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Relation of Phosphorus to Soil Fertility

By DR. M. M. McCOOL

Michigan Agricultural College

THE farmers of Michigan are being encouraged to produce larger crops by the intelligent use of sprays, seed treatment, and the sowing of high-yielding varieties, etc., all of which is well, but we must not lose sight of the fact that the above simply means a more rapid decrease of our fertility, and unless provision is made to meet this increased loss of plant food we shall soon be face to face with unprofitable agriculture on larger areas than we are confronted with at the present time.

One of the fundamental principles to consider in the maintenance of soil fertility is the use of phosphorus on our soils. Indeed, the question of using phosphorus on wheat is a real live one. Such being the case and inasmuch as the writer has studied soil and agricultural conditions in eastern, western, central and southern Michigan the last three seasons and therefore knows and appreciates the main soil problem of the state, it is considered fitting and proper to discuss the phosphate question somewhat at length.

Why does it become necessary to apply the phosphates to the soil? In order to answer this question we must first recall that phosphorus owes its presence in the soil to the original rock from which the soils were derived. It is unquestionably true that phosphorus does not fall to the earth in rain or snow, nor does it rise in appreciable amounts from the subsoil. Thus it follows, the composition of the soil is really an important consideration. Of course, the question arises, how well are Michigan soils supplied with this plant food constituent? The members of the Soils Department of the Michigan Agricultural College have been collecting information on this subject during the last three years and results of certain chemical studies given in Table I show that many representative soils of the state are quite deficient in their total phosphorus content. Although the writer appreciates the fact that chemical analyses have their limitations he is forced to conclude that these results point out one of Michigan's leading soil problems. We hear much about the available plant food and we agree that this is of some importance and it is true that the more readily available plant food goes out first, leaving the more resistant material.

Phosphorus in Michigan Soils.

Table I.

Manistee County:		Lbs.
Pine soils	567	
Oak soils	678	
Mason County:		
Pine soils	662	
Oak soils	1122	
Berrien County:		
Fertile sandy soil	1566	
Medium sandy soil	850	
Poor sandy soil	702	
Ingham County:		
Beech and maple—level	1125	
Beech and maple—hilly	1097	
Poplar—flat sandy plains	803	
St. Joseph County:		
Beech and maple—rolling sand	1194	

Loam prairie	1078	experience that a deposit in the bank
Oak—level sand	787	is removed if checked upon and not re-
Allegan County:		newed, and "one cannot have his pie
Oak—heavy clay	838	and eat it." We may further empha-
Oak—low lying soil	695	size this point in a general way by
Pine—light sand	655	presenting, as we have done in Table

It is doubtful if many of us realize

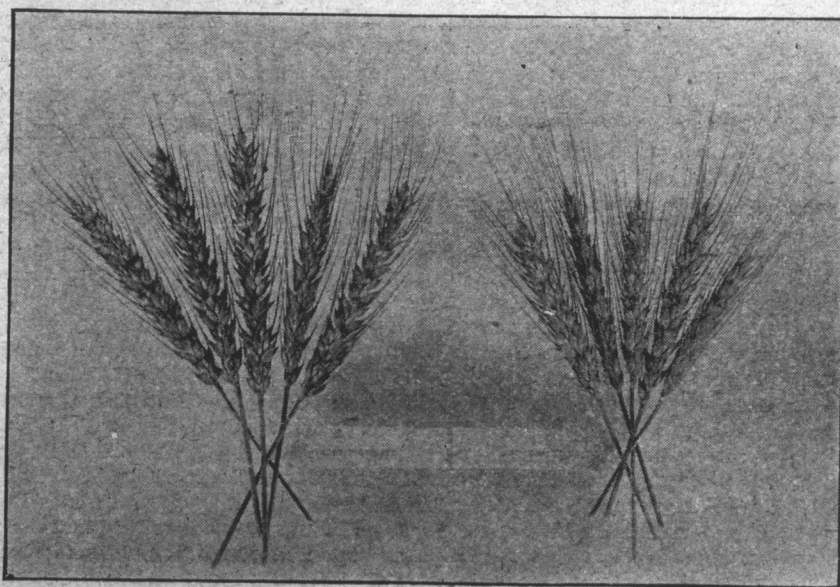


Wheat Growing on Light Soil—Check Strip Untreated; 200 lbs. of Acid Phosphate Per Acre on Balance of Field.

how much phosphorus is removed from it, the amount of phosphorus that is our soils by different crops, and therefore do not appreciate this phase of field crops. We have not taken our problem. Although we know by into consideration the amount of

Table II.
Phosphorus Removed from the Soil by Michigan Field Crops and Amount of Acid Phosphate Necessary for its Restoration.

Crop.	Michigan 10-yr. Av. Crop per acre.		Phosphoric Acid.		Total.	Amount 16% Acid Phos. to replace Phosphorus removed.
	Grain. lbs.	Straw. lbs.	Grain.	Straw.		
Wheat	1000	1600	11.9	4.6	16.5	103
Rye	835	1000	7.6	2.8	10.4	65
Barley	1225	1460	9.2	3.4	12.6	79
Oats	1008	812	7.0	1.7	8.7	54
Corn	1470	1260	12.4	5.8	18.2	114
Peas	984	1312	9.4	5.7	15.1	94
Beans	720	960	8.7	4.6	13.3	83
Sugar beets	13180	6000	83.5	100.0	183.5	1147
Potatoes	5160				38.7	242
Hay and forage	2560				12.3	77



Phosphate Causes Grain to Fill Out. Specimen at Right Grown on Soil Low in Phosphorus, the Other on Same Soil Treated with Phosphorus.

phosphorus returned to the soil in the form of stable manure, our observations being that large amounts of manure produced on the farm are not uniformly distributed on the soil.

Phosphorus plays an important role in plant feeding. It is now common knowledge, or should be, that an abundance of phosphorus in the soil is essential and therefore extremely important for formation of seed, a shortage being indicated by improper grain development. It should also be noted that if it is deficient the stem and leaf development of crops is greatly retarded. Moreover the addition of phosphates to soil deficient in this element results in greater development of the roots of wheat. The accompanying photographs show this in a striking manner.

Is it possible to cite records showing that the use of phosphorus proves profitable? We can answer this question in the affirmative and shall briefly review the work of several agricultural experiment stations bearing on this subject. The Pennsylvania Agricultural Experiment Station recently reported thirty-five years' results with fertilizers. When corn is estimated at sixty-three cents, oats forty-four cents, wheat one dollar per bushel, corn stover at three dollars, and hay at fourteen dollars and forty-two cents per ton, the value of the production from four acres rotation obtained from untreated soil and from soil receiving phosphates are shown in Table III.

Table III.

Pennsylvania Experiments with Phosphates.

Value of Products from Four Acres. One Rotation.

Untreated Plot.		Phos. Acid.
1882-86	\$89.54	\$ 95.52
1887-91	88.47	101.79
1892-96	62.89	96.68
1897-01	47.90	78.83
1902-06	54.90	85.68
1907-11	40.65	79.94
1912-16	49.95	86.05
1882-1916	\$61.95	\$ 88.21

The Ohio Agricultural Station has shown conclusively that the use of phosphorus is a paying proposition on their various experimental farms. Results of experiments conducted on the Strongsville Experimental Farm, with phosphorus and other substances, were recently reported. The total and net value of the five crops raised in the first and second ten-year periods on untreated and phosphated land are shown in Table IV.

Table IV.

Experiments with Limestone and Raw Phosphate at Strongsville.

First Ten Years.

	Value of Five Crops.		Net Value.
	Value.		
None	\$46.31		\$46.31
Acid phosphate	62.68		61.44
Second Period.			
None	\$60.19		\$54.19
Acid phosphate	79.95		71.71

Dr. C. G. Hopkins, of the Illinois Experiment Station has been advocating the use of phosphorus for many years, as a result of a vast amount of soil fer-

(Continued on page 135).

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CURRENT COMMENT.

In another column of this issue will be found an article on this topic which we believe to accurately reflect the sentiment of Michigan farmers on the policy of drafting farm workers into the first contingent of the new national army. The most intimate knowledge of the difficult labor situation which confronts the farmers of the country in general and Michigan in particular, can come only from first hand experience, and the knowledge which Michigan farmers have gained from their experience in facing this difficulty during the present season is so far from reassuring as to make common the viewpoint expressed in the article above mentioned.

That this viewpoint is shared by agricultural leaders as well as by the rank and file of our farmers is attested by recent events. At the wheat congress, held at the Agricultural College on August 1, resolutions were adopted pledging the farmers of the state to the movement for the doubling of the wheat crop of the state for 1918 and for a very considerable increase in the acreage of rye, which resolution was published in our issue of August 11. In response to this appeal the War Department pointed out to the chairman of the wheat meeting that provision has already been made in the President's regulations for the discharge from draft by district boards of those necessary to an agricultural enterprise which is necessary to the effective operation of the military forces, or the maintenance of national interest during the emergency. At a meeting held last week the Michigan State Board of Agriculture passed a resolution of similar import, which has been addressed to the several boards of exemption as well as to the President and the Secretary of War. Strong personal representations of like nature will doubtless be made to the various exemption boards and to the governor in numerous cases of appeal. It would thus appear that all of those whose duty it is to act in an official capacity in connection with exemptions from draft have been properly

advised concerning agricultural sentiment on this point.

It is probable that the farm labor situation is more acute in Michigan than in perhaps any of the other important agricultural states. Certainly it is more acute than in states which have not developed so rapidly along commercial lines, particularly in profitable lines of special manufactures, although undoubtedly the conditions above noted obtain more or less generally the country over. In so far as the condition is a local, rather than a general one, government officials having to do with draft and exemption rules cannot be expected to make radical exceptions to general rules to relieve the situation. They are engaged in the solution of new and big problems, and obviously must solve them on the basis of general conditions. So far as the local exemption boards are concerned they are confronted with the stern duty of selecting the allotted quota of physically fit for military service from their respective districts. From the standpoint of the ultimate public good it is greatly to be hoped that it will be found possible to excuse from immediate military service the men who have been drafted from the farms of Michigan and who are so badly needed to carry out the program of increased production, and particularly to save the crops now approaching maturity and to plant an increased acreage of cereal grains this fall.

But with the removal of a million of our most physically efficient young men from the producing industries of the country, and perhaps other millions in quick succession, as may be necessary for the successful prosecution of the war into which we have been unavoidably drawn, the labor situation in agriculture as well as in other industries is bound to become still more acute, hence the wisdom of planting as large an acreage of fall-sown cereals as possible. If the labor situation is more acute next season than it is this, and it surely will be if the war continues, an increased acreage of winter grains will be a great asset to the farmers who grow them, as well as to the country next year, since the labor of harvesting them will be far less than the labor required to grow spring planted food crops. Consequently it is the part of wisdom for the farmers of Michigan and the country to respond, so far as is within their power, to the government's appeal to their patriotism in the matter of increasing the acreage of wheat and rye to be sown on their farms this fall.

While the great war has now been in progress more than three years and the peoples of the belligerent European countries have of necessity become accustomed to its attendant handicaps and privations and suffering in greater measure than it would seem possible that our people will be called upon to endure, yet most of us fail to fully appreciate the fact that a very considerable measure of the same hardships must come to us as individuals and as a people, if the war lasts even another year, as now seems entirely probable. It is right for the farmers of Michigan to protest against an impending hardship which they believe to be poor public policy. It is their duty to do so. But it is also their patriotic duty to make a supreme effort to meet the world necessity for an increased production of food stuffs in the face of every discouragement. The present emergency is no time for the entertainment of discouragement. The farmers of Michigan have done their duty in both respects in the past, and they will continue to do it in the future. They are that kind of citizens; the kind who have made the United States the greatest nation in the world—a nation able to cope successfully with the present great world problem and work out its solution to the unselfish benefit of civilization and world-

wide democracy as against oppression and the fostering of special interests of nations or their rulers as well as individuals.

A Stabilized Wheat Market.

On this page will be found an authorized statement of the national food administration relating to the 1917 wheat crop, to which administrative attention has first been directed under the recently enacted food control law. The course outlined in this statement will effectually stabilize the wheat market and make the handling of this staple food grain a purely merchandising proposition. The personnel of the representative price-fixing committee insures the establishment of a fair price, which will be compensatory to growers, with the added advantage of enabling them to market the crop promptly, and will at the same time, through the future control which will be exercised over the product, properly protect the ultimate consumer from extortionate prices. This official announcement will inform the reader as to the methods by which these desirable ends will be served and is an auspicious beginning for food control in the United States.

In the strenuous campaign of growing an increased acreage of food crops this year, and of preparing for a liberal increase in the cereals to be sown this fall, many farmers may neglect to consider the benefit which might be derived from attending the State Fair as well as the local agricultural fairs held in this section of the state. There never was a time when the farmers of Michigan and the country were in greater need of the best varieties of grain, the best breeds of live stock or the most up-to-date equipment for their farms than they are at the present time. There is no place where such broad opportunity exists for helpful study and observation along these lines as at the State Fair. Here in the competitive exhibits the best of the plant and animal products of the farms are gathered and shown in a manner which facilitates both study and comparison, and the latest and best in farm equipment of all kinds is gathered together in compact space and much of it is demonstrated in a practical manner. These and many other valuable educational features will make it profitable for every farmer in the state to attend the State Fair this year. The high-class entertainment features which will be afforded are also worth while for every member of the farm family. Time and money spent in attending the foremost agricultural fair in the state, and one of the leaders of the country, will not be wasted. It will prove a good investment.

