaning.

In the past we have not troubled ourselves much about the other fellow. We farmers have become individualists, following laws in general but our own desires in greater particular. We have heard much of cooperation but haven't seen this bird in captivity for very long periods. When the clarion call to colors resounded throughout the land, we put our individualistic ways and ideas up in the attic where they have since become molded and dusty. We couldn't rejuvenate them if we would, for individualism is another name for despotism or absolutism. Rich and poor alike have shared the squalor of the trenches, the safety of the dugouts and the exhilaration of victory. The army tolerates no individualist. It proclaims in terms and unmistakable that it will have none of this. Individualism and democracy are inimical to each other.

Cooperation will be less talked about and more practiced in the year to come. Already the flaming torch of learning is showing the way to better teamwork and the past is only a half-brother to the future. Most farmers' organizations have come and gone after a brief though often volcanic existence, but we stand on the brink of a permanent change. All the world—business, labor, government and education are organized, affiliated and correlated—mutually helpful instead of predatorily preying on each other as a house is wont to glean the succulent



nourishment from its bovine host. Agriculture must likewise hook up its various agencies and abjure the individualistic state. In the name of progress, this is the next move.

Various clubs and groups will have their membership increased; they will combine their aims and enter the council lodge together and in harmony such as we have not seen in the past. He who is now outside should be inside; one is much likely to see more looking out.

Not only will a better coupling up of rural forces take place but the owner of each farm will heed the past and measure the future by the experience of that past. Learning and science are making an earnest and forceful march onward and he who would find favor and prosperity must keep under the kite, always remembering that the kite string does nothing but follow and lash the air that has been whipped into motion by the kite.

In the past, farmers have said, "Away with this stuff about increasing production. What I want is someone to do my marketing for me." Even state officials anticipating future favors have been known to make like utterances, all of which simply shows that they have not been counting the public pulse correctly. As a matter of fact, no sane farmer wants any such thing. Any activity that takes from the individual his incentive to think individu-

ally is destructive and of paternalism. Understand this, thinking should always be done individually, then the wisest counsels should be combined and action should be taken as a whole. I have seen a few attempts to supplant separate thinking and it does not look good to me. I have thought much as to what attitude we farmers should take towards production, marketing and education and I have come to the conclusion that production and marketing, while both important, pale away into insignificance in comparison with education because they naturally follow it. Yet there was a time when so-called successful farmers ridiculed the notion of farm education being valuable. Many of these men are dead now and this mistaken idea seems to have died with them. The generation now in the saddle believes that safety lies in knowledge and that ruin lurks in the wake of ignorance. Farmers' meetings are better attended now than they ever were before. People are there for what they can learn and their questions and discussions show a healthy tone in comparison with those of five years ago.

Management of farm, labor and fertility will be subjects of great importance now. Until a few years ago, few farmers ever gave any thought to managing the fertility of their farms. The farmer sowed and reaped and let fertility matters take care of themselves.

He built his barn on a hillside and expected the river to wash the manure away. He planted the same crop, year after year on the same field, pooh, poohing the idea that there would be diminishing returns. He gave no thought to fertilizers except to deride them and claim that they stimulated the land and when once used, must be continued. A few of these practices still linger but many of us have worked our farms long enough to find that the danger signals put forth a few years back now exact attention. The kindly stream with its valuable load of fertility has paled and lost some of its load. The manure spreader has taken over much of the load and the land once being constantly impoverished is being gradually though laboriously built up again. Those who once said harsh things about fertilizers now buy them by the carload and farm management is becoming acclimated to actual use on the better farms.

Surely agriculture has stepped forward at a dizzy pace during the last ten years. One does not have to be very old to remember those who derided the idea of a perfectly well and sane man riding on a sulky plow; when labor-saving ideas were scoffed at and all new-fangled things were ascribed to him of the under-nourished brain and over-fed body. When the cross-cut saw oscillated between two men, wearing itself into a log—those are only the days of yesterday. With the old world now doing the quickstep, who can say what will come with tomorrow. Undoubtedly manufacturing will take a big stride in an effort to provide work for those out of employment during the reconstruction period. It is probable that a large number of inventions will be put on the market. Probably the only worth-while thing to do in preparation for this change is to follow the old adage which runs, "In all emergencies, keep your feet warm and your head cool."

Sick Soils---Cause and Cure

WHAT more depressing sight than an abandoned farm? Who has not seen at least one such example? The gray old house stands doorless and windowless. The roof of the empty barn sags almost to the breaking points. Weeds unmolested grow everywhere about the neglected yards. Fields once fenced and cultivated now lie open to the commons, the soil barren of vegetation except for a few stray tufts of grass and gray mullein stalks. The cause—a system of farming which mined its limited stores of fertility from the soil and returned nothing, or, in still plainer terms, soil robbery, due possibly to the stress of circumstances, but often to mere ignorance of the underlying principles of permanent agriculture.

While such scenes are rare in Michigan, for our agriculture is relatively new, they are not unknown. An analysis of the causes of such conditions here in this new country generally ends with the discovery that live stock has been neglected on that particular farm, either because hay was grown only as a cash crop and sold off the farm, or because it became impossible to get a catch of clover and the number of head of stock had to be reduced for lack of hay. In the latter case it is hay, or rather the lack of it, which presents the most serious problem in farm management. It is this inability to get stands of clover which has become an increasingly important obstacle to profitable agriculture in the state of Michigan.

The hay crop was short everywhere

Evil Consequences from Short Hay Crops. Remedy Lies in Change of System. By H. L. Barnum

last year, but Michigan has some sections where the hay crop is usually too small to support the proper amount of live stock. Wherever such conditions prevail the result of this hay shortage is bad; for, with little clover sod and stable manure to plow under, cash crops, like potatoes and small grain, are fast causing soil fertility depletion,

decreased yields, unbearable poverty, and abandoned farms. This condition is serious. It is the beginning of a general community decline which should be headed off before the damage becomes irreparable.

The remedy, without a doubt, as proven by many cases where soil regeneration has been accomplished, is a

system of farming which includes more live stock, the general use of lime, and the use of acid phosphate, both to reinforce the stable manure and to apply alone with the grain crops to insure a stand of clover. In this system cash crops are used only in a short rotation consisting of cultivated crops, followed by small grain, and the grain followed by clover cut one year only. In this system the soil is sweetened, and fed, and rested by frequent and regular change of crops.

When the soil on a field or a farm has been abused so long that clover refuses to grow, no cheap, simple remedy will suffice to restore it to its virgin condition. Its quickly available plant food is gone and it no longer supports a normal plant growth. Its lime is leached away and soil acids have accumulated in damaging quantity. Its humus, or vegetable mold, has disappeared and it dries out too soon. Such a soil is said to be dead, depleted, exhausted, run out. It is all of these, and it can only be brought back to a profitable condition by recognizing the results which mismanagement have produced and then proceeding to repair the wreck step by step. Such fields or farms do not by any means present impossible problems; in fact, it is not a rare occurrence that, by proper management, the wornout farm, the eyesore of the community, becomes the most profitable and productive farm in the neighborhood.

The first step in reclaiming a worn-out piece of land in Michigan is, almost (Continued on page 97).



Plowing Under a Second Crop of Clover.

Orchard Soils and Fertilizers

(Part Two)

By U. P. Hedrick

I WANT to briefly discuss several comparative tests of fertilizers for fruits at the New York Agricultural Experiment Station. The first was carried on for twelve years in an old apple orchard in which the trees had practically completed their growth before the experiment began. The soil was a heavy clay loam fairly typical of the majority of the orchards of western New York. For twelve years applications of potassium, phosphoric acid and lime were made on an orchard forty-three years old, at the beginning of the experiment. There were some slight gains in yield for the fertilized trees, but there were no difference in color or keeping quality of the fruit between crops from fertilized and unfertilized trees. Practically, if not strictly in fact, the results were negative. The data showed that it was not profitable to apply potassium, phosphorus or lime to the soil of this station orchard; that fifty-five years of cropping had not reduced this soil to a condition where it needs a "complete" fertilizer. Stable manure or cover crops plowed under in this orchard usually showed beneficial results the same or the next season. It would be an assumption to say whether it is the food or the condition of the soil brought about by the organic matter, or both, that proved beneficial when manure and cover crops were plowed under.

The second experiment was with young apple trees and begun in the spring of 1896. Ben Davis stock set in April was top-worked to Rome Beauty in July, the buds having all been taken from one tree to avoid variations. The orchard was laid off in twelve plats of five trees each. In plats one and six, stable manure was used at the rate of five tons per acre; plats two and eight, acid phosphate at the rate of 350 pounds per acre; plats six and ten, acid phosphate and muriate of potash, 350 pounds of the first and 200 pounds of the second; plats four and twelve, the above amounts of acid phosphate and muriate of potash, plus 250 pounds of dried blood and ninety-five pounds of nitrate of soda; plats three, five and seven and eleven were checks. The first application of these fertilizers was made when the trees were three years old and fourteen applications have followed. Tillage has consisted of an early spring plowing and cultivation until about the first of August, followed by a cover crop of some non-leguminous plant. What are the results?

The orchard bore its first crop of fruit in 1902, trees six years of age, and has borne sixteen crops since. An examination of the individual records of the sixty trees and of the twelve plats, for the sixteen crops, shows very contradictory results.

In any way the data are studied it is impossible to find a very positive benefit for one treatment over another. The nitrogen applied is for most part lost. The potash and phosphoric acid are stored where "neither moth nor rust can corrupt." The storage, however, of these two food constituents in a soil such as ours, where there are already from fifty to one hundred times the quantities of them needed, is unprofitable business. One might as well "gild gold," "paint a rose" or "throw perfume on a violet."

These are the facts, but facts signify little or nothing unless they fit into a theory. Farm and garden crops on the station grounds respond generously to applications of fertilizers. Why do not apples? The answer probably is, that there is an abundance of plant food in the soil and the apple plant is pre-eminently able to help itself do what is set before it.

That there is an abundance of plant food in most cultivated soil, many chemists now agree. In a wheat field in Rothamstead, England, it was found on land cultivated for centuries and then subjected to fifty-four years continuous cropping with wheat without fertilizers, that there was still nutriment enough for a hundred or more full crops. Much of this food is not available but it now seems that by the regulation of the moisture and by putting organic matter in the soil where by we secure the solvent action of humus and of the bacteria that thrive in humus, much of the available plant food in a soil may be made available. How much, it would be an assumption to say, as there seem to be no experiments to prove this point. Indeed, to attempt to prove it would make a problem so complex as to be almost impossible and so variable for different soils as to require a solution for each par-



ticular soil. Notwithstanding the lack of definite proof as to how much of the unavailable plant food in a soil may be made available, it may, I think, be safely said from theoretical deductions that the yearly plowing, the continuous tillage, the well regulated supply of moisture and the addition of humus by plowing under cover crops, have made available the plant food the apple trees in these two experiments needed.

A favorite theory regarding fertilizers used to be, it is still held by many, that the composition of the crop is a good guide to the fertilizer requirements of that crop. Very unfortunately, there have been almost no well-conducted long-continued experiments to ascertain what the fertilizer requirements of fruits are. In America, there have been less than a half dozen experiments, planned and carried out for more than two years, that by any stretch of imagination could be called fertilizer experiments. Therefore, having no definite data for the apple as to fertilizer requirements, practically all of our recommendations for fertilizing this fruit are based on the differences in the chemical composition of this plant as compared with the composition of grain and garden crops. But the fertilizer requirements of fruits cannot be correctly apprehended by comparing chemical composition of the trees, bushes or vines, with those of grain and garden crops because their habits of growth are entirely different from those of the other crops. These differences in growth need to be kept in mind whenever the temptation arises to draw comparisons between the fertilization of orchards and of fields or gardens. Let us sum up the chief differences.

Trees have a preparatory time of several seasons before fruit-bearing begins; farm and truck crops make their growth, bear a crop and pass away for most part in a single season. Trees begin to grow early in the spring and continue until late fall; few annual crops are in active growth more than half the time that the leaves and roots of trees are at work. The roots of trees go much deeper and spread relatively farther than do those of succulent crops. Such data as are at hand seem to show that fruit transpires a greater amount of water in proportion to its leaf area than do most succulent plants, which means that the nutritive soil solution may be less concentrated than for grains and vegetables and yet feed the fruits equally well. Fruit crops are from eighty to ninety per cent water and the leaves for most part remain on the ground; in field crops the product has a much higher

percentage of solids and the roughage is not usually returned to the soil. These differences in manner of feeding, and in the crop taken from the ground, to my mind, largely account for the lack of results in applying fertilizers in orchards, while in fields along side farm crops have abundantly repaid the cost of fertilizing them.

Almost as barren of results as in the apple orchards are experiments carried on with commercial fertilizers for grapes in Chautauqua county, the chief grape region of New York. Fertilizers have been applied in six vineyards on different soils for several years. The results are confusing, contradictory, and unsatisfactory but from them in vineyards well-tilled, only the use of nitrogen as a commercial fertilizer could be encouraged—phosphorus, potassium and lime were usually inert or so nearly so as not to be profitable.

Seven other experiments, all deciduous, tree-fruits being included, are under way in different parts of New York the number of seasons for each varying from one to five. It is too soon to draw conclusions but the indications are that nitrogen and potassium are most often the limiting factor, that phosphorus is only occasionally needed and that in these New York soils, lime is very seldom needed for fruits.

What conclusions can be drawn from these several experiments? To me they indicate that in orchards and vineyards, if well drained, well tilled and properly supplied by organic matter from stable manure or cover crops, commercial fertilizers are little needed. The exceptions will largely be found on sandy and gravelly soils deficient in potassium and the phosphates and very subject to droughts; or on soils of such mechanical texture as to

limit the root range of the plants; or in soils so wet or so dry, or so devoid of humus, or so close in texture that soil bacteria do not thrive. These exceptions mean for most part that a soil possessing them is unfitted for fruit culture. There may be some orchards now receiving good care and planted on naturally good soil that require additions of one or possibly two of the chief elements of plant food. Few, indeed, require a complete fertilizer. What these special requirements are can only be decided by tests with the several fertilizers and are probably not ascertainable by soil analysis. These conclusions are somewhat revolutionary but I believe that they may be properly deducted from the experiments discussed, that they are substantiated by experiments elsewhere and that they are abundantly confirmed in fruit-growing experiences.

I cannot close without further emphasizing the importance in orcharding of paying attention to all the factors which contribute to plant growth as well as the supply of food, or any factors as moisture, soil temperature, aeration and the texture of the soil must not be neglected. Any of these, as well as the supply of food, or any combination of them, may be the factor which limits the yield in an apple orchard. Moisture is often the limiting factor, in my opinion, most often the limiting factor, carrying away plant foods in open soils and restricting the root run on heavy soils; in either case the plant may starve though food be present because there is not opportunity for the plant to take up the nutritive solution in sufficient quantity. It is only when the water supply is perfectly adjusted that there can be a fair test of the plant food resources of a soil. The same is true in a lesser degree of the other factors named.

In closing, it is my hope that this paper, much of it contrary to established teachings and practices, has not confused you. Beside giving you briefly the results of several long continued experiments with fertilizers for fruits, I have tried to present as best I could the latest teachings of science for the better understanding of the experiments. The accounts of the discoveries made by science in this field, it is hoped, will show you that fertility is a problem to be solved step by step and not a riddle to be guessed. Lastly, I hope my paper has given you desire to know more of the many interacting forces represented in a crop of fruits.

EXHIBIT OF "BLUE-BLOODED" GRAINS.

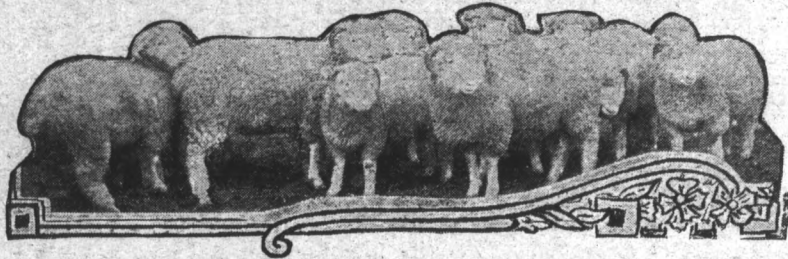
EXHIBITS made up of samples of "blue-blooded" grains harvested in all parts of the state will be assembled and placed on display February 3-7, at the Michigan Agricultural College. The coming grain show, so it is announced from the college, will be one of the central features of the week of meetings for farmers, housewives and home makers. The display will include representatives of all the pedigreed grain families, such as Red Rock, in winter wheat; Rosen, in the case of rye; oats of the Worthy strain, and other grains of equal prestige.

It is the hope of the college to press home to visiting agriculturists by means of the show a keener realization of the value of using high-yielding varieties.

As indicating a possible use for idle barracks in other places, the quarters vacated by the student army training corps are to be employed as "exposition" buildings. One of the barracks will be commandeered for the grain show, while others will be made use of for other features of the week's exhibits.

Feeds That Insure Strong Lambs

By Lester J. Meredith



THE palatability of roughage determines its profitable and economic consumption and has a great influence upon the health of the sheep. It is impossible for sheep, especially breeding ewes, to keep in vigorous condition and furnish nourishment to sustain the growing fetus on a low roughage ration. Improving the roughage ration is a step toward success in feeding sheep during the winter. Legumes are the best roughage crops. Clover and alfalfa hay are wonderfully good sheep feed and when properly harvested and stored possess a very high feeding value. These crops should be cut and harvested at a time when the leaves can be saved, which add greatly to their food value. On nearly every farm there is a variety of crops grown in the regular rotation that are admirably adapted for sheep. A frequent change of roughage induces a larger consumption and is beneficial to the health and thrift of the sheep. To furnish a variety of roughage does not involve additional expense, and with the wide variety of suitable crops grown on our farms there is no reasonable excuse for confining the flock to one kind of feed for weeks at a time during the winter.

Feeds that Insure Strong Lambs.

In compounding feeds for breeding

ewes some form of green or succulent food adds greatly to the efficiency of the ration. It stimulates digestion and assimilation and tones up the digestive and circulatory systems. Ewes that are confined to a dry ration and kept in small yards and sheds have a tendency to become dull and sluggish which weakens the growth and development of the unborn young. Some form of succulent food will help to counteract the irritating influences of lack of exercise upon the digestive and circulatory systems. Roots and corn silage are the most palatable and valuable forms of succulence. Small potatoes and cabbages are also good and are much relished by pregnant ewes. Where no form of succulence is avail-

able oil meal will help to counteract the detrimental influences of too much dry roughage and grain foods.

A roughage ration of any kind is not sufficient. A light ration of grain should contain as high a percentage of protein as it is possible to obtain from a mixture of home-grown grains. Corn, barley, oats, peas and soy beans make an ideal ration for pregnant ewes. Corn may be fed sparingly, but it is a fat-producing food and its use must be tempered with judgment. By feeding a variety of suitable roughage and home-grown grain feeds it is an easy matter to regulate the amount of food so as to bring the ewes through to lambing time in a thrifty and vigorous condition.

Ewe lambs that are to be retained to replenish the breeding flock should have the very best of treatment during the winter. It is short-sighted policy to save feed at the expense of weakening the future breeding qualities of the flock. These lambs are the future foundation of the flock. It is a waste of time and money to invest in improved blood and allow its value to be lost by improper systems of feeding and management, and that is what thousands of men are doing by neglecting to give their ewe lambs sufficient nourishing food to develop their inherent possibilities. Every effort should be made to protect these ewe lambs from deleterious influences that retard their physical development.

Provide Comfortable Quarters.

Thoughtful attention in arranging the barns, yards and feed racks facilitates the handling of the flock, and enables the man in charge to approximate the needs of the animals. Grain and roughage should be fed in separate racks. If the weather is warm much of the roughage may be fed in the yards, providing one has racks. Light racks that may be easily moved about save time and labor. They should be built so as to keep the dirt and chaff from sifting down into the fleece while the sheep is eating.

Type, Quality and Production

IN discussing the breeding of registered dairy cattle it will be well to omit the "dual purpose" breeds—that is, cows combining both milk and beef. They, undoubtedly, have a place in our American agriculture, but it is not on the intensively developed dairy farms where advanced methods of feeding, breeding and handling the cattle are practiced. The dairy farmer in undertaking the breeding of pure-bred cattle should select cows from those breeds which have for many generations been bred to a high degree of excellence for milk and butter production.

The registered dairy animal is the result of careful breeding for many generations. With ancestry on both sides of good quality she is but a type and fair representative of what her mother and her grandmother were before her and of what her sire's dam and grand-dam were in their day. She has the perpetuated excellence of her ancestry and in turn properly bred, will produce calves that will grow up into cows her equal and possibly her superior. It is this invisible dairy quality inherited by the pure-bred animal that justifies the greater cost of producing such an animal over the common grade. She has got the ability under proper conditions to transmit good qualities to the future generations of dairy animals. It has taken many generations of animal life to develop the leading breeds of dairy cattle to their present degree of excellence and this development along certain lines, and taking many years to accomplish, has improved the qualities which make them valuable.

It is only in recent years that it has been possible to give a cow her exact value and of course, equally possible to give the breeds their exact value. For this purpose prize ribbons at the fairs, milk yields and the general opinion of the breeder were about all we had to guide us in estimating the cow's value. In recent years, however, the jealousy of the advocates of the different breeds and enthusiasm of breeders have resulted in official milk and butter records of the many different animals under such conditions with such safeguards as to be official and

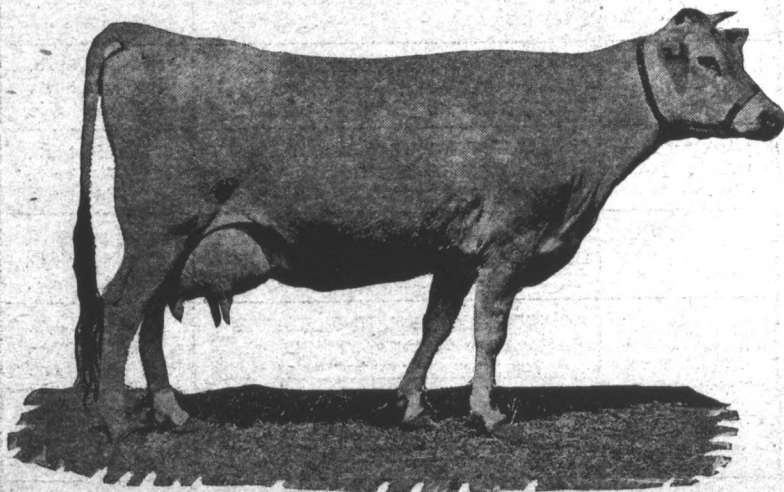
Three Essentials of the Profitable Dairy Cow--C. B. Ford

authentic and to possess great value. The actual quality of milk and its value for butter-making is now determined with mathematic precision and a few cows of a given breed have been tested and compared with a similar number of cows of another breed.

There have been many tests along these lines, and each of the tests has demonstrated the actual comparative value of the contesting animals as compared with other animals in the same contest without in any way establishing conclusively the actual relative efficiency of the different breeds. These tests, however, of the milk produced

by the different breeds serve to indicate that the Jersey, as a breed, produces milk containing the highest percentage of butter-fat; she is followed in order by the Guernsey, Ayrshire and Holstein-Friesian. The fact, however, that the Ayrshire and Holstein-Friesian cattle, as breeds, seem to produce milk with less butter-fat, loses much of its force in view of the fact that they produce a much more abundant flow of milk. These facts are mentioned to show how many breeders of pure-bred dairy cattle have been endeavoring to increase the percentage of butter-fat produced by their cows.

New Jersey Champion



SOPHIE'S AGNES, a six-year-old Jersey, owned by Ayredale Farms, Bangor, Maine, has just surpassed the coveted mark of one thousand pounds of fat in a year. She is the first Jersey cow to reach this mark, and she surpassed it by about the same fraction that her granddam, Sophie 19th of Hood Farm, fell short of it.

Besides being a remarkable record of itself, it shows that champions can be bred from champions, and that great cows are not necessarily freaks of na-

ture. Sophie's Agnes is a line-bred Sophie Tormentor, and there is a greatness on both sides of her family tree. She was bred by Hood Farm, Lowell, Mass., and was sold at public sale to her present owners for the record price of \$10,099. She is thus the record-holder in two ways, and has justified the high price that was paid for her. She was left at Hood Farm to finish her record, and she will now carry her laurels to her new home.

A. J. C. C.

Some breeders who attached too much importance to breed type and milk yields produced animals that gave an enormous flow of milk deficient in butter-fat. Such milk failed to come up to the standard demanded by city milk inspection; then breeders began to see a light and to breed with a view of increasing the percentage of butter-fat through the selection of animals from families of the breed that were noted for the quality of the milk they produced. The percentage of fat in milk is of particular importance in deciding the question of the yield as, unlike the quality of the milk produced, it is not influenced by the quantity or quality of the food, unless by some of the skillful feeders who employ forced methods and unquestionable ways of handling the animals that are being tested. The fat percentage is a hereditary characteristic. The results obtained by a few breeders who have used sires from ancestry that gave rich milk may throw light on this phase of breeding.

In Denmark farmers had for many years been increasing the flow of milk regardless of its percentage of butter-fat until some of their cows produced more than fourteen thousand pounds of milk annually. About thirty years ago when the cow-testing associations began operation in that country it required three pounds more milk to make a pound of butter than it does today. The improvement in the quality of Danish milk is the result of selective breeding. The work of breeding a herd along these lines is sure to be comparatively slow because it is only small fractions one is dealing with. If one could reckon with a gain of several points in each generation there would be little difficulty in reaching a high standard. Then, too, the higher we get the harder it is to advance, but it can be done and should be done until a fair standard is reached.

Many of the most prominent breeders in America are making no special effort to get above the market milk requirements. The market is unwilling to pay for higher quality and it is a mistake to try and increase the amount of butter-fat unless it will prove profitable. (Continued on page 103).

News of the Agricultural World

UNITED STATES NOW EXPORTS HONEY.

SINCE the outbreak of the war in Europe the supply of sugar has been greatly decreased, and it has been necessary to find some substitute to be used in place of it. Of all the various substitutes tried, honey has proved to be the most satisfactory. The sugar content of honey is very high, and when used for sweetening purposes at the table it may be substituted almost measure for measure in place of sugar. In cooking a slightly increased amount of honey will be necessary, but honey has other qualities which offset the fact that more of it must be used. Pies, cakes, or cookies, when prepared with honey, have a superior flavor and remain moist much longer than if prepared with sugar.

The domestic science bureau of the Department of Agriculture, as well as the home economics bureau of the Food Administration, is doing everything possible to teach housewives the value of honey and how to use it. If more honey were available in this country its use would be more generally recommended by the Food Administration even now. Ordinarily, the United States produces about three hundred million pounds, and import a great deal from Cuba, Porto Rico and South America.

Big Export of Honey to Europe.

This year very little honey will be imported, as most of the southern countries will send theirs direct to Europe, where there is an unprecedented demand for it. The export demand for honey in the United States has been greater than ever before. Several ships with cargoes made up exclusively of honey have left New York for Italy. This is the first time in the history of this country that a ship has cleared from any port with a cargo consisting entirely of honey. Before the war we shipped very little honey to Great Britain, but now vast quantities are being sent over.

The energy contained in sugar is more quickly available than any other form of food. Honey, on account of the fact that it has such a high sugar content, and due to the fact that its sugars are predigested, is an excellent form in which to serve sugar to men undergoing physical strain, such as is necessary in the armies.

Honey as a food supply can be increased without doing damage to anyone, because honey is gathered by the bees from the flowers in the fields. If this nectar is not gathered by them, then it is wasted. The gathering of nectar brings about cross-pollination, and in so doing benefits the plants which yield the nectar. In order to increase the honey supply, then more bees must be properly kept to take advantage of this food supply, which is open to all.

INDIANS RAISE FINE HOGS.

OKLAHOMA Indians are taking a leading part in introducing better live stock, particularly hogs, into that state.

J. A. Childers, of Broken Arrow, is a breeder of Duroc-Jerseys that have been winners at a number of fairs this fall, taking ninety prizes in all. At the Broken Arrow District Fair he took the championship on both boar and sow. He is said to be the only full-blooded Indian that has ever shown pure-bred hogs against the white man. Recently he bought a Duroc-Jersey sow for \$500, the top price of the sale in which the purchase was made. Mr. Childers also took prizes on cotton, oats, chickens, horses and corn.

R. A. Welch, of Red Oak, a Choc-

taw, is the first man in that part of the country to invest heavily in pure-bred hogs. He paid a Missouri hog man \$2,000 for a pig and an Illinois breeder \$2,500 for a young boar, both record prices for Poland China pigs of their age. On his farm is the ancient council house of the Choctaws, and around it roam many valuable porkers. He has held two sales in which the top price was above \$1,000. His sales have been attended by hundreds of persons, business men in the district practically abandoning their ordinary affairs to attend the sales and welcome the visitors. In his last sale, while Oklahoma and Texas hog men were the principal buyers, many of the hogs went to some of the leading herds of the corn belt. On forty head a general average of \$258 was paid. This is one of the best six sales of Poland Chinas reported anywhere in the country this fall.

SPEED UP ROAD WORK.

COOPERATIVE highway construction under the federal aid road act must be resumed as quickly as possible in full measure, the Secretary of Agriculture, D. F. Houston, stated at a conference of editors of agricultural journals held recently in Washington.

From unexpended balances of federal appropriations for the last few years from state funds beyond what was necessary to meet the federal allotments, and from amounts available during the current fiscal year, approximately \$75,000,000 will be available for expenditure during the calendar year. Next

year, if all the balances should be expended during this year, and we should have to rely solely on the funds accruing next year, there will be about \$20,000,000 from federal appropriations and probably more than this amount from state sources, according to the secretary's statement. The states, in addition, will expend sums in excess of what they have assigned, or will assign, for federal aid road projects.

Would Furnish Employment.

"It seems to me," said the secretary, "that we should take a further step—take this step not only because of the importance of good roads, but also because of the desirability of furnishing worthy projects on which unemployed labor during the period of readjustment may be engaged. There will be many things suggested for which federal and state funds will be sought. Some of these will be unworthy. Clearly such public works as roads are worthy, and it would be in the public interest to make available larger appropriations from the federal treasury to be used separately or in conjunction with state and local support.

Machinery Now Exists.

"There need be no delay in the execution of such a program. The nation has already provided the machinery in the Department of Agriculture and in the state highway commissions. The federal aid road act was fruitful of good legislation, and each state in the Union now has a central highway authority with power and funds to meet the terms of the federal act. The two agencies, in conjunction, have been engaged in devising well-considered road systems and in making surveys, plans, and specifications. The task will be one of selection, and those roads should be designated for improvement which are of the greatest economic importance, with due regard to such military and other needs as are proper for consideration. There is no necessity for any departure from this scheme. The suggestions made have been canvassed with the President, the Secretary of War, and the Postmaster General, and they are in accord with the view that additional funds should be made available to this department and that they should be expended through the existing machinery."

DEHYDRATION OF FRUITS AND VEGETABLES INCREASES.

COLORADO factories canned eight million pounds of peas in 1918 and that total could have been doubled had the peas been available. And along with the rapid growth of the canning business in Colorado, big strides are being made in the dehydration of fruits and vegetables.

Dehydration is one of the greatest achievements of the age. The reduction of fresh fruits and vegetables by simply removing all surplus water from the interior first and then from the exterior by means of properly regulated steam, heat and air, is gaining much popularity in the United States, and promises to greatly decrease the yearly waste of important food products.

It is claimed by dehydration experts that the process adds sweetness to products containing sugar, and that it does not harm the cellular structure, thus making it possible to restore the product to its original size, color, flavor and texture by a simple addition of pure cool water. No acids or chemicals are used in the process of reduction.

The government has recognized the advantages of dehydration and has used thousands of tons of such fruit and vegetables in feeding the armies in this country and Europe. Fourteen million pounds of dehydrated food, costing more than three million dollars, was purchased by the War Department last spring, and other orders lately placed aggregate more than forty million pounds, costing at least ten million dollars. The Food Administration highly recommends dehydration for the conservation of fruits and vegetables, pointing out that, since water makes up the most of the weight of such commodities, millions might be saved each year in freight charges.

The economic aspect of dehydration is two-fold. The farmer or gardener will no longer be hemmed in by limited local markets. His produce when dehydrated at a nearby plant can be cheaply delivered to any point in the world at from five to twenty times less expense and with much greater convenience than in its original condition. It will take up less space and will not deteriorate, but will always remain fresh and wholesome. Millions of tons of fruit and vegetables go to waste every year as a result of lack of transportation in the heavy shipping season, inability to get sufficient labor to gather the fruits and vegetables, before they become too ripe for shipment and heavy expense in obtaining cans, sugar and other things necessary for conserving purposes.

Green or raw product is heavy to transport on railways, bulky and inconvenient to handle in the kitchens, they rot easily, and fill our garbage cans with waste, whereas dehydrated product is all prepared at the plant and is ready for immediate use without any of these inconveniences.

Michigan's 1918 Crop Record

Comparisons of This Year's Crops with Those of 1917 and 1916 as Based Upon Federal Estimates are Shown Below.

	1918	1917	1916
CROP.	THREE CROPS COMPARED.		YIELD.
CORN.			43,300,000 bush.
			37,625,000 bush.
			45,375,000 bush.
WINTER WHEAT.			10,010,000 bush.
			15,210,000 bush.
			13,280,000 bush.
SPRING WHEAT.			706,000 bush.
			212,000 bush.
BARLEY.			8,332,000 bush.
			3,416,000 bush.
			2,450,000 bush.
OATS.			66,320,000 bush.
			55,800,000 bush.
			42,690,000 bush.
RYE.			6,750,000 bush.
			4,774,000 bush.
			4,648,000 bush.
BUCKWHEAT.			780,000 bush.
			585,000 bush.
			770,000 bush.
BEANS.			4,887,000 bush.
			3,294,000 bush.
			3,102,000 bush.
POTATOES.			28,560,000 bush.
			35,910,000 bush.
			15,360,000 bush.
HAY.			2,676,000 tons.
			3,837,000 tons.
			4,675,000 tons.
SUGAR BEETS.			373,700 tons.
			461,721 tons.
			502,705 tons.
APPLES.			10,966,000 bush.
			5,160,000 bush.
			12,480,000 bush.



Correct TRACTOR Lubrication

How to read the Chart

The four grades of Gargoyle Mobiloils for tractor lubrication, purified to remove free carbon, are:

Gargoyle Mobiloil "A"
Gargoyle Mobiloil "B"
Gargoyle Mobiloil "BB"
Gargoyle Mobiloil Arctic

In the Chart below, the letter opposite the tractor indicates the grade of Gargoyle Mobiloils that should be used.

TRACTORS		1918 Models	1917 Models	1916 Models	1915 Models
		Summer	Winter	Summer	Winter
Albaugh-Dover (Square Turn)					
Allice-Chalmers		BB	A	BB	B
All Work		BB	B	BB	B
Andrews		BB	B	BB	B
Appleton		BB	B	BB	B
Aultman-Taylor		BB	B	BB	B
" (18-36)		BB	B	BB	B
Avery		BB	B	BB	B
" (5-10 HP.)		BB	B	BB	B
" (Louisville)		BB	B	BB	B
Bates Steel Mule		B	A	B	A
Bean Track Pull		B	A	B	A
Best		B	A	B	A
" (12-26)		B	A	B	A
Big Bull		B	A	B	A
Power City		B	A	B	A
Buckeye (Indiana)		BB	B	BB	B
" (Indiana)/Giant Baby (Ohio)		BB	B	BB	B
Case		A	A	A	A
" (9-18)		A	A	A	A
" (10-20)		BB	B	BB	B
" (12-26)		BB	B	BB	B
" (20-40)		BB	B	BB	B
Chase		BB	B	BB	B
Cleveland		BB	B	BB	B
Common Sense		BB	B	BB	B
Con. D.		BB	B	BB	B
Con. D.		BB	B	BB	B
Creeping Grip		BB	B	BB	B
Emerson-Brantingham (EB)		A	A	A	A
" (EB) 9-16		B	A	B	A
" (Big Four) (Reeves)		A	A	A	A
Farm Horse		A	A	A	A
Flour City		B	A	B	A
" (Heavy Duty)		B	A	B	A
Galloway		B	A	B	A
" (Rumely Co.)		B	A	B	A
Grain Belt		BB	B	BB	B
Gray		BB	B	BB	B
Happy Farmer		B	A	B	A
" (Model B)		B	A	B	A
Hart Farm		BB	B	BB	B
Heider		B	A	B	A
Hoist Caterpillar		B	A	B	A
" (Model 45)		BB	B	BB	B
" (Model 18)		BB	B	BB	B
Huber		BB	B	BB	B
Imperial		BB	B	BB	B
Ingersoll		BB	B	BB	B
Kandell		BB	B	BB	B
K. C. Prairie Dog		BB	B	BB	B
Kinkadee		BB	B	BB	B
Leon		BB	B	BB	B
Little Chief		BB	B	BB	B
Little Giant		BB	B	BB	B
Maytag		BB	B	BB	B
Minneapolis		B	A	B	A
Mogul (I. H. Co.)		B	A	B	A
" (8-16) (I. H. Co.)		B	A	B	A
Moline Universal		BB	B	BB	B
New Age		BB	B	BB	B
Nichols & Shepard		BB	B	BB	B
Oil Pull (Rumely Co.)		BB	B	BB	B
" (14-28, 10-20, 20-40)		BB	B	BB	B
" (Rumely Co.)		BB	B	BB	B
Parrett		BB	B	BB	B
Pearson		BB	B	BB	B
Pioneer		BB	B	BB	B
Play Boy		BB	B	BB	B
Play Man		BB	B	BB	B
Pontiac		BB	B	BB	B
Rumely		BB	B	BB	B
" (14-28)		BB	B	BB	B
Russell		BB	B	BB	B
" (Little Four)		BB	B	BB	B
Sandusky		BB	B	BB	B
Simplex		BB	B	BB	B
Stamper		BB	B	BB	B
Strait		BB	B	BB	B
Titan (I. H. Co.)		BB	B	BB	B
Tom Thumb (4 cyl.)		B	A	B	A
Twin City		B	A	B	A
" (Model 16)		BB	B	BB	B
Wallis Cub		BB	B	BB	B
" (Junior)		BB	B	BB	B
Waterloo Boy		BB	B	BB	B
Waukegan		BB	B	BB	B
Waukegan		BB	B	BB	B

The Years Ahead

OLD farm methods are being thrown aside. The tremendous margin between what the farmer *has* produced and *can* produce—what he *has* earned and what he *can* earn—becomes every day more evident.

He realizes at last the vital part he plays in the welfare of his nation—and the other workers of the country are looking to him with a new respect.

For war has shown the people
the true importance of a man who
produces Food.

The farmer who has formed the habit of looking ahead, plans every year for a marked increase in his crops. He realizes that the productive possibilities of his soil have not been touched.

A sixteen year old boy has recently raised 169 bushels of corn on one acre. Illinois, our best corn state, averages per acre 29 bushels.

Recent experiments in Indiana, by scientific cultivation and fertilization of wheat, brought an increase of over 40% over the average crop.

Cases like these are becoming more common every day.

The two chief factors in the increase of yield per acre are proper fertili-

zation and proper farm machinery. The one type of farm machinery that is doing the most to increase production per acre is the tractor.

Think of it! Not many years from now millions of horses and mules now on the farms will be replaced by tractors.

Fewer men will cultivate more land. Arm labor, leg labor and back labor will be taken over more and more by machinery.

The farmer will be a business executive. He will work more with his mind and less with his body. He will have more time for recreation. His will be one of the most interesting, independent and worthwhile ways in which men earn their living.

TO the Vacuum Oil Company it is a matter of great satisfaction that, almost without exception, the leading tractor manufacturers consider Gargoyle Mobiloils first choice among the tractor lubricating oils.

Gargoyle Mobiloils are put up in 1- and 5-gallon sealed cans, in 15-, 30- and 55 gallon steel drums, and in wood half-barrels and barrels.

Write for "Correct Lubrication" booklet
containing complete automobile and tractor chart, and other valuable data.



Mobil oils

A grade for each type of motor

In buying Gargoyle Mobiloids from your dealer, it is safer to purchase in original packages. Look for the red Gargoyle on the container.

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Specialists in the manufacture of high-grade lubricants for every class of machinery. Obtainable everywhere in the world

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Boston Pittsburgh Chicago Indianapolis Des Moines

Correct AUTOMOBILE Lubrication

How to read the Chart

The four grades of Gargoyle Mobiloils, for engine lubrication, purified to remove free carbon, are:

Gargoyle Mobiloil "A"
Gargoyle Mobiloil "B"
Gargoyle Mobiloil "E"
Gargoyle Mobiloil Arctic

In the Chart below, the letter opposite the car indicates the grade of Gargoyle Mobiloils that should be used. For example, "A" means Gargoyle Mobiloil "A", "Arc" means Gargoyle Mobiloil Arctic, etc. The recommendations cover all models of both passenger and commercial vehicles unless otherwise noted.

This Chart is compiled by the Vacuum Oil Company's Board of Engineers and represents our professional advice on Correct Automobile Lubrication.

AUTOMOBILES	1918 Models		1917 Models		1916 Models		1915 Models		1914 Models	
	Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer	Winter
Abbott	Arc.	Arc.								
Abbott-Detroit			Arc.	Arc.	Arc.	Arc.	Arc.	Arc.	Arc.	Arc.
Allen	A	Arc.	A	Arc.	A	Arc.	A	Arc.	A	A
Apperson	A	A	A	Arc.	A	Arc.	A	Arc.	A	Arc.
Auburn (4 cyl.)			A	A	A	A				
(6 cyl.)	Arc.	Arc.	Arc.	Arc.	Arc.	Arc.	Arc.	Arc.	Arc.	Arc.
(6-38 & 6-39)			A	Arc.	A	Arc.				
(6-39) Tector 31	A	Arc.								
(6-39B) (Cont'l.)										
Autocar (2 cyl.)	A	Arc.	A	Arc.	A	Arc.	A	Arc.	A	Arc.
Briscoe	A	Arc.	A	Arc.	A	Arc.	A	Arc.	A	Arc.
(8 cyl.)										
Buick	Arc.	Arc.	Arc.	Arc.	Arc.	Arc.	Arc.	Arc.	Arc.	Arc.
Cadillac	A	A	A	A	A	A	Arc.	Arc.	Arc.	Arc.
Case	Arc.	Arc.	A	Arc.	A	Arc.	A	Arc.	A	Arc.
Chalmers		A			Arc.	Arc.	Arc.	Arc.	A	
(6-40)										
(6-39)			A	A	A	A				
Chandler Six	Arc.	Arc.	Arc.	Arc.	Arc.	Arc.	Arc.	Arc.	Arc.	Arc.
Chevrolet	Arc.	Arc.	Arc.	Arc.	Arc.	Arc.	Arc.	Arc.	A	Arc.
Springfield										
(F A)	A	Arc.								
Cole	A	A	A	A	Arc.	Arc.	Arc.	Arc.	Arc.	Arc.
(8 cyl.)										
Cunningham	A	A	A	A	A	A	A	Arc.	Arc.	Arc.
Dart	A	A	A	A	A	A	Arc.	Arc.	A	A
(8 cyl.)	A	Arc.	A	Arc.	A	Arc.	A	Arc.	A	A
(2 & 3 1/2 ton)										
Detroit	Arc.	Arc.	Arc.	Arc.	Arc.	Arc.	A	Arc.	A	A
Dodge Brothers	A	Arc.	A	Arc.	A	Arc.	E	Arc.		
Franklin (8 cyl.)	A	Arc.	A	Arc.	A	Arc.	A	Arc.		
Empire (4 cyl.)	A	Arc.	A	Arc.	A	Arc.				
(6 cyl.)	Arc.	Arc.	A	Arc.	Arc.	Arc.	Arc.	Arc.	Arc.	Arc.
Federal	A	A	A	Arc.	Arc.	Arc.	Arc.	Arc.	Arc.	Arc.
(Mod. S-30)										
(Special)	Arc.									
Fiat	B	A	B	A	B	A	B	E	B	A
Ford	E	E	E	E	E	E	E	E	E	E
Franklin	A	A	A	A	A	A	A	A	A	A
Grant	A	Arc.	A	Arc.	A	Arc.	Arc.	Arc.	Arc.	Arc.
Hal-Twelve										
Haynes	A	A	A	A	A	A	A	Arc.	A	Arc.
Hudson	A	A	A	A	Arc.	Arc.	Arc.	Arc.	Arc.	Arc.
(Super Six)	A	Arc.	A	Arc.	A	Arc.	A	Arc.	A	Arc.
Hupmobile	A	A	A	Arc.	A	Arc.	A	Arc.	A	Arc.
Kudon										
King										
(8 cyl.)										
(Com'l.)	Arc.	Arc.	Arc.	Arc.	Arc.	Arc.	Arc.	Arc.	Arc.	Arc.
(Mod. 48)										
(12 cyl.)	A	A	A	A	A	A	A	A	A	A
Lexington	Arc.	Arc.	Arc.	Arc.	Arc.	Arc.	Arc.	Arc.	Arc.	Arc.
Lippert	Arc.	Arc.	Arc.	Arc.	Arc.	Arc.	Arc.	Arc.	Arc.	Arc.
(Mod. M)										
(Mod. MW)										
Locomobile	A	E	E	E	E	E	E	E	E	E
McFarlan	A	Arc.	A	Arc.	A	Arc.	A	Arc.	A	Arc.
Madison	A	A	A	A	A	A	A	A	A	A
(8 cyl.)										
Marmon	Arc.	A	A	A	A	A	Arc.	Arc.	Arc.	Arc.
Maxwell	A	A	A	A	A	A	Arc.	Arc.	Arc.	Arc.
Mercer										
(32-70)							Arc.	Arc.		
Mitchell	A	Arc.	A	Arc.	A	Arc.	Arc.	Arc.	A	Arc.
Moline-Knight	B	A	A	A	A	A	A	A	A	A
National	Arc.	Arc.	Arc.	Arc.	Arc.	A	Arc.	A	A	A
Oakland	A	A	Arc.	Arc.	Arc.	Arc.	Arc.	Arc.	Arc.	Arc.
(8 cyl.)										
Oldsmobile	A	A	A	A	Arc.	Arc.	Arc.	Arc.	Arc.	Arc.
(8 cyl.)										
Overland	Arc.	Arc.	Arc.	Arc.	Arc.	Arc.	Arc.	Arc.	Arc.	Arc.
Packard		A			Arc.	Arc.	Arc.	Arc.	Arc.	Arc.
(12 cyl.)										
(Com'l.)	A	A	A	A	A	A	A	Arc.	A	A
Paige (4 cyl.)	Arc.	Arc.	Arc.	Arc.	A	A	Arc.	A	A	A
(6 cyl.)										
(6-36)	Arc.	Arc.	A	Arc.	A	Arc.				
(6-38-39)			A	Arc.						
(6-40)	A	Arc.								
Paterson	A	Arc.								
Pathfinder		Arc.	Arc.	Arc.	Arc.	Arc.	Arc.	Arc.	Arc.	Arc.
(12 cyl.)					A	A				
Peerless	Arc.	Arc.	Arc.	Arc.	Arc.	Arc.	Arc.	Arc.	Arc.	Arc.
Pierce Arrow	A	A	A	A	A	A	Arc.	Arc.	Arc.	Arc.
Premier	A	A	A	A	A	A	Arc.	A	Arc.	Arc.
Regal	Arc.	Arc.	Arc.	Arc.	A	Arc.	Arc.	Arc.	Arc.	Arc.
(8 cyl.)							Arc.	Arc.		
Renault (French)	A	Arc.	A	Arc.	A	Arc.	A	Arc.	A	Arc.
Rex	A	Arc.	A	Arc.	A	Arc.	A	Arc.	A	Arc.
Saxon	E	E	E	E	E	E	E	E	E	E
Selden	Arc.	Arc.	Arc.	Arc.	Arc.	Arc.	Arc.	Arc.	Arc.	Arc.
(5 1/2 ton)										
Simplex	A	A	A	A	A	A	Arc.	Arc.	Arc.	Arc.
Stearns-Knight	B	A	A	A	B	B	A	Arc.	A	A
(8 cyl.)	B	A	A	B	A	B				
Studebaker	A	Arc.	A	Arc.	A	Arc.	A	Arc.	A	Arc.
Stutz	B	A	A	A	A	A	A	A	A	A
Vellie (4 cyl.)	Arc.	Arc.	Arc.	Arc.	Arc.	Arc.	Arc.	Arc.	Arc.	Arc.
(6 cyl.)										
(2 & 3 1/2 ton)	Arc.	Arc.								
Westcott	A	Arc.								
White	A	A	A	A	Arc.	Arc.	Arc.	Arc.	Arc.	Arc.
(16 valve)	A	A	A	A	A	A	A	A	A	A
Willy-Knight	B	A	A	A	A	A	A	A	A	A
Willys Six	Arc.	Arc.	Arc.	Arc.	A	B	A	A	A	A
Winton	Arc.	Arc.	Arc.	Arc.	Arc.	Arc.	Arc.	Arc.	Arc.	Arc.

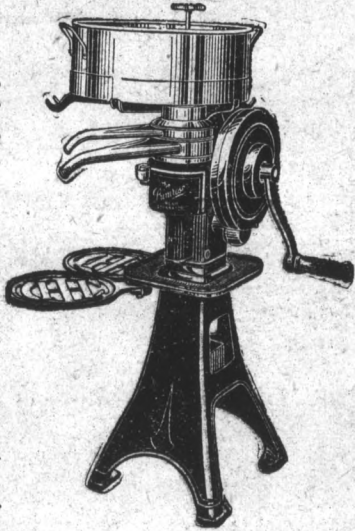
Waste No Butter Fat!

IF YOU are still setting your milk and skimming by hand, you are losing anywhere from one-fourth to one-third of your cream. If you are using an old separator or one that is not reliable, you are still losing an amount of cream that would surprise you if you knew it. **Butter fat is worth too much this year to be wasted.** Buy a **Primrose or Lily** cream separator and stop the waste.

Don't imagine that cream left in the skim milk will fatten pigs and calves faster. It has been proved scores of times that stock thrives as fast on warm separator skim milk, when a little meal or flax replaces the fat. Cream in the skim milk is dead-loss cream!

Primrose and Lily separators get that cream. We can prove to you that they get it all, except about one drop in each gallon.

Besides that, they are well-known as simple, easy-running, easily-cleaned machines, that last and do the same good work year after year. Buy a **Primrose or Lily** and know the satisfaction of using a close-skimming machine. See the local dealers, or, write us for catalogues of these or any other machines in the list below.



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Village Implements	Planting and Seeding Machines	Corn Machines	Other Farm Equipment
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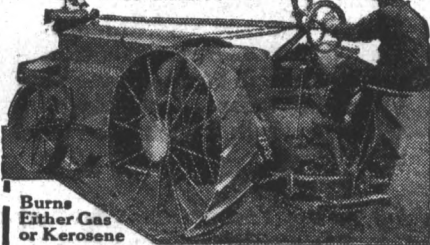
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The new Farquhar is a truly general purpose farm tractor equally efficient on draw bar or belt. Rated 3 and 4 plow outfit with ample belt power to drive Threshers up to and including 27 x 45 Farquhar Vibrator equip with Self Feeder and Wind Stacker.

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Land Settlement Policy

Federal and State Governments Cooperate in Plans for the Development of Michigan's Cut-Over Lands

By James M. McBride

THE commission appointed by Governor Sleeper to formulate plans for cooperation with the United States government and the respective states have taken the initiative in probably the most forward home-making movement ever proposed in the state.

Secretary of the Interior Lane has asked that the respective states provide the land and the United States would finance the improvements, including irrigation, clearing, drainage, buildings and loans for equipment of tools and live stock. So broadly drawn are these plans that no state or landless man who has agricultural qualifications need be excluded. After the soldiers have the opportunity "unallotted" lands are open to other citizens on similar terms.

The proposition in brief is that the state provide a commission of three, the chairman being named by the governor and the advisory members being the president of the State Agricultural College and state engineer, by virtue of their offices. The board then acquires land by purchase or use state lands, etc. Alternative in Sec. 7 of the proposition is more largely applicable to irrigated cut-over tracts and drainage propositions requiring large expenditure. On these the United States is the active agency in reclamation and improvement and foots the bills therefor. It may clear up some misapprehension as to the legal status of acquisition by this board of lands to add that the board may control as trustees. For example, a cut-over tract is given a contract for deed of lands by the owner and on the completion of its agreements transfers as trustee the title to the settler. It is probable that most of Michigan tracts would or could be handled in this way. This plan would not necessitate any constitutional changes in Michigan. A clear understanding of the plan can be maintained by holding in mind that the state acquires or controls lands and the United States improves, builds and makes them ready for occupancy for the soldier or settler. This is the line of state and national cooperation. The language of the proposed plan is "the basis of cooperation under the first alternative plan shall be that the state provide the land needed for settlement and the United States shall provide the money necessary to meet the expenses of reclamation and subdivision and the necessary improvements and equipment perform the necessary work and have charge of all settlement work." To those in Michigan who have suitable tracts of land for clearing up into farms, or undrained areas, the owners would say to the commission, "let us agree on an appraisal, take my land and have the United States improve it, construct buildings, etc., and transfer it to an actual settler and pay for the land from the settlers on long-time payments. The commission is the trustee to repay the United States for the advances, and pay the original owner on the unimproved appraisal. To the returned soldier first, and after that any other qualified American citizen, the commission would say, "here is your farm—pay me as an initial payment two per cent of the land value and ten per cent of the improvements, and then for the next four

years two per cent of both land and improvement values, and after that forty years is given at four per cent.

All proper safeguards are thrown around the plan to prevent worthless land being settled upon or sold. The second alternative applies more largely to farms already more or less improved, in fact, any farm that is offered the commission meeting their approval. Here the improvement is largely an individual affair and just such work as every farmer knows should be done to improve his farm. It may be drainage, buildings, etc., and this land is of more value than that of the first plan. The commission acquires the land as in the first plan. Then is authorized to make improvements for not less than twenty-five per cent of the value of the land. This is not all, the United States authorizes this board to make loans for stock, tools, etc. These loans are secured on the chattels and land. The low interest rates would put the capital into northern Michigan where it is badly needed. The whole activities of the state and nation would be exerted through the various agencies of their agricultural departments. The loan clause is applicable to both plans of settlement, and shall not exceed \$3,000 for a farm or \$1,000 for a farm labor allotment. All the money comes from the United States. The commission holding these liens for the federal loan. Those having \$15,000 or possessory rights hereto are excluded from the benefit of these plans of settlement. It is impossible to estimate the amount of new capital that would come into Michigan under these plans. Members of the commission appointed by Governor Sleeper are agreed that no such potential service to settlement and land improvement was ever offered before. It must be understood that this is not yet enacted by congress, but that it unquestionably will be and that the Michigan legislature must act in authorizing a commission for this state in anticipation thereof. The question of whether the returned soldier wants a farm is rather academic. He certainly will need food and clothing along with all other people, and this plan is to make provision therefor. Elwood Mead, of the University of California, spent much time in New Zealand where substantially this plan of settlement has been used most successfully. The writer had a full presentation of these plans several years ago personally from Professor Mead. The hardships incident to the individual settler upon new soil unaided is one of the tragedies that can be alleviated, and the potential wealth of a new country made available at an early period by governmental action. The California trio of strong men who are urging this plan is Franklin K. Lane, Secretary of the Interior, United States Senator Hiram Johnston, and Prof. Elwood Mead.

Do you object to a fly lighting on the end of your nose, and then transferring its proboscis to some other tender spot when you wave your hand? If not, say, "here is your farm—pay me as an initial payment two per cent of the land value and ten per cent of the improvements, and then for the next four

A Campaign to Protect You in Buying Your Watch

RALPH WALDO EMERSON, speaking in one of his essays of a distinguished man, said: "He is put together like a Waltham Watch."

This remarkable tribute to Waltham greatness is the result of the genius of many men whose inventive faculties have been concentrated for nearly three-quarters of a century to make it the wonderful time-keeping device it is.

The buying of a watch is an investment in time-keeping. And time is the most valuable possession of man.

You purchase a watch for one thing—to keep correct time for you—to tell it to you with dependability at any moment of the day or night.

A good watch, therefore, must have something more than good looks—it must have good "works."

Millions of people imagine that the "best" watch is made abroad—or, at any rate, that its works are imported from there.

Yet, in competitive horological tests at the world's great Expositions, Waltham has not only defeated these watches of foreign origin, but all other watches as well.

In a series of advertisements we are going to show Americans that there is a watch built in the United States whose time-keeping mechanism is more trustworthy than those of foreign make,—

A watch that is easily and reasonably repaired because its parts are standardized,—



Duane H. Church, famous inventor who filled the great shops at Waltham, Massachusetts, with exclusive watch-making machinery that performs miracles of accurate and delicate work which the human hand could never equal.

A watch that represents American leadership in mechanical skill,—

A watch that has revolutionized the art of watch making and assured accurate and dependable time-keeping.

We are going to take you through the "works" of a Waltham—lay bare those hidden superiorities which have led the horological experts of the greatest nations to choose Waltham as *the* watch for the use of their government railroads.

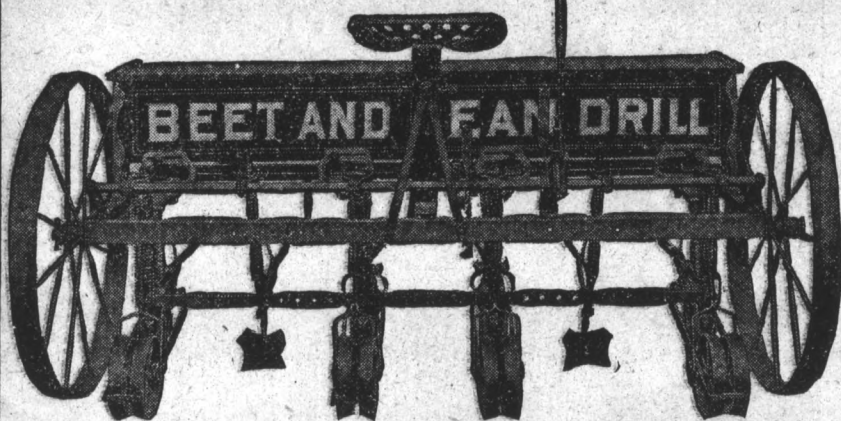
When you have finished reading these advertisements, which will appear regularly in the leading magazines, you will walk up to your jeweler's counter and demand the watch you want—because you will know how it is built and why it is superior to the foreign watch.

Look for these advertisements. Read them.

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THE WORLD'S WATCH OVER TIME

SUPERIOR FOUR ROW Beet and Bean Drills



Rear View Superior No. 6 Four-Row Double Disc Beet and Bean Drill with Irrigation Shovels and Concave Faced Press Wheels

Made in both Plain and Fertilizer styles. The **SUPERIOR** is a four-row machine having adjustments for widths between rows as follows: Plain type—16, 18, 20, 22 and 24 inches. When used with irrigating shovels the center rows can be 16 or 18 inches apart, and the outside rows, with shovels between, 20, 22, 24, 26 or 28 inches apart.

The Fertilizer type can be adjusted regularly to sow in rows 20, 22 or 24 inches apart; with irrigating shovels the center rows can be 18 inches apart, and the outside rows 22, 24 or 26 inches apart. The range of adjustment is unequalled by any other Beet Drill.

The Feeds for both Beet and Bean Seed and Fertilizer are Positive Force Feeds with Great Range of Quantity

The Press Wheels are 11 inches in diameter, $\frac{3}{4}$ inches wide and have deep concave face. This wheel presses down and inward, makes an oval-shaped ridge, loose in the center and of sufficient height to be crushed by land roller should the soil become crusted. Wheels can be used as gauge wheels to regulate depth of planting. Both furrow openers and press wheels have independent spring pressure. Flat or cone face press wheels can be furnished.

The **SUPERIOR** Beet and Bean Drill is warranted in every way. You run no risk in purchasing. If you want a Drill that will do your work in the best possible manner—a Drill that you can always depend on—a Drill that will save time, seed, labor, worry and repair bills, write for **SUPERIOR** Beet and Bean Drill folder. Ask your implement dealer to show you the **SUPERIOR** Beet and Bean Drill.

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Easily Pulls an
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"Pulled with ease a 16-16 and an 18-8 disc harrow, which would give eight horses all they could do."
—E. Rudd, Rudd, Iowa.

Minimum loss of energy between motor and wheels is one of the distinctive construction principles to which this tractor owes its great power at low fuel cost. Power generated by motor goes direct to belt pulley, and to rims of hind wheels, giving greatest pulling leverage, relieving hubs and axles of all strain. It is transmitted through powerful steel gears, roller bearing, oil-floated, which reduces friction.

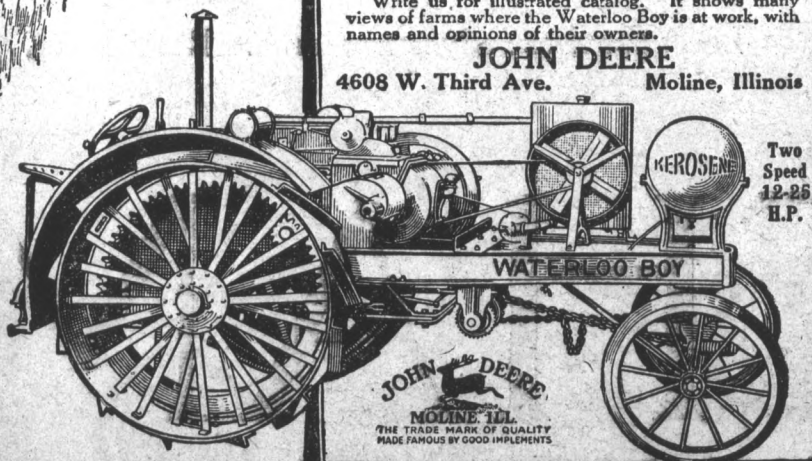
Complete Combustion of Kerosene

is the factor which contributes to low fuel consumption and trouble eliminating operation. In a 165-day test run to its full 25 H.P. capacity, the Waterloo Boy motor consumed an average of less than 1½ gallons kerosene per hour, without smoke or carbon deposit—no trouble from dirty spark plugs—full power from every drop.

Easy accessibility of dust-proof gears, dependable ignition, control by one lever and foot pedal, automobile type gear shifts, automatic lubrication, and other features combine to make this tractor efficient in unskilled hands.

Write us for illustrated catalog. It shows many views of farms where the Waterloo Boy is at work, with names and opinions of their owners.

JOHN DEERE
4608 W. Third Ave. Moline, Illinois



Two
Speed
12-25
H.P.

JOHN DEERE
MOLINE, ILL.
THE TRADE MARK OF QUALITY
MADE FAMOUS BY GOOD IMPLEMENTS



Cleaning Up Grubs with Hogs and Poultry

THE practice of "hogging off" corn, thereby saving the labor and expense of harvesting and marketing the crop and also producing more pork from the crop, is becoming a common farm practice, the value of which has recently been repeatedly demonstrated. The utilization of hogs for the destruction of soil-inhabiting insect pests more especially of white grubs and cutworms, however, has received little attention and seldom has been applied consistently, although pasturing hogs in grub-infested fields has been practiced occasionally for the last hundred years. The use of poultry is somewhat more restricted, since it can be utilized only when ground is being plowed and cultivated, and then only in fields near the farm buildings, unless a portable poultry house is used.

The main objects to be gained by these practices are eradication of the grubs, cutworms, and probably such other insect pests as wireworms; food value derived from the grubs, which is equal to a hog feed costing \$25 to \$35 per ton; manuring the land. The United States Bureau of Animal Industry has estimated the value of manure to be \$3.29 per ton in the case of hogs and \$7.07 in the case of poultry. When corn ground is "hogged" there is the additional advantage of a saving of labor and expense in harvesting and marketing the crop and the production of more pork from the crop.

The fondness of hogs for white grubs and May beetles is well known and evidenced wherever unringed hogs have been turned into pastures, but a most striking example has been shown in a case at Ludlow, Ill. One hundred pigs and eight sows were turned into an enclosed ten-acre corn field which was badly infested with grubs. Within twenty days eighty-six per cent of the grubs were destroyed and in twenty-seven days less than one per cent of the original infestation remained—a benefit of over ninety-nine per cent. If the number of grubs per hill is esti-

mated as 34.6, the count made at the beginning of the experiment, and the number of hills of corn to the acre as 3,556 (hills three and one-third feet each way), it is easily calculated that pigs destroyed something like 1,217,083 grubs in twenty-seven days; that is, 11,278 grubs, or possibly twenty-four pounds per animal. These hogs, by the way, suffered no ill effects from the continuous ration of grubs.

The effectiveness of chickens in controlling white grubs is demonstrated by an experience at Froelich, Iowa, where the farm poultry, numbering about one hundred and fifty chickens, were encouraged to follow the plow, harrow, and cultivator in a fifteen-acre field, badly infested with white grubs, adjoining the farm buildings. Scarcely a grub remained after a season's foraging by the chickens.

Occasionally reports of harmful effects to hogs from a continuous grub diet have been received, but it has not been possible to verify them. On the other hand, well-informed farmers and expert swine raisers who have had experience in pasturing hogs on grub-infested land disclaim any harmful or poisonous effects from such practices.

Likewise poultry may be fed white grubs and May beetles without any harmful results and without producing any noticeable effect in the eggs, such as is noticed when chickens feed continuously for several days on such caterpillars as the army worm. No difference in taste has been found in European tests between eggs from grub-nourished hens and those from others. On the contrary, the eggs of the former had better yolks for thickening and were worth three of the others to color sauces. No unfavorable effects resulted from the use of either grubs or May beetles as chicken feed, except in the case of dried beetles mixed with bread or potatoes, which proved too exciting for the older fowls.

Turkeys are very fond of grubs and search diligently for them.

The Wild Parsnip

THE wild parsnip may be classed with the rapidly spreading and noxious weed pests of many sections of the country. It is said that the wild poisonous parsnip and the garden vegetable of the same name are one and the same, except that the latter is not poisonous. But when plants of the garden variety are neglected and allowed to grow as weeds, it is claimed by some that they then assume a poisonous nature. We question the truth of this commonly accepted belief, but because of the close resemblance of the poisonous native wild parsnip and the garden variety, while growing "wild," we do not wish to dispute the statement that the tame or garden parsnip may become poisonous when allowed to grow as a "wild" or neglected plant. Undoubtedly, the garden parsnip becomes a noxious weed pest, whether poisonous or not, when allowed to ripen and scatter its seed over the farm. The seed is of such light weight that it is easily carried long distances by wind or water.

Children and, in a few instances, stock, have been poisoned from eating the roots or seed from the native wild parsnip, which was taken for the tame or common garden variety. To avoid such accidents, it may be well to class all parsnips, growing wild, as poisonous in root and seed.

The parsnip of whatever variety is a biennial plant—one that makes its root growth one season, and produces seed the next year. The plants make a very vigorous growth on rich soils, and each produces a large quantity of seed which is of fairly strong vitality but, fortunately, will not grow after it is two years old, hence the pests may be easily destroyed by the man who will not allow any plants to make a crop of seed for a couple of years.

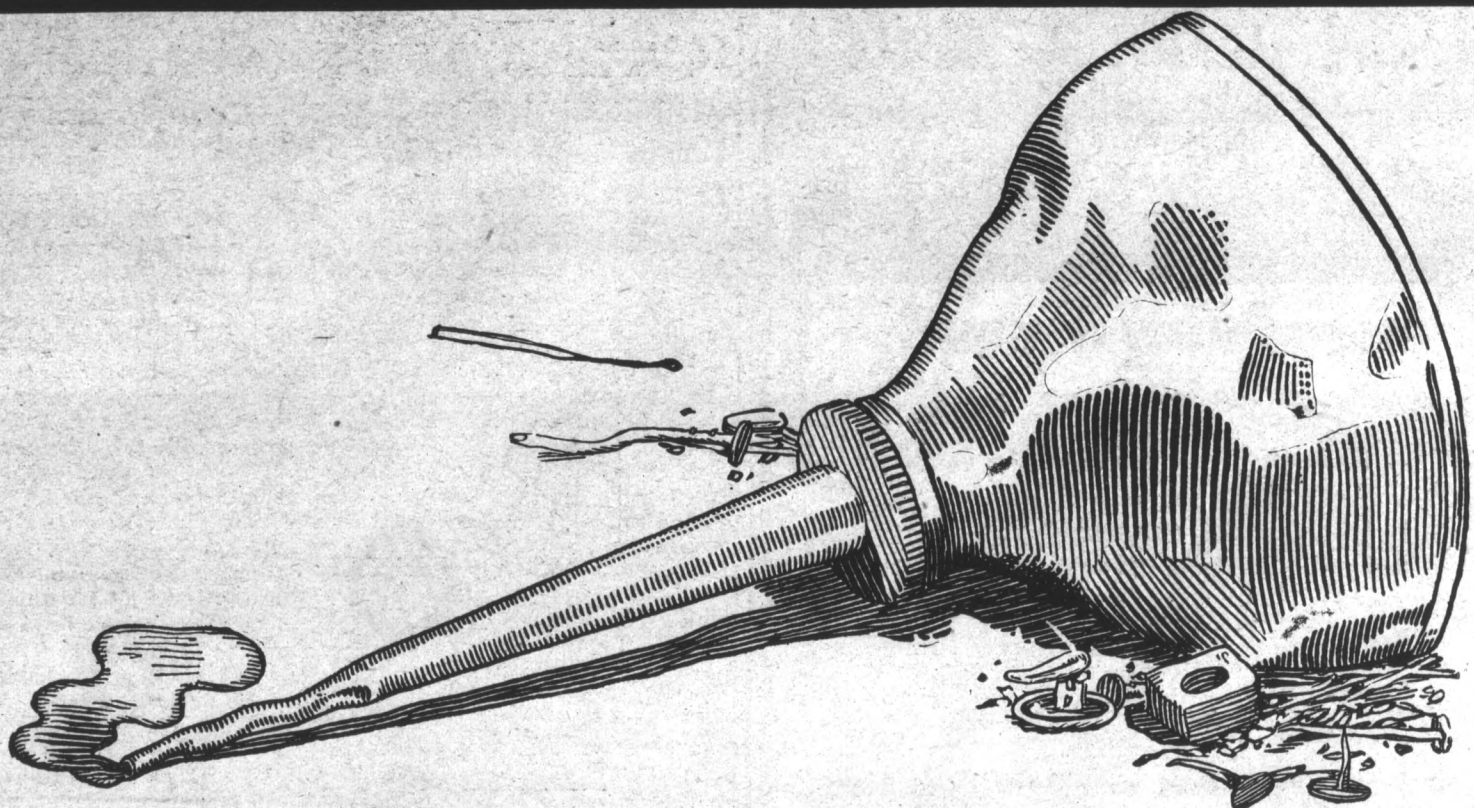
Indiana.

W. F. PURDUE.

The most important business of the dairyman is to increase the amount of manurial substances and apply them where they are most needed by the growing crops.

There is no one thing that adds more to the dignity and general appearance of a farmer than to drive into town with a pair of large, well matched draft mares, hitched to a comfortable rig. Our farming of today demands strong, prompt walking horses, and invariably the man who keeps light teams, does not give his farm good cultivation.

One man with three large draft horses can do as much farm work as two men with four small horses. All of our improved machinery requires an even, steady draft to perform its best work, and light horses cannot perform the work with ease and promptness, no matter how faithful they may be.



Throw Away the Oil Can

You have no use for an oil can with the Samson Tractor.

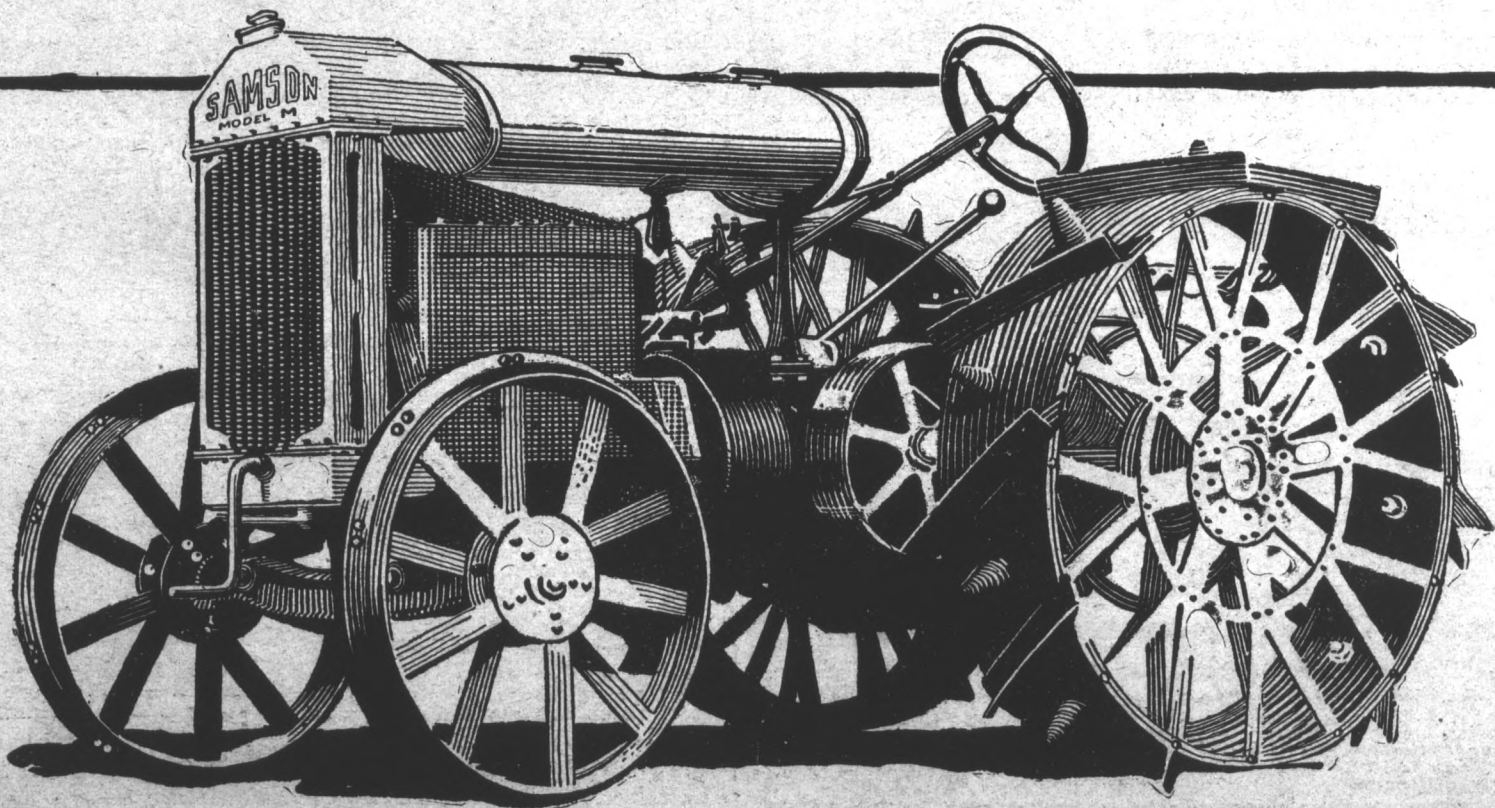
The oil, contained in the reservoir, is distributed to all moving parts.