GOVERNMENT TO BUY WHEAT.

A fifty-million-dollar corporation that will enable the government to purchase sufficient wheat to stabilize prices has been formed by the United States Food Administration. Determination of a fair basic price to be paid for wheat by the government lies in the hands of a committee headed by President Garfield, of Williams College. It is expected by the Food Administration that this price, when agreed upon by the committee, will be maintained in private as well as in government transactions.

The wheat price committee, which will meet in Washington at once, consists of H. A. Garfield, president of Williams College, chairman; Charles J. Barrett, president Farmers' Union, Union City, Georgia; William N. Doak, vice-president, Brotherhood of Railroad Trainmen, Roanoke, Virginia; Eugene D. Funk, president National Corn Association, Bloomington, Illinois; Edward F. Ladd, president North Dakota Agricultural College, Fargo, North Dakota; R. Goodwyn Rhett, president of

Chamber of Commerce of the United States, Charleston, South Carolina; J. W. Shorthill, secretary National Council of Farmers' Co-operative Associations, York, Nebraska; James W. Sullivan, American Federation of Labor, Brooklyn, New York; L. J. Tabor, Master Ohio State Grange, Barnesville, Ohio; Frank W. Taussig, chairman Federal Tariff Commission, Washington, D. C.; Theo. N. Vail, president American Telephone & Telegraph Co., New York City; Henry J. Waters, president Kansas State Agricultural College, Manhattan, Kansas.

Allied wheat purchases in the United States, together with those of our own government, will be handled by the corporation. This will not only stabilize prices to the allies, but will also protect the corporation against possible loss.

Decision of the Food Administration to require the allies to purchase flour instead of wheat is of very great importance to agricultural and other interests of the United States. Through the exercise of this regulation the by-products of the wheat milling industry, which are sorely needed by live stock growers, will be kept at home.

All of the stock of the corporation will be held and owned by the government. Management of the corporation will be in the hands of the wheat purchasing division of the Food Administration, the executive officers of which are: Chairman, Herbert Hoover, San Francisco, California; president, Julius H. Barnes, Duluth, Minnesota; treasurer, Gates W. McGarrah, President Mechanics' & Metals' Bank, New York City; vice-president, F. G. Crowell, Kansas City, Missouri; transportation director, Edward Chambers, vice-president Santa Fe Railway, Chicago, Illinois; counsel, Judge Curtis H. Lindley, San Francisco, California; secretary, J. W. Shorthill, secretary National Council of Farmers' Co-operative Associations, York, Nebraska.

Branch offices of the corporation are being established at the principal wheat terminals of the country to aid in conducting the government's transactions in wheat and flour with the regular dealers. Commissions sufficient only to cover the costs of operation will be charged.

The following men have been named by the Food Administration to represent it at the various wheat terminals: Edward M. Fleisch, St. Louis, Missouri; M. H. Houser, Portland, Oregon; C. B. Fox, New Orleans, Louisiana; H. B. Irwin, Philadelphia, Pennsylvania; P. H. Ginder, Duluth, Minnesota; Frank L. Carey, Minneapolis, Minnesota; George S. Jackson, Baltimore, Maryland; Howard B. Jackson, Chicago, Illinois; Chas. Kennedy, Buffalo, New York; R. A. Lewin, San Francisco, California; D. F. Piazek, Kansas City, Missouri; Chas. T. Neal, Omaha, Nebraska.

All of the men connected with the grain division of the Food Administration have dissociated themselves from all interest in the grain trade, and are giving their entire time and service to the government without compensation for the period of the war.

HAPPENINGS OF THE WEEK.

Foreign.

The European War.—Consistent advances were made on the western front by the allied forces this past week. Their efforts in Flanders won from Crown Prince Rupprecht positions of local importance which have since been consolidated with their old positions. The Germans have been feeling out the French lines in the Vosges and about Verdun but in all instances their attacks were repulsed. Throughout the battle line from Switzerland to the North Sea, artillery fire goes on with scarcely any interruption.—The Russians are now offering a stronger resistance to the enemy, especially on the Rumanian frontier where Austro-German forces have been unable to make further headway. Also about Vilna and in the Slavic sector they have beaten off well-prepared at-

(Continued on page 151).

Maximum Wheat Yields

By I. J. MATHEWS

It does not cost any more to raise a large wheat crop than to raise a small one until we commence to buy the twine with which to bind the bundles. The costs of preparing the seed bed, such as plowing, harrowing, and rolling, are no more for a big crop than for a small one; the cost of seed is little if any more, yet there are certain preliminaries which should be taken into consideration in order that next year's wheat crop may be as large as possible. Under the existing circumstances there can be no question but that it will pay, and pay well, to raise a large crop, provided the quality of that wheat is right, but where wheat is mixed with rye, or on the other hand, two wheats are mixed the yield of the crop will not be a criterion of its entire value, since wheat containing rye makes a very poor quality of bread, as does also the flour of mixed wheats.

Preparation of the Seed Bed.

In planning the crop rotation, one of the things that must be borne in mind is to regulate the crops so that they will take the food nutrients from the soil in its different layers. For instance, we have the deep rooted crops, such as alfalfa, clover, and corn; the medium rooted crops, such as beans, peas, and potatoes; while all of the small grains belong in the class with shallow roots. Where we have these three different classes grown in succession on a piece of soil, it means that the food in the entire soil is taken out with the same relative rapidity. In the wheat, we have the type of shallow rooted plant and probably the best place to sow wheat is either after a crop of corn or upon a sod that has been plowed under. Wheat should not be sown after wheat on account of the prevalence of the Hessian fly and the joint worm.

As soon as the land that will be sown to wheat has been vacated by the crop which was previously grown on it, it should be plowed to a medium depth. This early plowing of the wheat land enables one to run over the ground every week or ten days before the wheat is planted. Since wheat cannot be cultivated, this harrowing before planting accomplishes the killing of a great many weeds that would otherwise compete with the grain. Therefore, it is indeed worth while to kill out as many of these weeds as possible while they are still young.

When wheat land is plowed, as it usually is in the middle of the summer and at a time when the supply of moisture is usually very low, it has been found a paying practice to harrow and roll the ground immediately after plowing. This means that one should unhitch from the plow about half past four, then roll the land and follow this up with the spike-tooth harrow to make a dust mulch.

Use Good Seed.

After the land has been well fitted, and after all pains have been taken so that the moisture of the soil may be conserved for the wheat, all this work is brought to naught by the planting of poor seed. Within the last few days there has come to my attention the fact that neighbors are very often unwilling to pay the price that should be paid for suitable seed wheat. Suitable seed wheat for planting next year ought to be that which is absolutely free from rye as well as being free from the various weed seeds. While there are but few weed seeds that cannot be successfully separated from wheat by the fanning mill, seed wheat that shows both red and white kernels is also objectionable because of the fact that the white wheat is often a macaroni or soft wheat, while the red is usually the hard wheat. The two do not make a blend of flour that is relished by a great number of house-

wives and for this reason the millers do not like to buy the mixed wheats.

As to the price that one can afford to pay for seed wheat, that will vary with the material that is offered for sale. Here we are bid \$2.05 a bushel for new wheat on board the car and with wheat starting in at this price, it is very likely that much higher values will obtain before the season is over. When we consider that seed wheat is suitable because it has been kept free from weed seeds and because the rye has been cut out, not to mention the fact that the thresher has been thoroughly cleaned before the seed was saved, then we are in a position to know that the man who has seed wheat for sale may reasonably expect a price of nearly twice what the same wheat would bring on the market. Three dollars and a half under such conditions could hardly be considered an excessive price; neither should the grower we expected to sell this wheat on time since he can easily sell to an elevator man for cash.

With wheat as with all other farm seeds, it is always the part of wisdom to run the seed through the fanning mill and take out the lighter grains. No one would ever think of contending that these light grains do not make as good seed, but the real point is that the larger grains will furnish more food for the young growing plant and by so doing will enable the wheat to survive the winter and start out much stronger in the spring. No stones should be left unturned in order that a large wheat crop may be realized.

In the early history of fertilizers, many did not believe that it paid to fertilize for wheat. There are, however, but few soils where the intelligent use of fertilizers in the right forms will not pay a good investment.

When to Sow.

Wheat has enemies which are inactive in cool weather but they are very active in warm weather. The most destructive pest of wheat is no doubt the Hessian fly, which is thought to have been introduced by Hessian soldiers in the early days. Whether or not that part of history is true is hard to say, but certain it is that the Hessian fly getting abroad is one of the greatest single catastrophes that has ever befallen the new world at the hands of the old.

There are a number of ways of controlling this fly, such as the sowing of volunteer strips around the outside of the field, but the best way is probably to sow the seed rather late. During a season that is very cold the wheat

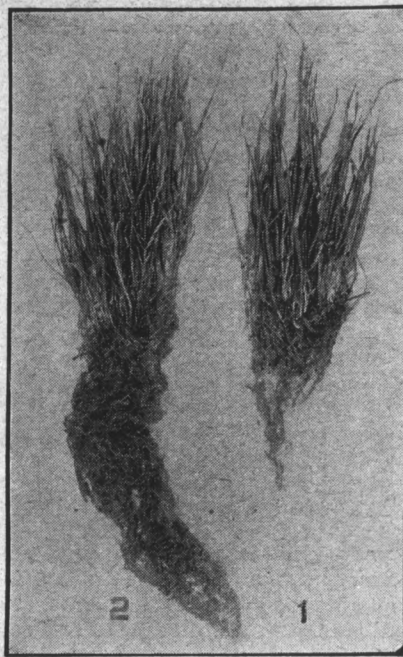
If the ground has been well fitted, the seed thoroughly selected and graded and placed in the ground, it is doubtful if there is much more to be done. Under the peculiar conditions of this year, however, it will undoubtedly pay to fertilize the wheat and one good way of fertilizing wheat is to top-dress with a rather fine, well-rotted manure after the wheat has been sown.

RELATION OF PHOSPHATES TO SOIL FERTILITY.

(Continued from first page).

tility work. Although we cannot take up in detail the results of his efforts, certain phases are invaluable at this time it seems.

At the Urbana Experimental Field,



Phosphates Stimulate Root Growth of Wheat—Sample No. 1, Untreated; No. 2 Grown on Soil Treated with Phosphate.

silt loam soil with an annual application of six hundred pounds of rock phosphate, in connection with decaying organic matter, the phosphates have yielded for each dollar invested in phosphorus, the amount shown in Table V.

Table V.

Illinois Results.

First rotation 1902-1904.....	.99
Second rotation 1905-1907.....	2.39
Third rotation 1908-1910.....	2.99
Fourth rotation 1911-1914.....	3.13

The results from field culture experiments on many other farms in Illinois show that the application of phosphorus is profitable.

The Indiana Experiment Station has shown by means of numerous field trials that acid phosphate either with

At present I am able to report that the application of either acid or raw rock phosphate has proven highly profitable on our outlying projects. Moreover, a number of the county agents report positive results from the use of acid phosphate. Last year co-operative experiments with County Agent Smith at the Kent county farm showed that four hundred pounds of acid phosphate increased the yield of potatoes sixty bushels over adjacent untreated soils. Two hundred pounds of acid phosphate applied to a sandy soil belonging to A. C. Green, in Lenawee county, increased the yield of rye from 16.9 to 21.4 bushels per acre, at the same time greatly benefiting the clover that was seeded in the rye. It is estimated that both acid phosphate and rock phosphate have doubled the yield of oats at the Van Buren county farm. In this case four hundred pounds of the former and two hundred pounds of the latter were added to the corn crop one year ago, thus the residue is responsible for the greatly increased yield.

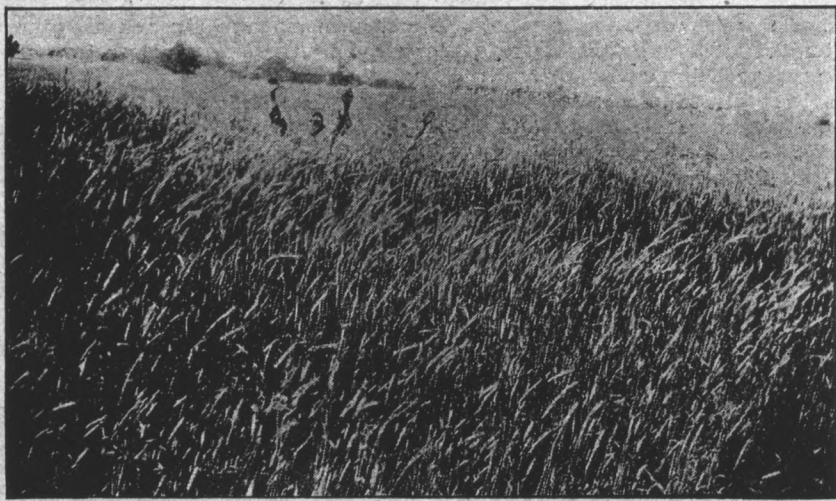
The evidence that the use of phosphates on soils is highly profitable is a safe practice and must be considered in our permanent systems of agriculture, is overwhelming. Yet there are many unsolved problems that are going to arise in this connection later on and therefore we must not lose sight of the tremendous importance of well planned and carefully conducted experimental projects in several different parts of the state.

What form and in what amounts should we use phosphates? These are important questions—ones which I am unable to fully answer with the amount of information at hand bearing upon Michigan soils. There are, however, two chief forms of phosphorus in unmixed goods, namely, the acid phosphate or the so-called soluble phosphate, resulting from the treatment of either ground bone or raw rock phosphate with sulphuric acid, and the raw rock phosphate. Two hundred pounds of the former should be applied to two grain crops in a four-year rotation, by means of a fertilizer drill or attachment. Four hundred pounds or more should be used on heavy cash crops, and fifteen hundred pounds of the latter once in a four or five-year rotation, it being advisable to apply raw rock phosphate to the sod before plowing, inasmuch as the decaying vegetable matter aids in making the phosphorus available. The raw rock phosphate is generally distributed by means of a lime spreader.

If one is unable to obtain either of the above forms of phosphates and can procure a mixture containing a small amount of nitrogen, say one or two per cent, and large amounts of phosphorus it is certainly advisable to do so, inasmuch as the phosphorus present will in the majority of cases pay handsome profits regardless of the fact that the nitrogen may not in itself be a paying proposition. In other words, if it is to be a mixed product or none, take the mixture. For wheat and rye about two hundred and fifty pounds is the proper amount on most soils, although some Michigan farmers are applying three hundred pounds per acre.

Attention should be called to the desirable practice in vogue in some communities of purchasing the phosphates or other fertilizers in carload lots. In this manner they are purchased at an appreciably lower rate.

In conclusion I desire to state to those who are skeptical regarding the benefits to be obtained from the use of phosphates on small grains, that it is no less than good business to apply the standard amounts to a small area, say one-half or one acre and determine whether or not it is a paying proposition. If the acid phosphate is used, charge two-thirds of the cost of the treatment to the first crop and the remainder to those that follow and bear in mind that rock phosphate oftentimes shows up to better advantage the second season than it does the first.



Seven-foot Rosen Rye on the Mike Welsh Farm in Montcalm County.

may be sown earlier than when the season remains warm. If the wheat is sown too late it may dodge the Hessian fly and still not make enough of a growth for winter, and if planted too early it will make sufficient growth, but the work of the fly may be damaging. If sown late it is better to fertilize liberally.

or without manure is an exceedingly paying proposition.

Now will phosphate increase the yield of crops on Michigan soils? We can answer in the affirmative, so far as the majority of the fields are concerned. The soils department is steadily accumulating results of field experiments in different parts of the state.

The Farmer and the War

By N. A. CLAPP

As a rule, we are accused of hoping for and expecting too much. Our desires and ambitions lead us to look on the bright side of all that we have before us, and we are inclined to believe that we can accomplish more than good judgment will lead us to expect. The business of farming, sowing with high hopes of an abundant harvest tends to cultivate within us the habit of thinking that we are able to accomplish much in the near future. Many years of experience, when failures and disappointments come very frequently has a tendency to teach us that we have been, and are, prone to hope for more than the case will warrant.

Conditions on the farm since the manufacturing industries received the stimulus of extensive trade, and the business interests of the country seemed to catch the attention of the masses, both the wise and the indifferent ones, seem to have compelled the farmers to work on the short end of the even. Sixteen per cent of the farm help has been lured, by tempting and apparently high wages, to leave the farmer and his stable business of feeding mankind, and have secured employment in the factories where they believed they were helping themselves to a better condition in life. Of dire necessity the number of acres of farm lands cultivated have gradually diminished, the work on those acres cultivated has not been as thoroughly done as in former years, the yields of staple crops have fallen off, and what might be expected has happened—after a single unfavorable season the supply of the needed food stuffs is short, speculation in the same is rife, and we are facing unprecedented high prices. With the exception of some of the favored artisans and tradesmen, whose wages have been raised proportionately with the ascent of prices, consumers are struggling in a desperate effort to exist.

The Farmer's Burdens Doubled.

Notwithstanding the well known fact that farm help is scarce and wages for farm hands doubled, the government has asked the farmers to increase their acreage of spring grains, which has been done under unfavorable conditions, and now they are asked to increase their acreage of wheat and insure a billion bushel crop in 1918. To some the demand may seem complimentary, but to others who seem to feel and see what the results of the army draft must be when the ranks of the farmer's help are still farther decimated, consider the outlook a gloomy one. After the farmers have carried all that they feel they possibly can carry, then to be asked to give up a part of their help and subsequently accomplish more than they have in the recent past, makes them halt and look discouraged.

During the early part of the present season the weather was cold and the moisture superabundant. It was practically impossible to get the corn planted in very many fields at what is usually called corn planting time. The cultivating was very imperfectly accomplished, and now we need not expect much, if any, above a half crop of corn in Michigan. It is encouraging to read that the outlook is good in what is called the corn growing states, for some of the corn from the corn belt will be needed in Michigan the coming winter.

A Righteous Plea for the Farmers.

The prime necessity, both at home and on the battlefield, is food to sustain the individuals that are actively engaged in the work of supplying the necessities of life as well as fighting the enemy. To the thoughtful ones it seems like poor policy to reduce the man power at the food end of the game. Let the first inflow of men into

the ranks of the army come from the congested centers of population and give the farmers an opportunity to produce and garner a bountiful supply of food that will fill up the gap in the shortage of the present food supplies.

A deep love for humanity and a desire to aid in breaking the yoke of tyranny that is bearing heavily on the necks of our fellowmen, is just as warm and sincere with those who toil in the farm fields as with those who labor elsewhere, and the dread of having the yoke of bondage extended to the dwellers in our own beloved country is just as great as with those in the most congested centers of population. A clear and firm declaration has been made by high authority that the success of the task of overpowering the enemy rests largely with the food producers. Give them a chance to perform their necessary work as food producers, before they are asked to shoulder arms and march to the front.

I do not think the matter, viewed from any standpoint, should be considered favoritism. The pressing necessities of the case demand that a bountiful supply of substantial food

stuffs be furnished the allied forces and soon as possible, and there is no other source from which it can be secured than from the farms in the United States. Reduce the working forces on the farms and we will be greatly crippled, if not defeated.

It would be a sad comment on the intelligence, sagacity and foresight of the leaders in this great struggle, if, after the sacrifices which are being made at home and abroad, the enduring of indescribable hardships in many directions where the horrors of war are being enacted, we reduce the producing forces on the farms, and let that be ascribed as the cause of our undoing. England confesses that she made a mistake in that direction. Shall we follow her example, or shall we profit by her mistakes?

It looks as though sentiment along these lines should be stimulated. We can not do as the Germans have done, when one-third of their man power is engaged in active service in the army (utilize the women, because our women are not trained to perform farm work), but it would be a wise policy to retain sufficient help on the farms, for a season, at least, to enable us to get on safe footing as far as food supplies are concerned.

(See Editorial Comment.)

The Sparrow and Food Conservation

By J. A. KAISER

At first glance, it may seem to some that the connection between the English sparrow and the conservation of our food supply is too insignificant to deserve notice. But the impression is altogether erroneous, and this Old World pest that now flourishes in such numbers in our land, plays a very important part in our food preparedness program. Indeed, because of the acuteness of the situation, right now is the opportune time to begin anew, a campaign against the English sparrow. Of late years, in Michigan at least, the war against this pest has slackened and in many neighborhoods, ceased almost entirely. This is due partly to the seeming hopelessness of annihilating the sparrow nuisance, and partly to a sort of passive indifference. This indifference is fostered and heightened by the fact that many of the evils of the English sparrow are produced indirectly, and therefore, not immediately apparent to many people. That this bird is a nuisance and a pest without redeeming feature, needs not to be demonstrated. Apologies for the English sparrow are too far-fetched to deserve serious attention.

In these days when the importance of increased production and the elimination of waste are being iterated and reiterated the full weight of the sparrow nuisance becomes apparent. As has been already hinted, these birds are harmful, both directly and indirectly.

Direct Losses Chargeable to the English Sparrow.

In considering the direct and more apparent vices of the sparrow under discussion, we find that the bird eats large quantities of grain of all kinds. This is not only eaten in the fields when the grain is growing or in the shock, but later, about the barn and poultry yards where the birds congregate during the autumn and winter, in immense numbers. Let this Old World sparrow have his own way, and he is primarily a grain eater, always. For his grain-eating propensities alone, the bird forfeits the right to protection. In addition to this, the filthiness of these birds during nesting time, and their habit of building in the covered tracks of barn doors and in other annoying situations, form another strong reason for extermination.

But by far the most harm is done by the English sparrow indirectly, and in

the following ways: Wherever these birds live about a place in large numbers, some of our most beneficial birds become rare or even extinct. The blue bird, the downy woodpecker, and the barn swallow are among the best known examples of this fact. These birds are all very beneficial, consuming myriads of insects about orchards and gardens, and doing no harm whatever, to any crop. The harm done in this regard, by the English sparrow, is of great importance. Every insect-eating bird is a valuable asset about any farm home. The English sparrow has decreased greatly, the number of these beneficial birds. Luckily the house wren, another valuable insect-eating bird, nests in holes and crevices so small that the sparrow can not enter, and for this reason, can not be driven away.

Still another evil indirectly brought about through the presence of the English sparrow, is found in its habit of frequenting poultry yards and poultry houses. It has been proved frequently that these sparrows are the carriers of mites and lice, and very often a flock of hens become burdened with these parasites as a result of the visits of English sparrows. It is probable, too, that contagious diseases among fowls and even among hogs and cattle, are spread by these numberless feathered vagabonds.

"Kill Two Birds with One Stone."

In the foregoing we have mentioned some of the evils of the English sparrow—evils which, it is evident, have their share in cutting down the general efficiency of the food preparedness movement. In another way, the program of food supply may be benefited by the destruction of these birds. These sparrows are excellent eating, and small as they are, might produce a large amount of wholesome, nourishing food. Because of his immense numbers, the English sparrow could be made to cut no small figure in a famine-stricken district. Why not, in this time of national and world crisis, slaughter these birds and thereby increase the available food supply as well as ridding the country of an unmitigated pest.

Whether or not it is possible to exterminate absolutely, the English sparrow, is a question about which there is a difference of opinion. But this much is certain: The bird may be so harried and slaughtered that its evil pro-

pensities will become so slight as to dwindle into insignificance. If anyone doubts this, let him look for English sparrows about the garden, farmyard, and orchard of some farmer who wages systematically, a campaign against these birds. The writer knows of such farms, and English sparrows are seldom seen there, and in any case, are so wary that they never frequent the poultry or barnyard. Let us give the problem of increased production and food preparedness a lift by waging war on the English sparrow. The campaign will be of benefit, not only during the world war, but for generations after the thunder of big guns has died away.

FARM NOTES.

Will a Cover Crop Injure the Corn?

I have a field of corn which is now clean and growing very rapidly. I wish, however, to grow a green crop to plow under next year; and have a farm that has been run quite badly; but as you know, the corn crop this year is very late, and its value, if matured, will be greater than usual. Will the sowing of a cover crop now interfere with, or detract in any way from, the present crop ripening early? And how much vetch and rye should be sown per acre?

Charlevoix Co.

B. E. W.

From the writer's experience in the planting of cover crops in standing corn, there is very little if any injury to the corn crop by adopting this plan. When corn is well established and has reached the tasseling stage, the ground is almost completely filled with corn roots below the surface, which has been kept loose by cultivation. Under dry weather conditions, no cover crop which is sown in this surface soil will make a very vigorous growth, and if there is sufficient moisture later in the season to insure a good growth of cover crop, there will be plenty of moisture at the same time to mature a good corn crop.

Where the ground is shaded by a heavy growth of corn, there is much less evaporation from the surface of the ground, and also far less evaporation from the leaves of these small surface rooting plants than would be the case if they were sown in the open. These little plants cannot successfully compete for the moisture needed by the corn crop, and we do not believe there would be any appreciable shortening of the crop from sowing vetch and rye in the corn as proposed.

The usual rate of seeding is about three pecks to a bushel of rye and about fifteen pounds of vetch seed per acre, although various combinations of the two are used, depending upon the condition of the soil, the purpose for which the crop is to be used and the relative cost of the seed. Such a crop should be preferably sown at a time when weather conditions would favor the early germination of the seed and development of the young plants, since under the handicap of the growing corn crop favorable conditions are needed if a good cover crop is secured.

MEETING OF THE U. P. BOOSTERS.