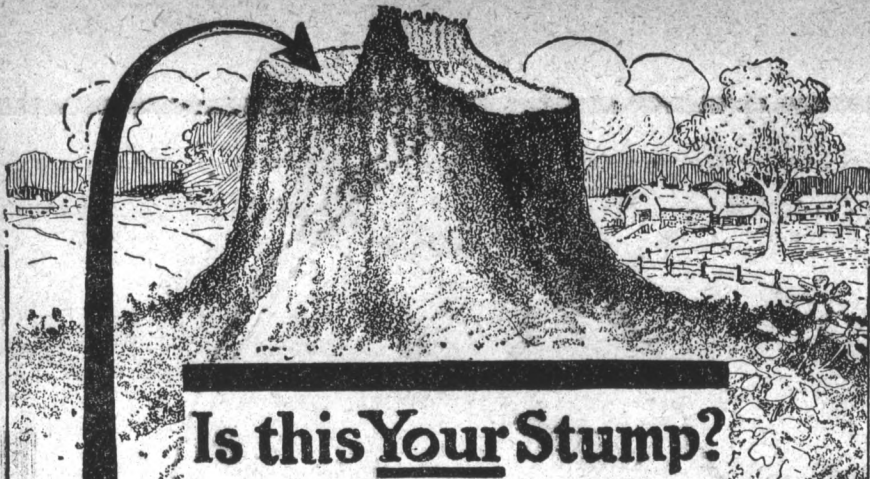
SAMSON TRACTOR COMPANY, JANESVILLE, WISCONSIN

SAMSON *MODEL M* \$650

*Capable of pulling two 14-inch plows at all times;
three 14-inch plows under favorable conditions*

*F. O. B. Janesville, Wis.
Complete with automatic power
take-off and automatic control*





Is this Your Stump?

ARE you going to leave it where it is?

Your land is your capital—and the land under this stump is tied up in a non-productive investment.

Set this land to work—a little dynamite, properly placed, will do the trick. You can turn your waste lands into fertile fields by using

HERCULES DYNAMITE

Sign the coupon below and mail it to the Hercules Powder Co. They will send you free their 68 page illustrated book, "Progressive Cultivation." This book tells you all about the uses of dynamite on the farm. It tells you how to plant trees, dig ditches, break up hard subsoil and do many other things with the help of dynamite.

Every farmer should have this book. Your copy is waiting for you. Send for it today.



HERCULES POWDER CO.
87 W. 10th Street
Wilmington Delaware



Hercules Powder Company 87 W. 10th St., Wilmington, Del.
Gentlemen:—Please send me a copy of "Progressive Cultivation"

I am interested in dynamite for _____

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Address _____



Cultivate 8 acres a day with only one mule.

You can do perfect work at one trip to the row with the **Light Draft Fowler Cultivator**

Unequalled for level cultivation; can also be adjusted to cultivate crops planted either above or below the level without destroying the sloping sides of the ridges. By removing the plow foot you can cultivate astride the row.

Works Like a Hoe

The Fowler cultivates above the crop roots which are undamaged, completely destroys all grass and weeds, makes a perfect dust mulch, and assures largely increased production. The Fowler is the best cultivator for corn, cotton, peanuts, tobacco, beets, beans, peas and truck crops planted in rows. 50,000 satisfied farmers are using this remarkable tool. Write for catalog.



Send for This **Free Catalog**

It is interesting, instructive and fully illustrated. Tells the whole story of the

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WRITE FOR IT TODAY—

It's Free.

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Locks 50 Cows Instead Of One

West Bend BARN EQUIPMENT

West Bend Automatic Stanchions equipped with our wonderful locking-releasing lever save you time and labor—and insure safety in locking up or releasing the cows, yet you pay no more for West Bend equipment than for ordinary stanchions that must be opened and closed singly by hand. The West Bend lever controls from

2 to 50 West Bend Automatic Swinging Stanchions. The entire row of cows can be locked up or released instantly by one throw of the lever. Cow stops are operated at same time, and when set guide cow into the stanchion. Every user says it's the greatest idea ever brought out in modern barn equipment. You certainly want this valuable new exclusive West Bend feature in your barn. Write today for catalog. **WEST BEND BARN EQUIPMENT CO., 289 So. Water St. West Bend, Wis.**

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Buy Hardy, High-Grade Trees and Ornamentals Direct from Nursery. Save agent's commission. Big, new, handsome 1919 Catalog describes the best stock grown. Many specialties. All Guaranteed. Start an Orchard this year. Order early for spring planting. To be sure of spring supply write today—a postal will do. **Catalog FREE.** **CELERY CITY NURSERIES, Box 18 Kalamazoo, Michigan**

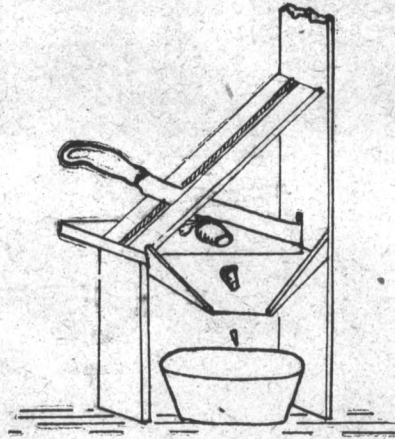


When Writing to advertisers please mention The Michigan Farmer.

For the Handy Man

HOME-MADE ROOT CUTTER.

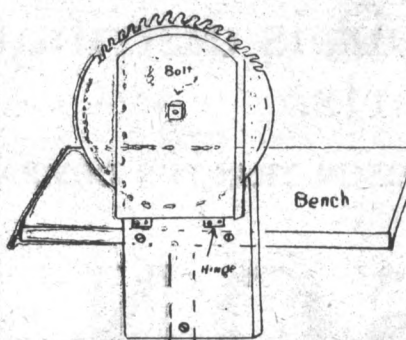
IT does not pay the average man to buy a root cutter when one like the sketch can be made at home. It



consists of two upright pieces and two parallel diagonal pieces which act as knife guides. A spout is attached to the cutting table to catch the roots as they fall. The knife can be a butcher knife or a piece of steel can be sharpened and used.—A. G.

HANDY SAW HOLDER.

UNTIL recently I always had difficulty when I sharpened my cordwood circular saw. I could not find any way to hold it so that it would be solid. Finally I rigged up a holder which does the work fine. Since using this I not only sharpen the saw much easier and quicker, but I also do a better job. I have found that the time taken (which, by the way, was spare time), to make this was worth the trouble many times over. The illustra-



tion shows how the saw holder is constructed, and by means of screws can be attached to different places, though with me I have found that my work bench was just the correct height so I could get at the saw teeth.

The saw is placed so that the bolt passes through the hole in it. This bolt holds the saw securely and when a section is sharpened, the saw is turned, after loosening the bolt. The board which holds the saw, on the edge near the teeth, I found was better when beveled so that there was room for different angles of the file. As shown in illustration, this board is hinged on its bottom edge.—Gorton.

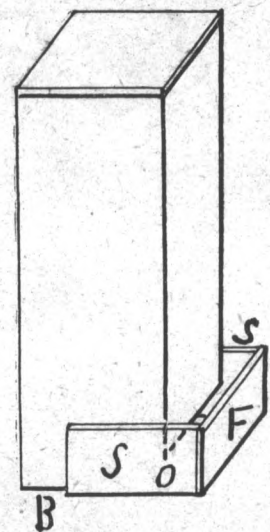
A STRAW HOOK.

THERE are times when it is necessary to get hay from the inside or center of the mow, or hay stack. In the winter time to pull out with the hands is a hard job, besides making them ache. Of course, it is impossible to get the hay with a hay fork. When hay is needed from a hay stack that is

Cut the rod off about four feet long, and weld a handle on that end at right angles the shape of a T about three inches on each side. When hay is needed, push the point into the place from which the hay is wanted and then pull on the handle and after a few times there will be an armful ready.

SELF-FEEDER FOR HENS.

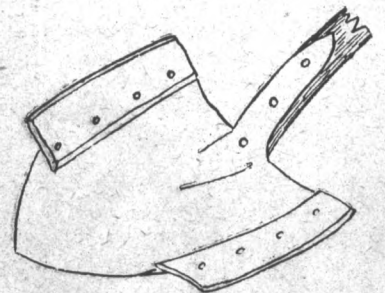
WHEN making self-feeders for the hens, I use dry goods boxes of about the shape that I want the feeder to be. At the end that I use for the bottom, B, I make an opening, O, two or two and a half inches wide across the side of the box. I then extend the bottom out two or three inches, and surround the opening, O, with the two sides, SS, and the front, F. I make the front, F, at least two inches higher than the opening, O, to prevent hens from scattering the contents of the feeder around, as they often do if the feed comes up to a level with the upper



edge of F. With this arrangement the feed will seldom reach half way up the front, F. I use such feeders for feeding bran, middlings, charcoal, and oyster shells, and whole grain to fattening hens, but not to layers. To layers I prefer to feed corn on the cob or grain in the bundle, or buried in litter, or from an exerciser that lets it down slowly. Layers should be made to work as much as possible and to eat slowly. Feeding grain in the bundle is far and away the best way to feed it; for the hens get the most exercise when they do their own threshing, and their treshing bill is zero; or better than that, they will pay one well for the privilege of doing it themselves, besides singing a great variety of accompanying songs.—L. B. A.

COMBINATION SHOVEL AND AXE.

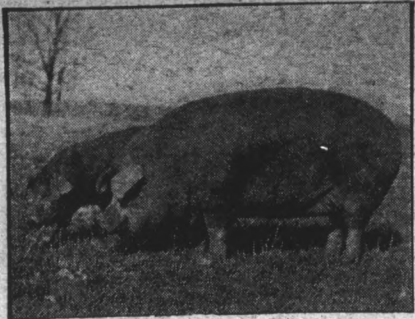
HERE is a simple and very useful time and labor-saving device. When digging ditches, the roots, bush and small saplings which cause so much annoyance are quickly done



away with by the blades on the side of the shovel. The blades are shaped from steel and riveted to the sides of the shovel.—G. P.

out of doors and covered with snow, that makes it worse. To overcome these difficulties, have a blacksmith take a piece of one-half-inch iron rod and on one end make a harpoon point with the prong about four inches long.

If the farmer carries with him a note book and pencil to jot down jobs needed to be done, he will usually not lack for work during winter days and rainy seasons.



Feeding Problems

BUTTERMILK FOR PIGS.

On the basis of corn at \$1 and oats at fifty cents, about the usual rations, please tell me the value of creamery buttermilk as a feed for growing pigs. Also as a feed for unbred sows and hogs, that one wishes to keep in moderate flesh.

Cass Co.

G. P. W.

Careful experiments show that buttermilk gives practically the same feeding results with pigs as skim-milk and as a matter of fact, its chemical analysis shows very little difference from skim-milk so they can be considered equal and the equivalent of each other when fed under similar conditions.

Several years ago when the market value of corn meal was about \$1.00 per hundred pounds, very thorough experiments were made by several experiment stations to determine the comparative value of skim-milk in feeding pigs. The results showed that when skim-milk was properly combined with grain foods that it had the value of twenty-five cents per hundred. Now, if corn is worth \$1.00 per bushel, that would make skim-milk worth forty-four and a half cents per hundred. At present retail price of corn, say \$1.60 per bushel, or \$2.80 per hundred, skim-milk or buttermilk would be worth seventy-two and a half cents per hundred pounds.

Of course, if skim-milk is fed alone or is fed in excessive quantities compared with the other foods, you cannot get as good results. To get these values for skim-milk it should be fed in the proportion of three pounds of milk to one pound of meal.

C. C. L.

WHEAT CEREAL FEED.

Will you please tell me what you know about wheat cereal feed, what its analysis is, and is it a good dairy feed?

Clinton Co.

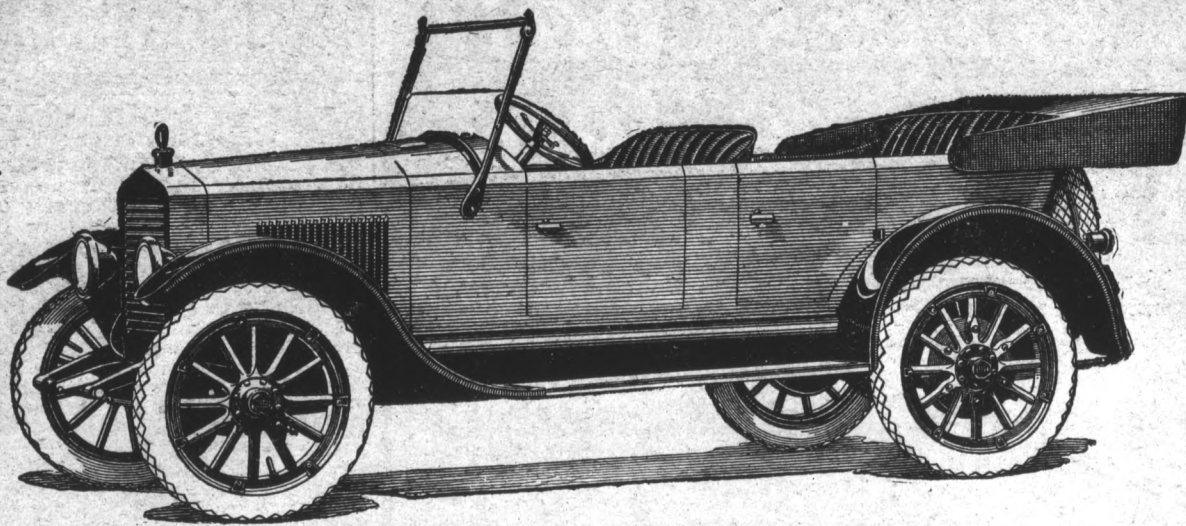
C. M. R.

There is more than one cereal food, so-called, made from wheat. C. M. R. does not give the trade name of the food which he speaks of. In a general way we can say that all of the by-products of wheat, when this cereal is prepared for human food, are good live stock foods. All of them are comparatively rich in protein. All of them are quite digestible, that is, have a rather small per cent of crude fiber, and the most of them are quite palatable. The question of their possible use depends upon the price compared to the farmer's home-grown grains of corn and oats. These foods do not all analyze alike. One product, for instance, that is a by-product of wheat, analyzes sixteen to eighteen per cent protein. It is thoroughly digestible but not so very palatable. Other foods made from wheat differ in other respects and so it is not possible to give very definite information without knowing exactly which food we are talking about.

C. C. L.

It is a well recognized principle that all grain crops thrive best in a fine, thoroughly worked seed-bed underlaid by a solid subsoil.

Milk intended to be sent to the factories should be cooled as rapidly as possible to a temperature of about sixty degrees F. The sooner and more thoroughly milk is cooled, the longer and better it will keep.



The Essex—\$1395

Light Weight, Durable, Rich in Appointments, Low in Cost, Economical and a Tremendous Performer

Is Now Ready

You are to advertise the Essex.

Instead of our praising it, we wish you to do that. And what you will say is what we want everyone else to think.

Every praise that can be suggested has already been applied to some other car and, as you know, all cars do not come up to the claims made for them.

So the Essex must speak for itself.

It is endorsed and will be sold by the leading automobile dealers in every section of the world.

Dealers of their type do not take on cars about which they have the least doubt. They do not make selling contracts with new and untried organizations.

The Essex Will Endure

A real car must have stability. It must remain rigid and free from squeaks and rattles.

You will see why this is so with the Essex. Hard service cannot loosen the body joints nor twist the radiator.

Be sure this is emphasized by driving over cobblestone pavements or rough roads. Take any speed you like. You will find it a comfortable ride and will marvel

that over such a road and at such a speed you are not pitched or bounced about.

Has Economy of the Light Car, Comfort and Endurance of the Costliest

The Essex's motor would inspire a whole season's advertising campaign. A slogan might be written about its beauty.

Its economy of fuel, lubrication and tires appeals to others.

It awakens the pride of ownership. It has dignity that comes from power and poise. It will retain its smoothness and flexibility and quietness throughout long hard service. The Essex is light in weight and cost. It is rich in detail and refinement.

Everyone says nice things about the Essex.

We Are Not Asking You To Buy Now. Just Ride in the Essex

Only a few cars are available for each territory. The first ones are being distributed so as to reveal their qualities to the greatest number of people. When you see by the newspaper that your dealer is ready with his Essex, go look at it and tell your impressions to your friends.



(2)



WATER and LIGHT in HOMES
EITHER OR BOTH

The Milwaukee Air Power Water System delivers fresh water anywhere direct from the well. No water storage tank to freeze or foul the water. We have pumps for all sizes and depths of wells.

RUNNING WATER



ELECTRIC LIGHT

The Milwaukee Electric Light System is sold with the water system or separate, as desired. They can both be run with one engine—giving water, light and also power for cream separator, churn, washer, shop and home.

Write for illustrated, descriptive matter telling how you can have fresh water, hot or cold, hard or soft—also electric light and power all over your house, barn and yards.

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Farm drainage demands durable tile. Our drain tile are made of the best Ohio clay, thoroughly hard burned—overlasting. You don't have to dig 'em up to be replaced every few years. Write for prices. Sold in carload lots. We are also manufacturers of the famous NATCO Silo, NATCO Corn Crib, NATCO Building Tile and NATCO Sewer Pipe. Send for the new edition of our book, "NATCO on the Farm".

National Fire Proofing Company.

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WRITE FOR THAT BOOK TODAY!

FREE GET MY LOW PRICES BEFORE YOU BUY

Don't neglect to send for my New Bargain Fence and Gate Book and see for yourself how you can SAVE BIG MONEY buying DIRECT FROM FACTORY

Don't buy any fence until you get this book and compare my prices on BROWN'S HEAVY ACID TEST GALVANIZED WIRE FENCE—the fence that resists rust longer—that's stiffer and stronger—that outlasts all others.

FREIGHT PREPAID

I pay the freight and save you 20% to 40%. Over 150 styles. Also Gates, Barb Wire. Write for Bargain Book today. (8)

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FENCE

Direct to Farmer at Wire Mill Prices

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1/3 Less Coal- 1/2 More Heat

You can use from a third to a half less fuel and have a *much warmer home than ever before* if you will install a CALORIC.

We have hundreds of letters from enthusiastic users in all sections of the country that prove what we say beyond any question. Read these typical letters:

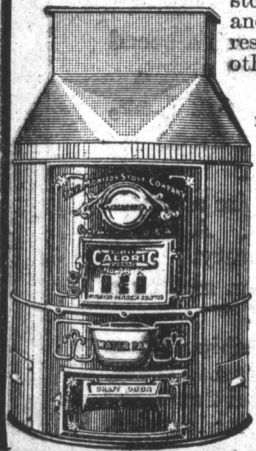
Irvin Lamb, Lancaster, O., writes that in his ten-room house, "All winter, the coldest Central Ohio has had in my lifetime, we burned ONLY SIX TONS of soft coal to keep us warm through all the house."

N. E. Stearns, Brookings, S. D., says he kept his eight-room house comfortable all winter, even when the temperature dropped to 30° below, at a total consumption of ONLY FOUR TONS of coal.



The CALORIC is the remarkable furnace that heats without pipes, through only one register. It circulates heat by Nature's own method, forcing warm air up into the entire house and drawing cool air down into the furnace to be reheated and purified.

The CALORIC heats practically all types of homes, bungalow or three-story house, up to eighteen rooms. It keeps kitchens and back bedrooms just as comfortable and warm as the rest of the house. Also heats churches, factories, stores and other business buildings. More than 50,000 already installed.



The CALORIC can be installed in new or old houses—no cutting of walls for pipes and no interference with present system of heating. It burns coal, coke, gas, wood or lignite, and saves from one-third to one-half the fuel.

Let the CALORIC dealer tell you the interesting CALORIC story. If you do not know him we'll send you his name, a copy of the Monitor Ironclad Guarantee and other literature which will show why the CALORIC backs up every claim.

Write us by tonight's mail.

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"PIONEERS OF PIPELESS HEATING"

Immediate shipment made from: Aurora, Ill., Burlington, Iowa, Columbus, Ohio, Green Bay, Wis., Philadelphia, Pa., Baltimore, Md., Harrisburg, Pa., Louisville, Ky., Minneapolis, Minn., New Haven, Conn., Newark, N.J., Omaha, Neb., Peoria, Ill., Lansing, Mich., Salt Lake City, Utah, Seattle, Wash., Spokane, Wash.

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GOOD AS CAN BE GROWN
Prices Below All Others.

I will give a lot of new sorts free with every order I fill. Buy and test. Return if not O. K.—money refunded.

Big Catalog FREE

Over 700 illustrations of vegetables and flowers. Send yours and your neighbors' addresses. R. H. SHUMWAY, Rockford, Ill.



Beacon Lamp FREE

Lights Your Home Like Day. 100 Candle Power Incandescent pure white light from (kerosene) coal oil. Beats either gas or electricity. COSTS ONLY 1 CENT FOR 6 HOURS. We want one person in each locality to whom we can refer new customers. Take advantage of our Special Offer to secure a Beacon Lamp FREE. Write today. AGENTS WANTED.

HOME SUPPLY CO., 28 Home Bldg., Kansas City, Mo.

Seed Corn 5,000 Extra selected, sure to grow. 20 Bushels. Leading varieties. Highest yields. Best show corn. Also seed oats, barley, alfalfa, Spring wheat. 1200 acres. Sample on request. Write today for catalog. W. N. SCARFF & SONS, New Carlisle, Ohio

WANTED:

A good farm foreman or superintendent, capable of managing a farm of 300 acres under cultivation. He must be a good stock man and used to general farming, or will lease farm to good tenant. Also want a good, reliable married farm hand by the year. HILLCREST FARM, Kalamazoo, Mich.

Wanted: Married man to take charge of farm, who understands general farming and care of cattle, hogs, sheep; farm near Baldwin, Mich. Must have references. H. W. Leverenz, 517 Mather St., Chicago.

A GIRL for general house work on a farm. E. E. STARK, R. 3, Manchester, Mich.

WANTED married man for general farm work. State experience and salary wanted in first letter. Address Michigan Farmer, Box 118, Detroit, Mich.

Wanted good man on farm, one who is an all around farm hand good wages to the right fellow. E. E. STARK, R. 3, Manchester, Mich.

Profitable Employment

Use your spare time profitably by representing the Michigan Farmer in your neighborhood. You can work up a pleasant and profitable business taking care of new and renewal subscriptions for us. You will be interested in our special literature and attractive subscription rates. Address, THE MICHIGAN FARMER.



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are of proven quality. You take no chances when you sow our

Michigan-grown seeds for Michigan Planters

Every good variety of vegetable seeds, all the profitable and productive farm seeds, can be shipped direct from our warehouse—you save freight, time, money.

Saier's Garden Book lists everything the farmer and gardener needs vegetable seeds, grains, ensilage corn, clover and grass seed. Send for a free copy today—before you order from a far-away firm.

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SEEDSMAN
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is the Best Investment

Because it has been on the market EIGHT YEARS, without a SINGLE FAILURE.

Made of famous Brazil Vitriolized Fire Clay—ONE ton costs as much as FIVE tons of shale.

A "B-V-T" WILL LAST FOREVER

Will not freeze or crack. Keeps silage in perfect condition. You never have to rebuild a "B-V-T"

Send Today for Catalog D.

Brazil Hollow Brick and Tile Company

BRAZIL INDIANA



50 good Belgian Hares, and other large Rabbits, also some fox and Rabbit hounds. Enclose stamp. W. E. Lecky, Holmesville, O.

NEWS OF THE WEEK

Wednesday, January 8.

PRESIDENT WILSON returns to Paris and is ready for the informal conferences to begin Thursday or Friday.—The list of deaths of United States troops in northern Russia numbered 132 up to January 4.—Civil war continues to grow in the city of Berlin.—Polish troops now menace Prussia.—Ohio, Oklahoma and Colorado ratify the federal dry amendment, making a total of nineteen states which have ratified the act to date.—Distillers in session in Chicago have launched a one billion dollar program to keep the country wet.—A terrific explosion wrecks a film exchange building in Pittsburgh, killing fifteen persons.—Railroad executives are urging congress to provide for a system of unified private management of rail lines with strong public control exercised by a secretary of transportation in the President's cabinet.

Thursday, January 9.

RUSSIAN troops of the Omsk district defeat a large Bolshevik army and capture 31,000 prisoners, as well as large quantities of war material.—Initial peace conference takes place in Paris.—A strike which will virtually tie up traffic in New York harbor is called by marine workers.—President Carranza of Mexico opposes resolutions congratulating President Wilson on his international policies.—Congressman-elect Victor L. Berger, of Wisconsin, and four other socialist leaders are found guilty of violating the espionage law by jury in the federal court at Chicago.—Dr. Chadsey, superintendent of the Detroit public schools, urges the extending of compulsory school age up to eighteen years.

Friday, January 10.

ALLIES send an ultimatum to the Turkish government stating that unless Turkish forces at Medina lay down arms immediately, the forts at the Dardanelles will be destroyed.—Government troops occupy all public buildings in Berlin, where martial law has been proclaimed.—A battle occurs between troops and strikers in Buenos Aires, Argentine.—Federal departments plan to interfere in New York harbor strike.—Live stock representatives in session at Washington predict new high meat prices unless control of private cars, stock yards and terminal refrigerator plants is taken over by the government.—A republic has been declared in an edict published by the Sinn Feiners of Ireland.—Republican national committee consider plans for the 1920 presidential campaign.

Saturday, January 11.

THE Ebert government claims to be master of the situation in Berlin. The last of American troops in English camps will leave inside of two weeks.—Government action to end the strike of marine workers in the New York harbor will await word from

President Wilson in Paris.—Disorder and fighting continue in Buenos Aires.—Munitions manufacturers of Detroit combine to press the adjustment of informal war contracts.—Each of the major Allies has prepared the draft of a program for the proceedings of the peace conference.—The inhabitants of Luxemburg have proclaimed a republic form of government.—A new British cabinet headed by David Lloyd George is formed.

Sunday, January 12.

THE Ebert government completely defeats the Spartacans and gains control of Berlin; reports insist that Liebknecht, the leader of the revolutionists, was killed during the street fighting.—The strike in Buenos Aires is brought to an end after a conference between representatives of the government and the strikers.—Troops policing western Germany will be reduced in number in the near future.—The republican national committee makes January 19 the date of national memorial services in honor of Colonel Roosevelt.—Marine workers' strike in New York harbor ends when strikers vote to return to work.

Monday, January 13.

TWENTY-ONE persons were killed and three seriously injured in a rear-end collision on the New York Central east of Batavia, N. Y. The coach contained travelers mostly from western Michigan.—The Spartacan followers have resumed fighting in Berlin, where their losses have already mounted to 1,300 killed.—The supreme inter-allied council is now holding session at Paris.—Paderewski, the great Polish leader and musician, is reported to have been shot but only slightly wounded, while on a political mission to Posen, Prussia.—Thomas W. Gregory, attorney-general of the United States, resigns his portfolio in President Wilson's cabinet.—Japan has ordered the withdrawal of her forces from Siberia.—February 9 has been set aside as "Health Sunday," to be observed by the churches throughout the country.

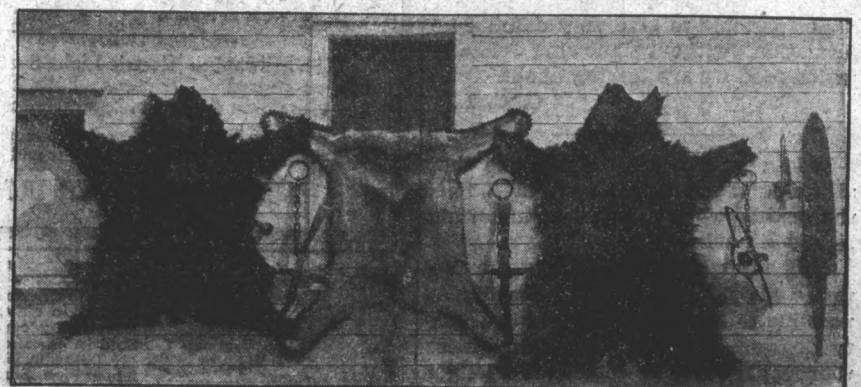
Tuesday, January 14.

RADICALS are utterly routed in the elections held in Bavaria where the moderates and conservatives return a big majority.—Count Karolyi is made the new president of Hungary.—Information is in possession of the Allies showing that the Bolshevik movement in Germany is being directed from Moscow, Russia.—Martial law is declared for Buenos Aires and ten thousand reserves have been summoned to colors, notwithstanding reports that differences have been adjusted.—All official statements regarding the progress of the peace conference will be issued by France.—A collision between two trains at Fort Washington near Philadelphia results in nine persons being killed and a score of others injured.

Two Methods of Trapping Muskrat

At the foot of slides or runs is generally the best place to take muskrat. Traps should be placed in shallow water and the bait hung about five inches above the trap. A weed or piece of brush on which is placed a few drops of the best muskrat bait will do; it should be fastened securely so that it will not float away on the current. A sheltered place is the best for setting the trap; if this cannot be found, a break of wood or stones should be made in order to protect the trap.

Another method which many trappers have found to be very successful is to build a mound of mud and stones in shallow water, set the trap at the bottom of the mound under the water, and then sprinkle a few drops of selected muskrat bait on top of mound. The mound should always be a little above the water in order that the bait will remain on it. The trap should be staked firmly in deep water so that the muskrat will drown itself in its struggle to get away after being caught.





Hog Feeding Experiences

By W. F. TAYLOR

WHEN vegetable products are changed into animal food, the change is always made at a great sacrifice of material. During the progress of the war, when we were putting so much labor and thought into the task of feeding the world, a noted authority upon the subject of nutrition said: "If the world would do away with the hog, the rest would be easy." He was thinking how much farther the corn would go in the feeding of human beings than would the pork the hog was able to make from the eating of the same corn.

The human race craves animal food, and we are not tending very rapidly toward a purely vegetable diet. Were it otherwise, were we able to live on vegetable products entirely, or rather, I should perhaps say, were we content to do so, the old earth would support a much larger number of people with less labor than now.

As yet, we know but little about the science of nutrition, and perhaps there is an excellent reason why it is not easy to make people believe they can get along just as well without meat. Perhaps it was never intended by the Creator that they should do so.

However, since the converting of vegetable products into animal food is necessarily done with a great loss of material, it becomes not only a matter of profit, but one of duty to study closely the laws governing animal growth, and to spread the knowledge of the best known methods of feeding and caring for animals produced for human food, as widely as possible.

With this somewhat lengthy introduction, permit me to say something about pig feeding, with the hope that it may at least create new interest and arouse to new thought, some of the many thousands who read this valuable paper.

I am perfectly sure that many thousands of bushels of good grain are wasted every year in feeding pigs, because of the use of a ration that is lacking in balance, or in the presence of one or two necessary elements in proper quantity.

Some of My Own Troubles.

A year ago last spring, I started into the season with as fine a lot of pigs as I ever saw. From the time they were six weeks old until the day they were sold, they had free access to grain in a hopper feeder. They did not have much milk, for there were too many hogs for the milk, and it simply would not go round. I took care to provide a liberal quantity of middlings in order to furnish the requisite amount of protein. The pigs were fat all the time, and the neighbors who came in to look at them said many encouraging things about them. But their bones did not grow, and I knew all the time that I must learn something about this work, something very simple, but necessary, and learn it soon, or stop writing about feeding pigs.

Well, the pigs were sold after a while, and I got \$75 for my trouble with them after paying for the feed. "Not so bad," do you say? No, \$75 paid me pretty well for the work, but I got that only because I was fortunate in buying a fine lot of middlings when the price was temporarily low. Had I bought the feed at retail as it was fed, the pigs would have cost me about as much as they brought in the market.

Later on, other lots of pigs were fed in much the same way, with similar results. One lot was fed practically on wheat middlings and just a little milk.

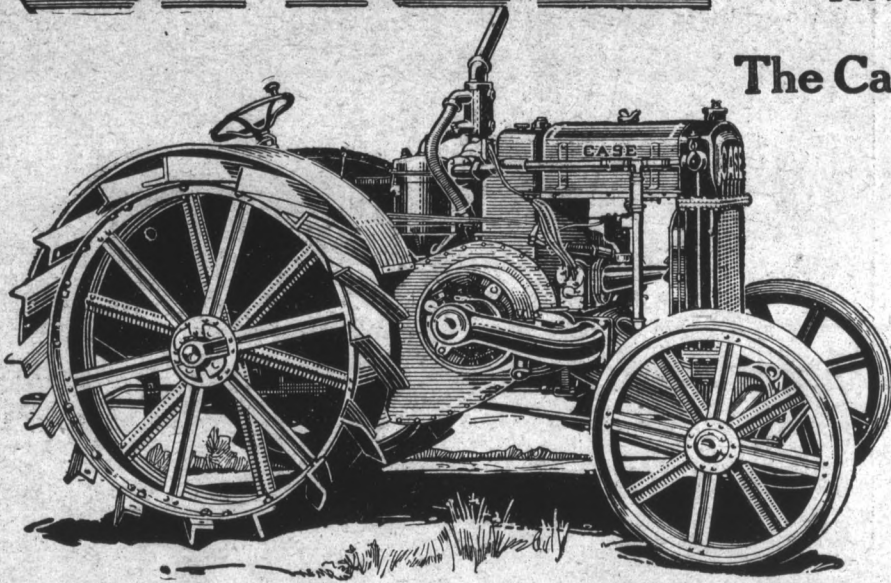
(Continued on page 106).

CASE

ANNOUNCES

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In fields where plowing is difficult—tough or baked soil, stiff grades, etc.—this tractor

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Red Clover, Alsike, Sweet Clover, Rye and Vetch mixed, Ear Corn, Peas, Sweet Corn, White Kidney Beans, some varieties of Garden Beans, etc. Write us stating what you have, send samples with prices, or we will make offers. Our 1919 Garden and Field Book will be ready to mail about Jan. 1st. A request will bring you one.

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SUGAR BEETS OR MANGELS.

What is the analysis of sugar beets for dairy cows, also mangels? Which is the best to use with ensilage and clover hay, with a good dairy feed for grain?

Kalamazoo Co. U. P. B.

For cows there is very little difference in the food value of sugar beets and mangel-wurzels. The sugar beets contain more carbohydrates or sugar, about twice as much as the mangels, otherwise the analysis is practically the same. Sugar beets contain 1.1 per cent protein, 10.2 per cent carbohydrates, and 0.1 per cent of fat, while mangels contain 1.1 per cent of protein, 5.4 per cent carbohydrates, and 0.1 per cent of fat. Of course, the extra amount of sugar in the sugar beets is a valuable food but the most of our rations for dairy cows contain carbohydrates, starch and sugar, in excess. Starch is practically as valuable for a food as sugar, but it is not quite so digestible, but the digestible tract of the cow can readily change the starch into sugar, so in figuring a ration we would consider starch just as valuable as sugar. This being the case, as long as we have in most rations an excess of carbohydrates, we would not be willing to pay very much for the extra amount of sugar in the sugar beets over and above that in mangels.

One great value of any kind of roots in a ration for dairy cows is that they furnish a succulent food which is very appetizing, and keeps the digestive tract of the animal in good condition and enables her to digest and assimilate economically large amounts of other foods in the ration. Mangels are just as valuable so far as this succulency is concerned, as sugar beets.

ALFALFA HAY FOR HORSES.

I would like a little advice regarding feeding alfalfa to horses. I am feeding it to my horses, but notice that since commencing on the alfalfa the urine is more milky or lighter colored. Does this indicate anything serious? The horses seem to be all right. My alfalfa got over-heated in the mow, especially in the center, where it is brown, but not moldy. The horses do not care as much for alfalfa as for other hay, especially where it has commenced to turn brown. As I am turning my farm into an alfalfa farm, or rather a rotation of potatoes, oats and alfalfa, I am anxious to get all the information I can for feeding alfalfa to horses.