The Upper Peninsula Development Bureau held its annual meeting at Houghton and elected the following officers: President, L. C. Harmon, of Manistique; first vice-president, A. T. Roberts, Marquette; second vice-president, Elmer Grimmer, Marinette; treasurer, H. W. Reade, Escanaba; secretary and manager, George W. Rowell, Marquette; executive committee, Alger county, G. S. Collins; Baraga, O. W. Smith; Chippewa, N. W. Dill; Delta, B. T. McKillican; Dickinson, S. T. McGregor; Gogebic, L. C. Brewer; Houghton, J. T. McNamara; Iron, E. C. Bowers; Keeweenaw, S. R. Smith; Luce, M. E. Bauerman; Mackinaw, C. W. Hecox; Marquette, R. P. Bronson; Menominee, R. A. Packard; Ontonagon, August Wallen; Schoolcraft, Benjamin Gero.

The Fruit Harvest Help Problem

THE matter of labor during the harvesting season is expected to be a serious problem to many fruit growers this season, and for several seasons to come. Fruit harvesting means temporary work for a large number of people over the number necessary for the maintenance and care of the orchard during the rest of the year. On this account help will be hard to obtain because, when help is scarce, the workers naturally take to work which gives them steady employment and good pay.

Some growers have realized the disadvantages of endeavoring to get help for a short time and have therefore arranged their orchard plantings so that they can keep the pickers busy through a long season. For instance, Mr. Amos Tucker, of Allegan county, has his orchard of 160 acres set out

the city. During the height of the cherry season Mr. Munson had at least seventy-five children picking. These children get five-eighths of a cent a pound for picking cherries, and gooseberries, and the weekly income of individuals during the picking season ranges from seventy-five cents to six or seven dollars, depending on how well the pickers stick to the job.

Keeping the Picking Record.

Mr. Munson's system of keeping record of the work of each individual is unique. He issues cards to pickers which have two rows each, of figures from five down. These figures stand for cents and as soon as a child gets a case of cherries picked the boss of the gang punches the card for the proper amount. Gooseberries are picked in bushel baskets and the card of the picker is tied to it. After the



Cherry Pickers Eating their Noon Lunch Amid Pleasant Surroundings.

so that he can employ help for picking, from gooseberry time through the apple harvest. His fruits include gooseberries, early and late cherries, plums, peaches, early and late apples.

A Long Picking Season.

During the cherry picking season Mr. Tucker had sixty pickers busy. A great many of these came from around his own vicinity, which is fifteen miles from South Haven and five miles from a railroad station. Other pickers are college students who plan to stay all through the entire vacation season. The Tucker farm is a scene of great activity all through the season on account of the long picking season. During the cherry picking season the pickers get a cent and a half a pound, and some of them make as much as four dollars a day. This is exclusive of board, which is furnished at reasonable rates to those who do not live in the vicinity. Mr. Tucker and his son take care of the pickers, one daughter arranges the meals and the other keeps the picker accounts. Girls are used as packers and the fruit is hauled to a boat landing about five miles from the farm for shipment to a Chicago pie concern which has contracted for the fruit at attractive prices.

During rainy days and in the evening the college boy pickers enjoy themselves at games and at the piano in the house. Besides making a good wages and enjoying the benefits of outdoor life, these boys thoroughly enjoy their season of work with Mr. Tucker.

Keeps Employees Content.

The reasons why Mr. Tucker is turning away help instead of begging for it are that he pays good wages, gives a long term of employment and endeavors to keep them happy by allowing them means of entertaining themselves when not working.

Mr. J. Pomeroy Munson has solved the picker problem in a different manner, because he is working under different conditions. His fruit farm is near to the city limits of Grand Rapids and his unfailing source of help is the children from the Polish districts of

gooseberries are put through the fanning mill to get the leaves out they are weighed and the card credited with the proper amount and returned to the picker.

The children are all loyal to Roy, as they all call him, because he is firm but fair with them. After they are through picking, if his auto or motor truck is going to town he gives them a ride. He also allows them to eat their noon-day lunches on his fine shady front lawn, where he has a water tap convenient for their drinking or washing up.

When picking is good, as it has been this year, the children will bring all their sisters, brothers and other juvenile relatives. As a result Mr. Munson had more pickers than he needed.

Methods to Beat the System.

Occasionally individuals endeavor to take advantage of him by punching their cards with pencils or complaining that their cards were lost, and stating the amount they had on them. The pencil punches do not work because the regular punches make clean cut, characteristic holes, while pencils holes leave rough edges on one side. When a card is lost the loss is the child's, not Mr. Munson's, as that scheme was worked too often before these restrictions were put into effect.

In order to have the picking done thoroughly there is a boss with each gang who sees that a bush or tree is cleaned up before another is started, and punches the cards. He is usually a high school boy who has worked for Mr. Munson during several vacations.

Pay day is on Friday, and it is interesting to watch the children, with anxious eyes, line up for their pay. Invariably from the smallest tot up, they have figured the amount due them and are very exact regarding the amount they should receive.

In some cases the writer has noted that the farmers have gained in the matter of labor supply by the fact that some of labor age have taken up farm work for the purpose of having an exemption cause.

The Scientific Correction of Acidity

You cannot get perfect results by trying to correct an acid soil in a hap-hazard, guess-work manner. It takes accurate scientific knowledge of conditions.

For example, when the thermometer stands at 30°F it requires only a small amount of sunshine to correct that freezing condition—just the same, when your soil is slightly acid it requires only a small amount of limestone to correct that sour condition and make it sweet.

When the thermometer stands at zero it takes more sunshine than most winter days can supply to thaw that freezing condition. But to sweeten an extremely acid soil is simply a question of applying greater quantities of limestone per acre. An accurate knowledge of just how much to use is, however, essential.

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Suppose you were trying to correct this freezing condition when your thermometer showed zero--20 degrees of sunshine wouldn't do it. Suppose you were trying to correct an acid condition in your soil without knowing the degree of acidity--perhaps one ton per acre would not be sufficient and your labor of applying would soon have to be repeated again.

Many authorities recommend the application of two tons of limestone per acre of sour soil as a general prescription—as a matter of fact, sometimes one ton per acre will be sufficient to properly sweeten your soil, then again it may take four to six tons, depending upon how low your thermometer of acidity stands.

Get The Advice Of Our Chemists

We suggest that you test your soil with Litmus Paper, which we will supply free. If your soil proves sour, send us a sample and our laboratories will report a test to you made by the delicate "Truogg" method. A test which shows five different degrees of acidity.

Then we will make a recommendation to you. You will not be obligated in any way but the information will permit you to go ahead and correct your sour soil without chance or guess work.

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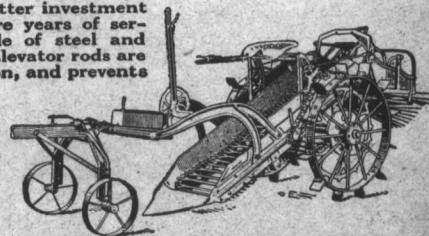
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Gets all the tubers. Saves the backaches from hand digging. Digs from five to eight acres a day. Delivers all of the potatoes on top of the ground—easily seen and picked up. No weeds or trash to bother. This is delivered to the side of row. Picker attachment can be furnished which delivers potatoes in piles or in crates.

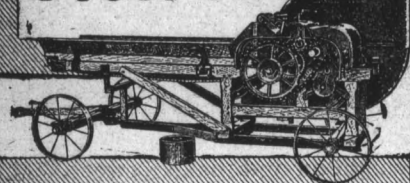
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Silage as a Grain Substitute

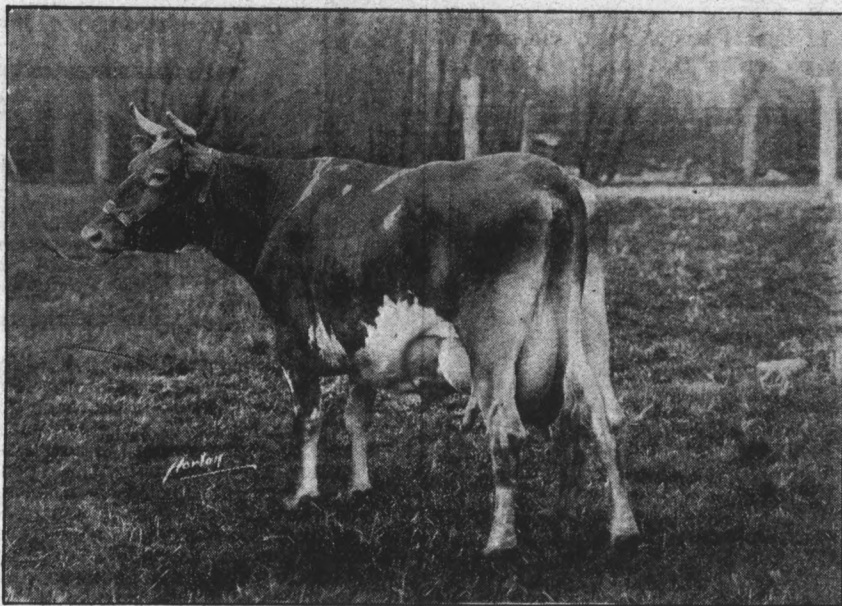
THE prevailing high prices of grain feeds in the face of very moderate prices paid for dairy products have reduced the dairy farmer's profits to a point where it is an open question with many whether it is possible to make the cow pay for the large grain ration necessary. Several western New York dairymen have found that if they are able to dispense with half the grain he formerly fed without materially reducing the milk production and butter-fat, the chances for profit have increased at a smaller cost of production.

Tests Show Advantages.

Several feeding experiments have been held in various sections of New York to determine just what position

The general plan of this experiment was to compare two rations which should carry as nearly as possible the same amount of dry matter and nutrients. In one ration these nutrients were to be derived largely from roughage, mainly silage; in the other ration no silage was to be fed and as little roughage as seemed wise, the bulk of the nutrients being derived from concentrates. The two rations fed carried practically the same amount of dry matter. In one over fifty per cent of this dry matter was derived from silage and less than eighteen per cent from grain. In the other over fifty-seven per cent of the dry matter was from grain, no silage being fed.

The silage used in the test was a



Starlight's Contrast, a High-producing Guernsey.

silage may be made to occupy in the dairy cow's ration, and the relative basis for feeding as compared with purchased grains. In one of these tests ten cows were used, representing five different breeds, to determine what effect the feeding of more silage than is usually fed, with a corresponding reduction in the grain portion of the ration might have upon the production of milk, butter-fat, gain in weight, cost of ration, and consequent profit.

mixture of one ton of soy beans and cowpeas to two and a half tons of silage corn. There were nearly twice as many soy beans in the mixture as cowpeas. The silage corn was very low in dry matter, owing to an unfortunate season. The silage was found to contain 18.63 per cent dry matter, 2.36 per cent protein, 4.68 per cent crude fibre, 0.92 per cent of fat, and 9.36 per cent of nitrogen free extract, being richer in protein and poorer in carbohydrates than average corn silage on account of the admixture of soy beans and cowpeas.

The cows fed the silage ration produced 96.7 pounds of milk and 5.08 pounds of butter-fat per hundred pounds of dry matter; those fed the grain ration produced 81.3 pounds of milk and 3.9 pounds of butter-fat.

The cost of feed per hundred pounds of milk produced was \$0.687 with the silage ration and \$1.055 with the grain ration. The cost of feed per pound of butter-fat was 13.1 cents with the silage ration and 22.1 cents with the grain ration. The average net profit per cow per month (over cost of feed) was \$5.864 with the silage ration and \$2.465 with the grain ration.

Results Show Silage a Grain Substitute.

Comparing the average daily product of each cow for the entire test with her average daily product for the month previous to the change in ration (or the first month of their test in the case of two cows), the cows fed the silage ration shrank 2.84 per cent in milk and gained 1.89 per cent in butter-fat production. The cows fed the grain ration shrank 9.11 per cent in milk and 14.18 in butter-fat production. Upon the conclusion of the experiment each lot of cows was found to have gained in live weight—the silage-fed cows an average of forty-seven pounds per head; the grain-fed cows an average of fifty-seven pounds.

The facts reported seem to justify the conclusion that silage can be made to take the place of considerable grain that is being fed to dairy cows in var-

ious dairy sections. Growing more feeds rich in protein—clover, alfalfa, soy beans, cowpeas, field peas, vetches—and ensiling them, or feeding them as hay, will be possible to further reduce the amount of feed cost, and to increase the profits of the dairy herd. New York. E. W. GAGE.

SILOS CONSERVE FEED.

Erecting a silo is not so spectacular as shelling a trench; but is certain to have an important part in winning the war. We must conserve food or Uncle Sam cannot supply his hungry neighbors. Here the silo plays its part in world affairs. It is the greatest feed saver known to farming.

An acre of corn fodder put into the silo has more feeding value than an acre of field corn whose stalks have been stripped of its ears and fed with the meal made from the dry corn. There are several reasons for this. One is that in putting corn into the silo none of it is wasted. The whole corn plant, except the roots, goes in and when it comes out it is so palatable that the cattle, horses and sheep just cannot leave it alone until the last vestige has disappeared.

Another economy in the use of the silo results from corn being stored at a time when it contains the greatest amount of nutrients per acre. Then, after the fodder is in the silo, it goes right on getting better. It becomes even more palatable than the corn was before being ensiled, tasting so good in the ration that the cow or steer does not mind particularly if some of the other feeds are somewhat dulling to the appetite.