Emmet Co

H. W.

Alfalfa hay is a very successful food for work horses or growing colts, but it cannot be considered first-class hay for idle horses, when fed liberally. Alfalfa hay is rich in protein, a muscle-forming nutriment which idle horses are not so much in need of. Common red clover hay can be fed quite successfully as this contains less protein. Again, in feeding alfalfa hay to idle horses, one ought to consider the grain ration. Corn would work in better with alfalfa than oats, being a carbonaceous food. For idle horses or horses that do light work I would expect to get satisfactory results by feeding alfalfa hay and oat straw, or good wheat straw, once a day, with a grain ration of oats or a ration of corn and oats.

It can be stated in a general way that too much protein in a ration is not good for the health of any animal. An excess of protein does affect the kidneys. It has been noted in the west where liberal and continuous feeding of alfalfa has been practiced that it is not as good for the animal as a combination of foods, some of which contain less protein.

The modern dairy cow must be handled with understanding and her owner must have a knowledge of her wants and make every effort to supply them.

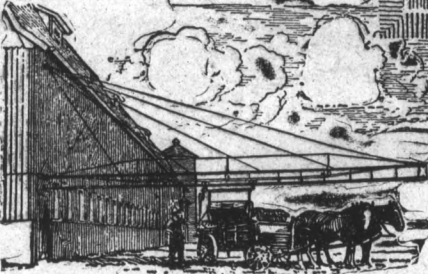
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Fur Trapping a Money Maker

By F. H. Sweet

FOR several years there has been an ever-increasing demand for furs. The past year, with the government using practically the entire output of the country's woolen mills for making soldiers' uniforms, the call for furs has grown stronger than ever before. Women are finding it almost as cheap to buy a fur coat as a woolen one, and the fur coat is a good investment, as it lasts for years. This condition has brought about higher prices for raw furs than any time in history. Skunk, coon, muskrat, fox, wolf, even the lowly rabbit, all are now wanted, and prices paid to trappers and shippers have reached unheard of levels.

In addition, thousands of trappers are in military service, which means a further shortage of furs. The field for boys is wide open, and many of them who engage in trapping this winter will have snug sums before the season is over.

To start trapping requires but a modest outlay. The number of traps necessary depends upon how many you wish to tend, and how large a territory you expect to cover. You can start with a dozen traps, or set out half a hundred or more. The sizes most popular are No. 1 and 1½ for skunk, muskrat, mink and marten, etc., and No. 2 for fisher, fox, and wildcat, up to No. 4 for wolf and coyote. The size number is determined by the spread of the jaws. Narrow runways, of course, take the narrower size traps. For water animals, a floating or submarine trap has proved to be very successful. This can be set in deep or shallow, still or running water. It is supported by buoyant steel cylinders, and anchored by a rock or heavy stone. Swimming animals are effectually caught and drowned in a few minutes.

Animal baits also help toward large catches, as a few drops sprinkled near the traps lure animals from long distances. The animals seem to lose their natural suspicion and cunning and become careless, when this liquid is used.

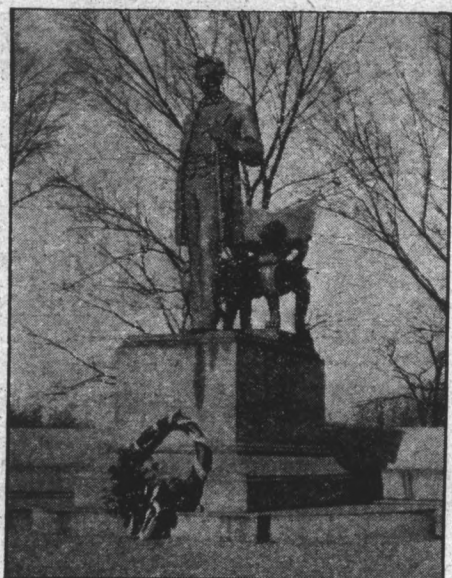
A quick method of trapping den animals is to smoke them out. In this way it is possible to clean up an entire den in a few minutes. Traps are set at the entrance, a dense smoke is pumped into the den, and the animals are caught as they rush for fresh air. Those that escape the traps may be shot with a rifle. This method also enables you to select the heavy furred full-grown males, and let the females, pups and kits escape, to be taken later when they become more valuable. Animals can also be caught alive without injury. Smoking out the animals saves

much tiresome digging and re-visiting dens. It is very successful, especially in skunk-trapping. Smokers may be obtained either in bellows form, or made in the shape of a torpedo, which is pushed into the den by a heavy, flexible wire cable.

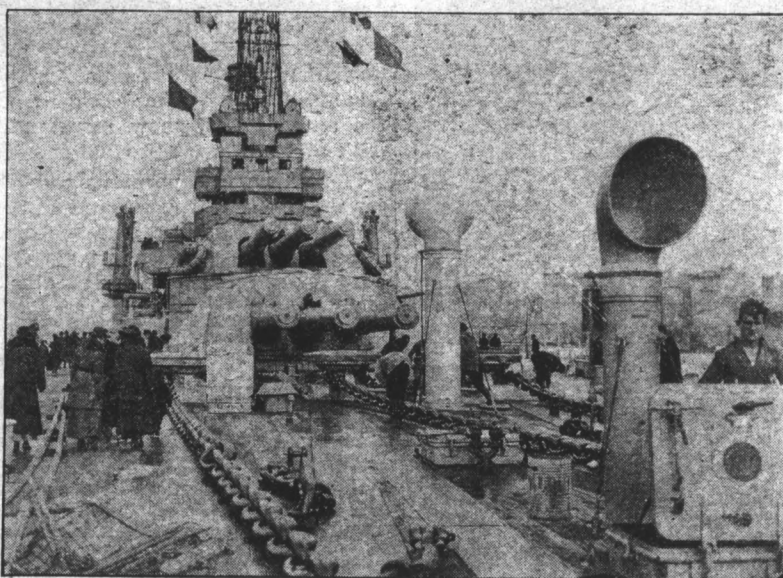
In preparing furs for shipment, the following should be noted: That is, never cut open down the belly; foxes, mink, marten, skunk, opossum, weasel, civet cat, lynx, otter, wildcat and muskrat. To remove skins, a cut should be made crosswise just under the tail, and lengthwise down the back of the hind legs, so as to get the skins free from the legs; then peel the skin right off, pelt side out. The following should be taken off open: coon, badger, beaver and bear. See that the skin is free from fat or meat by scraping if necessary, but do not cut or damage the skin. Stretch on a thin board, cut to shape, or on a wire stretcher. Do

(Continued on page 100).

WORLD EVENTS IN PICTURES



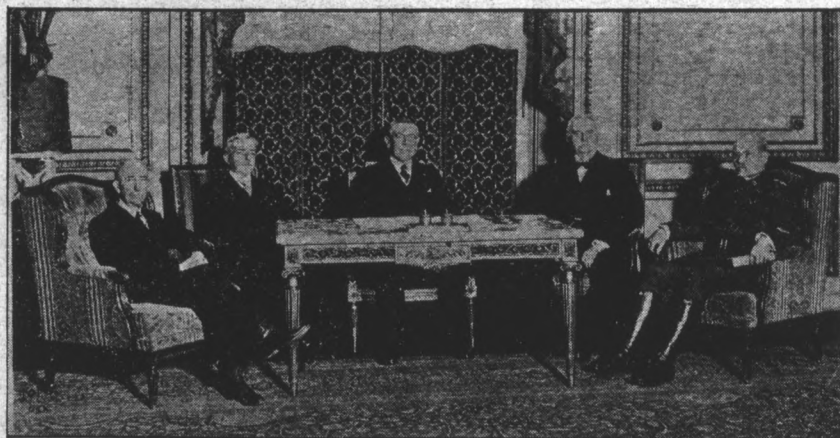
Statue of Lincoln Chosen as Gift to England.



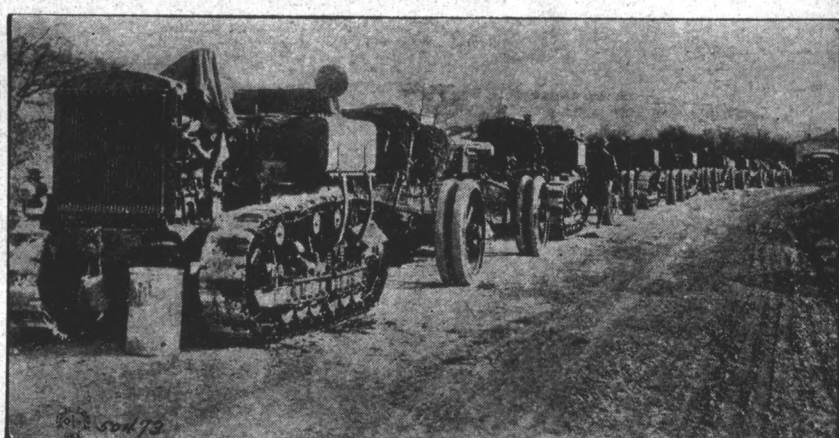
Visitors Explore the Man-of-War "Pennsylvania," Anchored in the Hudson River.



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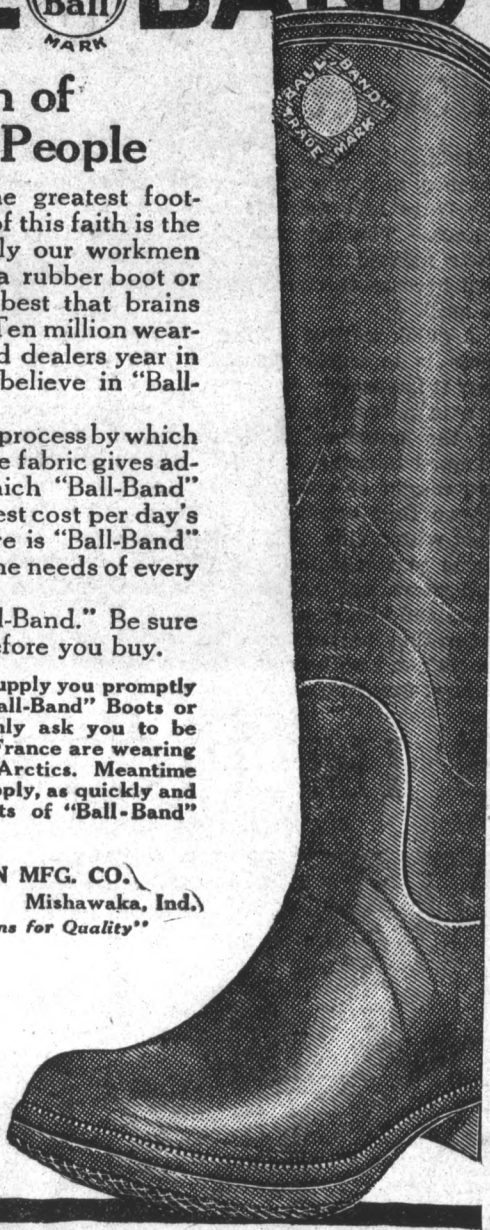
If your dealer is not able to supply you promptly with the particular type of "Ball-Band" Boots or Arctics you desire, we can only ask you to be patient. Many of our boys in France are wearing "Ball-Band" Rubber Boots and Arctics. Meantime we are doing our utmost to supply, as quickly and as fully as possible, the wants of "Ball-Band" wearers at home.

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Why Milk Tests Vary

As a general proposition milk is a far greater from what it would when product that is fairly uniform in she was maintained in good flesh composition. At the Maine Experiment Station the fat content of the milk from a herd of mixed cows fluctuated on an average of 3.75 per cent of its usual amount at each milking, and the total yield of butter-fat varied from eight to ten per cent of its ordinary yield at the same time. Again, the milk yield and composition of cows that are on official test shows some remarkable variations, in some cases the percentage of butter-fat varying from 2.7 to 6.7 per cent in the different milkings of two consecutive days.

What causes these variations in milk tests of individual cows? As a rule, they result from the succulence and nutritive value of the food, the temperature of the weather and the health and condition of the cows. The ordinary dairy cow on winter feed or good pasture in summer will show less variation in the per cent of butter-fat produced than during the months in which her rations are frequently changed. The first principle of maintaining a uniform butter-fat test is uniformity of feeding and care since cows regularly fed and handled show more uniform milk and butter-fat production.

It is always a perplexing question for the breeder of registered dairy cattle to determine accurately between the difference in milk tests due to heredity and those due to feeding and management. When one studies the variation in milk tests made by individual cows he is frequently led to believe that heredity plays a less important part in determining the per cent of butter-fat produced than is popularly supposed.

Successful breeders believe and maintain that the only way to permanently influence the percentage of butter-fat is through the breeding of the animals. That is, that every cow maintains a certain definite percentage of butter-fat that is normal for that particular cow. While changes in age, condition, environment and feed may temporarily change the fat content of her milk for brief periods, she will eventually return to her normal test and maintain nearly the same average for each period of lactation.

Of course, it goes without saying that the well-fed, properly treated cow will show a higher percentage of butter-fat than the same cow would if poorly fed and badly treated. Exceptions may be noted, but as a general breeding proposition families that produce milk with a low percentage of fat will continue to produce cows with that characteristic. Innumerable experiments conducted in an effort to increase the test of milk beyond the normal limits have failed.

On the other hand, it is a well-known and generally recognized fact that if a cow is fed a heavy ration of rich protein feeds during the time she is dry, she will not only store up on her body an excess of lean protein flesh, but will also, when fresh, if fed a narrow, but stimulating ration, milk off this surplus lean meat, at the same time showing a percentage of butter-fat considerably beyond her normal test. This probably explains why it is possible for some of the famous breeders of dairy stock to make such wonderful seven-day, thirty-day and sixty-day butter-fat records.

The best cow in the world if given improper food and care would probably fall considerably below her normal test. Her production of fat might dif-

fer greatly from what it would when she was maintained in good flesh composition. At the Maine Experiment Station the fat content of the milk from a herd of mixed cows fluctuated on an average of 3.75 per cent of its usual amount at each milking, and the total yield of butter-fat varied from eight to ten per cent of its ordinary yield at the same time. Again, the milk yield and composition of cows that are on official test shows some remarkable variations, in some cases the percentage of butter-fat varying from 2.7 to 6.7 per cent in the different milkings of two consecutive days.

DOG A NECESSITY TO POULTRY-MEN.

I HAVE just read the article in your last issue, "Why the Dog?"

Let me say, I am not a dog lover but keep a full-blood Airedale from necessity, rather than choice. This dog cost me \$10 when a pup, because I refuse to keep mongrels of any kind. She is fed wholesome food daily and some skim-milk and my purse has felt this expense since war prices began as I believe, in terms of flour, she eats fully fifty pounds a year.

So you see I admit the cost, which I charge in full to protection.

This dog is never off the place except at my heels on rare occasions and is chained nights and mostly days. I venture the opinion that if five thousand poultrymen were interviewed all but eighteen would be found with dogs, for the same reason mine is kept, namely protection.

Now, as a paper that plays up the poultry industry which this state already has and which has been staggering along on a cost, or less than cost basis, since before the war, is it wise to influence further tax or otherwise destroy about the only protection we have to build up a new industry?

Nearly every improved road in this section that you city people enjoy with your autos, brings us a two-legged pest far more to be dreaded than a sheep-killing dog, thus we are forced to the expense of protection.

If the framers of a dog law to suit the sheepmen will consult any poultry or fruit man pestered by thieves and add an amendment that will make a food producer's products as immune from theft as railroad property now is I for one will be not only willing but glad to dispose of the dog.

When you consider that one visit from thieves in the fall often means the loss, not only of an entire flock of pullets, a season's work, and the cash outlay for feed, but also a large part of the living for a family through the winter, you can understand why we feel justified, even at the figures of \$40 plus first cost and tax, in keeping the best kind of protection obtainable.

Why can't we all get together on this problem and make the dog unnecessary, make hanging the least penalty for poultry and fruit thieves and brand any "law sharp" who opposes such legislation, "a low-down chicken-stealing hound," make stolen products "so hot" no dealer can hold them with comfort, and add a fat fee for the peace officer who does his duty.

I am for the sheepmen for I still hope to buy a suit of clothes some day and I am for myself, first, because I am here and have the poultry, fruit, etc., and am not protected except by the dog.

Ottawa Co.

H. W. H.

Choose Your Field Seeds With Care

You can't afford to experiment with "bargain" seeds or seeds of unknown quality. You know that the success or failure of your crops depends largely on the seed. Poor seed won't produce on the richest soil but good seed will grow even though the soil is not the best. When you sow

APEX BRAND TESTED SEEDS

you can depend on bigger, better crops if you do your part.

There's seed satisfaction in every bag of Apex Brand Seeds. They are all northern grown—growing vigorous, healthy shoots. Apex Brand Seeds are tested for purity and germination under the supervision of a former Assistant State Seed Analyst—tested in one of the best equipped laboratories in the country.

Consider, too, that the company back of Apex Brand Seeds has been selling seeds in Michigan for the past 25 years. The success of Apex Brand Seeds and our rigid adherence to a square deal policy have now gained for us a state-wide reputation as Michigan Field Seed Specialists. We are the largest exclusive field seed distributors in Michigan. Our Company is incorporated under Michigan laws and our dealings governed by them. Our business record and the quality of Apex Brand Seeds merit your confidence.

For bigger, better crops—sow APEX BRAND SEEDS.

In case your dealer can't supply you, accept no other brand—write direct and give us your dealer's name.

Caughey Jossman Co.

Dept. M

Detroit, - Michigan



"By the Way"

SOUND LOGIC.

A colored preacher had just concluded a sermon on "Salvation Am Free," and announced that a collection would be taken up for the benefit of the parson and his family. A member in the audience objected to the paradoxical nature of the proceedings and received this bit of negro logic in response:

"S'pose yo' was thirsty an' come to a river. Yo' could kneel right down an' drink your fill, couldn't you? An' it wouldn't cost yo' nothin'. Dat water would be free. But s'posin yo was to hab dat water piped to yo' house, yo'd have to pay, wouldn't you? Waal, brudder, so it is wid salvation. De salvation am free, but it's de habin' it piped to yo' dat yo' got to pay fo'."

Pat and Mike were working on a new building. Pat was laying brick and Mike was carrying the hod. Mike had just come up to the fourth floor when the dinner whistle blew. His lunch was on the ground. "I hate to walk down after it," he said.

"Take hold of this rope," said Pat, "and I'll let you down." Pat let him down half-way, and then let go of the rope. Mike landed in a mortar bed, not much hurt, but terribly mortified.

"And why did you let go of the rope?" he demanded.

"I thought it was going to break," said Pat, "and I had prisence of mind enough to let go."

PIES ARE NOURISHING.

PROBABLY the worst thing about a pie is that it used usually to be taken with little realization of its high food value. The dyspeptic Yankee gobbled it off with the feeling that it was the mere aftermath of a hearty meal. With our present tendency to interpret food much as a fireman looks upon fuel, as possessing so many calories, so much desirable bulk or so much growth production property, we realize that the pie is by no means an accessory of a meal, at least that it should not be so regarded.

So when you plan to have pie for a meal remember that it is a very hearty little tidbit in itself and make that dinner one in which you have a light main course. If the pie crust is crisp and not soggy, and the pie filling is not too rich, it is a very wholesome dish for those whose activities are normal. Like any other hearty food, it ought to be looked at skeptically by the person who gets little exercise.

Apple pie is as wholesome as any pie, for the reason that the cooked fruit and sugar of the filling make an ideal combination with the fat and protein of the crust. Moreover, it is easy to cook an apple pie without letting the crusts become soggy—much more so than is the case with a custard or other very moist filling.

Of late years raisin pies, prune pies and others made of dried fruits have become popular and they have much to recommend them. A raisin and cranberry pie is a new favorite that is wholesome. Pumpkin pie and squash pie contain the nourishment of the milk and sugar and the slight starch value of the vegetable. When crisp and freshly cooked they are wholesome and nourishing.

Just cut me a slice, of the apple pie twice,

Or pumpkin, or raisin, or berry,
I'll take some of each, and if you have peach,

A small slice of that, and of cherry.

Oh! the pies were abused, and often misused,

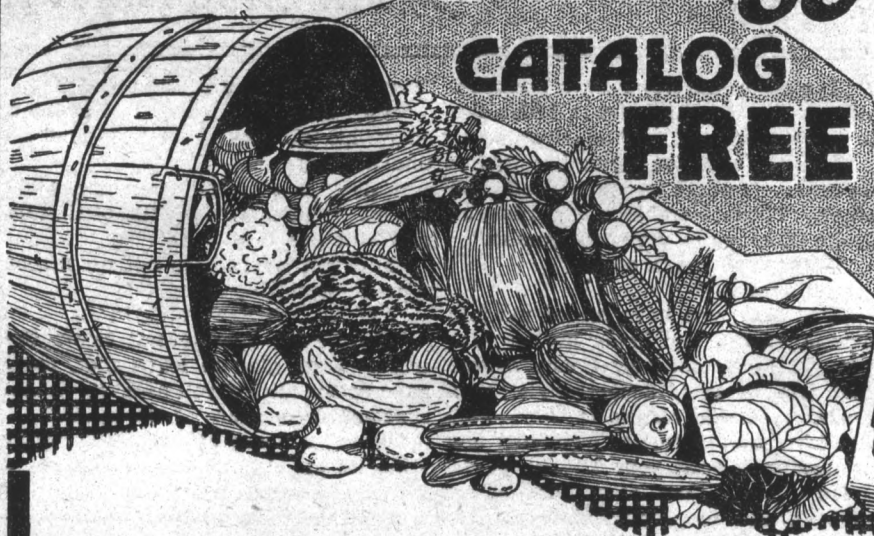
But again they're come into their glories.

We can eat them today, in the old-fashioned way,

For we've found they are stuffed with calories.

L. W. S.

Now For a Bigger Crop!



Prepare With Good Seeds For The Victory Harvest

With the coming of Victory America needs great crops. American farmers must this year produce the biggest crops in history, and big crops mean many extra dollars in profit for the grower. He will get high prices and labor will be plentiful. There must be no "Slacker Acres," no crop failures, if human effort can prevent it. Good seed is of first importance. To be sure of the seed you plant—get

Isbell's Seeds

"As They Grow Their Fame Grows"

For Garden



For Farm

They give you the very best that money can buy at money-saving prices. 40 years' experience goes into Isbell's Seeds. Ceaseless experiments, careful selection and testing has produced the most hardy, big yielding varieties. Only the cleanest, purest seed ever reaches an Isbell customer—seeds you can "bank on" being good, full of life and will grow. Every ounce is Guaranteed. You can have your money back if your own tests do not prove satisfactory. This fair and square Isbell policy has made more than 250,000 satisfied buyers of Isbell's seeds.

It's Money in Your Pocket to Investigate

It means money saved to buy at Isbell's fair prices and money made by growing bigger and better crops. Never has care in the selection of seed been more important. Isbell's modern methods of preparing seeds for market in its new modern plant and Isbell's "proven value," Michigan grown varieties are as near crop-insurance as you can get.

Isbell's 1919 Seed Annual Now Ready

It's a true guide for growing a Victory Crop. It shows how quality seeds are selected, cleaned and tested—written by men who have years of experience, and shows how to take the guesswork out of planting. With this book we'll send your choice of any field seeds you want to test. Mail the coupon—the book and sample seeds are Free.

S. M. ISBELL & COMPANY

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Jackson, Michigan

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To prove Isbell quality we will send you FREE Samples of any farm seeds and when you open the bag you'll find the seed as good as the sample. Isbell field seeds are carefully grown and carefully cleaned by the most modern methods—tested and sold with the understanding that they are all we say or you can have your money back.

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Name _____

Address _____

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Spraying is "cumulative insurance"—because each year's spraying makes the work of the succeeding year more effective.

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highest analysis)
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Calcium Arsenate
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for the Least Expense)
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(Water Glass)

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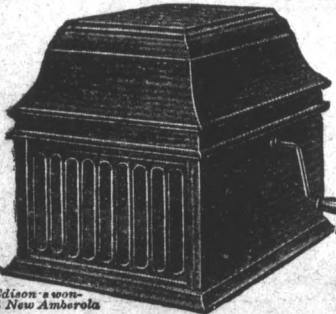
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Delicious



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Drain Tile Sewer Pipe Building Blocks Vitrefied Tile Silos



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Keep the New Edison Amberola—Edison's great phonograph with the diamond stylus—and your choice of records, for only \$1.00. Pay balance at rate of only a few cents a day. Free trial in your own home before you decide. Nothing down. Write today for our New Edison Book and pictures, free. F. K. BABSON, Edison Phonograph Dist. 4811 Edison Bldg. Chicago

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"Beyond the Frontier"

By RANDALL PARRISH

"The act would never have been considered had you opposed it, Monsieur. It was your choice, not the governor's."

"I would wed you—yes; but this is no crime. But let us understand each other. Those were harsh words you spoke in anger in the room yonder."

"They were not in anger."

"But surely—"

"Monsieur, you have forced me into marriage; the law holds me as your wife. I know not how I may escape that fate, or avoid accompanying you. So far I submit, but no farther. I do not love you; I do not even feel any friendship toward you. Let me pass."

He grasped my arm, turning me about until I faced him, his eyes glaring into mine.

"Not until I speak," he replied in a threatening manner. "Do not mistake my temper, or imagine me blind. I know what has so suddenly changed you—it is that gay, simpering fool yonder. But be careful how far you go. I am your husband, and in authority here."

"Monsieur, your words are insulting; release your hand."

"So you think to deceive! Bah! I am too old a bird for that, or to pay heed to such airs. I have seen girls before, and a mood does not frighten me. But listen now—keep away from De Artigny unless you seek trouble."

"What mean you by that threat?"

"You will learn to your sorrow; the way we travel is long, and I am woodsman as well as soldier. You will do well to heed my words."

I released my arm, but did not move. My only feeling toward him at that moment was one of disgust, defiance. The threat in his eyes, the cool insolence of his speech, set my blood on fire.

"Monsieur," I said coldly, although every nerve of my body throbbed, "you may know girls, but you deal now with a woman. Your speech, your insinuation is insult. I disliked you before; now I despise you, yet I will say this in answer to what you have intimated. Monsieur de Artigny is nothing to me, save that he hath shown himself my friend. You wrong him, even as you wrong me, in thinking otherwise, and whatever the cause of misunderstanding between us, there is no excuse for you to pick quarrel with him."

"You appear greatly concerned over his safety."

"Not at all; so far as I have ever heard the Sieur de Artigny has heretofore proven himself quite capable of sustaining his own part. 'Tis more like I am concerned for you."

"For me? You fool! Why, I was a swordsman when that lad was at his mother's knee." He laughed, but with ugly gleam of teeth. "Sacre! I hate such play acting. But enough of quarrel now; there is sufficient time ahead to bring you to your senses, and a knowledge of who is your master. Hugo Chevet, come here."

My uncle climbed the bank, his rifle in hand, with face still bloated, and red from the drink of the night before. Behind him appeared the slender black-robed figure of the Jesuit, his eyes eager with curiosity. It was sight of the latter which caused Cassion to moderate his tone of command.

"You will go with Chevet," he said, pointing to the fire among the trees, "until I can talk to you alone."

"A prisoner?"

"No, a guest," sarcastically, "but do not overstep the courtesy."

We left him in conversation with the pere, and I did not even glance back. Chevet breathed heavily, and I caught the mutter of his voice. "What meaneth all this chatter?" he asked gruffly.

"Must you two quarrel so soon?"

"Why not?" I retorted. "The man bears me no love; 'tis but gold he thinks about."

"Gold!" he stopped, and slapped his thighs. "'Tis precious little of that he will ever see then."

"And why not? Was not my father a land owner?"

"Ay! till the King took it."

"Then even you do not know the truth. I am glad to learn that, for I have dreamed that you sold me to this coxcomb for a share of the spoils."

"What? a share of the spoils? Bah! I am no angel, girl, nor pretend to a virtue more than I possess. There is truth in the thought that I might benefit by your marriage to Monsieur Cassion, and, by my faith, I see no wrong in that. Have you not cost me heavily in these years? Why should I not seek for you a husband of worth in these colonies? Wherefore is that a crime? Were you my own daughter I could do no less, and this man is not ill to look upon, a fair-spoken gallant, a friend of La Barre's, chosen by him for special service—"

"And with influence in the fur trade."

"All the better for that," he continued obstinately. "Why should a girl object if her husband be rich?"

"But he is not rich," I said plainly, looking straight into his eyes. "He is no more than a penniless adventurer; an actor playing a part assigned him by the governor; while you and I do the same. Listen, Monsieur Chevet, the property at St. Thomas is mine by legal right, and it was to gain possession that this wretch sought my hand."

"Your legal right?"

"Ay, restored by the King in special order."

"It is not true; I had the records searched by a lawyer, Monsieur Gauthier, of St. Anne."

I gave a gesture of indignation.

"A country advocate at whom those in authority could laugh. I tell you what I say is true; the land was restored, and the fact is known to La Barre and to Cassion. It is this fact which caused all our troubles. I overheard talk last night between the governor and his aide-de-camp, Colonel Delguard—you know him?"

Chevet nodded, his interest stirred.

"They thought themselves alone, and were laughing at the success of their trick. I was hidden behind the heavy curtains at the window, and every word they spoke reached my ears. Then they sent for Cassion."

"But where is the paper?"

"I did not learn; they have it hidden no doubt, awaiting the proper time to produce it. But there is such a document; La Barre explained that clearly,

and the reason why he wished Cassion to marry me. They were all three talking when an accident happened, which led to my discovery."

"Ah! and so that was what hurried the wedding, and sent me on this wild wilderness chase. They would bury me in the woods—sacre!—"

"Hush now—Cassion has left the canoe already, and we can talk of this later. Let us seem to suspect nothing."

This was the first meal of many eaten together along the river bank in the course of the long journey, yet the recollection of that scene rises before my memory now with peculiar vividness. It was a bright, glorious morning, the arching sky blue overhead, and the air soft with early autumn. Our temporary camp was at the edge of a grove, and below us swept the broad river, a gleaming highway of silvery water without speck upon its gleaming surface. Except for our little party of voyagers no evidence of life was visible, not even a distant curl of smoke obscuring the horizon.

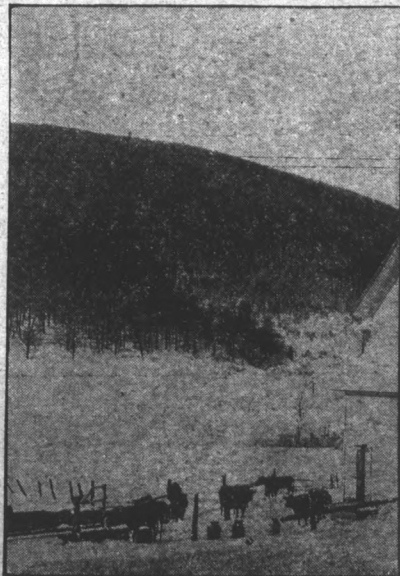
Cassion had divided us into groups, and, from where I had found resting place, with a small flat rock for table, I was enabled to see the others scattered to the edge of the bank, and thus learned for the first time, the character of those with whom I was destined to companion on the long journey. There were but four of us in the first group, which included Pere Allouez, a silent man, fingering his cross, and barely touching food. His face under the black cowl was drawn, and creased by strange lines, and his eyes burned with fanaticism. If I had ever dreamed of him as one to whom I might turn for counsel, the thought instantly vanished as our glances met.

A soldier and two Indians served us, while their companions, divided into groups, were gathered at the other extremity of the ridge, the soldiers under discipline of their own under officers, and the Indians watched over by Sieur de Artigny, who rested however, slightly apart, his gaze on the broad river. Never once while I observed did he turn and glance my way. I counted the men, as I endeavored to eat something, scarcely heeding the few words exchanged by those about me. The Indians numbered ten, including their chief, whom Cassion called Altudah. Chevet named them as Algonquins from the Ottawa, treacherous rascals enough, yet with expert knowledge of water craft.

Altudah was a tall savage, wrapped in gaudy blanket, his face rendered sinister and repulsive by a scar the full length of his cheek, yet he spoke French fairly well, and someone said that he had three times made journey to Mackinac, and knew the waterways. There were twenty-four soldiers, including a sergeant and corporal, of the Regiment of Picardy; active fellows enough, and accustomed to the frontier, although they gave small evidence of discipline, and their uniforms were in shocking condition. The sergeant was a heavily built, stocky man, but the others were rather undersized, and of little spirit. The same thought must have been in the minds of others, for the expression on Monsieur Cassion's face was not pleasant as he stared about.

"Chevet," he exclaimed disgustedly, "did you ever see a worse selection for wilderness travel than La Barre has given us? Cast your eyes down the line yonder; by my faith there is not a real man among them."

Chevet who had been growling to himself, with scarce a thought other than the food before him, lifted his eyes and looked.



"Not so bad," he answered finally, the words rumbling in his throat. "Altudah is a good Indian, and has traveled with me before, and the sergeant yonder looks like a fighting man."

"Ay, but the others?"

"No worse than all the scum. De Baugis had no better with him, and La Salle led a gang of outcasts. With right leadership you can make them do men's work. 'Tis no kid-gloved job you have, Monsieur Cassion."

The insulting indifference of the old fur trader's tone surprised the Commissaire, and he exhibited resentment.

"You are overly free with your comments, Hugo Chevet. When I wish advice I will ask it."

"And in the woods I do not always wait to be asked," returned the older man, lighting his pipe, and calmly puffing out the blue smoke. "Though it is likely enough you will be asking for it before you journey leagues further."

"You are under my orders."

"So La Barre said, but the only duty he gave me was to watch over Adele here. He put no shackle on my tongue. You have chosen your course?"

"Yes, up the Ottawa."

"I supposed so, although that boy yonder could lead you a shorter passage."

"How learned you that?"

"By talking with him in Quebec. He even sketched me a map of the route he traveled with La Salle. You knew it not?"

"'Twas of no moment, for my orders bid me go by St. Ignace. Yet it might be well to question him and the chief also." He turned to the nearest soldier. "Tell the Algonquin, Altudah, to come here, and Sieur de Artigny."

They approached together, two specimens of the frontier as different as could be pictured, and stood silent, fronting Cassion who looked at them frowning, and in no pleasant humor. The eyes of the younger man sought my face for an instant, and the swift glance gave harsher note to the Commissaire's voice.

"We will reload the canoes here for the long voyage," he said brusquely. "The sergeant will have charge of that but both of you will be in the leading boat, and will keep well in advance of the others. Our course is by way of the Ottawa. You know that stream, Altudah?"

The Indian bowed his head gravely, and extended one hand beneath the scarlet fold of his blanket.

"Five time, Monsieur."

"How far to the west, Chief?"

"To place call Green Bay."

Cassion turned his eyes on De Artigny, a slight sneer curling his lips.

"And you?" he asked coldly.

"But one journey, Monsieur, along the Ottawa and the lakes," was the quiet answer, "and that three years ago, yet I scarce think I would go astray. 'Tis not a course easily forgotten."

"And beyond Green Bay?"

"I have been to the mouth of the Great River."

"You" in surprise. "Were you of that party?"

"Yes, Monsieur."

"And you actually reached the sea—the salt water?"

"Yes, Monsieur."

"Saint Anne! I never half believed the tale true, nor do I think overmuch of your word for it. But let that go. Chevet here tells me you know a shorter journey to the Illinois?"

"Not by canoe, Monsieur. I followed Sieur de la Salle by forest trail to the Straits, and planned to return that way, but 'tis a foot journey."

"Not fitted for such a party as this?"

"Only as you trust to your rifles for food, bearing what packs we might on our backs. With the lady the trail is scarcely possible."

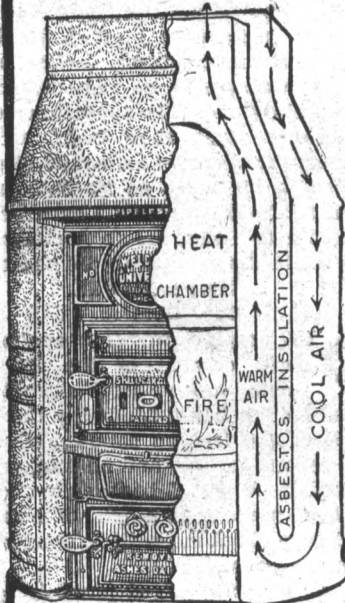
"As to the lady I will make my own decision. Besides, our course is de-

(Continued on page 96).



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Because it contains patented improvements of wonderful value, found only in the UNIVERSAL.

UNIVERSAL Asbestos-Insulated Pipeless Furnace

Scientific Air Control

We spent months, and made thousands of tests to secure a perfect balancing of warm air and cool air movement in the UNIVERSAL. So the instant a fire is lighted warm air begins to flow from the furnace, and cool air to return to it. And this constant flow of heat never ceases while a spark remains in the fire box.

Perfect Insulation

The two best heat insulators known are asbestos and dead air. Our engineers use both in surrounding the warm air chamber of the UNIVERSAL with complete insulation from the cool air passage. (See sectional drawing.)

So we know that no heat is wasted; none can penetrate where it is not useful. Constant air circulation is always going on.

Asbestos Widely Used

Asbestos is Nature's greatest insulator. It is used on boilers, steam pipes, hot water tanks, flat roofs—to keep heat in. And on cold storage houses, freight cars, refrigerators—to keep heat out. But we add to asbestos our system of unit air cells and give you the benefit of BOTH asbestos and dead air insulation between warm air and cool air passages. Combined with our over-size air passages, and our patented 'Shell Bar' grates, this guarantees wonderful fuel economy and perfect air circulation—the two things that make success in a pipeless furnace.