In the labor saved lies further silo economy, which is of great importance now. It takes no more labor to put an acre of corn in the silo than to shock, husk and shred it; but the product is more valuable.

Rats and mice cannot eat the corn that is in the silo, nor wind and rain decrease its feeding value.

In many sections the filling season is very close at hand, and quick action will be needed if a silo is to be put up this year. Every fall sees a rush for silo materials at the last moment. The rush will be greater than ever this year on account of the feed shortage.

SUGGESTIONS ON THE CARE AND FEEDING OF DAIRY CATTLE.

Do not feed the dairy herd as a herd, for cows differ in their food requirements just as human beings do. By feeding all cows in the herd alike, some are sure not to get enough for the greatest profit and others will get more than they can use to advantage.

Cows need much water and should be induced to drink two or three times a day if possible. The average milch cow requires nearly ten gallons of water a day and more than two-thirds of that must come as drink and the balance from water in the feed. Always provide clean fresh water.

Salt should be supplied at the rate of five to seven ounces a week, given as often as twice during the week. Do not use a common salt box in the yard unless all the cows are absolutely free from disease.

It pays in dollars and cents to give the cow extra care. The cow that is kept comfortable will give the best returns.

It is always desirable to grind all grains for the dairy cow because of the large amount of feed that a cow must digest in order to produce well.

There is no advantage in cooking or steaming feeds for dairy cows. Some unpalatable feeds may be consumed in larger quantities if cooked but cooking does not ordinarily add much to the palatability of grains and may even decrease their digestibility.

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Your tractor pulls a terrific load. The working temperature of your engine is extreme, whether you burn gasoline or kerosene for fuel.

You must have an oil that will maintain its viscosity under any and all conditions. If it doesn't, metal will touch metal and there is trouble—serious trouble—more expensive than your lubricating oil for several seasons will amount to.

Crookston, Minn., June 28, 1917

To Whom It May Concern:—

Considerable advertising has been done by a great many Oil Companies, stating the amount of saving, etc., which could be made through the use of high priced lubricating oil, and as I am the owner of a Big Four—four cylinder—30-60 Gasoline burning tractor, I was interested in finding out whether high price had anything to do with high-quality, so decided to have a test made.

June 26th I filled my engine crank case with an oil retailing in Crookston at 65c per gallon when purchased in barrel quantities, and which is the oil recommended by the company manufacturing it to be the proper oil for summer use in a 1915 model, Big Four 30-60 tractor.

I ran the tractor myself, pulling the same load under exactly the same conditions as those previously encountered while using Stanolind Gas Engine Tractor Oil, and although there was practically no difference in the weather temperature, it only took two hours work pulling a 30-inch, Model A, Russell Elevator Grader until the temperature of the cooling system had risen 50° higher with the 65c oil than when using Stanolind Gas Engine Tractor Oil.

It is needless to say that with this difference in temperature of the cooling system more gasoline and lubricating oil was used. I, therefore, feel that I can conscientiously recommend Stanolind Gas Engine Tractor Oil, even though it is much cheaper in price, to all operators of Big Four 30-60 Gasoline Burning Tractors.

My tractor was purchased during the season of 1915, and since that time to date I have plowed 1800 acres, broke 475 acres, and have pulled a heavy road grader more than 800 miles in the construction of roads. I have never found it necessary to overhaul the motor as the compression is good and the tractor has plenty of power.

With the exception of one barrel of lubricating oil, I have never used other than Stanolind Gas Engine Tractor Oil manufactured and sold by the Standard Oil Company of Indiana, which is selling today at 29.4c per gallon F. O. B. Crookston.

Yours very truly,
[Signed] E. A. McCoy.

A High-Priced Oil Does Not Mean The Best Oil

There are lubricating oils on the market which sell for double the price of Stanolind Gas Engine Tractor Oil, Standard Gas Engine Oil and Polarine.

But these latter oils are made by the Standard Oil Company (Indiana) and for that reason can be, and are sold, at a low price.

They are made especially for tractors. They are the results of exhaustive and extensive research work on the part of the most complete assemblage of lubricating experts who have devoted their lives to the solution of lubricating problems. These men recommend Stanolind Gas Engine Tractor Oil for tractors using kerosene; Standard Gas Engine Oil for tractors burning gasoline—and Polarine in various grades for tractors having high speed motors.

They Say—

that these oils add power and life to your motor; that they are of great durability and economical in use; that they lubricate thoroughly even the remotest reciprocating surfaces, reducing friction to a minimum; that they maintain their viscosity even under extreme heat conditions to practically the same degree as the so-called heavy oils.

What Leading Tractor Builders Say—

The International Harvester Company recommends Stanolind Gas Engine Tractor Oil for their tractors. J. I. Case Threshing Machine Company recommends Stanolind Gas Engine Tractor Oil for their tractors, as do numerous other manufacturers recommend one or the other of these superior lubricating oils for their respective tractors.

And the letter from Mr. E. A. McCoy of Crookston, Minn., at the left, needs no comment. If you go to a physician you accept his diagnosis—you don't dispute the judgment of a lawyer on legal matters. Accept the united recommendation of the largest manufacturers of tractors, of the largest refiners of oil, of the best petroleum research men, and an enthusiastic tractor owner.

Made, Recommended and Guaranteed by the
STANDARD OIL COMPANY
(Indiana)
72 W. Adams St. Chicago, U. S. A.

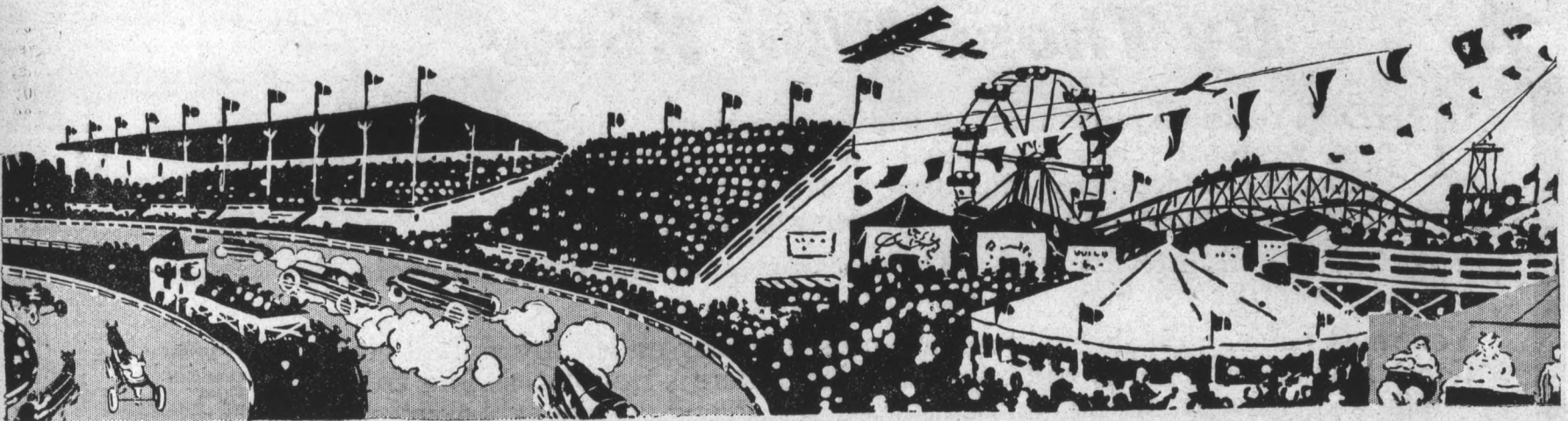
Table of Tractor Specifications and Cylinder Oils Recommended

Key S. G. E. Standard Gas Engine Oil
G. T. Stanolind Gas Engine Oil
Pol. Polarine Oil
H. P. Heavy Polarine Oil
E. H. P. Extra Heavy Polarine Oil

Advance Rumely—		
Oil Pull	80-60	G.T.
Gas Pull	15-30	G.T.
All Purpose	8-16	G.T.
	12-24	G.T.
Allis-Chalmers	10-18	H.P.
Allwork	12-25	G.T.
American	20	S.G.E.
	60	S.G.E.
" Oil Tract.	20-35	G.T.
Andrews	10-20	Pol.
A & T	18-36	E.H.P.
A & T	25-50	E.H.P.
A & T	80-60	E.H.P.
Avery	5-10	H.P.
"	8-16	H.P.
"	12-25	E.H.P.
"	18-36	E.H.P.
"	25-50	E.H.P.
"	40-80	E.H.P.
Baby Johnson	27-29	Pol.
Bates	10-20	G.T.
	16-30	G.T.
Bates Steel Mule	30	H.P.
Beeman-Garden	4	G.T.
Best	75	G.T.
Big Bull	7-20	S.G.E.
Boring	10-20	G.T.
Brillion	25	S.G.E.
Buckeye, Jr.	8-16	Pol.
Buckeye	40	G.T.
Case	10-20	H.P.
"	12-25	H.P.
"	20-40	G.T.
"	80-60	G.T.
Caterpillar	45-25	G.T.
	75-50	G.T.
Champion	16	S.G.E.
Chase	25-35	H.P.
	15-25	H.P.
C.O.D.	15-25	G.T.
Common Sense	15-25	Pol.
Creeping Grip	20-12	G.T.
C.T.A.	16-32	Pol.
Dakota No. 1	20-25	Pol.
No. 2	40-45	Pol.
Denning	10-18	H.P.
Dill	23-47	Pol.
Eagle	12-25	G.T.
Emerson L.	12-20	H.P.
" Big 4	20-35	G.T.
" Big 4	30-55	G.T.
Reeves	40-45	G.T.
Fairmont	24	G.T.
Farm Horse	15-26	S.G.E.
Farmer Boy	35	Pol.
Farmobile	12-20	Pol.
Farquahr	4-30	G.T.
	4-40	G.T.
Fitch	25	G.T.
Gray	20-35	S.G.E.
	15-25	S.G.E.
Hackney Auto		
Plows	20-25	S.G.E.
	15-20	S.G.E.
Happy Farmer	8-16	S.G.E.
Hart-Parr—		
Little Devl	22	G.T.
Crop Maker	27	G.T.
Oil King	35	H.P.
Steel King	40	H.P.
Old Reliable	60	H.P.
Hoosier	8-16	Pol.
Huber	20-40	G.T.
	35-70	G.T.
Hume	20-30	Pol.
Hume Jr.	12-18	Pol.
I. H. C.—		
Mogul	8-16	G.T.
	12-25	G.T.
Titan	10-20	G.T.
"	15-30	G.T.
"	80-60	G.T.
Imperial	40	G.T.
Ingeco	10-20	G.T.
Iron Horse	15-25	Pol.
K-C	20	Pol.
Kinnard	15-25	G.T.
Knox	40	Pol.
K-T	12-25	Pol.
Lausen	15-25	H.P.
	20-35	H.P.
Lawter	40	S.G.E.
Leader	12-18	S.G.E.
Leader, Jr.	9-15	S.G.E.
Leader	25-40	S.G.E.
Lion		S.G.E.
Little Oak		H.P.
Louisville Avery	10-20	G.T.
Maytag	25	Pol.
Minneapolis	15	S.G.E.
"	20	G.T.
"	25	G.T.
"	40	G.T.
Moline Universal	6-12	G.T.
Morton	60	Pol.
New Age	10-18	Pol.
Neverslip	12-20	S.G.E.
Nilson	40	H.P.
Olin	13-25	G.T.
Paramount		Pol.
Parrett All Pur.	10-20	Pol.
Peoria	8-20	S.G.E.
Pioneer		S.G.E.
Pioneer "30"	20-40	E.H.P.
Jr.	20-45	E.H.P.
" Pony	15-30	G.T.
Plow Boy	10-20	S.G.E.
Prairie Dog	25	Pol.
Rock Island		
Heider	10-20	G.T.
Russell	12-24	S.G.E.
"	20-40	S.G.E.
"	30-60	G.T.
Sandusky	33	S.G.E.
Simplex	15-30	S.G.E.
Simplicity	25	G.T.
Smith	10-20	S.G.E.
Standard-Detroit	10-20	Pol.
Stewart	40-60	H.P.
Straddle Row		
Universal	35	Pol.
Straight, Model 2		Pol.
" 3		S.G.E.
Strite		G.T.
Sullivan	8-10	G.T.
Tom Thumb	20-12	G.T.
Twin City	15	H.P.
"	25	H.P.
"	40	H.P.
"	60	H.P.
Waite	8-10	G.T.
Wallis (Cub)		G.T.
Waterloo Boy	12-24	H.P.
Wolverine		G.T.
Yuba		G.T.

MICHIGAN STATE FAIR

AUG. 31 to SEPT. 9



Unequalled Entertainment Features Every Day of the Big Annual Exposition

THERE will not be a moment's delay in the succession of thrilling and interesting amusement numbers which make up the entertainment program of the Michigan State Fair this year. Thousands of dollars have been spent in bringing these remarkable entertainment features together, forming the greatest array of exhibition and platform talent ever gathered at a State Fair.