Easily Installed

The UNIVERSAL Pipeless Furnace readily can be placed in any house, old or new. If the house has no cellar, a special pit easily may be provided.

If you think of building a new house let us give you sketches and estimates of pipeless heating—free of charge.

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The UNIVERSAL burns any fuel—coal (hard or soft), wood or gas. Many a house has been heated during moderate weather with practically no cost for fuel. One UNIVERSAL user heated an 8-room house in a cold part of the country with only three tons of coal in a year.

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While wonderfully successful in houses of 5, 6 and 7 rooms we do not claim that a pipeless furnace is suited to every house. If not adapted to your home it might be poor economy to buy one. We make many styles of warm air heaters. Write us for name of nearby dealer and let us suggest a plan to fit your home. The booklet tells you more.

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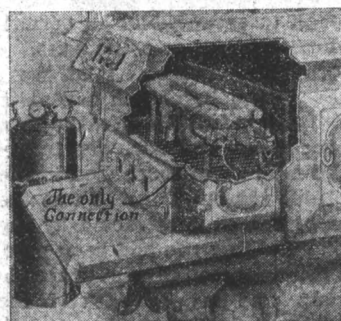
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A FARM FENCE FAMINE!

If you will need fence next spring and know where you can buy, DO IT NOW, even if you have to borrow the money. Don't wait for the price to come down nor buy more than you will really need, for many will have to go without. Reason for this prediction explained in our "Fence Famine Bulletin." Free for the asking. Not at all; you're welcome.

BOND STEEL POST CO., 16 Malmee St., ADRIAN, MICH.

Wanted To hear from owner of farm or unimproved land for sale. O. K. HAWLEY, Baldwin, Wisconsin

WANTED To hear from owner of good farm for sale. State cash price, full particulars. D. F. Bush, Minneapolis, Minn.

Farms and Farm Lands For Sale

208-Acre Stock Farm, \$70. Pair Horses, 16 Cows and

5 heifers, 2 colts, brood sow, hens, grain binder, mowing machine, roller, drags, harrows, cultivators, plows, wagons, harness, long list tools, harvested crops, stove wood, etc. included. On county pike near two cities. 125 acres dark loam fields big crops, wire-fenced, 40-cow pasture, door-collected milk, home use wood, fruit. 12-room house, 3 big barns, hog, poultry, tool houses, all painted, good condition. Retiring owner's low price \$14,500 including everything if taken soon. Small amount down. Details page 69 Strout's Big Catalogue of this and other corn and stock farms; copy free. Dept. 101, E. A. STROUT FARM AGENCY, Ford Bldg., Detroit, Mich.

FOR RENT

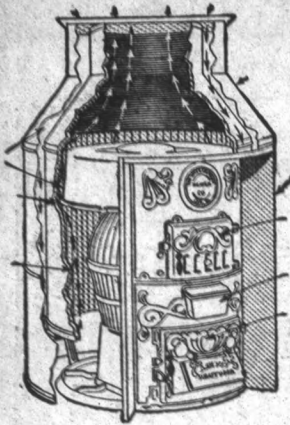
650 Acres plow land and 360 acres pasture—in one farm or two—separated by road in equal parts, buildings on both. Basement barns with flowing water for 200 head of cattle. Raised 3000 bushel grain and 250 tons hay in 1918. Renter must be responsible with means for operation. Tractor on farm. Will assist in financing stock. Level clay soil. Joins Port Hope, Huron Co. Michigan. Address C. R. SMITH, Executor, Niles, Mich.

FARM to rent to married man and small family. Seventy acres. On good road. Twenty miles from Detroit. If responsible and well recommended will rent on shares and provide horses and one cow as well as machinery. Good house in summer resort village with extra rooms to rent to summer boarders. Good garden ground. Fine opportunity for a man to get a start if industrious and honest. E. H. CRANEY, Rockwood, Mich.

Beautiful modern home, steam heat, 8 lots, expensive shrubbery, fruit and shade, block from CENTRAL MICHIGAN NORMAL COLLEGE. Will sell or trade for small farm, or stock general merchandise. Cooper, Goyer & Francis, Mt. Pleasant, Mich.

For Sale The best paying 60 acres in Mich. I want an experienced celery and veg. grower to answer, will sell one half interest; modern home. H. E. GIBBS, Ithaca, Mich.

More Heat at Lower Cost



Now you can do away with troublesome, messy, wasteful stoves and the need for keeping more than one fire going. The Williamson Pipeless Furnace delivers warm, healthful heat to all the rooms through a single register. No warm air pipes or cold air duct to take up valuable space in basement. Very easy to install. No need to tear up floors or partitions. Fits any cellar.

WILLIAMSON Pipeless Furnace

Burns large chunks of wood as easily as it burns hard or soft coal or coke. Draws the cold air from chilly rooms and converts it into delightful warmth. Also protects your root crops against freezing.

Interesting Book Free

The Williamson Pipeless Furnace is made by a company that has specialized in the making of heating apparatus for thirty years. It is low-priced and economical. It is fully described in an interesting

book which is free for the asking. Send the coupon today. NOW!

The Williamson Heater Co.
461 West 5th Street Cincinnati, Ohio

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461 W. 5th St., Cincinnati, Ohio
Without cost or obligation to me please send book describing the Williamson Pipeless Furnace.

Name.....

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Muskkrat!



The World looks to us for its supply of Muskkrat.

We have a tremendous demand now, prices running as high as \$2.50 each for extra fine skins. Ship us all you have—take advantage of the high market today!

Whether you ship extra large or average skins, blue pelted or prime you will get the most money from FUNSTEN

We are also paying extremely high prices for Skunk, Mink, Fox, Civet Cat, Wolf, Marten, Otter, Ermine, and Lynx. Don't wait until season closes. Ship to FUNSTEN and make big profits now!

FUNSTEN

FUNSTEN BROS. & CO. International Fur Exchange 927 Funsten Bldg., St. Louis, Mo.

RAW FURS WANTED

Owing to scarcity of Labor, and High prices of Material, we issue no Price Lists this year. We prefer to give you the benefit in price for your Raw Furs, which we want badly, and will accept in any quantity.

We remit the day we receive your shipment. We pay all Express or Parcel Post charges; will hold your shipment subject to approval, or return if you so request.

Our references are—Your own Bank, Grocer or Dry Goods Jobber, or your very neighbor, if our shipper.

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Capital \$500,000. First Credit

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Horse, cattle, fur coats made to order, from horse or cattle hides you furnish. Robes, Rugs, Gloves, Mittens, Ladies' Coats, Sets of Furs. Taxidermist work on Deer Heads, Rugs.

W.W. WEAVER
Custom Tanner
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Fine for windbreaks, hedges and lawn planting. All Hardy, vigorous and well rooted. We ship everywhere. Write for free Evergreen book and 60 Great Bargain sheet.

D. HILL NURSERY CO., Box 5230 Dundee, Ill.

Wanted position of a farm by married man, by month or year, between Howard City and Traverse City; farm experienced.
EDW. SCHARF, R. 2, Box 104, Sturgis, Mich.

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Know the value of skins, and should be sure they get it.

We Want Your Raw Furs

We promise you fair treatment and absolute satisfaction whatever the size of your shipment. We will spend \$500,000 this season. How much can YOU send us?

One Skin or a Thousand We will grade them carefully and pay you full value. We charge no commissions. We do not claim to be the largest house in the world, but our check will convince you it is worth while dealing with us.

WRITE FOR PRICE LIST.

Vreeland Fur Co. 43 Jefferson Ave., Detroit, Mich.

"Beyond the Frontier"

cided. We go to St. Ignace. What will be your course from Green Bay?"

"Along the west shore, Monsieur; it is dangerous only by reason of the storms."

"And the distance?"

"From St. Ignace?"

"Ay! from St. Ignace—What distance lies between there and this Fort St. Louis, on the Illinois?"

"'Twill be but a venture, Monsieur, but I think 'tis held at a hundred and fifty leagues."

"Of wilderness?"

"When I passed that way—yes; they tell me now the Jesuits have mission station at Green Bay, and there may be fur traders in Indian villages beyond."

"No chance to procure supplies?"

"Only scant rations of corn from the Indians."

"Your report is in accordance with my instructions and maps, and no doubt is correct. That will be all. Take two more men in your boat, and depart at once. We shall follow immediately."

As De Artigny turned away in obedience to these orders, his glance met mine, and seemed to question. Eager as I was to acquaint him with the true reason of my presence it was impossible. To have exhibited the slightest interest would only increase the enmity between the two men, and serve no good purpose. I did not even venture to gaze after him as he disappeared down the bank, feeling assured that Cassion's eyes were suspiciously watching me. My appearance of indifference must have been well assumed, for there was a sound of confidence in his voice as he bade us return to the canoes, and I even permitted him to assist me to my feet, and aid me in the descent to the shore.

CHAPTER VIII.

I Defy Cassion.

OUR progress was slow against the swift current of the St. Lawrence, and we kept close to the overhanging bank, following the guidance of the leading canoe. We were the second in line, and no longer overcrowded, so that I had ample room to rest at ease upon a pile of blankets, and gaze about me with interest on the changing scene.

Cassion, encouraged possibly by my permitting his attendance down the bank, found seat near me, and endeavored to converse; but, although I tried to prove cordial, realizing now that to anger the man would only add to my perplexity, his inane remarks tried me so that I ceased to reply, and we finally lapsed into silence. Chevet, who held the steering oar, asked him some questions, which led to a brisk argument, and I turned away my head, glad enough to escape, and be permitted the luxury of my own thoughts.

How beautifully desolate it all was; with what fresh delight each new vista revealed itself. The wild life, the love of wilderness and solitude, was in my blood, and my nature responded to the charm of our surroundings. I was the daughter of one ever attracted by the frontier, and all my life had been passed amid primitive conditions—the wide out-of-doors was my home, and the lonely places called me. The broad, rapid sweep of the river up which we won our slow passage, the great beetling cliffs dark in shadows, and crowned by trees, the jutting rocks whitened by spray, the headlands cutting off all view ahead, then suddenly—here extended a panorama of which I could never tire.

My imagination swept ahead into the mystery which awaited us in that vast wilderness toward which we journeyed—the dangerous rivers, the portages, the swift rush of gleaming water, the black forests, the plains of waving grass, the Indian villages, and those immense lakes along whose shores we were destined to find way.

All this possibility had come to me so unexpectedly, with such suddenness, that even yet I scarcely realized that my surroundings were real. They seemed more a dream than an actual fact, and I was compelled to concentrate my mind on those people about me before I could clearly comprehend the conditions under which I lived.

Yet here was reality enough; the Indian paddlers, stripped to the waist, their bodies glistening, as with steady, tireless strokes, they forced our canoe forward, following relentlessly the wake of the speeding boat ahead; the little group of soldiers huddled in the bows, several sleeping already, the others amusing themselves with game of cards; while just in front of me sat the priest, his fingers clasping an open book, but his eyes on the river. The silhouette of his face, outlined beyond his black hood, seemed carved from stone, it was so expressionless and hard. There was something so sinister about it that I felt a chill run through me, and averted my eyes, only to encounter the glance of Cassion beside me, who smiled, and pointed out a huge terrace of rock which seemed a castle against the blue of the sky. I think he told me the fanciful name the earlier explorers had given the point, and related some legend with which it was connected, but my mind was not on his tale, and soon he ceased effort to entertain me, and his head nodded sleepily.

I turned to glance back beyond the massive figure of Chevet at the steering oar, to gain glimpse of the canoes behind. The first was well up, so that even the faces of its occupants were revealed, but the second was but a black shapeless thing in the distance, a mere blotch upon the waters.

Ahead of us, now sweeping around the point like a wild bird, amid a smother of spray, appeared the advance canoe. As it disappeared I could distinguish De Artigny at the stern, his coat off, his hands grasping a paddle. Above the point once more and in smoother water, I was aware that he turned and looked back, shading his eyes from the sun. I could not but wonder what he thought, what possible suspicion had come to him, regarding my presence in the company. There was no way in which he could have learned the truth, for there had been no communication between him and those who knew the facts.

Never would he conceive so wild a thought as my marriage to Cassion. He might, indeed, believe that some strange, sudden necessity had compelled me to accompany them on this adventure, or he might suspect that I had deceived him, knowing all the time that I was to be of the party. I felt the shame of it bring the red blood into my cheeks, and my lips pressed together in firm resolve. I should tell him, tell him all; and he must judge my conduct from my own words, and not those of another. In some manner I must keep him away from Cassion—ay, and from Chevet—until opportunity came for me to first communicate with him.

I was a woman, and some instinct of my nature told me that Sieur de Artigny held me in high esteem. And his was the disposition and the training to cause the striking of a blow first. This must not be, for now I was determined to unravel the cause for Cassion's eagerness to marry, and La Barre's willing assistance, and to accomplish this end there could be no quarreling between us.

The weariness of the long night conquered even my brain, the steady splash of the paddles becoming a lullaby. Insensibly my head rested back against the pile of blankets, the glint of sunshine along the surface of the water vanished as my lashes fell, and, before I knew it, I slept soundly. I awoke with the sun in the western

sky, so low down as to peek at me through the upper branches of trees lining the bank. Our surroundings had changed somewhat, the shores being no longer steep, and overhung with rocks, but only slightly uplifted, and covered with dense, dark woods, somber and silent. Their shadows nearly met in midstream, giving to the scene a look of desolation and gloom, the water sweeping on in sullen flow, without sparkle, or gaiety. Our boat clung close to the west shore, and I could look long distances through the aisles of trees into the silent gloom beyond. Not a leaf rustled, not a wild animal moved in the coverts. It was like an abode of death.

And we moved so slowly, struggling upward against the current, for the Indians were resting, and the less expert hands of soldiers were wielding the paddles, urged on by Cassion, who had relieved Chevet at the steering oar. The harsh tones of his voice, and the heavy breathing of the laboring men alone broke the solemn stillness. I sat up, my body aching from the awkward position in which I lay, and endeavored to discern the other canoes.

(Continued next week.)

SICK SOILS—CAUSE AND CURE.

(Continued from page 77).

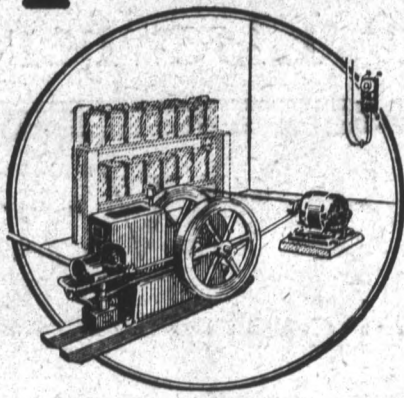
Invariably, the use of some form of lime, probably marl or pulverized limestone. This should be worked into the soil after plowing. It tends to neutralize the acids present and thus fits the soil for the thrifty and rapid growth of beneficial soil organisms, like the nitrogen-fixing bacteria found growing independently in the soil or on the roots of legumes. At the same time the lime may become the source of calcium which some plants require in greater amounts than can be secured from a leached and run-down soil. And lastly, in case the soil has become lifeless and easily runs together to form clods, the lime will loosen it up and make it crumbly.

The next step in reproducing a near-virgin soil is the restoration of available plant food. Complete commercial fertilizers will serve this purpose; but if stable manure can be obtained in any way, this, with the addition of acid phosphate to balance the plant food contained therein, will be better. Stable manure, besides furnishing considerable amounts of nitrogen and potash, also carries into the soil the life-giving humus which loosens a heavy soil, increases the water-holding capacity of any soil, provides a lodging for innumerable beneficial bacteria, and by its decomposition helps to release plant food from the mineral particles of the soil. This is why live stock is such an important factor in maintaining the productivity of farms.

In case stable manure cannot be obtained, the soil doctor must use the commercial manures and plan to grow his humus in rye and vetch, oats and vetch, soy beans, sweet clover, crimson clover, etc., which are plowed under as green manure. The soil now approaches its virgin condition. It is sweet from the renewal of its lime content; it has available plant food from the commercial and stable manures added to it; and for the natural mold of leaves and rotten wood has been substituted the stems, leaves, and roots of cultivated plants. It is now in condition to grow crops profitably, and the new system which will keep it in a condition of perpetual fertility must include short rotations, systematic fertilization, regular liming, and enough live stock always to consume all the crops. Cash crop farming depletes the soil, but live stock farming conserves fertility and makes a permanent agriculture possible.

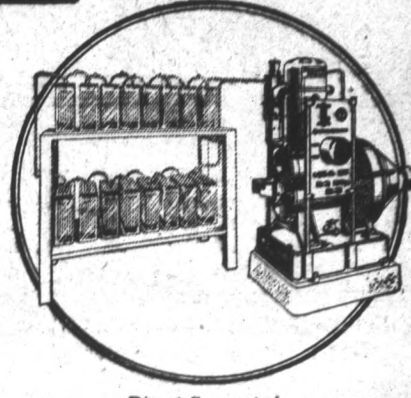
Maxims are only maxims, after all. Thousands of people are early to bed and early to rise, but only a few are healthy, wealthy and wise all at the same time.

Western Electric POWER and LIGHT



Belted

Careful Buyers
Prefer to
Have a Choice
of Plants



Direct Connected

Get the plant that fits your needs. Don't fit your needs to any particular plant.

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If a man has an engine, we are content to sell him the necessary electrical equipment; no reason why he should buy another engine. If, however, he wants a complete plant, we offer him two kinds:—(1) the belted type where the engine is belted to the generator and is readily available to drive other machinery. (2) the direct connected

type, with engine and generator built in one unit.

We are not interested in selling any one particular type of plant. You can choose the one that will best serve your needs.

And remember that the Western Electric Company with its forty years experience, offers you not alone its line of power and light plants, but its motors, water system, milking machine as well as a complete line of electrical labor saving appliances for the home—all bearing the familiar trade mark, Western Electric, your guarantee of satisfaction.

There is a Western Electric man near you. Mail the coupon for Booklet No. MF-12 and we will tell him to get in touch with you.

WESTERN ELECTRIC COMPANY INCORPORATED

Kirby Ave. and Dequindre St.,
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Have wonderful values. New recleaned Alfalfa, \$9.00 per bu.; Timothy, \$4.50; Clover at low prices; Hulled White Sweet Clover, \$12.00; Unhulled Sweet Clover, \$4.95; Alsike-Timothy mixed, \$6.50; Clover and Timothy, \$7.50; and field and grass seed of all kinds at greatly reduced prices. You should investigate our prices. They mean dollars to you. We are the largest growers and dealers in seeds selling direct to the farmers and can offer the biggest and best bargains. Our customers will testify to this fact. Get our big 16-page catalog and be convinced. Write today for special prices and samples of seed you wish to buy. It will mean money to you. All free. Write.

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ON PURE
Tested Guaranteed
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at World's Original and Greatest School and become independent with no capital invested. Every branch of the business taught. Write today for free catalog. **JONES NATL. SCHOOL OF AUCTIONEERING**, 23 N. Sacramento Blvd., Chicago, Ill. Carey M. Jones, Pres.

A Grand Stock of all kinds of fruit trees, berry plants, grapes, shrubs, vines, roses, the choicest varieties. Also seed corn and garden seeds. Prices right. Catalog free. **ERNST NURSERIES**, Box 2, Eaton, Ohio.

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35 H. P. Delavergne Fuel Oil Engine. Type Hornsby-Akroyd, complete with air and water tanks. Also electric power equipment connected with engine, complete with engine, complete with generator, switchboards, meters, etc., all in good condition. Too small for present H. P. requirements. The Bracher Co., Belleville, N.J.

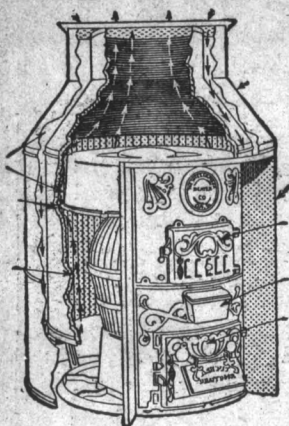
Westinghouse electric lighting system with batteries two horsepower International gasoline engine and Meyers water suction pump all in good order. **JOHN A. ARMUS,** Halfway, Mich.

Kentucky SORGHUM MOLASSES, Absolute Pure, 8 ten lb. pails to the case, \$7.25 per case. Ten cases \$70.00. Sample 10c. **S. ROSENBLATT,** Hawesville, Ky.

Strawberry plants 23 varieties, seed beans, oats and barley. Instructive list free. Pleased to mail you one. **MAYER'S PLANT NURSERY,** Merrill, Mich.

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My imagination swept ahead into the mystery which awaited us in that vast wilderness toward which we journeyed—the dangerous rivers, the portages, the swift rush of gleaming water, the black forests, the plains of the waving grass, the Indian villages, and those immense lakes along whose shores we were destined to find way.

All this possibility had come to me so unexpectedly, with such suddenness, that even yet I scarcely realized that my surroundings were real. They seemed more a dream than an actual fact, and I was compelled to concentrate my mind on those people about me before I could clearly comprehend the conditions under which I lived.

Yet here was reality enough; the Indian paddlers, stripped to the waist, their bodies glistening, as with steady, tireless strokes, they forced our canoe forward, following relentlessly the wake of the speeding boat ahead; the little group of soldiers huddled in the bows, several sleeping already, the others amusing themselves with game of cards; while just in front of me sat the priest, his fingers clasping an open book, but his eyes on the river. The silhouette of his face, outlined beyond his black hood, seemed carved from stone, it was so expressionless and hard. There was something so sinister about it that I felt a chill run through me, and averted my eyes, only to encounter the glance of Cassion beside me, who smiled, and pointed out a huge terrace of rock which seemed a castle against the blue of the sky. I think he told me the fanciful name the earlier explorers had given the point, and related some legend with which it was connected, but my mind was not on his tale, and soon he ceased effort to entertain me, and his head nodded sleepily.

I turned to glance back beyond the massive figure of Chevet at the steering oar, to gain glimpse of the canoes behind. The first was well up, so that even the faces of its occupants were revealed, but the second was but a black shapeless thing in the distance, a mere blotch upon the waters.

Ahead of us, now sweeping around the point like a wild bird, amid a smother of spray, appeared the advance canoe. As it disappeared I could distinguish De Artigny at the stern, his coat off, his hands grasping a paddle. Above the point once more and in smoother water, I was aware that he turned and looked back, shading his eyes from the sun. I could not but wonder what he thought, what possible suspicion had come to him, regarding my presence in the company. There was no way in which he could have learned the truth, for there had been no communication between him and those who knew the facts.

Never would he conceive so wild a thought as my marriage to Cassion. He might, indeed, believe that some strange, sudden necessity had compelled me to accompany them on this adventure, or he might suspect that I had deceived him, knowing all the time that I was to be of the party. I felt the shame of it bring the red blood into my cheeks, and my lips pressed together in firm resolve. I should tell him, tell him all; and he must judge my conduct from my own words, and not those of another. In some manner I must keep him away from Cassion—ay, and from Chevet—until opportunity came for me to first communicate with him.

I was a woman, and some instinct of my nature told me that Sieur de Artigny held me in high esteem. And his was the disposition and the training to cause the striking of a blow first. This must not be, for now I was determined to unravel the cause for Cassion's eagerness to marry, and La Barre's willing assistance, and to accomplish this end there could be no quarreling between us.

The weariness of the long night conquered even my brain, the steady splash of the paddles becoming a lullaby. Insensibly my head rested back against the pile of blankets, the glint of sunshine along the surface of the water vanished as my lashes fell, and, before I knew it, I slept soundly. I awoke with the sun in the western

sky, so low down as to peek at me through the upper branches of trees lining the bank. Our surroundings had changed somewhat, the shores being no longer steep, and overhung with rocks, but only slightly uplifted, and covered with dense, dark woods, somber and silent. Their shadows nearly met in midstream, giving to the scene a look of desolation and gloom, the water sweeping on in sullen flow, without sparkle, or gaiety. Our boat clung close to the west shore, and I could look long distances through the aisles of trees into the silent gloom beyond. Not a leaf rustled, not a wild animal moved in the coverts. It was like an abode of death.

And we moved so slowly, struggling upward against the current, for the Indians were resting, and the less expert hands of soldiers were wielding the paddles, urged on by Cassion, who had relieved Chevet at the steering oar. The harsh tones of his voice, and the heavy breathing of the laboring men alone broke the solemn stillness. I sat up, my body aching from the awkward position in which I lay, and endeavored to discern the other canoes.

(Continued next week).

SICK SOILS—CAUSE AND CURE.

(Continued from page 77).

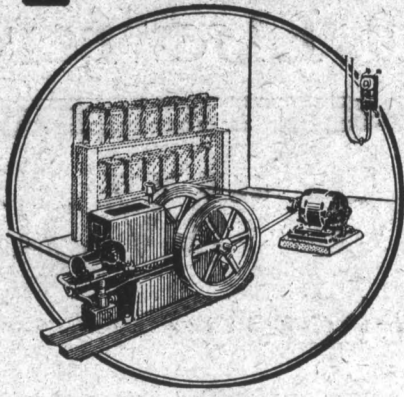
Invariably, the use of some form of lime, probably marl or pulverized limestone. This should be worked into the soil after plowing. It tends to neutralize the acids present and thus fits the soil for the thrifty and rapid growth of beneficial soil organisms, like the nitrogen-fixing bacteria found growing independently in the soil or on the roots of legumes. At the same time the lime may become the source of calcium which some plants require in greater amounts than can be secured from a leached and run-down soil. And lastly, in case the soil has become lifeless and easily runs together to form clods, the lime will loosen it up and make it crumbly.

The next step in reproducing a near-virgin soil is the restoration of available plant food. Complete commercial fertilizers will serve this purpose; but if stable manure can be obtained in any way, this, with the addition of acid phosphate to balance the plant food contained therein, will be better. Stable manure, besides furnishing considerable amounts of nitrogen and potash, also carries into the soil the life-giving humus which loosens a heavy soil, increases the water-holding capacity of any soil, provides a lodging for innumerable beneficial bacteria, and by its decomposition helps to release plant food from the mineral particles of the soil. This is why live stock is such an important factor in maintaining the productivity of farms.

In case stable manure cannot be obtained, the soil doctor must use the commercial manures and plan to grow his humus in rye and vetch, oats and vetch, soy beans, sweet clover, crimson clover, etc., which are plowed under as green manure. The soil now approaches its virgin condition. It is sweet from the renewal of its lime content; it has available plant food from the commercial and stable manures added to it; and for the natural mold of leaves and rotten wood has been substituted the stems, leaves, and roots of cultivated plants. It is now in condition to grow crops profitably, and the new system which will keep it in a condition of perpetual fertility must include short rotations, systematic fertilization, regular liming, and enough live stock always to consume all the crops. Cash crop farming depletes the soil, but live stock farming conserves fertility and makes a permanent agriculture possible.

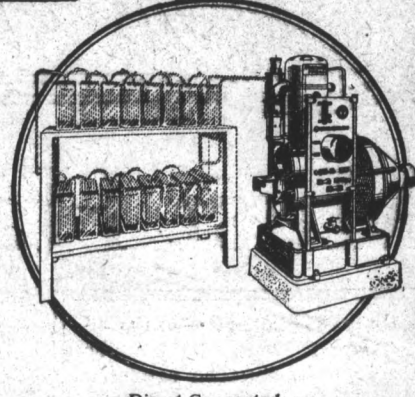
Maxims are only maxims, after all. Thousands of people are early to bed and early to rise, but only a few are healthy, wealthy and wise all at the same time.

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Woman and Her Needs

At Home and Elsewhere



"Must Haves" and "Would Likes"

By Deborah

DEAR DEBORAH:—Am wondering if some of the older women whose children are now grown up could be induced to help us young mothers by writing some of their short cuts in housework, and plans for getting it done alone.—Young Mother.

IN publishing this Macedonian appeal, I am actuated by the hope that some experienced women will take time to reply to this perplexed mother. For I know at the outset that the average woman would never follow the "short cuts" and "plans" which I adopt to get through with the work which falls to the lot of mothers, with or without help. As a matter of fact, no woman will follow exactly any other woman's methods, for individuality asserts itself in housework as in everything else and we must all cut our goods to suit our pattern. But as women are women, I feel pretty sure that mighty few would even try to adopt my plan for I have a strong leaning towards masculine styles in house-keeping.

To begin with, I make a strong line of demarcation between "must haves" and "would likes." The "must haves" include plain food, clean clothes and rooms and lots of soap and water applied to bodies and house furnishings. The "would likes" include fancy work, crocheted doilies, pillow shams, embroidered towels, bric-a-brac stuck up all over the mantel and piano, photo-

graphs in like places, plate rails covered with fancy china, fancy pillows, lace curtains which take a week's time to "do up,"—in short, all the frills and furbelows so dear to the feminine soul, and so conspicuous by their absence in a bachelor's bungalow.

All these things are nice, if you like them. I'll grant they, or a few of them, play a part in our aesthetic education, but I contend they are non-essential. And O, the time they take to make them and then keep them nice.

Along with the furnishing, which I eliminate as time-killers, I include fancy cooking, frosted cakes, fearful and wonderful entrees, desserts and salads that take an hour to make and two minutes to eat, and all the related line of dishes which call for a half-dozen ingredients and give you an attack of indigestion. These, Hooverism has taught me, are not only non-essentials, they are criminals. Dyspepsia lurks in their train and woman's strength is wasted in their making.

Add to this list of things cut out, the daily wearing of delicate lingerie and house dresses which require much ironing and you have stricken out about all that beauty-loving women dote on. So you see why I say I know beforehand that no one is going to follow my advice.

I think perhaps the hardest part of being a young mother is the getting used to the sacrifices you have to make for your children. Up to the

time of your first baby's arrival you have been expecting other folks to cater to you. From the time your first-born arrives you begin to live a new life, a life of service to others. At first the nurse and your mother tell you you must do this and that for the baby's sake, but before many months you wake up to find the young tyrant telling you himself. For some inscrutable reason, children assume from their earliest conscious moments that their mother is their own personal property with no rights which they are bound to respect. And after awhile conscientious mothers begin to feel a little themselves as though their duty to their children was paramount.

And as a matter of fact it is. I heartily believe that the most important thing a mother has to do is to serve her children. Children first, house next, is the true way. Too many mothers turn it about and make the children second. A clean, well-kept house is to them of more importance than happy children. But they are wrong. They will have many years to keep up the house after the children are grown, but the years when they can train their children into right habits of living and thinking are all too few.

If I were the young mother who has written in for advice I should sit down with a pencil and paper and make a list of everything I try to do in a week. Then I would go through it and pick

out the things I get done and those I never manage to get at. I should study both lists and decide on what must be done in order to keep up in good health and what I want to do because everyone else is doing it. Those last things I'd kiss a fond good-bye until the children are grown up.

If there was anyone in the neighborhood whom I could get to help me a few hours each week I should hire them, even if the farm is not paid for in the time limit I'd like. A little help now, and time and strength to enjoy your babies is of more importance than a deed to a farm. And I should buy everything I could in the way of labor-saving devices to save myself the drudgery of heavy farm work. You will have enough of it if you save yourself all you can. No doubt you have a cream separator. Don't stop with that. Get a power washing machine, a mangle, a charcoal or gasoline iron, bread mixer, a fireless cooker, everything you hear of that will help save your strength. These things are no longer experiments any more than tractors and motor trucks. They are things you really need and should insist on having.

Above all, be your own mistress. Don't let neighborhood habits or opinions influence you to try to do things for which you have neither time nor strength. A large per cent of the things women do are done for no other reason than because "folks will talk." Let them talk. You can afford to if your refusal to conform to their standards gives you a few hours extra time for pleasure or rest.

Daintiness and Comfort for the Baby

OUR readers are presented with two dainty jackets for babies, either one of which is sure to please the most fastidious mother, and it would be hard to decide which is most fetching when worn by the little king or queen. It is the nicest sort of work for evenings, they grow rapidly, and do not tire one's eyes or nerves.

Number one is perhaps a trifle easier to make. For it you will require one and a half hanks of creamy white Shetland floss, a yellow celluloid hook, about number three, or one that will carry the yarn loosely; two yards of number three satin ribbon. I may as well say right here, never wind yarn, always nest it to insure fluffiness.

To make jacket number one: Chain 71, turn; in the fifth stitch from hook, one double; one double in every stitch of chain until you have 34 doubles; chain 2, one double in each stitch of chain until you have 34 doubles again; chain 2, two doubles in last stitch of chain; turn.

Second Row: Chain 3; two doubles over the chain of two; first row, one double through back loop of each stitch until chain in center back is reached; two doubles, two chain, two doubles over it; one double through back loop of each stitch; chain 2, two doubles in chained loop on end; turn.

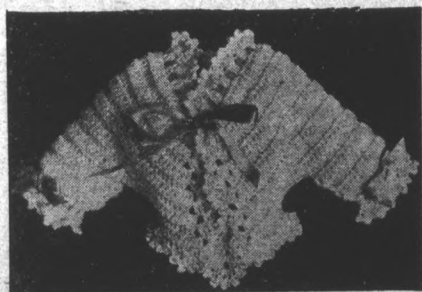
Third Row: Same, except put three

doubles in front, center back, and other side of front.

Fourth Row: Like second.

Fifth Row: Like third.

Keep on the same until there are thirteen rows; you will notice it is three doubles, then the next row says two doubles, they come alternately, forming a point in center back, also

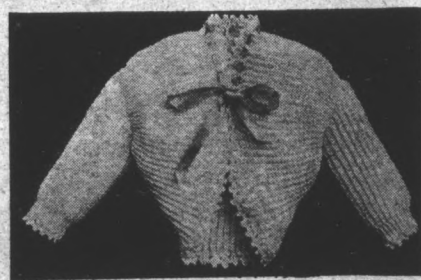


No. 1, of Shetland Floss.

each side of front, and they just cover the waist line; break off yarn, and draw it through last stitch; from the front and back lower points, count up 14 stitches; sew up 10 stitches. Do the other side like it; tie on yarn at the sleeve; go around it back and forth five times, joining each round with a slip stitch; break off, draw the yarn through last stitch; work other sleeve precisely like it; finish neck, fronts,

bottom and sleeves with a small scallop thus:

Tie on yarn anywhere; skip three doubles, double between next two; chain 3, one single through top of same double; make three more like it in the same place; chain 3, skip 3, one single between next two; chain 3, one single in same place; repeat all around it; break off, draw yarn through, and fast-



No. 2, Saxony Yarn.

en it securely on wrong side. Cut-off half-yard of ribbon, run it in and out between every two stitches and tie in a tiny bow; trim both sleeves the same; use the remaining yard for the neck.

For jacket number two you will require three and a half laps of creamy white saxony yarn; the same yellow celluloid hook used for number one; a patent steel chochet hook No. 5, and

one yard of narrow taffeta ribbon. With the yellow hook chain 55; into the second stitch from hook, put one single; in each stitch of chain put one single, making 54 in all; turn.

Second Row: Chain 1, skip first stitch, then one single through back loop of each stitch; 54 stitches, including one chain at start; always chain one to begin a row, skip one; it counts as one stitch; one rib is now formed; work back and forth until there are 29 ribs, (not rows).

Thirtieth Row: Work up 22 stitches with yellow hook, then nine stitches with steel one; turn.

Thirty-first Rib: Chain 1, nine stitches with steel hook, 22 with yellow one; continue same until there are 28 of these short ribs; break off and draw through last stitch, finishing one side.

To make the other side, count down 23 stitches; tie on yarn; make nine stitches with fine hook, 22 with large one; work up and down for 28 ribs on this piece also; break off, and draw yarn through last loop; sew the end to shoulder across thirteen ribs; skip three ribs, sew the other piece to correspond; to form a tiny V neck, work a row of holes, starting half-way down the front; chain 5, skip one rib, one double through next rib; chain 1, skip 1, one double through next rib; go across neck and half-way down other

side. To make sleeves: Chain 36 with yellow hook; turn; with small hook work nine singles; with large hook 27; turn; chain 1; shape the sleeve at the top by adding one stitch each row; go on down 28 stitches with large hook, nine with fine one; keep on up and down until there are ten ribs, then three plain without increasing, then leave off one stitch each alternate row at top, until you are back to 27 large stitches, and nine small ones, 10 ribs, 23 ribs in all; break off, sew up, and overcast it finely in the arm-hole; the fine work forms a pretty ribbing round the hand.

To edge sack and sleeves: Tie on yarn, right side out, anywhere, with fine hook chain 3; one double beside it; chain 4, one single through top of double; one more double in the same place with double; skip 2 fine ribs on sleeve, or one large one on body when you get that far; one double in next; one double, chain 4, one single through top of double, one double beside it; repeat all way around; join with slip stitch. Run ribbon through holes in the neck.

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Any of the patterns illustrated may be secured by sending order to Pattern Department, Michigan Farmer, Detroit, enclosing the amount set opposite the patterns wanted.



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118 claims for fire	\$29,546.95
169 claims for theft	25,878.60
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Our Boys and Girls At Work and play

A Fight in the Dark

By Hugh F. Grinstead

WHEN Roy Gilson, herder at the Palo Verde sheep camp, found two of his flock dead in the corral, one of them half devoured and the other left with its skull crushed in, he knew it to be the work of a mountain lion. A wolf would never have killed more than it could eat.

For three nights after that Gilson slept near the brush corral. Determined to waylay the sheep killer, he spread his blankets in a little hollow fifty or sixty yards to windward of the pen, where the stiff night breeze would carry the human scent away. There, with lantern and loaded gun in readiness, he lay down with his clothes on. "Ted," the sheep dog, curled up under a dwarf mesquite a few yards away.

Nothing disturbed the herder or his flock the first two nights of his vigil, and he began to think the mauler was only a passing visitor, probably miles away by that time.

The third night, however, an hour or so before dawn, the herder was roused by the terrified bleating of sheep, and a sharp growl from the dog. The thoroughly awakened man ran his arm through the bale of the lantern, and with a firm grip on his gun, he sprang up and ran toward the corral gate, followed reluctantly by the sheep dog, who had caught the scent of an unknown enemy.

The corral fence was made of thorny mesquite brush, and the herder was confident the night prowler would be compelled to leap the gate in order to make his escape.

A crescent of the waning moon was just peeping over the eastern horizon; and in the dim light, while he was yet thirty yards away, Gilson saw a dark streak clear the gate, and caught a flash of white. The suspicious beast made off with a lamb to eat undisturbed. With scant hope of hitting the fleeing mark, the excited herder fired into the darkness. Then with an encouraging shout to Ted, he dashed across the open ground where he had last seen the strange animal.

Heartened by the attack of his master, the sheep dog now gave chase eagerly. Guided by the sharp, eager barking, Gilson stumbled after, urging on the chase by an occasional shout.

The trail led through an "orchard" of prickly pear; but dodging the sprawling clumps of cactus, the herder managed to keep within hearing of the chase. He kept doggedly on in the hope of running the mauling beast into its den in case it had one in the vicinity.

Scratched by treacherous cactus spines, his clothes torn on the scrubby mesquite, Gilson finally emerged into more open ground. He paused a moment to listen. From the side of a little hill, a hundred yards ahead, came the short bark of a baying dog, and he ran on at increased speed.

From the base of the hill, he was compelled to proceed more slowly, picking his way cautiously around barrel cactus and over huge rocks. Years before, some misguided prospector had among the scattering yucca of the barren hill, sunk half a dozen shallow prospect holes, two or three of them burrowing back into the hill for several yards.

When half way to the top, the herder beheld, to his amusement, the sheep dog barking assiduously into a clump of greasewood scarcely large enough to hide a rabbit.

Disgusted, Gilson was on the point of giving the dog a swift lesson on the folly of chasing rabbits at night, when, peering into the shadow he saw the dark outline of a well-worn hole, almost hidden by the shrub.

He struck a match, and carefully shielding it from the wind, lighted the lantern. A hasty examination revealed the choked entrance to an old prospect tunnel. Rocks and dirt had slipped down, till an opening large enough for only some slender body remained.

He searched about for something to run into the hole. A few feet up the sloping hillside he spied the slender, green shoot of a young mesquite, that had grown almost straight into a fair-sized branch. Scrambling up, he swung the lantern at the base of the scrubby growth.

The light fell upon something dark, like a flat stone. Gilson attempted to push it with his foot, and barely saved his balance by clutching the thorny branch within reach. It was a black hole a foot in diameter, that led downward into the mysterious depths of the abandoned shaft—a cave-in from the top.

When he discovered that there were two openings to the den appropriated by the mountain lion, the herder hastened to block with heavy stones the one at the old entrance, where the dog was still industriously scratching and barking.

Then, holding fast to the little tree, the roots of which he knew to be firmly bedded in the soil, Gilson reached out cautiously with his foot, and tried the crumbling soil at the edge of the hole. A rim of loose earth and gravel fell rumbling into the pit beneath, widening the opening to twice its former size. Still holding to the mesquite, he stepped out and bore his weight on the tunnel roof within a foot of the hole; it seemed to be perfectly safe.

Lying flat, he drew himself cautiously toward the opening till his face was directly over it; then, lowering the lantern as far as his arm would reach, he swung it about. It is difficult to see much below a lantern, but he caught a glimpse of the bottom, apparently ten feet below, and a heap of earth and stones directly beneath.

Withdrawing the lantern, he lay



FUR TRAPPING A MONEY MAKER.

(Continued from page 91).

not use any "preparations;" simply stretch and dry. Never dry by the fire, or in the sun, but in a cool place, sheltered from rain. Most skins can be shipped as soon as they have been dried long enough to hold their shape. They should be laid flat and securely sewed up in a stout burlap sack without holes, then shipped by express or parcel post.

quietly listening for several minutes. He could hear distinctly the crunch of bones and flesh, and thought he heard a subdued growl.

In order to make further exploration he cut a slender branch from the mesquite, hung the lantern on a hook fashioned at one end, and again lowered it into the darkness. It reached almost to the floor, but the man lying flat on the ground above could see only a small circle of light.

He swung the lantern from side to side. An angry snarl scarcely ten feet from the light announced the presence of the cornered beast as well as the limits of the excavation.

Apparently the tunnel was little more than a yard in width—just wide enough for the prospector to work in comfortably—and dipped slightly into the hillside. Before the cave-in occurred, it had been about seven feet from floor to roof.

In his eagerness to see farther back, Gilson shifted around to the other side of the opening, and leaned downward. Without warning, he felt the untried brink drop from beneath him, clutched wildly at the opposite rim, and pitched headlong into the pit below.

He struck on his hands, slid harmlessly upon the heap of earth, and rolled against the wall. Turning almost a complete somersault in the plunge, he had lost all sense of direction, uncertain whether the back of the cavern were to his right or to his left.

In the narrow prison with an animal that would prove dangerous when cornered, the lantern extinguished and covered by the falling dirt, his gun lying on the ground above, there flashed upon Gilson the full significance of his dilemma. Crouched low, he listened and tried to gather his scattered wits.

Presently he heard a rustling sound to his left, and looking intently he saw a pair of fiery balls—the night-seeing eyes of the big cat—fiercely regarding him through the gloom.

Instinctively the trapped herder did that which a man of action would be expected to do. He retreated a step, and reached for his only weapon of defense—a strong, keen-bladed pocket-knife.

He took another step backward, and touched the fallen earth and stones that choked the old entrance—he had retreated as far as he could.

In close quarters with a beast of little less than his own weight, its every tooth and claw a piercing weapon, Gilson, unable to see his hand before him, appreciated the handicap. Undaunted, he took a step forward in order to get out of the pocket at his back.

Vividly, he recalled a tale he had heard of a hunter's combat with a mountain lion. Following the whimsical inspiration of a moment, he slipped his right arm from the sleeve of his heavy duck coat, and with a dexterous movement wrapped the garment around his left arm.

Willing to leave the beast at the other end of the tunnel unmolested, if he could thereby escape, Gilson, his left arm crooked in front of his face, crept upon the little mound beneath the ragged patch of light. He hoped that he could reach high enough to scramble out the way he had fallen in.

Whether the big cat had seen a chance for escape by the same way, or had mistaken the stealthy movements of the man, it shot forward like a streak. The crouching man in its path was bowled over, the two rolling to the floor together.

As he fell backward, Gilson struck vigorously, and felt the impact of his blade against the furry object. If it were a chance encounter, it now quickly turned into a fight.

Maddened by the knife thrust, the beast struck back savagely with its forepaw, catching the prostrate man just under the arm. The herder thrust his muffled arm toward his antagonist and struggled to his knees.

He felt the great jaws close on his forearm in a vain endeavor to force the cruel teeth through the heavy garment; he struck with all the strength of his right arm, only to feel the blade rebound harmlessly from the knot of tough skin and muscle.

The desperate man brought the knife round with an overhand blow, and felt it glance from the skull of his assailant. He struck again and again till it sank into a soft spot, and the animal released its hold for an instant.

Involuntarily the man shielded his face with the protected arm and tried to get to his feet. He shrank from the pain as the sharp claws raked across his side, and raised his shoulder higher when he felt the hot breath of the beast as it reached for his throat.

The piercing teeth were already closing on his shoulder above the protection of the coat, and Gilson realized that their grip might end the battle disastrously.

Mastering all his strength in a final effort to shake the hold of his antagonist, he pitched forward till the back of the brute touched the ground. At the same time he put all the power of his right arm and the weight of his body into a blow aimed between the sinewy forelegs of the animal.

He felt the keen blade enter the yielding flesh, and waited for a second—it seemed much longer—for the powerful teeth to crush through the bone and flesh of his own shoulder or relax in a final gasp.

Then the knife was jerked suddenly from Gilson's nerveless fingers; he thought the ugly jaws must have loosened their hold, though he could still feel the sting of the sharp teeth.

Unable to continue the contest longer, had it been necessary, the man fell across the body of his vanquished foe. Panting for breath in the close cave, he lay still for several minutes. Uncertainly he got to his feet; he thought that he had suffered no serious injury. Sticky, warm blood trickled from his fingers, but he knew not how much of it was his own.

Feeling about in the dark, he placed two large stones on the pile of earth; and mounting these, he found that he could reach a branching root near the brink of the hole above. Exerting all his remaining strength, he drew himself to the top, and rolled thankfully out upon the rough ground.

He hastened to the tent and dressed his numerous scratches, which he found to be painful though not deep, with a tarry, ill-smelling ointment, kept on every ranch, a cure-all for man or beast.

When the herder returned, after daylight, with a wire hook to "fish" the dead animal from the hole, he found two half-grown kittens sniffing about the carcass. Two well aimed shots added as many scalps to the state bounty collection; and Gilson understood why the old cat had fought so valiantly.

Never pick a quarrel till it's ripe.

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Are Egg-Laying Contests Worth While?

(Continued from page 75).

they become "Leghornized" as to type. The head of the hen is a good index as to quality of the egg sack and egg production. Coarse, thick heads, with yellow pigment present, in beak, earlobe and in the ring below the eye combined with a creamy red face, indicate an inclination towards beefiness in the hen but fine heads with alert active eyes indicate quality of egg sack and high production. The body conformation is somewhat wedge shape, when viewed from the side, shallow breast, oblique back with good depth posteriorly. The tail is usually, but not necessarily, high and pinched, indicating vitality. The hen is tight-feathered and compact. The egg sack will show a capacity during the period of production of five or six fingers between the tip of the breastbone and the arch of the pelvic bones. The egg sack will be free from fat, full and flexible and very contractible when slight pressure is applied. The region surrounding the pelvic bones shows a laxness, not tight and muscle-bound as in the poorer producers.

The "Potter" system of selection is primarily designed to prevent killing the laying hens. Its weakness lies in the fact that all hens at some time show a contracted condition between the pelvic bones, so that the good hen is liable to be sent to the block as well as the poor hen, during the broody or moulting period. When the ovaries are dormant, moreover, the mere fact a hen is laying doesn't always mean she is laying profitably. This test, while helpful is insufficient.

The "Hogan" system is a step in advance of the "Potter" method—capacity and fine pelvic bones are demanded. Mr. Hogan oversteps his system, when he tries to draw up a scale of production according to capacity of egg sack and the degree of fineness of the pelvic bones. Many people try to apply this system in selecting pullets and males, but it fails to work because of the fact that pullets never develop capacity until in laying condition, and since the males are not gifted with this characteristic of production the measurements would tell nothing.

The weakness in the "Hogan" system lies in the fact that the keel or breastbone expands and contracts according to rate of ovulation or production and many good hens would be discarded while in a non-laying condition. Furthermore, the condition of the egg

sack was overlooked. This is a very important point. Hens showing large capacity and fine pelvic bones, are not all good layers. They may produce heavily for a short time then suddenly quit or go broody often. This is characteristic of hens showing fleshy egg sacks, but when the egg sack is mellow and pliable it usually means persistent production. The hens that make big records require ten to twelve months of steady laying with no interference through broodiness. The "quality" test will segregate these extreme producers.

The "pigmentation test" is valuable in selection when used in conjunction with other physical conditions. It is especially good in selecting the drones from the flock during the late summer



Record of 226 Eggs in Ten Months.

and early fall. Hens at that time carrying an abundance of yellow pigment in shanks, earlobes and beak have not produced profitably, but on the other hand, hens showing pale or bleached shanks, beak and earlobes may not all have been heavy producers either, this is more noticeable in older hens, lacking in vitality. One glance at the head of the bird, however, and if a healthy complexion is evident, the bleached or white appearance indicates profitable production.

The "ideal" utility hen is one that makes a good winter record with a yearly total of two hundred eggs or better. The eggs laid should be normal in size, shape and color, capable of hatching into strong livable chicks. She will moult during October or November, commencing to lay again in six or seven weeks or quickly enough to make a high second-year record.

What Is a Pullet Worth?

FREQUENTLY the farmer has a surplus of pullets for sale and wishes to dispose of them at a profit. What is a fair price to ask for a pullet that is six months old and well developed for her age? Prof. L. E. Card, of the Connecticut Experiment Station, says that a Leghorn takes twenty pounds of feed up to twenty-four weeks of age and a Rhode Island Red requires twenty-four pounds to the same age. He states that the birds will require from one and a half to two pounds of feed per bird each week after they reach twenty-four weeks of age.

It is evident that the farmer cannot sell pullets around six months of age for \$1.00 each and make much profit on them at the present price of feed. Good pullets should bring a premium and they ought to be worth at least \$2.00 each or more depending upon the breed and the bred-to-lay or exhibition quality of the stock.

Conditions governing the cost of producing pullets will differ on practically every farm. Some farmers may have an abundance of sour milk and plenty of range. Others have unusually fine equipment suitable for early hatching. Some breeders possess more skill than others and enough acreage

to raise nearly all of the feed required. All of these things influence the cost of production. Rats, weasels and hawks increase the cost of production on some farms by cutting down the flock after the birds which they kill have already consumed much valuable feed.

It is evident that the old days when pullets were cheap have passed. Today, the breeder that asks \$2.00 for a well-grown pullet is not asking one cent more than he should demand. If the pullets are good enough to sell at all for breeding stock they should be worth \$2.00 each or more.

NUMBER OF HENS PER NEST.

About one nest for every six hens will be satisfactory. This will largely prevent two or more hens trying to crowd on the same nest. When hens have to fight for their nests the disturbance is not conducive to the best egg production and eggs may be broken. When eggs are broken in the nests clean litter should be supplied immediately. It is much better to have the eggs come in from the nests perfectly clean than to reduce their keeping qualities through washing.

Ingham Co.

R. G. KIRBY.



Type, Quality and Production

(Continued from page 79).

able to do so. It is to every breeder's interest to breed his cattle up to the requirements of the markets that are to be supplied by the farmer into whose hands they will ultimately pass. The prices paid for milk and the quality demanded by the city trade and condensary plants do not warrant the practice of breeding for a higher percentage of fat by the Ayrshire and Holstein-Friesian breeders so long as the Jersey and Guernsey breeds are well qualified to meet the demand for richer milk at advanced prices.

Absolutely the first concern of the new breeder should be to breed and develop a herd of uniform, large, vigorous females that can digest great quantities of food. Vigor and digestion are the basis of heavy milk and butter production. With a herd made up of choice females of his own breeding mated with a suitable sire it is possible to breed his herd up to a high standard at a moderate cost. Success in breeding and developing a herd of efficient dairy cattle has been ascribed to various secrets in the art of combining and uniting blood lines, to a study of pedigrees, to in-breeding and line-breeding, yet the fact remains that some of the most successful breeders of animals of all sorts have disregarded one or more of these rules that we have accepted as theoretically the foundation of breeding success.

The few conservative breeders of dairy cattle have made it a practice to hold over all of their promising heifers until they were tested. High prices do not tempt them to sell heifers that are needed to build up their herds. The man who breeds along approved lines and saves his best heifers cannot fail to achieve success as a breeder. But every time he sacrifices the young heifers needed for improving his own herd he slips back the few feet that he has climbed above the average of the breed. It is with cows of his own breeding that he produces the best results, and no matter how high prices the females from other herds cost him, they seldom give as good results as those he has bred and developed according to his own ideals as to type and productive qualities. The reason why many breeders failed to make a financial success is because they disposed of their heifers and young cows before they knew their value. It is always safer for the breeder to test out every young cow before putting a price on her. Likewise, the value of young males is not understood until the cows in the herd have been tested. The purchased sire of another line of breeding can seldom do for a herd what one of home-breeding and an equal record can accomplish, although it is many times advisable to buy one to obtain new blood for the herd. It is with the finest of one's own crop of calves that the best young animals are produced.

Holding a herd of dairy cattle up to a high standard of milk and butter-fat production, after such a standard has been reached, is a problem as puzzling as it is great. Many splendid herds, created by genius, have passed into oblivion through the inability of owners to hold them up to the high standard that has been attained. When a high standard is reached the greatest care and skill are required to hold it there, for there is always a tendency to degenerate. Many of the most skillful breeders of dairy cattle have been deceived by the introduction of animals from other herds into their own herd. The man who buys a sire that is capa-

ble of maintaining or increasing the milk yields of his herd after a standard of twelve thousand pounds of milk, or six hundred pounds of butter-fat per year has been attained has certainly been in a measure successful.

When one has a herd of cows that is producing almost up to the limit of animal capacity, at least such capacity as has been reached at the present time, it is very difficult to increase that production. Indeed, it is a difficult matter to avoid losing some of what has already been gained. It is a very easy matter to select a sire that is capable of increasing the production of a herd of cows whose annual average is below six thousand pounds of milk or three hundred pounds of butter-fat. Almost any good sire of the leading dairy breeds would produce such results. This only illustrates the extreme difficulty of properly selecting a head of the herd of already high productive quality. It is a problem that increases in difficulty as the animals in the herd approach perfection.

GRAIN TO BALANCE RATION.

Kindly give me a good balanced ration for dairy cows. I have plenty of alfalfa hay, cornstalks, oat straw, small potatoes and mixed hay. How much of each shall I feed, and what would I have to buy?

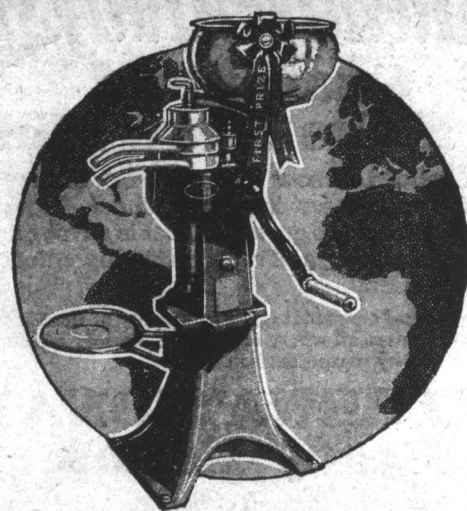
Charlevoix Co.

C. J. S.

Alfalfa hay, cornstalks and oat straw and mixed hay are all excellent roughage feeds. Small potatoes are also a bulky food but would be valuable to furnish succulency. I would not advise, however, feeding them in large quantities; ten to fifteen pounds per day would be sufficient. All of these foods are bulky and there is not enough protein in alfalfa hay to balance the carbohydrates in cornstalks and oat straw. Besides a ration ought to be balanced from two viewpoints. First, there should be a certain proportion of protein and carbohydrates; and second, there should be a certain proportion of roughage and concentrates. And so to balance this ration one must have grain and concentrates and this grain must contain protein in excess in order to make it a balanced ration. A good grain ration would be corn meal and wheat bran, mixed equal parts by weight, in addition to three pounds of oil meal fed to each cow per day. I would prefer to feed the oil meal separately if possible so that you would know just the amount you were feeding because this and cottonseed meal, which will do just as well, are highly concentrated foods and one is liable to overfeed or to feed irregularly if it is mixed with other grain.

I would suggest that you feed this three pounds of oil meal or cottonseed meal separately. You can give the cows the corn meal and wheat bran and then immediately put the oil meal in the manger, say one and a half pounds in the morning and again at night, then you know just how much oil meal your cattle are getting. Feed a sufficient amount of corn and wheat bran in addition to the three pounds of oil meal or cottonseed meal to give each cow a pound of grain per day for every four pounds of milk produced in a day if the milk tests less than four per cent. If it tests more than four per cent, then feed one pound of grain per day to every three pounds of milk produced in a day.

If you have sufficient alfalfa feed this once a day and then cornstalks and mixed hay once a day, feed liberally of this bulky food. C. C. L.



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Order your De Laval now and let it begin saving cream for you right away. Remember that a De Laval may be bought for cash or on such liberal terms as to save its own cost. See the local De Laval agent, or if you don't know him, write to the nearest De Laval office as below.

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We need a young married man with small or no family to work at Brookwater farm. No man who cannot furnish best of references as to character and dependability need apply. Wife must be a good cook and willing and able to prepare meals for 1 or 2 extra men as required. We are looking for clean capable people who are ambitious to find a permanent place where faithful efficient service will be appreciated. Must demonstrate ability, willingness, loyalty, before unusual wages will be paid. BROOKWATER FARM, R.F.D. 7, Ann Arbor, Mich. Herbert W. Mumford, Owner J. B. Henderson, Mgr.

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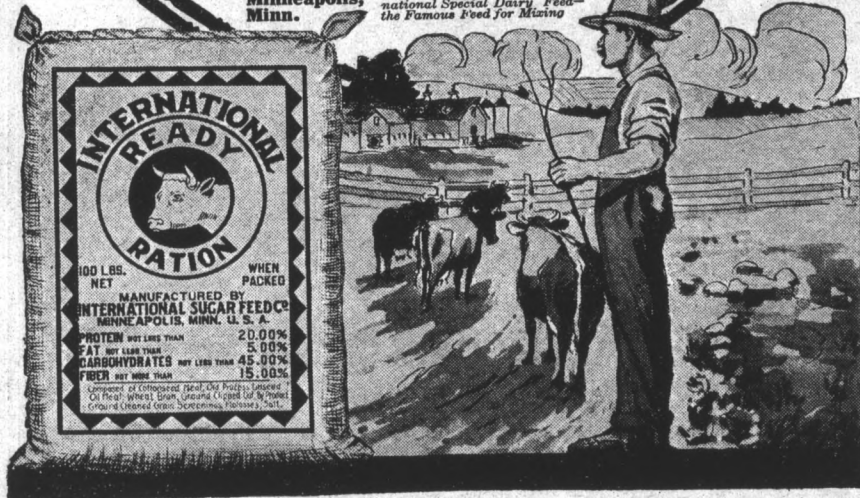
This feed takes the guesswork out of feeding. International Ready Ration is a 20 per cent protein feed, containing every food element essential to maximum milk production. That is why it is guaranteed to increase the flow of milk.

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Considered from any standpoint—food conservation—economy—better feeding—better live stock—bigger profits—the Kalamazoo Silo is a valuable asset to any farm. During the twenty-eight years they have been on the market, no Kalamazoo Silo has ever "worn out" or passed the usable stage. Think of that!

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Your choice of four of the best time-defying woods. Shipped complete, ready to set up. Quickly and easily erected by inexperienced home labor. All Kalamazoo Silos, whether wood or tile, have the famous Kalamazoo Galvanized Steel Door Frames and continuous doors.

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There is no reason to postpone action any longer. A little investigation and study of the silo question will quickly show that the Kalamazoo is the best for you. We offer special inducements to early buyers, and easy terms, too, if desired. Write for catalog today.

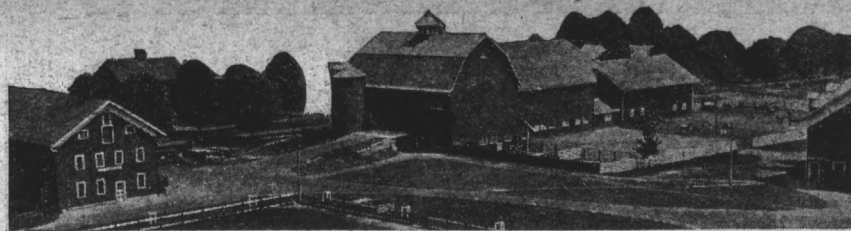
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Feeding the Dairy Cows

BARLEY, OATS AND CORN.

I would like to know in what proportion to feed barley, oats and corn, crushed, for cows giving about forty pounds of milk per day. They have all the ensilage twice a day that they can eat, that could husk about eighty baskets of corn per acre. Put in September 1, also mixed timothy, one-third, and clover two-thirds hay, good oat and barley straw. How will I feed these home-grown crops to get the best results for a balanced ration. Will it pay to sell some and buy other feed? Livingston Co.

F. L.

You can't combine barley, oats and corn so as to make a balanced ration when you feed corn silage and mixed hay as roughage. There isn't protein enough; purchase cottonseed meal or oil meal. If you will feed two pounds of oil meal per day, or two pounds of cottonseed meal per day, and then will feed your barley, oats and corn in equal parts by weight and mix this with one-half this weight of bran, you will have sufficient protein to balance the ration with your roughage.

A good rule for feeding grain to the dairy cows is to allow them a pound of grain per day for every four pounds of milk they produce if the cow produces less than four per cent milk; if she produces more than four per cent milk she ought to have a pound of grain for every three pounds of milk. The proper way to feed this grain would be to feed oil meal or cottonseed meal separately, giving a pound night and morning on the ensilage, then feed enough of the mixture of barley, oats, corn and bran so that it can make the required amount of grain.

About one-third of a ration for the dairy cows should be concentrated or grain foods, the other two-thirds roughage. If you have a ration fairly well balanced so far as bulk is concerned and also food nutrients there is no danger of injuring a cow by over-feeding. You can give them all they will eat up clean without injury, even if fed for long periods.

C. C. L.

A BALANCED RATION FOR HOLSTEIN COWS.

Can you give me a balanced ration for 1,000-lb. Holstein dairy cows? The most of them are pure-bred; I have silage, no corn on it, and buy the rest; can get any feed desired that is in the market. I have oats but think them too high-priced. I am feeding bran and cottonseed meal.

A. R. G.

Silage may be a splendid feed, even though it does not contain many ears, provided, of course, that the reason it does not contain many ears is because it was planted thickly. Of course, we want the corn well matured.

You say nothing about hay, but I take it for granted that you have hay to feed as you do not say anything about purchasing it. With clover hay, or even mixed hay, and this corn silage you have a splendid roughage. Bran and cottonseed meal will balance this ration very well but if you feed a sufficient amount of grain you will probably get a slight excess of protein in the ration. Much will depend upon the kind of hay you are feeding and this I do not know, but if it is clover hay you can afford to feed some ground oats in connection with the bran, mixing oats and bran equal parts by weight. Feed the cows not to exceed two pounds of cottonseed meal a day, a pound in the morning and also at night, on the ensilage, then feed a sufficient amount of the ground oats

and bran to give each cow a pound of grain for every four pounds of milk she produces daily. If you do not care to feed the oats you can substitute corn meal in place of this, but if I did this I would mix the corn and bran in the proportion of one to two, one pound of corn meal to two pounds of bran.

C. C. L.

SELLING OATS AND BUYING COTTONSEED.

We have eight cows giving milk; the price of which is \$3.60 per cwt. for four per cent butter-fat, with nine cents for each point above. We have forty tons of silage from corn that would have husked from thirty to fifty bushels of corn per acre. Also plenty of stalks and oats for grain. Would it be advisable to sell oats and buy concentrated feeds? How much grain should one feed?

Kent Co.

F. E.

You do not mention any hay among the roughage feeds, consequently I take it that you have no hay to feed. This being the case it is quite essential that you purchase a concentrated food richer in protein than oats, otherwise you cannot get a combination which will furnish sufficient protein to make a balanced ration even with clover hay in connection with corn silage. Oats would not furnish a sufficient amount of protein. Therefore, it will pay to purchase cottonseed meal or oil meal or gluten feed, some concentrated food richer in protein to balance these carbonaceous foods. It will even take more cottonseed meal to balance this ration than I would like to feed to the cows, and so I would advise that you feed one and a half pounds of cottonseed meal and one and a half pounds of oil meal, and then mix your ground oats with wheat bran, equal parts by weight, and feed each cow a sufficient amount of this mixture, together with the three pounds of oil meal and cottonseed meal to make a pound of grain for every four pounds of milk produced in a day if the milk tests less than four per cent. If it tests more than four per cent the cow should have a pound of grain for every three pounds of milk she produces.

Of course, the bean fodder is of a nature similar to clover hay and would in a measure take the place of clover hay but the cows do not like it as well, in fact, much of it is not fed for cow feed, but it would be a good plan to give them what they will eat, providing you do not expect them to eat all of the bean stalk, let them pick out the best. The cow should have all the corn fodder and corn silage that they will eat up clean without waste.

C. C. L.

GRAIN RATION FOR DAIRY COWS.

I would like a little advice as to the best ration for dairy cows. I have for roughage corn silage, shredded corn fodder and oat and wheat straw. I have corn, oats and barley and can buy oil meal at \$60; cottonseed meal at \$60, and wheat bran at \$38.

Livingston Co.

A. F. B.

Your roughage is deficient in protein. Corn silage, shredded corn fodder and the oat and wheat straw are all foods of the same nature so far as food ingredients are concerned. They make very good roughage but when one wishes to balance a ration with grain foods he must use more protein than he would if he was feeding clover hay or alfalfa hay instead of shredded cornstalks. Where one has corn



silage and clover and alfalfa hay, ground corn and oats with wheat bran and perhaps a little oil meal or cottonseed meal will make a splendid ration, but in the absence of clover hay you will have to feed more cottonseed meal or more oil meal in order to balance it. Where you have corn silage I would not advise feeding corn meal. You might better feed oats or barley with the bran.

In this instance, I would suggest that you feed a pound and a half of oil meal and a pound and a half of cottonseed per day. You could feed the oil meal, say in the morning on the ensilage, and cottonseed meal at night—that will make three pounds of grain per day. Now, you could mix ground oats or ground barley equal parts by weight with bran and feed a sufficient amount of this with your three pounds of concentrates to make one pound of grain a day for every pound of butter-fat your cows produce in a week. For instance, if you have a cow that is producing ten pounds of butter-fat in a week, give her ten pounds of this grain per day. If you do not test your cows so that you know the amount of butter-fat produced, another good rule is to feed a pound of grain for every four pounds of milk produced.

C. C. L.

GRAIN RATION WITH UNHUSKED CORN.

Please give me a balanced ration for dairy cows. My rough feed consists of corn silage, unhusked corn and clover hay. I have oats, oats and barley grown half and half. I would like to feed the unhusked corn twice a day. What will I have to buy?

Wexford Co.

A. H.

Corn silage, unhusked corn and clover hay are all splendid roughage foods. There will probably be some waste in feeding the unhusked corn because cows will not masticate this ear corn thoroughly enough so that you will get economical digestion. A portion of the hard corn will pass through the alimentary canal without being acted upon very much by the digestive fluids. Where fattening steers are fed on husked corn, the feeders find it necessary to have hogs follow the steers to utilize this waste and the same thing, of course, could be done with cows that are fed on unhusked corn.

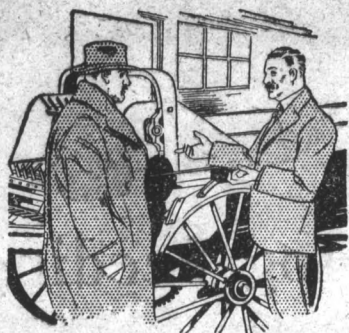
It is necessary to have some concentrated food with your oats and barley to furnish a sufficient amount of protein to balance up the ration. I would suggest that you mix wheat bran with the ground oats and barley, say in the proportion of one hundred pounds of oats, one hundred pounds of barley and one hundred pounds of wheat bran, then feed cottonseed meal at the rate of two pounds per day, giving each cow one pound night and morning on the ensilage, and feeding a sufficient amount of the other grain so that each cow will receive one pound of grain per day for every four pounds of milk produced if her milk tests less than four per cent. If it tests more than four per cent, then feed her one pound to every three pounds of milk she produces in a day.

C. C. L.

The droppings from the cattle will benefit the pasture more if they are spread or broken up with a spike-tooth harrow with the teeth set well aslant. This prevents the grass from being killed out and weeds coming in where the droppings have lain.

A good cow in the hands of a poor dairyman is a poorer proposition than a poor cow in the hands of a good dairyman. Both are very poor combinations, however; a good dairyman will not keep a poor cow more than one season.

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The use of steel where strength is needed in the Bellevue No. 10 Spreader is assurance of its ability to stand up to hard work—not alone for one season, but for many years.

There's the steel arch that keeps the bed from "giving" and that acts as a support for the upper cylinder. The bed is built on channel steel sills and is supported by steel braces and straps. And the cylinders that pulverize the manure are steel and each tooth is riveted to an angle steel cross-bar. The distributor is made of steel

from the sharp points of the blades clear through to the square shaft to which they are securely fastened.

Rugged strength characterizes the entire Bellevue No. 10.

That's the only kind of a spreader that is profitable for you to own—one that's built from the ground up to give you the same economical, satisfactory service, season after season.

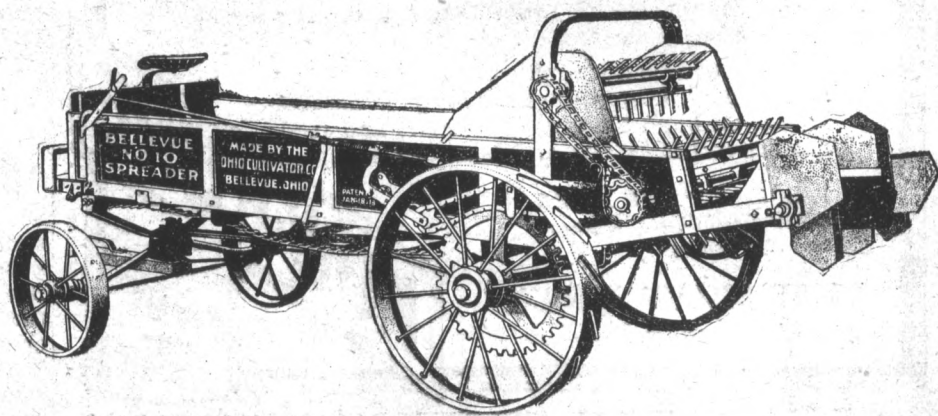
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OHIO CULTIVATOR COMPANY

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Liming Soils In Winter

Winter soil liming has become an established economic farming practice, under the prevailing conditions of labor shortage and transportation facilities. Investigations show conclusively that lime may be applied to the soil during the winter with practically the same efficiency as when applied prior to planting.

For the information of farmers, considering this subject, we here publish the statements of opinion from these Agricultural College and Experiment Station experts.

DR. WM. FREAR

Pennsylvania Experiment Station

"With reference to the desirability of the winter transportation of lime, under existing transportation difficulties, I think there can be no question."

PROF. F. C. JOHNSON

Director of the Virginia Truck Experiment Station, Norfolk, Va.

"We think it a very good practice for the farmer to purchase lime during the Fall and Winter for immediate application, or for application prior to planting crops in the early Spring."

DR. H. J. PATTERSON

Maryland Agricultural College

"We have gotten very good results by applying lime during the Winter as a top dressing on wheat and fall seeded grasses."

DR. JACOB G. LIPMAN

New Jersey Agricultural College

"The wisdom of purchasing and spreading lime in the Fall and Winter is entirely proper. It has been our practice for some time past to advise farmers in New Jersey not to leave certain of the farm work that can be done in the Winter until early Spring."

DR. ELMER O. FIPPIN

Cornell University

"In the matter of the ordering and use of lime in the Winter, we have emphasized the importance of farmers ordering their lime in the winter, because of difficulties of getting cars in the spring. Also they have more time for such work. We are also recommending in our regular work the practice of applying lime in the Winter any time when the ground is essentially bare of snow."

We have for free distribution a bulletin on "Liming Soils In Winter." Also Pamphlet No. 2, "Facts about the Use of Lime in Agriculture." Write for them today, and secure complete information for economy and profit.

THE LIME ASSOCIATION

AGRICULTURAL BUREAU

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A Healthy AYRSHIRE

This champion three-year-old is a notable example of perfect health. Her yearly record is 15,056 lbs. of milk and 589.2 lbs. of butterfat.

JOIN THE "HEALTHY COW" MOVEMENT

Present-day prices for dairy products are making dairy-men everywhere think more about the milk production of their cows.

The "poor-milker" is usually non-productive because of some disorder of the digestive or genital organs that is sapping at her health and strength. Even apparently slight troubles of this nature usually lead to more serious ailments so common among dairy cows, such as Abortion, Retained Afterbirth, Barrenness, Scouring, Bunches, etc.

A sick cow should be treated like a sick person—with medicine that will correct the trouble. Kow-Kure is the most valuable and best known remedy for the prevention or treatment of cow ailments because its medicinal properties act on the organs where disease originates.

There will be no trouble about the milk flow of a healthy cow; keep yours healthy by having KOW-KURE on hand always. Druggists and feed dealers sell it, in 60c. and \$1.20 packages.

Free book, "THE HOME COW DOCTOR," is yours for the asking.

DAIRY ASSOCIATION CO.
Lyndonville, Vt.



Hog Feeding Experiences

(Continued from page 89).

after they had obtained a weight of perhaps forty pounds.

The middlings were bought at \$44 per ton and the pigs were sold during the month of February last, at a fine price. They also paid for their feed, with a fair allowance for the labor, but they grew slowly and weighed much less than they should at the age at which they were sold.