Ruth Law and Louis Gertson In Day and Night Flights

Two of America's most renowned masters of aviation--Ruth Law, the only woman military flyer in the United States; Louis Gertson, most daring army aviator in this country--will be seen in day and night aerial exploits never before exhibited. The reckless flights of these fearless artists are a revelation. In their experience they have mastered every feat known to aviation. Today nothing, in this respect, is new to them.

Disbrow Defends Race Title; Fast Harness Horse Events

Mile-a-minute averages will fade into insignificance when Clark, Klein, Horey and others strive to wrest the dirt track championship from Louis Disbrow in the speed carnival at the opening of the big annual exposition, Saturday and Sunday.

Trotters and Pacers from all parts of the U. S. and Canada will be entered in the six day program of harness horse events which will feature the Fair this year.

Wild West--Horse Show--Midway--Fireworks, Daily Features

A true picture of frontier life is presented by California Frank's company of 35 people in realistic Indian fighting, roping, shooting and riding acts.

Thoroughbred riding and driving animals are entered in the Evening Horse Show.

Wholesome amusement for young and old in Johnny J. Jones' superior Midway attractions. Patriotic Fireworks close the Fair program every evening.

All of these are in addition to immense exhibits of farm produce, live stock and mechanical farm helps.

Numerous educational exhibits offer valuable suggestions in the rearing of children, conduct of the home, cooking, canning and other subjects vital to the American household.

See the mammoth \$75,000 Child Welfare Exhibit--reproductions of this valuable display have been shown in many European cities.

Judging contest for boys inspires interest in live stock; Prizes for girl canning club teams; Better Babies' Contest; Girls' milking Contest and Boys' State Fair School.

See All of Them at Detroit

AUGUST 31 TO SEPTEMBER 9

Magazine Section

LITERATURE
POETRY
HISTORY and
INFORMATION

MICHIGAN FARMER
AND *LIVE STOCK* JOURNAL
PUBLISHED WEEKLY
ESTABLISHED 1843

The FARM BOY
and GIRL
SCIENTIFIC and
MECHANICAL

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

FEEDING and clothing the navy is one of the big tasks of the war, particularly when in this day of high prices the United States is determined to keep up its reputation of having "the best fed, best clad navy in the world."

With its reserves and auxiliaries, the navy will soon have a force of 200,000. To provide three square meals a day for this large number of men requires mountains of food. The principal items for a single month are: Meat (refrigerated), 5,509,600 pounds; flour, 4,854,000 pounds; vegetables (mostly potatoes), 8,769,200 pounds; butter, 620,400 pounds; coffee, 462,000 pounds; sugar, 1,678,000 pounds; beans (white navy), 100,200 pounds; tomatoes, 612,200

Supplying the U. S. Navy

pounds, corn, 251,000 pounds; and milk (evaporated), 624,600 pounds.

Steady Stream of Supplies.

To furnish this food requires a steady stream of supplies to every navy yard, training station, port, and ship. Most of the articles must be arranged for long in advance, and there must be no hitch or delay in transportation or delivery. The navy draws its supplies from many sections of the Union—flour from the grain centers; meat, from the packing houses; canned vegetables and fruits from the places where the canning industry flourishes; coffee and sugar, from the

principal producing and distributing points. All this must be brought together at the ports where it is needed to provision ships or provide for the men in training ashore.

Clothing the greater navy has been no small undertaking. More than 100,000 men have been enlisted in the regular navy and naval reserves since war was declared, and to outfit these men the following was required: Over-shirts, 200,000; dress jumpers, 100,000; blue trousers, 200,000; overcoats, 100,000; blue caps, 100,000; white hats, 200,000; white undress jumpers, 300,000; white trousers, 400,000; drawers,

nainsook, 200,000; drawers, heavy, 200,000; undershirts, heavy, 200,000; undershirts, light, 200,000; jerseys, 100,000; watch caps, 100,000; leggins, 100,000 pairs; neckerchiefs, 100,000; gloves, 100,000 pairs; socks, 400,000 pairs; shoes, 200,000 pairs; mattresses, 100,000; mattress covers, 100,000; blankets, 200,000; towels, 200,000.

All this in addition to providing for the requirements of the men who were in the navy before the war was declared, and clothing which is subjected to much greater wear under war service conditions than in time of peace has had to be constantly replaced.

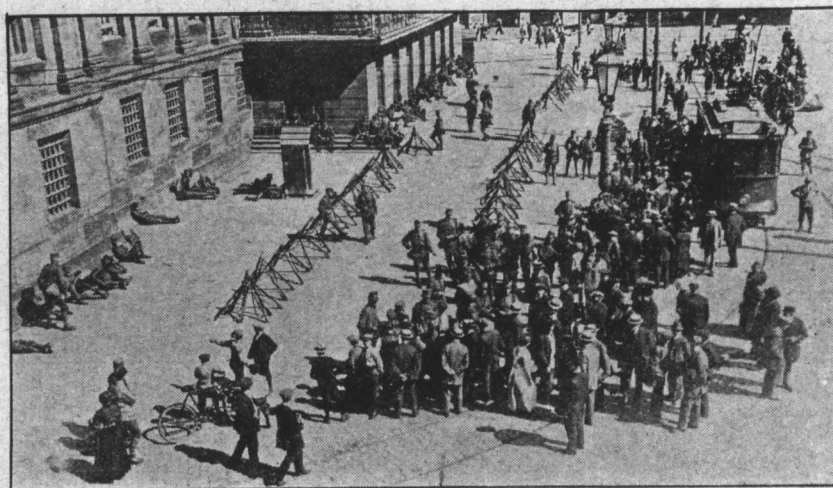
Some of the Contracts Let.

There probably will be a quarter of a million men in the naval service be-

WORLD EVENTS IN PICTURES



Happy Women Railroaders in Yards at Jersey City.



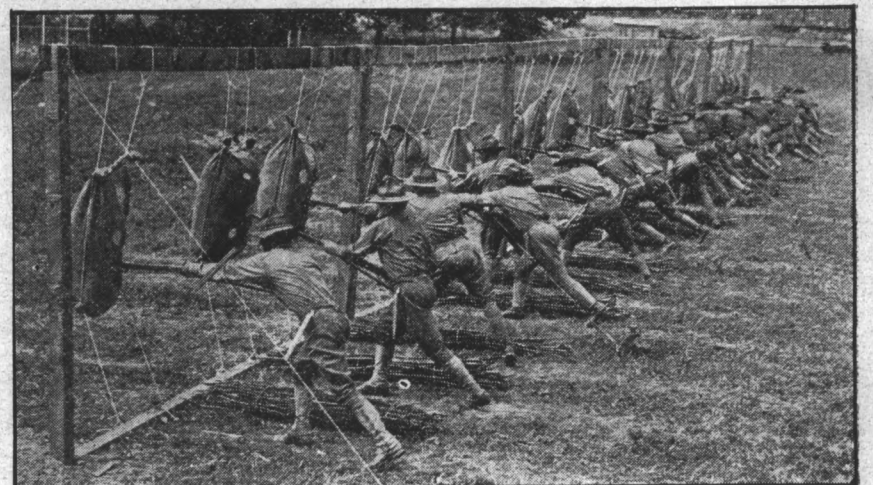
Holland Troops in Amsterdam Protect Public Property During Food Riots.



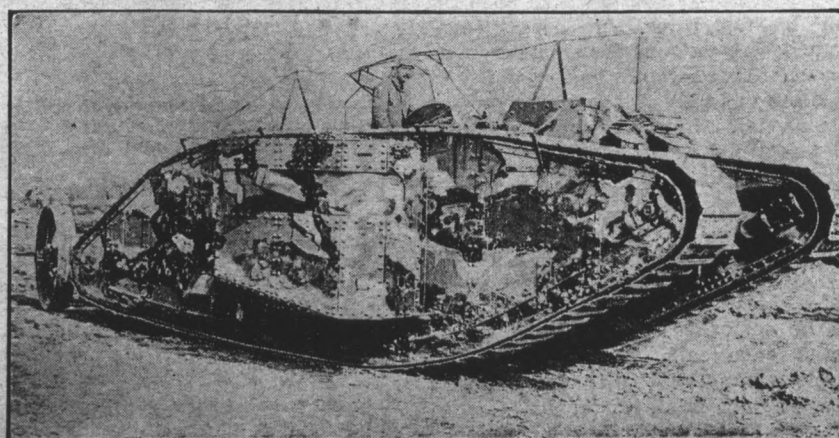
Young French Airman Brings Down His Fifteenth Enemy Plane.



Stars and Stripes in Old Coliseum at Rome as America Joins the Allies.



Student Officers Use Dummies in their Advanced Bayonet Drill.



British Armored Caterpillar Painted to Lessen its Visibility to Enemy Eyes.



Amidst the Ruins of Ancient Greece Soldiers Stand Guard Over Athens.

fore many months, and to keep them in clothing vast quantities are required and must be arranged for long in advance. Here are some of the big contracts for future needs that have been awarded by the navy department: Cotton socks, 3,500,000 pairs; woolen socks, 600,000 pairs; shoes, 700,000 pairs; jerseys, 750,000; cotton undershirts, 3,000,000; nainsook drawers, 1,400,000; handkerchiefs, 4,000,000; bath towels, 950,000; blankets, 600,000; heavy undershirts, 500,000; heavy drawers, 500,000; watch caps, 450,000; sick neckerchiefs, 340,000; woolen gloves, 300,000 pairs; leggings, 300,000 pairs; bleached twills for white uniforms, 6,000,000 yards; blue denim for dungarees (overalls), 3,000,000 yards; heavy canvas for sails, awnings, covers, hammocks, cots, etc., 4,000,000 yards; mattress covers, 400,000; heavy overcoats, 250,000; 11-ounce cloth for shirts and jumpers, 1,500,000 yards; trousers cloth, 1,250,000 yards.

How it Was Done.

This was only one of the many tasks of the Bureau of Supplies and Accounts resultant from the war. Speaking of how it has been performed, Rear Admiral McGowan, chief of that bureau and Paymaster General of the navy, said:

"When war was declared recruits poured into the navy at the rate of more than a thousand a day. From every naval station came the call for uniforms, blankets, and all the various things needed by the thousands.

"At the Brooklyn and Charleston clothing factories it was not a case merely of working overtime, but all the time, the output being limited, not alone by the number of operatives available, but very much by the short supply of materials obtainable.

"The navy manufactures most of its uniforms in its own factories. The naval clothing factory at Charleston is now turning out daily 2,500 pairs of white trousers, 1,500 white jumpers, and 1,500 suits of dungarees (overalls). When the large addition which was completed some time ago is working with the full number of operatives, this factory will be able to turn out 100,000 suits of white clothing a month. The clothing factory at the New York Navy Yard, which has charge of the production of blue uniforms, has greatly increased its output. In May, 200,000 blue suits were

produced. Now they are being turned out at the rate of 700,000 suits a month, a large part of the work being done by private contractors.

"The great difficulty we experienced in getting blue cloth, of which there was very little in the market, has been overcome. To provide for future needs, we have this week awarded contracts for the manufacture of 2,500,000 yards of blue uniform cloth. The manufacturers may either secure the wool from other sources or from the navy, as they desire.

"Contracts have been given for 3,750,000 pairs of socks, for hundreds of thousands of pairs of shoes, and for many other articles of clothing which will be required. We are anticipating our needs and providing not only for the present emergency, but for the creation of a reserve.

"It is our business to furnish the men who are fighting our battles on the seas with everything required for their comfort, and we are determined to do it. America is giving them the best in the shop."

Reflecting Character

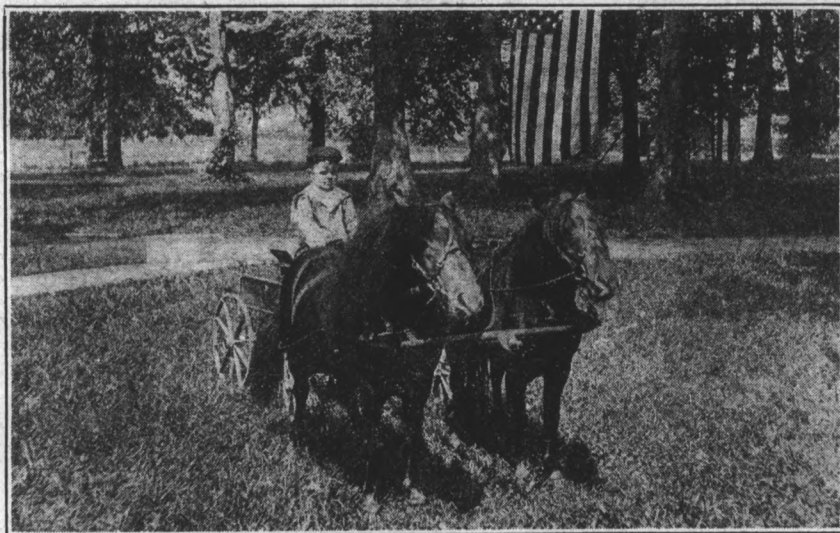
By AUNT QUILLA

FRANK and Fred were cousins who lived on farms only a mile or two apart. This gave them a chance for frequent visits, and one Saturday afternoon in spring Frank came over to spend a couple of hours with Fred.