In the fall of 1917 I fed an old sow practically on wheat middlings. She farrowed eight pigs, and raised seven of them. They were always fat, but did not grow normally. After taking them from the sow, I gave them plenty of milk, but they never grew well, and cost about as much in expense of feed, as they brought when sold.

What Was the Matter?

As I now see it, several things were wrong, all of which I might have remedied.

First, experiments seem to show that wheat middlings have been over-estimated as feed for young pigs. Mixed with other grain, and given in connection with plenty of milk or tankage, they are all right, but fed in too large quantities they are not profitable. It has been clearly proven that wheat contains a poison that when taken in too large quantities prevents growth in the young animals, and reproduction later on.

Again it has been demonstrated that pigs can not be grown to normal size by the use of grain alone, no matter what it may be. So far as is known, corn contains no poison, but alone it will not grow a pig normally. In the first place it does not contain sufficient mineral properties to make the bones, and it probably lacks other properties about which we can not speak so definitely. With plenty of skim-milk added, corn will grow a pig to normal size in as little time as it can be done in any other way.

When pigs have the milk of the mother until they are six or ten weeks old, with a chance to run in good fresh pasture, they will develop in time to normal size by the addition of the ordinary grains. But the progress will be slow without either the skim-milk or tankage.

One may easily balance the ration as far as protein, carbohydrates and fat are concerned, by adding oil meal, beans or peas to the ration of corn. But this will not insure normal growth. The pigs must either have a proportion of animal food in some form, or they must be given access to good pasture.

The writer has been trying to make the hog conform to his way of feeding. From now out, if he feeds hogs he is going to let them have their way.

It is hard enough at best to produce pork at a profit with grain at the present high prices, and it is therefore more than ever before necessary that we should take advantage of every condition in our favor.

If we could furnish the protein lacking in the corn, from cheap cull beans we should be glad to do so, and we can use them to advantage to a certain extent, but we can not grow young pigs normally without a proportion of animal food, or plenty of good pasture. If we have not skim-milk enough, then

we should use tankage. Tankage is very high in price just now, but no higher in proportion than other feed. The feeders of a large district might easily go together and use a car of tankage which would materially reduce the price. In any case, it should be used unless we have plenty of milk.

The hopper feeder is a convenience in hog feeding, but its value will always be regulated by what it contains. There are few cases in which the tankage may be wisely omitted.

GRAIN RATION WITH SILAGE.

Will you please advise a good feeding ration for fattening 800-lb. steers, and also feeding milch cows from the following feed, which I have: Silage of corn and soy beans grown from seed which was mixed four-fifths corn and one-fifth soy beans, and both were ripe at time of cutting, plenty of oat straw and mixed clover and timothy hay; have oats and barley to grind. Would it be necessary to feed cottonseed meal with the above amount of soy beans in silage? I am not feeding it at present and steers are growing nicely on the following ration: One bushel of silage and two quarts of ground oats and barley to each steer twice daily, a good forkful of hay once daily and all the oat straw they want to eat.

Tuscola Co.

C. P. H.

Soy beans in the silage would certainly increase the protein content and therefore it would not require quite as much protein in the grain ration to make a balanced ration for your cattle yet I don't think oats and barley contain a sufficient amount of protein to balance this ration without feeding some cottonseed meal because by so doing you will get more economical consumption of roughage foods, that is, the cows and steers will not need to consume as much of the roughage in order to get the necessary amount of protein to produce a maximum flow of milk or extra growth.

I would suggest that you feed silage, mixed hay and oat straw, in liberal quantities; feed all the cows and steers will eat up clean, then I would feed the cows two pounds of cottonseed meal per day, one pound on the silage night and morning, and balance of grain ration, ground oats and barley. It would be well to get wheat bran and mix with the oats and barley, equal parts by weight, and feed the regulation amount of grain.

A ration for fattening steers would not differ materially from a ration for milch cows, provided the steers were kept in shelter the same as the cows. If the steers are allowed to run outdoors or in an open shed, they will need more carbohydrates to keep them warm than cows that are kept in a warm barn. Otherwise, there would be little difference theoretically in the ration. If the steers are kept outdoors, I would increase the feed of barley and you will find it profitable if you want to turn these steers off as soon as possible to feed them as much as four or five pounds of cottonseed meal per day, beginning with a small amount and gradually increasing. C. C. L.

Half ripened cream churns very slowly—in other words, the butter from it is a long time coming, and the yield is not so good as from the properly ripened article.

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Raise the Calves Easily, Successfully and Profitably on

Blatchford's Calf Meal

In the United States alone more than 1,000,000 calves were raised on Blatchford's Calf Meal last year. It puts calves through to a healthy, vigorous, early maturity at less than one-half the cost of milk. Write for booklet "How to Raise Finest Calves on Little or No Milk." We'll send it free, also name of your nearest dealer.

Blatchford Calf Meal Co. — Dept. 4811 —
In Business Over 115 Years Waukegan, Ill.

KELLY DUPLEX GRINDING MILLS

One of the Easiest Running Mills Made
Grinds ear corn, shelled corn, oats, wheat, barley, rye, kafir corn, cotton seed, corn in shucks, alfalfa, sheaf oats, or any kind of grain. Bagger has a double spout attached to either side of mill. We furnish extra hopper for grinding small grain and ear corn at the same time. Made with double set of grinders or burrs. Have a grinding surface of just double that of most mills of equal size, therefore, do twice as much work. Requires 25% less power. Especially adapted for gasoline engines. We make 7 sizes.
Write for Free Catalog.
DUPLUX MILL & MFG. CO., Box 308, Springfield, Ohio

Ross "Improved" Superior Duplex Mill

Grinds cob-corn, shelled corn, oats, rye and all small grains—fine or coarse; also alfalfa.
Positive Gear Drive
Small Power and Low Speed
Strong and durable, none better made; easily regulated. Every Mill guaranteed. The Pivoted and Adjustable Self-Confirming Duplex Burrs guarantee uniform grinding. Ground meal saves one-fifth or more of grain and means cheaper feeding. Write today for catalog.
The E. W. Ross Co., Box 1014, Springfield, Ohio

It Pays to Dehorn
Dehorned cows give more milk; take less room; are gentle and easily handled. Steers fatten quicker and are harmless—they pay better. The new Improved Keystone Dehorner removes horns quickly, cleanly and safely. Shear has sliding cut; no bruising. Easy to dehorn. Money-back guarantee. Send for booklet.
M. T. Phillips, Box 126, Pomeroy, Pa.

Cow Waters Herself

with this wonderful new Libbey Automatic Water Bowl. Animal moves lever, opening water valve, when it starts to drink. Lever swings back, closing valve, when animal stops drinking.
15% More Milk
Milk is 87% water, and cows cannot give their greatest yield unless they have plenty of water constantly within reach. Farmers who use Libbey Bowls report an increase of 15% to 20%, which soon pays for the bowls.

Libbey Automatic Water Bowls

are the most sanitary and successful ever invented. Each bowl controls its own water supply, operated entirely by cow, and may be put at different heights, or in any stall or pen. No float tank required. Cannot overflow; cannot get out of order. Almost no water left in bowl to become stagnant. They save labor and feed and increase milk. Prevent spread of contagious diseases, as each cow has her own bowl and no water can pass from one to another, as with old-style bowls. Very simple and easy to install. Write for circular and prices, also FREE DAILY MILK AND FEED RECORD.
If interested in Stanchions, Stalls, Carriers, etc., ask for free General Catalog.

C. A. LIBBEY COMPANY
104 Marion Street Oshkosh, Wisconsin



GALLOWAY AND GUERNSEY CATTLE.

Can you tell me why we hear no more of the Galloway cattle? Can you give me a brief history of the Guernsey cattle, also what advantages have they over other breeds?

Genesee Co.

C. D. C.

Galloway cattle have not gained a foothold on Michigan farms because they are primarily adapted to conditions where beef production is the main object. It would seem that this breed could be made to pay good returns in some of our northern counties. The hide of the Galloway, with its thick and long fall or winter coat, has a distinct value in itself. Properly tanned it furnishes a lap robe, overcoat or floor rug, surpassing in beauty the pelt of the Buffalo, now so highly prized. Good Galloway rugs or lap robes sell for from forty to fifty dollars, and overcoats of this fur command high prices.

The origin of the Guernsey, like the Jersey, is quite obscure, but is supposed to have been derived from the same ancestry. Like the Jersey, the Guernsey has for many generations been protected at home by the exclusion of all other breeds. The introduction of this breed into America dates back to 1842. The size of the Guernsey most acceptable is about 1,500 pounds for a mature bull, and 1,050 pounds for a mature cow.

The quantity of milk produced by a Guernsey may be considerable. The cows are persistent milkers and produce very rich milk. In numerous public tests, and on farms under official supervision the breed has attained high honors as butter producers. Guernsey milk is usually of a higher natural color than that of any other breed equally common, due to its butter-fat content. The fat globules are large and have a deeper yellow than even the Jersey. In fact, the Guernsey breeders seek the rich yellow as a characteristic claiming that with this breed it is not necessary to color the butter. While Guernsey cows have not been tested as much as either the Jersey or Holstein-Friesian cows, they have made excellent butter records.

THE NEW YORK MILK SITUATION.

JUST now there is a milk strike on and no League members are shipping to New York. City-dealers announced a reduction in price which would be paid to producers after January 1, amounting to one cent a quart, I understand. The Dairymen's League, which has apparently almost universal membership here, called a stop immediately, and not a farmer is delivering milk to the station. At my cousin's place he and several neighbors installed a separator and a churn in their milk room, and the producers from about there bring in their milk night and morning and all assist in the work for all. They do considerable sweating and are considerably inconvenienced by the unusual work, but not one complains, and they are looking forward to but a few days of the trouble.

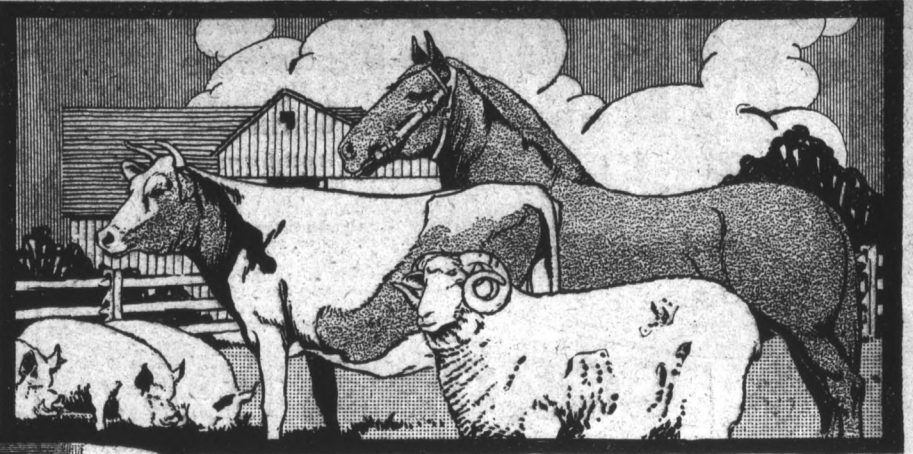
I never saw cooperation between neighboring farmers carried out so well or far as it is here. They unite to rent land, plow, plant, cultivate, harvest and thresh their products, and the results are truly satisfactory from any way you look at it. I never thought farmers would stick together to the degree that these do.

J. P. M.



DR. HESS STOCK TONIC

Dr. Hess Poultry PAN-A-CE-A
will help make your hens lay now



ARE YOU FEEDING WORMS?

FEEDING wormy animals is wasting food. They eat more but they do not thrive.

Every farmer wants to be up to the limit of production now while the hungry world is calling for food.

Make every pound of feed you feed do its whole duty.

Drive out the worms and condition your stock for growth, for work—for beef, mutton and pork, by feeding Dr. Hess Stock Tonic.

Eliminate Waste and Increase Production

Condition your cows for calving by feeding Dr. Hess Stock Tonic before freshing. Then feed it regularly to increase the flow of milk. It lengthens the milking period.

It means healthy, thrifty animals free from worms. It contains *Tonics to improve the appetite, Laxatives for the bowels, Vermifuges to expel worms, Aids for digestion, Ingredients which have a favorable action on the liver and kidneys.*

The dealer in your town will sell you Dr. Hess Stock Tonic according to your needs and refund your money if it does not do what is claimed. Buy 2 lbs. for each average hog, 5 lbs. for each horse, cow or steer, to start with. Feed as directed and see how your animals thrive.

Why pay the peddler twice my price?

25-lb. pail, \$2.25; 100-lb. drum, \$7.50

Except in the far West, South and Canada.

Smaller packages in proportion.

DR. HESS & CLARK, Ashland, Ohio

Dr. Hess Instant Louse Killer Kills Lice

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CATTLE.

Wildwood Farms

Breeders of Best Strains of
Aberdeen Angus Cattle
and **Duroc Jersey Hogs**

Several young bull calves on hand, three of which are of serviceable age, out of Black Monarch III, three times Grand Champion, Michigan State Fair. Also several AI Brood sows. Will be glad to correspond with you by letter regarding stock. Write

SIDNEY SMITH, Supt.

Wildwood Farms, Orion, Michigan
W. E. SCRIPPS, Proprietor.

REGISTERED Aberdeen Angus two heifers, ten bulls, from eight to ten months old. Our motto: size with quality, best of breeding. Price two hundred dollars each. F. J. WILBER, Ohio, Mich.

WOODCOTE ANGUS

TROJAN-ERICAS & BLACKBIRDS (BLACKCAPS) only. The most fashionable strains of the breed. Great care given to matings and pedigrees. Every animal BRED IN THE PURPLE. Breeders and feeders of many INTERNATIONAL WINNERS. WOODCOTE STOCK FARM, Ionia, Mich.

Cloverly Angus Good quality bulls of serviceable age and younger. Inspection invited. Geo. Hathaway and Son, Ovid, Mich.

For Sale Registered Guernsey Bull

Gov. Chene Golden Noble & May Rose breeding. Tubercular tested by state Haley Sequel born 1912. Great grand son of Gov. Chene sires and grand sires are all A. B. breeding. Price \$250 F. O. B. Avondales Hope born Mar. 25, 1917. Sire Haley Sequel Dam Gertrude of Halcyon. Farm price \$150 F. O. B. Luella's Duke of Avondale born Jan. 1, 1918. Sire Lord Sunrise Dam Luella's Maid. Price \$100 F. O. B. Avondales Hero born Jan. 10, 1918. Sire Haley Sequel Dam Serena of Pittsfield. Price \$200 F. O. B. Avondales Joy born Feb. 8, 1918. Sire Haley Sequel Dam Winkle of Pittsfield. Price \$125 F. O. B. Avondales Mark born Apr. 9, 1918. Sire Lord Sunrise, Dam Popular Polly. Price \$100 F. O. B. Come and look our herds over. AVONDALE STOCK FARM, Wayne, Mich.

GET GUERNSEYS

If you want to increase your dairy profits you need to know about the cows whose average production, under tests supervised by State Agricultural Colleges, is three times as great as the average of all dairy cows in the United States. Ask for "The Story of the Guernsey."

THE AMERICAN GUERNSEY CATTLE CLUB, Box 1, Petersburg, N. H.

Registered Guernsey Bull Grandson of King Bell Bury of Strawberry Hill. Born April 24th, 1917. Splendid individual. First calf of heifer whose dams and grand dams have high advanced registry records. Tuberculin tested. A bargain at \$250.00. Telephone 56F2. STRAWBERRY HILL FARM, Birmingham, Mich.

GUERNSEYS must reduce herd, so offer a few choice females of Glenwood breeding also bulls, all stock of A. B. breeding, herd tuberculin tested. T. V. HICKS, Battle Creek, Mich.

Registered Guernsey Cow Strawberry Sally Born July 15th 1914. Celebrated Masher blood lines. A good individual but her nose is black. Tuberculin tested. Will sacrifice for \$225.00. Telephone 56F2. STRAWBERRY HILL FARM, Birmingham, Mich.

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

GUERNSEYS Registered bulls two years old and under grade heifers all ages, write your requirements. WALTER PHIPPS FARM, 80 Alfred St. Detroit

Registered Guernsey Cow Rose of Dedp Dale four year old. May Rose breeding. Very handsome individual. Right in every way. Tuberculin tested. A good buy at \$375.00. Strawberry Hill Farm, Birmingham, Mich., Tel. 56F2.

For Sale Registered Guernsey Cattle and Berkshire Swine. JOHN EBELS, R. 2, Holland, Mich.

Guernsey Bull For sale, 15 mo. old, right in every way. Write for particulars. O. A. HENNESEY, Watervliet, Mich.

FREE

-Postpaid

This Big Sample Box of My Famous Healing Ointment



I want you to see for yourself what a wonderful healing preparation CORONA WOOL FAT COMPOUND is. I want to prove to you on your own horses and cows and WITH-OUT A CENT OF COST how quickly it will heal and cure Galled and Sore Shoulders, Sore Necks, Collar Boils, Barb Wire or Other Cuts, Wounds, Scratches, Split Hoofs, Sore and Contracted Feet, Sore Teats on Cows, Etc.

CORONA WOOL FAT

is unlike anything you ever tried or used. Don't confuse it with salves which contain grease and blister compounds. This remedy has no equal. It is not a grease but the fatty secretions extracted from the skin and wool of the sheep. It is readily absorbed by skin and hoof, penetrates to the inflamed inner tissues and

Heals Without Leaving a Scar

CORONA does not burn or blister, grows hair over cuts and sores, causes no pain, soothes and heals surprisingly quick. The free sample will prove my claim. A postal brings it postpaid, and I'll also send you my free book "HOW TO TREAT HOOF, WOUNDS, SORES, ETC." Send for both today. We also manufacture Corona Distemper Cure for Horses and Cows and Corona Balm for household use. Sold by leading blacksmiths, druggists, harness and hardware dealers.

C. G. PHILLIPS, Pres., THE CORONA Mfg. CO. 13 Corona Block, Kenton, O.

How To Treat Hoofs Wounds Sores etc



COTTONSEED MEAL AND OIL MEAL.

What are the relative merits of cottonseed meal vs. oil meal, (old process), used as a supplementary feed to ensilage and alfalfa hay in the fattening of cattle for beef? There is a difference of price in these two feeds of about \$5 a ton and their analysis is practically identical. How does molasses feed compare with either of the above?

Monroe Co.

S. B. W.

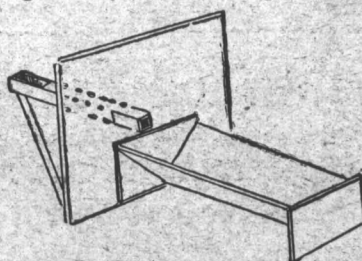
These two by-products compare favorably as sources of protein in compounding balanced rations. Cottonseed meal contains on the average 37.2 per cent digestible protein, 16.9 per cent digestible carbohydrates and 12.2 per cent ether extract or fats, while linseed meal (old process) contains 29.3 per cent digestible protein, 32.7 per cent carbohydrates and 0.7 per cent ether extract or fats. You will notice that cottonseed meal is about ten per cent richer in digestible protein but does not contain as much carbohydrates while it contains a larger per cent of fats. The nutritive ratio or the proportion of carbohydrates to protein are about the same in each, but in feeding there is a difference in them. Cottonseed meal is constipating while oil meal is laxative. If cottonseed meal is fed in large quantities to breeding animals it affects them, producing bad effects, while oil meal can be fed quite freely, sometimes it is rather laxative but usually it has a beneficial effect.

Molasses feed is a different food, being richer in carbohydrates but deficient in protein. It is more like corn meal than cottonseed meal, oil meal, wheat bran or other protein foods. Molasses food is so different from these other foods that you cannot compare them. If you were feeding alfalfa hay for roughage and wanted to feed some cottonseed meal or oil meal, then it would be well to mix molasses feed with the protein feed to balance the ration, otherwise you would have too much protein, but where your roughage is silage or cornstalks and mixed hay, you want a grain ration that is rich in protein like the oil meal or cottonseed meal. Molasses feed would not help balance such a ration.

C. C. L.

SLOPPING THE PIGS.

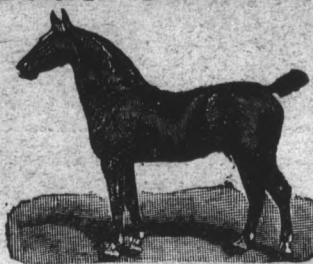
WHENEVER I went out to the pig pen or pig house to feed the pigs, I always had trouble, as they would climb into the trough and up around the door, and if I was not very careful some of the feed would be spilled; especially if it was very much liquid. I did not care so much if the solid part was not put in the trough, as they could find it in time and there would be no waste; but when liquid, like skim or buttermilk was spilled, it was generally a loss. To prevent any



further spilling and bother, as I have mentioned above, I rigged up a spout that went to the trough from the outside of the pen and since then I have had no more spilling or losses of liquid feed.—C. E. R.

The mangel is more nutritive as a stock food than the turnip; weight for weight, it contains more dry matter and a higher percentage of sugar.

Gombault's Caustic Balsam



Has Imitators But No Competitors

A Safe, Speedy, Positive Remedy for

Curb, Splint, Sweeny, Capped Hock, Strained Tendons, Founder, Wind Puffs and Lameness from Spavin, Ringbone and other bony tumors. Cures skin diseases or Parasites, Thrush, Diphtheria. Removes Bunches from Horses or Cattle.

As a Human Liniment and Antiseptic for external use it is invaluable.

Every bottle of Caustic Balsam sold is warranted to give satisfaction. Price \$1.75 per bottle. Sold by druggists, or sent by parcel post, with full directions for its use. Send for descriptive circulars, testimonials, etc. Address

The Lawrence-Williams Co., Cleveland, O.

Calf Enemies

WHITE SCOURS BLACKLEG

Your Veterinarian can stamp them out with Cutter's Anti-Calf Scour Serum and Cutter's Germ Free Blackleg Filtrate and Aggressin, or Cutter's Blackleg Pills.

Ask him about them. If he hasn't our literature, write to us for information on these products.

The Cutter Laboratory
Berkeley, Cal., or Chicago, Ill.
"The Laboratory That Knows How"

Lump Jaw

The farmer's old reliable treatment for Lump Jaw in cattle.

Fleming's Actiniform

Sold for \$2.50 a bottle under a positive guarantee since 1896—your money refunded if it fails. Write today for FLEMING'S VEST-POCKET VETERINARY ADVISER. A book of 197 pages and 67 illustrations. It is FREE.

FLEMING BROS., Chemists, 252 Union Stock Yards, Chicago



A General Purpose Breed

The Holstein-Friesian breed excels in milk production; it is superior for veal production and valuable for beef production.

If interested in

HOLSTEIN CATTLE

Send for our booklets—they contain much valuable information.

HOLSTEIN FRIESIAN ASSOCIATION OF AMERICA, Box 164, Brattleboro, Vt.

For Sale

20-2 year old high grade Holstein heifers; part open; part bred to my 30 lb. herd bull. All from my own herd of 50 milch cows. Herd averaged better than 8,000 lbs. each year. These will do better.

John B. Martin

G. R. Sav. Bank Bldg., Grand Rapids, Mich.

Parham's Pedigree Stock Farm offers Reg. Holstein cattle, Chester White Swine, extra bargains in calves and fall pigs. Bulls half price. B. B. PARHAM, Bronson, Mich.

For Sale Registered Holstein heifer bred dam gives 125 lb. milk a day. Price \$300.00 JOHN EBELS, R. 2, Holland, Mich.

Reg. Holstein Bull Calves dandies at \$50 reg. and del. J. ROBERT HICKS, St. Johns, Mich.

\$30 Buys high grade unregistered Holstein heifer, nearly 2 months old, sired by a 30 lb. bull. B. B. REAVEY, Akron, Mich.

The Wildwood Jersey Farm. Bulls for sale by Majesty's Oxford Fox 134214 and Eminent Lady's Majesty 150834, and out of R. of M. Majesty dams. ALVIN BALDEN, Capao, Mich.

Maple Lane R. of M. Jersey herd. Bulls, bull calves and heifer calves sired by a nephew of the new World's Champion, Sophie's Agnes. Also R. L. R. Cockerels, both combs. Irwin Fox, Allegan, Mich.

Hillside Farm Jerseys, offer 3-yearling bulls, backed by tested dams, and sired by a double grandson of Royal Majesty, first prize & junior champion at Mich. State Fair, good individuals. C. & O. Deake, Ypsilanti, Mich.

The Michigan Live Stock Insurance Company

A Michigan organization to afford protection to Michigan live stock owners. We have paid over \$17,000 in death losses since we began business July 5th, 1917.

Is there any stronger argument for this class of insurance than \$17,000 of losses on \$1,500,000 of business?

Your animals are well and sound today but tomorrow some of them are dead. Insure them before it is too late.

We indemnify owners of live stock—horses, cattle, sheep and hogs, for loss by accident and disease.

See our agent in your vicinity.

Colon C. Lillie, Pres.
319 Widdicombe Bldg., Grand Rapids, Mich.

Harmon J. Wells, Sec.-Treas.
Graehner Bldg., Saginaw, W. S., Mich.

FEEDING HOGS? THEN HERE IS WHAT YOU WANT!

Ask your dealer for

DIAMOND HOG MEAL

Made from the nutritious hearts of corn kernels

Write to C. FRANCIS, 909 Ford Building, Detroit, for sample, literature and particulars

CATTLE

"Top-Notch" HOLSTEINS

The young bulls we have for sale are backed up by many generations of large producers. Buy one of these bulls, and give your herd a "push". Full descriptions, prices, etc. on request. McPherson Farms Co., Howell, Mich.

"Winwood Herd"

REGISTERED
Holstein-Friesian Cattle

Sire in Service

FLINT MAPLECREST BOY

His sire is Maplecrest Korndyke Hengerveld. His three nearest dams each over 30 lbs. of butter in 7 days. His dam and granddam both made over 1232 lbs. of butter in one year. It is the yearly cow we are looking for to deliver the goods. Flint Maplecrest Boy's Dam is Gluck Vassar Bell, 30.57 lbs. of butter in 7 days and 121 lbs. in 30 days. Her butter fat test is 5.27. This looks about right to the man who goes to the creamery. We have bull calves from 2 weeks to 12 months old. From A. R. O. dams and sired by Flint Maplecrest Boy, which we will sell at a dairy farmers price breeding considered. Just think 40 more cows to freshen which means more bull calves. Let us know your wants. We will make terms on approved notes.

JOHN H. WINN, Inc.

Lock Box 249, Roscommon Mich.
Reference Roscommon State Bank.

The Pontiac Herd

"Where the Champions come from"

Offer Bull Calves sired by sons of Pontiac Korndyke, Hengerveld DeKol, Pontiac Dutchland, or Admiral Walker Pietertje.

Do you want a Pontiac in your herd?

Pontiac State Hospital, Pontiac, Mich.

THE HOLSTEINS

At Maple Avenue Stock Farm are under Government supervision. The entire herd have just been tuberculin tested and not one reactor. A good place to buy that bull you are looking for, and I have two very fine, richly bred, and splendid individuals ready for any amount of service. I want to answer any question you may ask about them.

L. E. CONNELL, Fayette, Ohio.

The Traverse Herd

We have what you want in BULL CALVES, the large fine growthy type, guaranteed right in every way. They are from high producing A.R. O. ancestors, Dam's records up to 30 lbs. Write for pedigrees and quotations, stating about age desired.

TRAVERSE CITY STATE HOSPITAL
Traverse City, Mich.

For Sale An 11 lb. 2 yr. old dam of a 31.77 lb. bull and a 26 lb. 3 yr. old. This heifer is a fine 3 yr. old, and due to calve Feb. 1 by a 35 lb. bull. Priced to sell at once. LeGrande Farm, N. P. PIERCE, Mgr. Manchester, Mich.

CLUNY STOCK FARM

100--REGISTERED HOLSTEINS--100
When you need a herd sire remember that we have one of the best herds in Michigan, kept under strict sanitary conditions. Every individual over 6 mos. old regularly tuberculin tested. We have size, quality, and production records backed by the best strains of breeding.

Write us your wants.

R. BRUCE MCPHERSON, Howell, Mich.

DISPERSAL

10 A. R. O. Holstein Cows, 4 to 6 years old, records up to 26 lbs. in 7 days, 3 Heifers 2 to 3 years old, 4 yearling Heifers from A. R. O. Dams, 5 Heifer calves.

Cows all fresh since October save one, due this winter. All under Government supervision for control of tuberculosis. Herd located at Fabius Station near Three Rivers, Michigan.

Peaceland Stock Farm, Three Rivers, Mich.
Chas. Peters, Herdman. For breeding and prices Write C. L. BRODY, Port Huron, Michigan

For Sale at a bargain. A few young bull calves from high producing stock. Buy one of these fine calves and raise a bull for next fall. A. F. LOOMIS, Owosso, Mich.

\$75 gets 1 mos. old grandson of all four D.D. Aitkens Maplecrest Korn. Heng; 26 lb. dam of Johan Heng. Lad; 20 lb. son DeKol 2nd, Butter Boy 3rd, 19 lb. 2 yr. M. L. McLAULIN, Redford, Mich.

HOLSTEINS of quality. Bull calves from dams with records high as 31 lbs. in 7 days. Also collier puppies. E. A. HARDY, Rochester, Mich.

Reg. Holstein Bull three mo. old, also some females, some springing, now good O.R. O. breeding. VERNOR CLOUGH, Parma, Mich.

One 4 Year Old

Choice Reg. Guernsey Heifer, will freshen inside 60 days right in every way. \$400. J. M. WILLIAMS, North Adams, Mich.

A Good Note accepted in payment of finely bred registered Holstein bull calves. Quality of the best, and at prices within reach of all. Write: GEO. D. CLARKE, Vassar, Mich.

Veterinary.

CONDUCTED BY DR. W. C. FAIR.

Sand in Stomach.—We had a horse taken sick recently; called our local Vet. to treat him, but the horse died two days later. I opened him and found stomach about full of sand. Can such a case be cured? J. F., Pama, Mich.—The use of a stomach pump and plenty of water might have relieved this case; however, a correct diagnosis is seldom made until after death. Had the horse been fed a balanced ration he might have left sand alone.

Voracious Appetite—Worms.—What can I give a young horse that will eat twice as much grain and hay as the other horses, paws for more and remains thin. The formula you advised containing Fowler's solution, quinine, etc., I have lost, so will ask you to again prescribe for him. Occasionally this horse has passed worms and the commercial remedies I have given fails to rid him of them. R. L. F., Fennville, Mich.—First of all, you had better notice that his grinder teeth are not in need of floating. Give him 1 dr. of santolin, 1 dr. calomel and 1 dr. of powdered areca nut at dose in bran mash three times a week for two weeks, this should destroy many of the worms. Give ½ oz. of Fowler's solution, ½ oz. tincture cinchona and 1 oz. tincture gentian at a dose, either in feed or drinking water. Commence this treatment after finishing giving the worm medicine. This horse may perhaps be one of the kind that is not inclined to lay on flesh.


Cow Gave Bloody Milk—Teat Polypus—Sluggish Kidney Action.—I have a cow that freshened last spring and who, at times, gave bloody milk from one teat, but for only a short period. Then a small bunch seemed to form in teat, which is no larger than a pea. She is due to come fresh in about three weeks and I would like to know what can be done with her. I also have another cow that is due to freshen in February, which seems to have trouble passing water. I might say she has had one calf. L. J. J., Breeds-ville, Mich.—A surgical operation performed by a skillful person is what is required to remove a teat polypus, but bungling, unclean work will only ruin her one quarter, or perhaps more of the udder, therefore I advise you to leave her teat alone. Give her one teaspoonful of acetate of potash in feed or water two or three times a day until kidneys act freely.

Hip Joint Lameness.—Last spring one of my cows got hurt in some way; since then she has been lame in hip. When walking hip joint would snap, then she would travel very lame for a rod or two, then be less lame. During the summer she improved but since she has been stabled she is worse. I removed her from stanchions, and now keep her in a box stall. C. I. R., Sumner, Mich.—Apply equal parts turpentine, aqua ammonia and raw linseed oil to hip joint once a day. Give her 1 dr. sodium salicylate in feed three times daily. She should be kept warm.

Sow Fails to Come in Heat.—I have a pure-bred Hampshire sow that is nine months old, which has not yet been in heat. For the past eight weeks she has been in pen with boar, but am quite sure has not been served. She is fed some corn, middlings, cooked potatoes and milk. F. D., Springport, Mich.—Keep her warm, feed her stimulating food, leave her in pen with the male, and give her ten drops of fluid extract nux vomica and 30 drops of fluid extract capsicum at a dose in feed three times a day. Perhaps she may not come in heat until next spring, and it is well to keep in mind some sows never come in heat or breed.

Nodular Disease.—Will you please tell me what ails my sheep and how to cure them? In my flock of one hundred, there are ten of them that are gradually growing poorer every day, although they have fairly good appetites, eat plenty of feed, but grow weaker and are unable to get up. After being down a few days they die. I opened the stomach of one, found it full of fluid and very little food. G. S., Owosso, Mich.—I am inclined to believe that your sheep suffer from parasitic bowel trouble, "nodular disease," an incurable ailment in sheep. Give each sick sheep a teaspoonful of gasoline in four ounces of sweet milk three times a week for two weeks. In drenching the sheep avoid holding the head too high, and do not be in too much of a hurry. Mix together one part powdered sulphate iron, one part salt, and four parts ground gentian and give all of your sheep some in ground feed once a day; one-fourth of a teaspoonful is a full dose for each sheep.

Write For FREE Copy
of Our Book
"How to Break
and
Train
Horses"



**\$125 PROFIT ON
ONE HORSE**

HOW ONE MAN CHANGED A VICIOUS "NAG" INTO A FAITHFUL PLUGGER

Charles H. Mackley, of Unadilla, New York, bought a vicious, kicking and biting mare for \$50. The horse was a mean one and no mistake. Impossible to drive, and the mere sight of any one transformed the horse into a regular "bucking broncho."

It looked to Mr. Mackley as though this terror wouldn't even earn her feed. About this time Mr. Mackley was introduced to a student of Professor Beery, the famous American horseman. And at this friend's suggestion, Mr. Mackley wrote to Professor Beery for the Beery Course in Horse Breaking and Training. Mr. Mackley gave the course a little spare-time attention and then applied his knowledge to correcting his vicious mare. In 10 days, thru the application of Beery Methods, this \$50 "unbreakable broncho" was transformed into a patient, obedient and faithful plugger, which its owner later sold for \$175.

\$125 profit through the Beery System is but one instance. Hundreds of others write us how they have transformed balkers, kickers, horses with habits, and dangerous horses of all kinds into patient, obedient workers of high value.

QUICK, EASY WORK SURE RESULTS

No theory about the Beery Method. It is the result of 30 years' experience with thousands of horses. The Beery Method is certain and guaranteed to produce results.

Thru the Beery Course, you can easily tame the most vicious horse into a gentle, dependable plugger. Not only will the Beery System teach you to break vicious colts the right way, but thru it you can break any horse of any of his bad habits permanently. Balking, shying, biting, kicking, fright, and all other bad habits will be totally cured forever—and the result will be a more useful horse to own, and a more profitable horse to sell.

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Many Beery Students have been able to pick up a number of "ornery" horses which their owners were glad to get rid of. Then, through the Beery Methods, they have quickly transformed these vicious "nags" into willing workers and have sold them at a big profit. Our free book "How to Break and Train Horses" explains fully about the Beery Course and how much it will mean to you. With the knowledge gained from the Beery Course, you can quickly make your horses or anyone else's horses gentle and dependable.

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Beginners In Holsteins

Consider what it means to you to be able to buy cattle of breeders who give a positive guarantee and a 60 day retest with their cattle.

The Central Michigan Holstein Breeders Sell
FORTY HEAD

At Michigan Agricultural College

East Lansing, Mich. beginning at

9:30 A.M. Thurs. Feb. 6, 1919

Thirty two are cows, seven heifers and two bulls. A 32.36 lb. cow, a 31.81 lb. cow, a 27.3 lb. cow, a 25.6 lb. cow and her 22.3 lb. and 26.95 lb. daughters, a 25 lb. jr. 3 yr. old, a 20 lb. 2 yr. old and a 22.5 lb. cow. Several are yet to be tested and some more good records are likely to be made before sale. Ten head will be bred to a 35 lb. grandson of King Segis, others bred to bulls up to 33 lbs.

A bull calf from a 29.9 lb. jr. 4 yr. old sired by a 32 lb. son of King Segis Pontiac Alcartra, the \$50,000.00 bull. Another bull calf from a 31.81 lb. cow sired by a bull whose sire is a son of a 32 lb. son of K. S. P. Alcartra and whose dam is a 31.1 lb. daughter of a 31.5 lb. cow.

All tuberculin tested and sold subject to 60 day retest privilege and guaranteed breeders if of age. For catalog address

CHAS. A. DANIELS, Sales Mgr.
OKEMOS, MICH.

BROOKWATER FARM
2 Bulls
Ready for Service
Sired by butter bred bulls, and out of high testing dams.
The Producing Kind
with Jersey type and capacity.
Prices reasonable. Also a few bred girls (Durocs) and boars.
Brookwater Farm,
Herbert W. Mumford, Owner,
J. Bruce Henderson, Mgr.
Ann Arbor, Mich.
R. 7.

BUTTER BRED JERSEY BULLS
FOR SALE
CRYSTAL SPRING STOCK FARM,
Silver Creek, Allegan County, Michigan.

JERSEY BULLS
Ready for service FOR SALE
WATERMAN & WATERMAN, Ann Arbor, Mich.

FOR Sale Registered Jersey bulls, ready for service, also calves, line bred Majestic's from high producing dams. All stock tuberculin tested by U. S. Gov't. Reasonable prices. C. A. Taggart, Fairgrove, Mich.

Polled Jersey Cattle Breeders' names, sale dates and other information of
CHAS. S. HATFIELD, Box 57, R. 4, Springfield, Ohio

Meridale Interested Owl No. 111811 heads my herd. Bull calves from this great sire and out of R. of M. dams for sale. C. B. WEBER, Allegan, Mich.

For Sale Registered Jersey Cattle
of both sex. Smith & Parker, R. 4, Howell, Mich.

Herefords

5 Bulls 9 to 14 months old Prince Donald, Farmer and Perfection Fairfax breeding.

ALLEN BROS., Paw Paw, Mich.

Michigan Herefords

REPEATERS AND PERFECTIONS
Young stock for sale at all times.
80 head in herd, all ages.

Farm 5 miles south of Ionia. Visitors welcome. JAY HARWOOD, Ionia, Mich.
CITIZENS TELEPHONE 122-4
Buy a Hereford Sire Improve your Stock

Herefords Polled and Horned blood lines embrace Fairfax, Polled Perfection and Prime Lad 9th breeding. Prices reasonable. COLE & GARDNER, Hudson, Mich.

Herefords Bob Fairfax 404027 at head of herd. Stock for sale, either sex, polled or horned, any age. Priced right. EARL C. McCARTY, Sec'y. H. B. Ass'n. Bad Axe, Mich.

Francisco Farm Shorthorns

We maintain one of Michigan's good herds of Scotch and Scotch Topped cattle. They are well bred, properly handled and price reasonable. Come and see; we like to show them.
P. P. POPE, Mt. Pleasant, Mich.

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

Will sell for quick sale at \$125, bull calf Experience 68277 Registered Shorthorn, calved April 20, 1918, dam Lucy 21978 out of Woodland Choice 66389. If you want quality and lots of it with some real breeding do not lose this chance. Write
THE JENNINGS FARMS, Bailey, Mich.

Shorthorn Seven Scotch and Scotch Topped bulls for sale. Price reasonable.
W. B. McQUILLAN, R. 7, Howell, Mich.

BIDWELL SHORTHORNS

For Beef and Milk.

Registered bulls, cows and heifers—Good Scotch and Scotch-Topped for sale. In prime condition. Modern sanitary equipment. Farm 10 minutes from N. Y. O. depot, 1 hour from Toledo, Ohio. Automobile meets all trains. Write
BIDWELL STOCK FARM,
Box B, Tecumseh, Mich.

Richland Farms—Shorthorns

Home of the Mich. Champions. We have just purchased the entire herd of Scotch cattle belonging to the Estate of the late A. D. Flintom, Kansas City, Mo. About Feb. 1st. we will offer a choice lot of young bulls for sale.

C. H. PRESCOTT & SONS,
Office at Tawas City, Mich. Farms at Prescott, Mich.

For Sale Shorthorns of Quality Scotch and Scotch Topped descendants of Archers Hope, Avondale, Maxwellton Sulton and White Hall Sulton by the Oscola Co. Shorthorn Breeders Ass. JOHN SCHMIDT, Sec. Reed City, Mich.

Shorthorn Bulls ready for service of the choicest breeding. Write me you wants.
A. A. PATULLO, R. 4, Deckerville, Mich.

For Sale Shorthorn Bulls of the choicest breeding and ready for service.
LUD HASTINGS, Napoleon, Mich.

Shorthorns 100 head to select from. Write me your wants, price reasonable.
Wm. J. BELL, Rose City, Mich.

The Kent Co. Shorthorn Breeders have both males and females for sale. Ask about them.
L. H. LEONARD Sec., Caledonia, Mich.

For Sale Best Bakes Shorthorn cows and heifers. Bulls all sold.
CLARE RIGGS, Mason, Mich.

Oakwood Shorthorns. Three bulls sired by Gloster Boy 489681, 9 to 12 months old.
COLLAR BROS., R. 4, Conklin, Mich.

Milking Shorthorns of most noted families either sex, all ages, write OSCAR SKINNER, Pres. Central Mich. Shorthorn Ass'n., Gowen, Mich.

Scotch Shorthorn. A fine lot of young bulls for sale. Phone Pontiac 71575 or Union Exchange. John Lessiter & Sons, R. 1, Clarkston, Mich.

Scotch Shorthorn Bulls including a roan yearling prospective herd header a grandson of Imp. Villagr. LAWRENCE P. OTTO, Charlotte, Mich.

For Sale Roan Shorthorn Bull 1 yr. old, also calves good milking strain.
CHAS. WARNER, Jr., Imlay City, Mich.

SHORTHORN bull calf 3 weeks old. Red, a good Stone from good milking strain. First \$50 takes him.
IRVIN DOAN, Crosswell, Mich.

SHORTHORNS for milk and beef are raised in the BUTLER HERD. Young bulls for sale.
ROSEMARY FARMS, Williamston, Mich.

Stockers & Feeders For Sale

180 Shorthorn Steers ave. 1065 lbs.
130 Hereford Steers ave. 990 lbs.
2 cars of yearling Herefords ave. 750 lbs.
2 cars of Shorthorn yearlings reds and roans. These steers are dehorned and in good flesh. Wapello Co. Ia. is noted for its good cattle. Write
JOHN CARROW, R. 3, Ottumwa, Ia.

For Sale Registered Guernsey Bull 15 mo. old, also a few Bull calves.
E. J. HIMELBERGER, R. 3, Lansing, Mich.

HOGS

For Sale Reg. Berkshire Sows & Boars all ages. Priced to sell.
RUSSELL BROS., R. 3, Merrill, Mich.

Registered Berkshire pigs ready to wean \$15 to \$20 each also three service boars fine quality.
FAIRMAN FARM, Plymouth, Mich.

Duroc Boars, April 1, boars and gilts of the choicest breeding. Also an A.B.O. 1 yr. Holstein bull.
F. E. EAGER & SON, Howell, Mich.

DUROC-JERSEYS

E. D. HEYDENBERK, Wayland, Mich.

DUROC JERSEYS Nothing but spring pigs for sale. CAREY U. EDMONDS, Hastings, Mich.

Duroc bred gilts for March and April farrow with quality and size. Fall pigs both sexes not akin.
W. C. TAYLOR, Milan, Mich.

BIG TYPE DUROCS

Unrelated Trio of fall pigs for \$60.00, single pig \$21.00 Best at breeding. A few excellent Buff Plymouth Rock Cockerels at \$3.00 each.
RUSH BROS., Romeo, Mich.

Duroc Jerseys Large heavy-boned gilts, bred to Junior Champion boar for March and April farrow; prices reasonable. Come and see them, free livery expenses paid if not as represented.
F. J. DROIT, R. 1, Monroe, Mich.

Raise Chester Whites?
Like This
the original big producers



I HAVE started thousands of breeders on the road to success. I can help you. I want to place one hog from my great herd in every community where I am not already represented by these fine early developers—ready for market at six months old. Write for my plan—More Money from Hogs.
G. S. BENSAFEN, R. F. D. 10, Portland, Michigan

Additional Stock Ads. on Page 111

LATEST MARKET REPORTS

SECOND EDITION.

The markets in this edition were revised and corrected on Thursday afternoon, January 16.

WHEAT.

No changes have taken place in wheat prices during the past week. The visible supply in this country increased 3,989,000 bushels, making the present stores in sight to aggregate 129,300,000 bushels. The demand for this cereal has been somewhat modified the past few days, although the grain is being absorbed rapidly in all consuming districts of the northern hemisphere. The growing crop is promising, according to January crop reports. One year ago the price for No. 2 red wheat on the local market was \$2.17 per bushel. Present values here are:

No. 2 red	\$2.30
No. 2 mixed	2.28
No. 2 white	2.28

CORN.

Quotations for corn suffered a decline since a week ago. As is customary at this season of the year, when information on the maturing crop in South America is becoming available, the bears are making much capital of threatened importations from Argentina. These importations have never materialized to an extent that should influence markets in this country. The probabilities are that shipments will be of small volume this year, although Argentina will have a fair surplus to export. The natural course of this corn however, is to Europe rather than to a corn-producing country like the United States. Labor disturbances in Buenos Aires have, however, disappointed the bears and a slight reaction is noted in the majority of our markets. One year ago the trade was paying \$1.80 for No. 2 corn on the Detroit market. The visible supply increased this past week 497,000 bushels to a total of 3,090,000 bushels. Present Detroit quotations are:

No. 3 corn	\$1.42
No. 3 yellow	1.47
No. 4 yellow	1.42
No. 5 yellow	1.39
No. 6 yellow	1.32

Chicago.—The trade showed decided weakness in Chicago, with the market closing at \$1.32½ for February and \$1.28½ for May corn.

OATS.

The relatively small receipts of oats gave this branch of the market independent strength, although the prices have declined in sympathy with the change in corn values. The visible supply of this grain in the United States is now 29,444,000 bushels, a decrease of 1,358,000 bushels since a week ago. On this date last year standard oats sold at 84½¢ a bushel. The present Detroit prices are:

Standard	72½
No. 3 white	72
No. 4 white	71

RYE.

Dealers are neglecting this grain and prices are off, showing a decline of four cents during the week. No. 2 spot is now quoted at \$1.58 per bushel on the local market.

BARLEY.

Trading in this cereal has been of a meagre sort and quotations remain steady with the close of last week. Cash No. 3 barley is quoted here at \$2; No. 4 at \$1.95, and feeding barley at \$1.85@1.90 per cwt.

SEEDS.

No change is noted in clover seed, while timothy is 10c lower. Prime red clover \$25; March 25.20; alsike at \$19.25; timothy \$5.

BEANS.

Domestic consumption of beans has improved materially since the first of the year. This has been offset, however, by the failure of the government to take on additional stocks, and the net result has been a little easier tone in some of our markets, especially on the seaboard. In New York choice pea beans are quoted at \$10, and mediums at \$10 per cwt. Quotations at Detroit have suffered a break and immediate shipment at shipping points are now quoted at \$8.75. Michigan hand-picked pea beans, choice to fancy are quoted at \$8.75@9, and extra fancy are higher at Chicago. The best red kidneys are selling at \$12@12.50.

FEEDS.

Each week dealers make additions to prices for all mill feeds, notwithstanding the price of wheat holds steady. At Detroit bran is now quoted in 100-lb. sacks to jobbers at \$55; standard middlings \$55; coarse corn meal \$63; cracked corn \$64; corn and oat chop feed \$52.50 per ton.

HAY.

There is no let up in the demand for hay, while arrivals continue light. The local market is firm at the following prices:

No. 1 timothy	\$28.50@29.00
Standard timothy	27.50@28.00
No. 1 mixed	25.50@26.00
No. 1 clover	24.50@25.00

Pittsburgh.—Dealers have no diff-

culty in disposing of their stocks at prices 50c above those obtaining a week ago. This, however, holds good only with the better grades. Quotations are:

No. 1 timothy	\$30.50@31.00
No. 1 light mixed	28.00@29.00
No. 1 clover mxd	28.00@29.00
No. 1 clover	27.50@28.50

BUTTER.

A somewhat easier tone is noted in the butter markets. Lower quotations are made for the Detroit trade, fresh creamery firsts now selling to jobbers at 62½¢@63c. The Chicago market is also lower with creameries at 60¢@65c. The situation is unsettled in New York, with creamery prices ranging from 63½¢@68c. In Philadelphia a de-

cine has also taken place, with western creamery extra quoted at 69c.

EGGS.

Increased receipts are forcing lower prices and giving an easier tone to the egg trade. At Detroit fresh firsts are now quoted at 59c and extra firsts, candled, in new cases at 60c. Chicago values are lower, with firsts at 57¢@57½¢; ordinary firsts 56¢@56½¢.

POULTRY.

Dealers report an increased supply of poultry with an easier tone prevailing. Live springers are quoted at 26¢@29c; hens 29¢@30c; small hens 27¢@28c; roosters 20¢@21c; geese 28¢@30c; ducks 27¢@28c; turkeys 34¢@35c.

POTATOES.

In the majority of the northern markets potatoes are easier than they were last week. At Chicago the prices suffered a decline on Monday, receipts having accumulated at that place until about 200 cars were held on track. This allowed buyers to force a decline. Prices in Chicago on Thursday for Michigan U. S. Grade No. 1 ranged from \$1.80@1.90. At Detroit quotations declined 10c and more during the week, with the above grade selling to jobbers at \$3.10@3.25 per 150-lb. sack. The same grade from Michigan sold in Cleveland at \$2.25@2.35 per cwt; in Buffalo at \$2@2.10; in Pittsburgh at \$2.16@2.20; in Cincinnati \$2.20; in Indianapolis \$2.05@2.15 per cwt; in New York \$3.40@3.60 per 150-lb. sack.

APPLES.

The general tendency of the apple market is toward a higher level. On the Detroit market, Baldwins were selling Tuesday morning at from \$4.25@6.25. In western New York buyers are paying from \$6.50@7 for Baldwins at shipping points.

GRAND RAPIDS

During the past week apples have moved freely out of storage. Buyers from Indiana have been in this market and several cars have been shipped to that state. The market is active and demand strong. Indications are that the amount in storage will be greatly depleted shortly by withdrawal. Low temperature has caused potato market to become very dull. Very few are being moved at present. Colder weather has caused a heavy demand for cabbage. Dealers now quote it at \$3 per cwt. There is an increased demand for onions and the market is a little higher.

DETROIT CITY MARKET

Increased activity is noted at the city markets at prices somewhat advanced over those of a week ago. Apples are selling at \$1.50@2.25 per bu; beets 75¢@1; cabbage 3¢@10¢ a head; carrots 90¢@1.25 per bushel; onions 90¢@1; parsnips \$1@1.25; No. 1 potatoes \$1.15@1.25; No. 2 do 75¢@90¢; turnips 75¢@82¢; dressed hogs 23¢@24¢; chickens 40¢; live poultry 32¢.

LIVE STOCK NEWS.

Western markets are still glutted with hogs, largely of the better class. Recent Chicago receipts have averaged 227 pounds, comparing with 219 pounds a year ago, 210 pounds two years ago and 194 pounds three years ago.

Late as it is, there is a fair demand still for feeding lambs, with desirable lots selling recently in the Chicago market at \$14@15.50 per 100 pounds.

To make dairying a success we must make it of interest to the boys.

DIRECT MARKETING SERVICE.

Readers of the Michigan Farmer who desire to build up a mail order trade with city consumers will find it to their interest to send their names with a list of the products they have for sale, to United States Bureau of Markets, 316 Hammond Building, Detroit, Mich. The Bureau of Markets is publishing a list of farmers who have produce to sell and distributing it among city consumers. Several large cities have demonstrated that this method of marketing can be made a success, and it has developed into an important part of their marketing system.

Live Stock Market Service

Reports for Thursday, January 16th

BUFFALO.

We sold pigs here today at from \$16.25@16.50 and other hogs at \$17.80. The lamb trade was extremely slow, with tops at \$16.75. Calves sold at \$19.50@20. Cattle moved very slowly at 25¢@50c lower than yesterday.

CHICAGO.

Hogs. Receipts 55,000; held over 37,671; mostly steady. Tops \$17.80; bulk of sales \$17.40@17.70; heavy \$17.65@17.80; mixed and light \$17.55@17.70; packers \$16.60@17.25; medium and heavy \$17.10@17.40; light bacon \$16.85@17.50; pigs, good to choice \$14@14.75; roughs \$16@16.50.

Cattle. Receipts 13,000. Beef steers steady; butcher cattle 15¢@25c higher; stockers and feeders steady to 25c higher. Good to prime choice steers \$16.25@19.85; common and medium butchers \$9.75@16.25; heifers \$8@14.50; cows \$7.25@13.75; bologna bulls \$8.25@12.75; canners and cutters \$6.40@7.25; stockers and feeders, good \$10.50@14; do medium \$8@10.50.

Sheep and Lambs. Receipts 20,000. Lambs opened steady; sheep and yearlings strong to 25c higher. Choice to prime lambs at \$16.50@16.75; medium and good lambs \$15@16.60; culls \$11.50@13.75; medium and good choice feeders \$14@15.35; choice yearlings \$14.50@14.75; medium and good yearlings \$12@14.50; wethers, medium and good \$10.50@12.

Reports for Wednesday, January 15th

BUFFALO.

Cattle. Receipts 5 cars; slow. Prime heavy steers \$17@18; best shipping steers \$15@16; medium shipping steers \$14@15; best yearlings, 950 to 1000 pounds, \$16@17; light yearlings, good quality \$14@15; best handy steers \$13@14; fair to good kinds \$11@12; handy str and heifers, mixed \$11.50@12.50; western heifers \$13.50; best fat cows \$9@10; butcher cows \$7@8; cutters \$7@7.50; canners \$6.25@6.50; fancy bulls \$9@10; butcher bulls \$8@9; common bulls \$6; best feeding steers \$10@10.50; medium feeders \$8.50@9; stockers \$7@8; light, common \$6@7; milkers and springers \$75@150.

Hogs. Receipts 10 cars; lower; heavy and yorkers \$17.80@17.90; pigs \$16.50@16.75 per cwt.

Sheep and Lambs. Receipts 15 cars; market is lower; top lambs \$16.75@17; yearlings \$15@16; wethers \$12@12.50; ewes \$10.50@11. Calves \$7@20.

CHICAGO.

Cattle. Estimating the Wednesday arrivals at 12,000 head, 74,213 cattle have been received during the first half of the week, comparing with 67,220 for the same time last week. During the first two days of the week prices declined for the greater part of the cattle from 50¢@75c, with some lots showing reductions of 75¢@1; but the market was in better shape today, prices averaging 15c or more higher. Some choice weighty steers brought \$19@19.25 per

DETROIT

Cattle. Receipts 3,360. Market 50c lower on all grades; closed strong at decline. Best heavy steers \$14.00@14.50. Best handy wt bu strs. 10.25@11.25. Oiled steers and heifers 9.25@10.00. Handy light butchers 8.25@8.75. Light butchers 7.25@7.50. Best cows 9.00@9.25. Butcher cows 7.25@7.75. Cutters 6.50@7.00. Canners 6.00@6.50. Best heavy bulls 10.00@11.50. Bologna bulls 8.50@9.25. Stock bulls 7.25@7.75. Milkens and springers 60¢@125.

Veal Calves. Receipts 1,451. Market closed dull and \$1 lower than Monday. Best 18.00. Others 8.00@17.00.

Sheep and Lambs. Receipts 7,000. Market 25¢@50c lower than last week. Best lambs 16.00. Fair lambs 14.50@15.25. Light to common lambs 11.00@13.00. Yearlings 8.50@9.00. Fair to good sheep 8.50@9.00. Culls and common 6.00@7.00.

Hogs. Receipts 7,750. Hogs are steady at \$17.50; pigs very dull and \$1 lower than the opening this week at \$15.50.

cwt., with prime heavies quotable up to \$19.50 or higher but not many steers are coming good enough to bring \$18.50, and the bulk sell at \$14@17.50. Fair to fancy yearlings are quotable at \$14.50@19, and inferior little canning steers sell down to \$8@9. Butcher cows and heifers are selling at \$7.50@15, with canning cows and cutters going at \$6.35@7.45 and bulls at \$7.50@13. Stockers and feeders are unchanged and in good demand on the basis of \$8.25@13.60 and prime selected feeders quotable up to \$14, although comparatively few sales are made above \$12.50.

Hogs. Estimating the Wednesday receipts at 32,000 hogs, the receipts for the first half of the week foot up 124,114 head, comparing with 143,873 a week ago. Prices have been barely steady, with more hogs than could be disposed of, and 40,281 head were left unsold last night, but the market advanced 5¢@10c today on more active buying. The early top was \$17.70, but \$17.75 was paid later, sales taking place at \$17.45 and over for the better class of butcher hogs, while the rough to fair heavy packers sold at \$16.50@17.20 and most of the pigs at \$13@15.

Sheep and Lambs. About 76,750 head have been received here during the first half of the week, comparing with 73,866 a week ago. Receipts for Wednesday are call 21,000 head, mainly lambs, and priced for lambs are firm to 15c higher, with sales at \$13@16.65, and feeding lambs salable at \$14@15.50. Yearlings are in the usual demand at \$11@14.35, and wethers at \$9.50@11.60; ewes at \$6@10.75.

The Farmers' Income

ACCORDING to the United States census of 1910, the last official census that we have, 6,361,502 farmers in the United States produced products for which they secured \$5,487,000,000, making the average annual gross income of the farmer \$863. It seems to me that something is wrong when the average income per farm in this great country of ours is no more than that. The same census gives the value of the farm property in this country as \$40,991,449,090.

The same year, according to the same census, 7,678,578 people engaged in manufacturing produced goods that sold for \$20,672,002,000 or on the average \$2,642 each. Remember that in many instances the farmer had to have hired help. This is not taken into consideration in estimating the number of farmers which would leave the average annual income per worker engaged in agriculture much below \$863, while each worker engaged in manufacturing goods received on an average \$2,642. At the same time the capital invested in manufacturing at that time amounted to only \$18,428,270,000, or not quite half as much as the money invested in agriculture. Now, the goods produced by the farmer is of more value to the people of the United States than the goods produced by the manufacturer, if it is proper to make the comparison, and yet the goods sold by the manufacturer brought nearly four times as much as the goods produced by the farmer.

Now the question is: Why should these manufactured articles sell for more than the farm products? In my estimation it is largely because the manufacturers are organized and because they put more money into the selling end of the proposition than the farmer does. The farmer has been in the habit of simply producing all that he could and taking just what was offered him. The manufacturers produced what they thought they could sell at a profit and they devote practically as much attention to the selling as they do to manufacturing. Now if this area of good prices which makes agriculture profitable at the present time is to continue and to be maintained after the war the farmer has got to pay some attention to the selling end; he has got to pay some attention to the amount that will be needed or we will get back into the same rut and be selling goods again below the cost of production.

For this reason an economic business organization resting on the secure foundation of the Farm Bureau in each county and being completed and crowned with the National Chamber of Agriculture is necessary, and it is our duty now as farmers, as business men, to see to it that this great and practical idea is developed so that it can be used when the proper time comes to keep agriculture on a paying basis. We mustn't go back to the average annual gross income of \$863 per farm. That isn't a good living, let alone a profit. COLON C. LILLIE.

"I see you are advertising that heifer of yours." The man of whom that was said took it to heart and he went and took the poke off the heifer. A little while afterward the heifer took a walk toward the butcher shop. I did not blame the man at all. An unruly cow, especially a heifer, is about as poor property as a man can have for his own peace of mind. No poke can alter that fact.

While it would be too much to say that honey will again take its place as a sweet and force sugar from the market, yet it will be safe to say that the increased demand and the greater number of uses to which it has been put, has acquainted people with the advisability of using honey as a food, and this demand will probably continue.



It pays to buy **Tix Ton-Mix** with salt the year around keeps flock healthy and free from stomach worms and ticks. A \$5.00 box makes \$60.00 worth of medicated salt—saves you big money—A \$2.00 size box of **Tix Ton-Mix** by parcel post will medicate a barrel of salt.

Write for club offer—booklet on "Nature and Care of Sheep"

PARSONS CHEMICAL WORKS

Leona Park Experiment Station, GRAND LEDGE, MICH.



Here's Where YOU Save Money On A Range, Friend!

DEL DANE, "The Old Stove Master," promised you money-saving offers on Kalamazoo Ranges, Stoves, Furnaces, Gas Ranges, Oil Ranges and Kitchen Cabinets. We are here to make good that promise. We are manufacturers and sell direct to you, the user. That enables us to

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Chesters Gilts bred for March, April and May farrow from mature stock of the large prolific kind. Satisfaction guaranteed. F. W. ALEXANDER, Vassar, Mich.

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big type O.I.C.S. Stock of all ages for sale. Herd headed by Oleway Edd, the World's Champion O. I. C. boar assisted by C. C. Schoolmaster, Grand Champion boar of Michigan, New York and Tennessee state fairs. Also, C. C. Giant Buster, undefeated Senior boar pig wherever shown and Grand Champion of Oklahoma state fair. Get our catalogue of Grandell's prize hogs, Cass City, Michigan.

Shadowland Farm

O. I. C.'s

Bred Gilts 200 to 300 lbs. from prize winning stock. A few fall yearlings and 2 yr. old sows, big type, growthy boars of all ages, guaranteed as breeders. Everything shipped C. O. D. Express paid and registered in buyers name. J. CARL JEWETT, Mason, Mich.

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Strictly Big Type with QUALITY. Have a few spring pigs either sex for sale. They are of the right stamp, good enough to be shipped C. O. D. NEWMAN'S STOCK FARM, R. 1, Marlette, Mich.

8 Large Type O. I. C. spring boars also 2 prize Jr. yr. boar Mich. State Fair 1918. CLOVER LEAF STOCK FARM, Monroe, Mich.

O. I. C.'s big type serviceable boars. Yearling sows and gilts bred for spring farrow. G. P. ANDREWS, Dansville, Mich.

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O. I. C. Boar, 14 months old. Large fall pigs of either sex. C. J. THOMPSON, Rockford, Mich.

O. I. C. Serviceable boars sold. Gilts bred for March and April farrow. H. W. MANN, Dansville, Mich.

O. I. C.'s bred gilts all sold, have some good fall pigs either sex not akin and 2 last June boars, farm 1/2 mile west of Depot. OTTO B. SCHULTZE, Citizens Phone 124, Nashville, Mich.

BIG TYPE POLAND CHINAS

Spring boar and gilts. Also fall pigs. **Hillcrest Farm, Kalamazoo, Mich.**

FOR 25 YEARS

This establishment has been head quarters for Big Type Poland Chinas. We have a nice lot of boars and sows of strictly big type breeding at very low price. Let me know what you want. Sell phone. JNO. C. BUTLER, Portland, Mich.

Large type P.C. Largest in Mich. Boars all sold. 20 Bred gilts sired by and bred to the best boars the breed can produce, with dams of equal merit, extreme size with quality, come and see them, free delivery, expenses paid if not as represented. W.E. Livingston, Parma, Mich.

Big type Poland Chinas. Spring gilts of the best of breeding. With quality from 1000 lb. sire's and 800 lb. dam's. Will be bred to a great son of the noted 2600 lb. Gortendale Jones. Also fall pigs. W. BREWSTER & SONS, R. 5, Elsie, Mich.

Big Poland Chinas with quality. Spring, summer, and fall pigs, both sex, and bred sows, for sale. G. A. BAUMGARDNER, R. 2, Middleville, Barry Co., Mich.

Big Type Poland gilts bred to Gerstale Superior and B Gerstale Lad sons of Gerstale Jones the \$2600 boar. O. L. WRIGHT, Jonesville, Mich.

Large Type P.C. boars all sold. Spring gilts and young tried sows, bred for March and April farrow. Free delivery from Augusta. W.J. Hagelshaw, Augusta, Mich.

Michigan's Champion herd of Big Type P. C. bred sows fall pigs. Come and see them. E. R. LEONARD, R. 3, Box 53, St. Louis, Mich.

Big Type Poland Chinas. Spring boars for sale. Big Bocking orders for bred gilts. Inspection invited. L. L. CHAMBERLAIN, Marcellus, Mich.

L.T.P.C. Gilts bred for April farrow. Fall pigs of either sex; inspection invited. A. A. FELDKAMP, Manchester, Mich.

Big type P. C. Big boned fellows from Iowa greatest Bherds, special prices on spring boars and choice bred gilts. E. J. MATHEWSON, Burr Oak, Mich.

Special Sale on big type fall pigs also yearling big type boar of extra size form and finish. ROBERT NEVE, Pierson, Mich.

A FEW choice, large type P. C. Spring boars and gilts, also summer pigs. CLYDE FISHER, R. 3, St. Louis, Mich.

B.T.P.C. Bred Gilts, the best lot ever on the farm at prices any good farmer can afford to pay. H. O. SWARTZ, R. 37, Schoolcraft, Mich.

Big Type P. C. boar and bred gilts. Choice Aug. pigs at a bargain. A. A. WOOD & SON, Saline, Mich.

Big Type Poland China. Get a Gilt, sired by Giant King, bred to Monroe's Big Jones 3rd; three bred to Smooth Mastodon. John D. Wiley, Schoolcraft, Mich.

Mammoth P. C. Starchy big boned individuals 175-200 lbs. 5% months double immune. Write wants. Clyde Weaver, Ceresco, Mich.

Hampshire spring boars at a bargain, bred gilts now ready to ship. JOHN W. SNYDER, R. 4, St. Johns, Mich.

Hampshire Hogs The International Grand Champion Hog of 1918, both sexes for sale. Spring deliveries booked now. ELI SPRUNGER & SON, Saginaw, W. S., Mich.

SHEEP

To The Kids of Mich. I have 75 beautiful registered Hampshire and Shropshire ewes that will have lambs this spring. I wish to sell them to you and buy back the ram lambs next fall at a mighty good price. Start now in a small way. Liberty Bonds taken. Write at once for particulars. KOPE KON FARM, S. L. Wing, Owner. Kinderhook, Mich.

200 Bred Ewes Choice natives, coming two years, bred to Shrop Rams, in lots to suit. ALMOND B. CHAPMAN, South Rockwood, Mich.

Shropshire Rams Yearlings and Ram B.D. KELLY & SON, Ypsilanti, Mich.

FOR SALE SHROPSHIRE LAMBS, ewes or rams. ARMSTRONG BROS. R. 3 Fowlerville, Mich.

OXFORD Down Ram lambs, also a few ewe lambs. Berkshire both sexes. Booking orders for fall pigs. CHASE STOCK FARM, R. 1, Marlette, Mich.

For Sale Registered Oxford Down rams and ewes; can be seen at FAIRVIEW STOCK FARM, Fred Wolfe, Snover, Mich.

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STOCK FARM Belgian and Percheron Stallions and Mares and registered Holstein Cattle, of the best breeding, for sale.

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We have on hand at all times a choice selection of young Percheron Stallions. **PALMER BROS.,** Belding, Mich. R. R. Orleans.

Percherons, Shorthorns and Duroc Jersey Hogs. J. M. HICKS & SONS, R. 2, Williamston, Mich.

Percherons, Holsteins, Angus, Shropshires, Durocs DORR D. BUELL, Elmira, Michigan.

Percheron Stallions and mares of reasonable prices; inspection invited. F. L. KING & SON, Charlotte, Mich.

For Sale Reg. Black Percheron 3 yr. old Stallion and a number of good sound grade draft colts. CHAS. BRAY, Okemos, Mich.

Percheron for sale stallions and mares at reasonable prices. Wm. BLAKE, Dutton, Mich.

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1200 EGGS FROM 29 HENS

Writes a MICHIGAN Man

"The 'More Eggs' Tonic I received from you one year ago did wonders. I had 29 hens when I got the tonic and was getting 5 or 6 eggs. April 1st I had over 1200 eggs. I never saw the equal."
EDWARD MEKKER, Pontiac, Mich.

AS America's foremost poultry expert I predict that eggs are going to retail for a dollar a dozen this winter. Right now the retail price is from 50c to 75c per dozen in some of the large cities. At a dollar a dozen poultry raisers are going to make tremendous egg profits. You, too, can make sure of a big egg yield by feeding your hens a few cents worth of "More Eggs" tonic. This product has been tried, tested and proven. It is acknowledged the best and most successful egg producer on the market today. Every day that you don't use it means that you are losing money. Don't delay. Start with a few cents worth of "More Eggs" tonic now.

125 Hens—Sold 8988 Eggs

Mrs. W. H. DEAHL, Exline, Iowa, writes: "Since using 'More Eggs' Tonic I have got more eggs than at any time I have been in the poultry business, about 30 years. From March to November I sold 749 dozen eggs and I have only 125 hens. I highly recommend 'More Eggs' Tonic to all poultry raisers."

A. P. WOODARD of St. Cloud, Fla., writes: "I get from 40 to 50 eggs a day now. Before using 'More Eggs' I was getting only 8 or 9 eggs a day." Here are the experiences of a few others of the hundreds who write me:

"160 Hens—1500 Eggs"

E. J. Reefer: I have fed two boxes of More Eggs Tonic to my hens and I think my hens have broken the record for eggs. I have 160 White Leghorns and from March 25 to April 15 sold 125 dozen eggs.
Waverly, Mo.
MRS. H. M. PATTON

"More Than Doubled In Eggs"

E. J. Reefer: I am very much pleased with your "More Eggs" Tonic. My hens have more than doubled up in their eggs.
Mendon, Ill.
L. D. NICHOLS

126 Eggs In 5 Days

E. J. Reefer: I wouldn't try to raise chickens without "More Eggs" which means more money. I use it right along. I have 33 hens and in 5 days have gotten 104 dozen eggs or 126.
Salina, Okla.
MRS. J. O. OAKES

"15 Hens—310 Eggs"

E. J. Reefer: I used your More Eggs Tonic and from December 1 to February 1, from 15 hens, I got 310 eggs. Your remedies are just what you claim them to be.
Turner Falls, Mass.
MRS. C. R. STOUTON

"Gets Winter Eggs"

E. J. Reefer: It is the first time I got so many eggs in winter. When I began using "More Eggs" I was only getting from 1 to 3 eggs per day and now I am getting 11 to 13 eggs per day.
Wilburton, Kan.
MRS. JULIA GOODEN

18 Hens—12 Eggs a Day

E. J. Reefer: Six weeks ago I began giving "More Eggs" Tonic and I was not getting an egg from 18 hens, and now I am getting 10 to 12 every day. You can quote me as saying that it is the best chicken tonic in the world.
Luray, Va.
E. L. REYNOLDS

"Layed All Winter"

Dear Mr. Reefer: I gave the tablets to my hens and in three weeks they began laying and layed all winter. I never saw anything like them in the world.
Lockawana, N. Y.
Yours truly, MRS. ALBERT SMITH

"37 Eggs a Day"

E. J. Reefer: That More Eggs Tonic is simply grand. When I started using it they did not lay at all, now I get 37 eggs a day.
Elwood, Indiana
EDGAR E. J. LANNIGER

"Increase from 2 to 45 Eggs a Day"
Reefer's Hatchery: Since I began the use of your More Eggs Tonic 2 weeks ago I am getting 45 eggs a day, and before I was only getting 2 or 3 a day.
Derby, Iowa
DORA PHILLIPS

"Doubles Egg Production"

E. J. Reefer: I have been using More Eggs Tonic 3 or 4 weeks and must say it is fine. My egg production has been doubled.
Paradise, Texas.
J. C. KOENIGER

"48 Dozen In One Week"

Dear Mr. Reefer: I can't express how much I have been benefited by answering your ads. I've got more eggs than I ever did. I sold 42 1/2 dozen eggs last week, set 4 dozen, ate some and had 1 1/2 dozen left. From your friend, MRS. LENA MCGROON

"Increase From 8 to 36 Eggs a Day"

E. J. Reefer: I am well pleased with your More Eggs Tonic. I was only getting 8 or 9 eggs, now I am getting 3 dozen a day. Yours truly, WM. SCHMIDT.
Shady Bend, Kansas



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I hereby guarantee that Mr. Reefer will carry out his agreement *** and this bank further agrees to return to the customer the total amount of his remittance, if Mr. Reefer fails to do as he agrees.

Very truly yours,

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President.

More Eggs Makes Layers Out of Loafers

This is a concentrated tonic, not a food. It consists of every element that goes toward the making of more eggs. A perfect regulator, aids digestion, stimulates egg production and builds firm bones and strong muscles. The foremost authorities in America, and poultry raisers from every state endorse Reefer's "More Eggs" tonic.

Results Guaranteed!

Here is the facsimile of the guarantee of a million dollar bank that "More Eggs" will produce results. This million dollar bank guarantees to refund your money if you are not satisfied. You run no risk. So don't delay. Every day you wait you are losing money.

Order Today

Send a dollar today for a full-sized package of "More Eggs" tonic; or better yet send \$2.25 at extra special discount and get three packages. Three packages is a full season's supply. Don't put it off. Order now and start your hens making money for you. Remember, you run no risk. A Million-Dollar Bank will refund instantly if you are not satisfied. [Whether you order "More Eggs" now or not, at least mark the coupon for Mr. Reefer to send you absolutely free his valuable Poultry Book that tells the experience of a man who himself has made a fortune and is helping others to make money out of poultry.] Act NOW. Don't wait. Pin a dollar bill to the coupon. Or send \$2.25 which will guarantee your winter's egg supply. Send for this bank-guaranteed egg producer NOW. Today! It has helped thousands of others and will help you, too.

E. J. Reefer Co., 2031 Reefer Bldg., Kansas City, Mo.

E. J. REEFER, 2031 Reefer Bldg., Kansas City, Mo.

Enclosed find **\$1.00** for one full size package of "More Eggs" Tonic. ☐
\$2.25 for three full size \$1.00 packages of "More Eggs" on special discount. ☐

(Mark X in the square opposite order you want.)

Send this with an absolute Bank Guarantee that you will refund my money if this tonic is not satisfactory to me in every way.

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