After exhausting all the entertainment that the barn and back yard afforded, Fred proposed taking a walk to the woods where hepaticas, Dutchman's brushes, and other wild flowers were in bloom.

As they strolled along the wayside

tion of the fine weather and his good feed. With head erect, glossy mane tossing in the sunlight, round and round he was galloping about his green enclosure, every now and then giving vent to his high spirits by throwing his heels into the air and cavorting and snorting about so oddly and so merrily that Fred again shouted with glee. "O, pshaw!" said Frank, "that doesn't compare with the fun that an old nag afforded me on my way to town one day last summer. Her ears,



The Afternoon Drive.

they came to a field where some lambs were playing, and their antics were so like the frolicsome ways of young children that Fred at once became greatly absorbed in watching them. A farm hand had begun to plow the field and up and down the long furrows they raced until, for a change, they began leaping over a large stone near which no work had been done. First, the leader would skip over it, and then one by one the others would follow, all clearing it so neatly, gracefully, and cunningly, that Fred, who had entered into the spirit of the play, laughed aloud and clapped his hands in glee. Frank, however, looked on stolidly for a moment and then thrusting his hands carelessly into his pockets, and making no comments, went whistling on his way.

They had not gone far before a chance for his amusement occurred. A rabbit rushed from a clump of bushes followed by a big baying dog, who, with tongue extended, and vicious looking jaws, was rapidly gaining ground on his would-be prey. With pert little ears pressed closely to his head, heart palpitating, and eyes almost bursting from their sockets, bunny kept up his frantic attempts at escape. "That is what I call fun," exclaimed Frank, as he set the dog on more fiercely than ever. At last his enthusiasm became so great that he actually threw himself on the ground, laughing and rolling in merriment over the exciting chase. "That is what I fall fun," he again exclaimed; "I wouldn't give a rap for all the sissy games those lambs could play in a whole summer."

Farther on they came to a pasture where a colt was showing his apprecia-

neck, and flanks were fairly plastered with flies, and the old ninny seemed to think she could get away from their stings by switching her tail and lumbering along so fast that she nearly threw the boy who was driving her from the old ramshackle wagon in which he sat. I suppose I made him mad but I couldn't help shouting, "Go it Nancy Hanks, you are the finest old lady coming down the pike!"

And so it went. It seemed impossible for the two boys to see the laughable side of the same thing. At last they came to a ditch into whose water four kittens had been thrown and left to die in the chill of the coming night. Three were already dead but the fourth was still struggling to climb its steep sides, but being too exhausted it would fall back at every attempt. This made Frank laugh but Fred, hearing the old cat mewling up the road, extricated the unfortunate and gave it over to its mother.

On reaching the house they found grandpa out in the yard where he had been looking after the bees. Now grandpa was an American of German descent. His ancestors had come from the Rhine, and he still loved to recall the vine-clad hills he had once visited, and was proud of the literature of his fatherland.

Questioning the boys as to their walk and what had most diverted them he noticed that Frank had nothing to say. Shrewdly drawing his own conclusions and looking significantly at him he remarked: "The great poet Goethe once said, 'Men show their character in nothing more clearly than by what they think laughable.'"

At this Frank suddenly remembered that he ought to be going as he had

Jenny Wren's Summer Home. already staid over time, and turning about with a very red face he set out for home.

MANY TEAMS ENTERED IN CANNING CONTESTS.

Girls' canning clubs throughout the state have fallen in so heartily with plans for the canning tournament at the State Fair in Detroit, August 31 to September 9, that twenty-five teams have already announced an intention to enter, it is reported by Miss Anna B. Cowles, of the Michigan Agricultural College, state leader of girls' clubs. Prizes totaling \$300 will be paid to teams showing the highest efficiency in the preserving arts.

The scoring of competing squads, according to instructions sent out this week, will be made on four points—skill, subject matter, the canned product, and the team as a whole. Twenty-five points will be allowed for each of these. In addition, each of these four important items will be subdivided. Under "skill" will be considered ease in procedure, neatness and speed; under "subject matter," the scoring will be done on points of accuracy, completeness and presentation; under the head of "canned product," the details considered will be packing, color, liquid, and flavor of the product put up, and finally, under the subject of "team as a whole," the points will be allowed on accuracy, preparation, arrangement and use of equipment, neatness, replies to questions and appearance of team.

AT THE SPRING.

BY J. A. KAISER.

Here beside this crystal spring
Where the gay, glad waters sing
And glint and gleam;
Where the whispering zephyrs croon
Through the trees a drowsy tune,
Above the stream;
Let me rest awhile from care
And Dame Nature's freedom share,
And drift, and dream.

Through the sylvan aisles I hear,
Borne on notes flute-like and clear,
The red-bird's song.
And the black and white chewink
On the distant river's brink,
Trills sweet and strong.
And the grouse his drum doth beat
Where the spring and river meet
And rush along.

Far a-down the azure sky
Falls the hawk's shrill, piercing cry,
From dizzy height;
As he sails the ether through,
Scarce a speck against the blue,
Mid sunbeams bright.
While the cawing of the crow
As he wings his way below,
Doth mark his flight.

Near at hand, a sparrow sings.
Far away, a cow-bell rings,
Faint-borne and low.
Through the brush a rabbit hops,
At my whistle starts and stops
With eyes aglow;
Then affrighted, darts away.
While the birds their music play
And waters flow.

How I love these wooded aisles!
Where the face of nature smiles;
Where life's dull care
'Neath the spell doth drop away;
Where the wild, free creatures stay;
Where jewels rare,
Never found in palace halls
Nor enclosed in man-made walls,
The forests wear.

THE RESERVES.

BY Z. I. DAVIS.

List the coming of the army,
Each one wears a thoughtful smile;
Troops of merry hearted children,
Forming in the rank and file.

As we hear the steady tramping
Of the young and untried feet,
Comes the strong appeal of childhood,
Through their young life, pure and sweet.

Eagerly we mark their footsteps
To the schoolhouse on the hill,
As they leave the park and woodland,
Quite forsaken, lone and still.

With a long look to the future,
And a glance at yesterday,
Bless the children, God in Heaven,
Guide them, keep them in Thy way.



The emblem on this boy's sleeve is the "4-H" emblem symbolizing the union of head, hand, heart, and health. He is one of thousands of boys over the country who is learning the art of canning, preserving, etc., under the co-operative instruction of federal and state agents.

"Contraband" RANDALL PARISH

"And more than that, I pay my debts," his temper now entirely ruined by my pretence at indifference. "So I advise you to keep a civil tongue in your head—you're no longer in command of this ship."

I smiled at the two of them, calmly sitting down on the stool. I was not certain yet what hand I held, but determined to play the cards coolly.

"So you fellows are in control; and you come to me now with some sort of proposition. All right; what is it?"

"We need a navigator for a few days; one who will lay out the course we decide on."

"And I am the only one on board?"

"You are by far the most competent," he confessed. "But you need not think from that we are helpless without you. I have no doubt I could figure the matter out fairly well if I had to, and I am perfectly aware that Miss Carrington possesses some knowledge of navigation. I imagine you might prefer doing this yourself rather than having her compelled to show her proficiency."

"Where is Miss Carrington?"

"In her own stateroom; I have not seen her since we took possession of the ship."

"And the others—Bascom, and the officers?"

"They're all right," broke in Liverpool, "except for some sore heads. We downed the owner and the second mate easy, but Leayord and the engineer made some trouble, and had to be soaked. We got 'em all quiet enough now, where they can't make any trouble."

"Where are they confined?"

He winked at me in a half-drunken leer.

"Which is none o' yer business—hey, Mr. McCann?"

CHAPTER XXIII.

A Compromise.

THE impudent manner of the fellow served to fully awaken me to a realization of the helpless position I occupied. Only a consciousness of absolute power would give him liberty to speak like that; and it as instantly flashed over me that if I would save the ship, and give these others on board an opportunity at escape, the only possible chance lay in an apparent yielding. I held back the first hot retort on my lips, and forced a smile.

"I get the idea," I said, pretending a good nature I was far from feeling. "I am to merely work under orders. Well, I'd rather do that than let you wreck the ship, and perhaps drown the whole company. What's your object in this affair? You surely don't hope to dispose of this vessel and cargo?"

"No, I don't," and McCann took a step forward, his hand resting on the desk. "To be frank with you, Hollis, this affair has gone farther than I intended; it got the start of me while you held me prisoner aft here in the cabin. There's nothing for me to do now but work out of the fix as best I can."

"Mutiny, then, was not part of your original plan?"

"Not open mutiny—no, I'm no fool, and I know what that means. I started in to make the crew dissatisfied, as they would force you to put back to an American port. I offered them money, but with no intention of resorting to force. Then you locked me up, and this other thing happened. We've gone too far now to back out. The only thing left to consider is how we are going to get away safely."

"And leave the Indian Chief uninjured?"

"Certainly. If there is no real damage done in dollars and cents there

will be no object in pursuit, once we are safely away. Who is there to care?"

"Your point is not a bad one from your standpoint," I admitted. "But if ever I get ashore alive the port officers will compel me to make a report."

"We'll fix up the report on board," he said grimly. "It will be no trick to fake that."

"But suppose either Bascom or I refuse to sign such a document?"

"See here, Hollis, you may think this is a pretty little play, but it is not. We know what we're in for; we've talked it all over, and decided on the best thing to do. We don't care for this ship, or its cargo, but we realize what mutiny means, and that some of us would likely face a life-term if we get caught. We don't mean to get caught. So it's up to you to decide whether the Indian Chief remains afloat, and no lives lost; or whether the old hooker is never heard of again."

"You'd scuttle the ship?"

"That's for you to decide; it's my advice to you not to take the chance."

I could scarcely believe he meant this; the proposition was so absolutely heartless, so cold-blooded. I could hardly associate it even with Fergus McCann. The past week to be sure had pretty thoroughly revealed to me the despicable character of the fellow; I believed there was no crime too low for him to attempt if circumstances led him that way. He was vindictive, cowardly, and lawless. Yet I could not drive wholly from memory my earlier recollections of the man—a seemingly good-natured, story-telling guest on the pleasure yacht of a millionaire. The outward change was so great my mind could not fully grasp the facts. Surely he was not in reality the utter villain he now professed himself. My eyes left his face, and sought Liverpool, who was leering at me in drunken gravity.

"Is this true, Red? Have you fellows held council?"

"Some of us have," he said sullenly. "Jim, Dugan, Sims, and me, we talked it all over with Mister McCann here, an' agreed what was best. That's why the two of us come ter see you."

"Unless I consent to sign a report showing your desertion of the ship justified, you propose to sink the Indian Chief?"

"You, an' Bascom—both of yer."

"And if we do sign—what then?"

"You'll sail us within fifty miles of the nearest open port, and we'll take to the boats, and leave you to be picked up."

"You'd report our condition ashore?"

"Nothin' was said about that. Yer would be southard, an' would soon bring yer in the track o' ships; besides there's enough left ter handle the sails ter give the hooker steerage way. We figured ye'd be safe unless there was a big storm."

It was certainly a cold-blooded proposition, but the fellow's tone was so matter-of-fact I no longer doubted this to be their final decision. McCann evidently suddenly aroused to the danger of his position engendered by the violence of the crew, had schemed this method of escape, and gained their consent. Liverpool and White would be ripe for anything they might hope to profit by, and the others would be afraid to oppose. Knowing how useless the effort probably was I played my last card.

"See here, Red," and I drew a paper from the drawer of the desk. "Do you fellows realize the value of this ship, and the cargo below decks?"

"We don't care about that."

"Well, you better, for it's a tidy sum."



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Now see here—I'll pledge the crew fifty thousand dollars, to be divided as you choose, if you will dock the Indian Chief at Hamburg."

"Who'll pay it?"

"The owner, within ten days of landing."

"An' if we get snapped up by an English, or French cruiser on the way over, all we'd ever get would be a jail. That sorter plan don't make no hit with me, nor my mates. We've talked it all over."

McCann struck the desk with his fist, impatient at the discussion.

"Your price is too low, Hollis. This is no piker's game. Red knows it is worth more than fifty thousand to me to get back to New York." He laughed sneeringly. "You might be able to do me up with your fists in an open boat, my man, but when it comes to a show down in hard cash you're licked off the boards every time. So now, will you help us quietly, or shall we have to make you?"

"What is it you desire of me?"

"That you work out an observation once a day, and set the ship's course as we direct; then tell us when a certain point has been reached."

"What point?"

"Fifty miles northeast of St. John's."

"And then what happens?"

"We will take to the boats, and leave you and your officers to do what you please with the ship."

"Are all the crew with you in this mutinous deal?"

The eyes of the two men met, and Liverpool blurted out.

"They'll all do what we say; there's none ov 'em yer kin count on fer ter fight on your side; but maybe there's a couple we won't have no use for when we take to the boats."

"Who are they?"

"Thar's no need o' my telling yer that."

"Well, even with those two this will only give us six able-bodied men; that is not enough with which to bring the Indian Chief into port."

"It will be all you'll have, anyhow," said McCann grimly. "And you are mighty lucky at that. The drift will be southward, and will take you directly into the steamer lane. All you need do is to keep steerage way, and wait until you are picked up. You don't imagine we want you sailing into the harbor at St. John's the same time we get there, do you? Come on now; stop this talk, and give us an answer."

For a long moment I stood motionless, staring out through the open port at the sun-lit waters. It seemed to me my best course was to at least pretend to yield to their wishes. Nothing certainly could be gained through refusal, for they possessed the power to compel obedience. To acquiesce would insure me a measure of freedom on board, an opportunity to learn the exact conditions, and might enable me to save the ship from destruction. The mutineers had already gone too far to withdraw; their position was sufficiently desperate to render them reckless as to other crimes. Probably there was no act they would hesitate to resort to now to insure their escape from the punishment already due under the law. Not even murder, the sinking of the vessel at sea, would be beyond them.

As to McCann, he had some object in all this far more important than appeared on the surface. He was never assuming this risk, or investing all this money in an illegal cause, without a more serious purpose than an idle desire to return to New York. He was taking a tremendous chance, driven by some impulse I could not comprehend. What was the secret—hate, revenge, greed, love? I would find out sometime; but now I could only grope in the dark, guessing at his motives. Yet I knew this—his promises were lies. He would make use of me; he would induce me to pilot the ship to the spot he desired to attain on the

broad bosom of ocean, and then—what? The man would never be fool enough to permit the Indian Chief to sail into any harbor to accuse him of such a crime. Back of all his words, his explanations, his apparent fairness, lurked treachery. I felt it, and knew it, and the very suspicion led me to reach swift decision. My eyes met his with a smile.

"I cannot conceive that I have much choice," I said quietly. "It is to either do this in freedom, or under compulsion. Naturally I prefer the former. This isn't my boat, you know, or my cargo. I merely agreed to navigate it as a kindness to Bascom, and in a spirit of adventure. My head is worth more to me than a few dollars, and there is no reason why I shouldn't figure out the position for you. Indeed, I must do it for the safety of the ship. It's nearly noon now."

"You mean you accept our offer?"

"Yes; I will figure out the proper course, and report to you when the vessel is at the place you designate. That is all that is asked of me. In return I have your pledge that the ship will be left in good condition, with all who are loyal safe on board?"

"Yes."

"There is one more condition, McCann."

"What?"

"That Miss Carrington be left absolutely unmolested by either you or your men, until the time comes for you to take to the boats."

"Ah! So that is really where the shoe pinches!"

"We will not quarrel about it—either say yes, or no."

"What do you mean by unmolested? Am I prohibited from speaking to the lady?"

"That is to be left to her choice, not yours. She is to retain the key to the stateroom; to eat alone if she prefers, and to see such associates aboard as she desires."

Liverpool laughed drunkenly.

"Oh, what's the difference," he said easily. "So far as I see that don't change things none. She's locked herself in anyhow, an' won't answer nobody. Yer might as well tell the skipper yes, Mister McCann, an' let him get on deck ter shoot the sun. We don't want to lose a whole day just dickerin' down here."

McCann growled something which I took to be assent, and I was myself, so anxious to ascertain our exact position, as to have no desire for further argument. The best course of action I could pursue for those left helpless aboard, was to accept whatever degree of freedom the mutineers offered me in return for the services I could render them. I could be of no possible value locked a prisoner in that stateroom; no protection to her. Indeed, if I refused to navigate the vessel, leaving the ship to drift blindly through these unknown waters, exposed constantly to peril, I would be guilty of a failure to do my duty almost as great as the crime of these others. On deck, knowing where we were and the direction in which we were heading, the opportunity might arise for the accomplishment of much. I grasped the necessary instruments from the swinging shelf, and, with these in my hands, turned toward the door.

"Come on, then," I said, ignoring the fact that I was any longer a prisoner. "Bring the chart one of you, and I'll point out where we are to you on deck."

"Just hold on a minute," and Liverpool, blocking the doorway, pushed me back with his huge hand. "We're the bosses, not you. Git it out o' yer head right now, Mister, that yer the captain of this ship Indian Chief. You ain't nothin'; an' if yer attempt to play us any dirty tricks, I'll smash yer the same as I would a fly. Ain't that right, Mister McCann?"

"Oh, Hollis understands, Red. He knows we've gone too far in this game

to take any chances. Let him pass."

"Well," growled the giant, stepping aside, "I just wanted him ter know. I don't kill nobody in cold blood; but I'm goin' ter take keer of myself, an' my mates. Yer get me, skipper?"

"Yes, I get you," I answered a bit wearily. "So let it go at that, my man; I know the time to fight, and the time to keep quiet. Now let's go on deck."

CHAPTER XXIV.

The Interruption.

EXCEPT for the absence of the regular officers from their stations I should not have known any especial change had taken place on board the ship. Outwardly everything appeared about as usual. There were no signs of disorder in the after-cabin, although several of the stateroom doors stood wide open, and Dade, who was polishing the stair-rail, turned and gazed at me curiously as I emerged behind Liverpool, with McCann trailing behind. The latter paused to insert the key into the lock of the door, and I indulged in one swift glance about the apartment.

"Bascom occupies his own stateroom?"

Liverpool nodded ungraciously enough.

"And Miss Carrington retains hers?"

"We are not here to be interviewed, Hollis," broke in McCann sharply. "Go along on deck, and keep your tongue to yourself."

Realizing that silence was my best weapon, I made no response, but climbed the stairs. It was a day of beauty, a soft southwest wind blowing, the sky a deep blue overhead, and the sea just rough enough to be full of charm, the wave crests tipped with sun, the hollows dark with shadows. I paused an instant, seamanlike, as my eyes swept the distant horizons, and then wandered aloft to the furled topsails. It was, indeed, a fair sea picture, with the Indian Chief alone amid the whole expanse of ocean. Forward a few sailors loitered about the capstan, and there was a man in the maintop, but these were all that were visible, and they stared at us without movement. White leaned over the poop rail, looking down in silent curiosity—but nowhere was there any evidence of disorder, or relaxation of discipline. The decks were clean—had evidently been scrubbed that morning, and nowhere could I perceive any signs that the ship was in the hands of mutineers. Liverpool gripped my shoulder. "Up the ladder with you," he ordered. "There's too little time left for gaping about here."

There were two men at the wheel, although one could have attended to the service, as the ship was at half-speed, and the sea far from heavy. I recognized both faces, but couldn't recall their names; the shorter fellow, deeply potted, exhibited a fresh scar where I had struck him with my boot heel the night before. He grinned good naturedly, and pointed to the bruised flesh, as I caught his eye. White was evidently the temporary officer in charge, and the brutality of his face was clearly revealed in the bright light, as he leaned against the rail. However, I had scarcely time to more than glance about, as the sun was already at the zenith. The others stood around silent, watching as I figured out our position on the back of an old envelope. I took my time at it, not only from my own anxiety to be accurate, but also because of other thoughts in my mind, yet the calculation was completed at last, and I lifted my eyes to McCann's gaze.

"Well?" he said.

I gave him the figures.

"Are you sure this is correct?"

"As sure as I can be, the chronometer hasn't been corrected since the ship left Baltimore; except for possible variations on that account, the figures are right. Spread out the chart, and I'll show you where we are within

ten miles. Here—that was our position at noon, yesterday; since then our course has been about as follows—hand me the ruler and compasses, White. Yes, those are what I mean. Now lean down here where you can see for yourselves. We held nor', nor'-east until sundown at quarter-speed; then straight north at from fifteen to eighteen knots as long as I was on deck. That should have put us along in here. What did you do after that?"

Liverpool stepped over to the binnacle, and peered into the hood.

"About a point west o' north, with the wind on our port quarter."

"At what speed?"

"Pretty steady, as we are now, isn't that it, White?"

"Yes; shut down maybe an hour."

"When did you furl the sails?"

"After we started up the engines again; while we had all hands on deck."

"Well, I announced, after a moment of measuring, 'that would tally pretty close with the figuring. Our present position is just about here, where I put the red cross.'"

The three bent down and stared at the spot on the chart, McCann even getting to his knees on the deck, and the two wheelmen craning forward to look over our heads. There was a moment of breathless silence, and then McCann took the compasses from my hand, and began to measure distances.

"Two hundred and ten miles to the northern extremity of Newfoundland—is that it?"

"A trifle more, I should say."

"This is St. John's here; what southing does that give?"

"Over two hundred."

"Do you know the harbor?"

"Only by description; I have never been there. This is the best season, of course, but even at that the coast is not considered very safe."

"Ice?"

"There might be some even this late, but the principal danger is from storms and fog. St. John's is quite a shipping point, however, and a naval base during the summer months."

"Even the Montreal steamers pass to the south of where we are?"

"They do not even sight Cape Race."

He studied the map a few moments longer, the three men talking earnestly while I left them, and walked over to the starboard rail. It was of no particular interest to me where they decided to go—the one port meant the same to me as another; I was only anxious to have the matter definitely settled, and learn my exact status on board. Finally McCann got up, rolling the chart in his hand.

"There is no use then," he called, "of our going further north?"

I turned and faced them.

"Not if your port is St. John's; the course would be sou', sou'west. Is there anything more wanted of me at present?"

McCann turned and spoke to the others, both answering him in low tones.

"No," he said stiffly. "We will send for you, if you are needed on deck."

"I am expected to keep below?"

"Below, and to your stateroom. If you attempt to converse with any of the crew you will be locked in."

I passed them without a word, and clambered down the ladder to the main deck, aware of the grinning faces of the men at the wheel. Humiliating as the situation was, this was no time for resistance, or the exhibiting of a spirit of revolt. White crossed over to the rail and watched until I vanished within the companion. I realized his presence without so much as glancing up.

To my surprise the cabin was vacant, with no preparations for dinner evident. Even the swinging table had not been lowered, although I could hear Dade rattling dishes in the steward's pantry. There came to me, as

I paused at the foot of the stairs, a sudden eagerness to speak to Vera, to explain to her the situation, and bring to her a word of comfort. There was no shadow on the skylight above; nothing to make me feel that my movements were being observed, and, as I glanced upward to gain this assurance, I noted the telltale compass, and marked that the ship was already swinging about on the new course. This change would rivet the attention of those on deck for a few moments, at least, and yield me opportunity. I crossed over hastily and rapped at her stateroom door. I felt sure there was a movement within, but no response. With lips close to the wood I spoke.

"Miss Vera."

"Who is it?"

"Hollis; may I have a word?"

The key turned, and she stood facing me, her eyes filled with startled welcome. An instant the girl gazed at me, as though distrusting her own sight; then suddenly extended both hands, with a stifled cry.

"Why—I thought; they told me—oh, I am so glad!"

"They told you what?"

"Why, nothing direct. But there was fighting last night. I—I heard the struggle on deck, and then here in the cabin; and when I started to leave my room I encountered McCann, and some of the crew. They were dragging Leayord down the stairs, and his face was all blood."

"You were not injured?"

"No; the big man with the red hair threatened me, but McCann interfered, and thrust me back into the stateroom. He told me to lock the door, and not to make any noise."

"Yes, but what was it you were told about me?"

"Nothing then; later, perhaps an hour or two, all was quiet below when someone tried my door. I asked who was there, and it was Fergus McCann who answered. I was afraid of him and would not open the door. I told him I was armed and would fire if he tried to enter. What I said made the man angry, but after a while he went away, yet first he said some things about you."

"No doubt, the cowardly cur—what were they?"

"You mustn't ask—only that if I expected your help I'd wait a long while. I—I thought they had killed you."

"Well, they tried hard enough, but, as you see, I am very much alive still. They trapped me in the forecabin. Do you know what has become of the others?"

She shook her head.

"What I've told is all I know. Those villains have control of the ship."

I related the story to her swiftly, concealing nothing. Hers was a nature to trust at such a time, and I marked her eyes darken, and her slight form straighten as I proceeded. Twice she questioned me, as though already some vague plan of action was forming itself in her mind. At the last she asked:

"That is all? You know no more?"

"No."

"Then the others must be alive, and on board. Surely you would have heard if any had been killed?"

"I believe so; they would not kill, if possible to avoid it, as such a crime would render their own case more desperate. Then there was no need as the surprise of the attack was complete. No one had any chance to resist."

"What—what are you going to do?"

"Frankly, Miss Vera, I do not know," I confessed. "I have had no time to think, and my head still throbs so from blows that I hardly realize the situation. I cannot hope to fight these men alone, and there can be no immediate danger—they are sailing the ship toward St. John's; see the compass yonder; we head into the south-west."

"You believe they will take to the boats, and leave us aboard?"

"That would be their only safe course. They would never dare sail the Indian Chief into that, or any other harbor. They must land as shipwrecked seamen; tell their story, and then quickly disappear."

"I—I know that—but—but will they dare to leave us afloat, to be picked up by some vessel?"

I hesitated, but her eyes compelled an answer.

"I do not know," I said soberly. "It hardly seems possible they can contemplate such an act of villainy as the scuttling of the ship, and leaving us on board to drown like rats. That would be too horrid a crime for this age. White and Liverpool might be brutal enough, but surely not Fergus McCann."

"Why not Fergus McCann?"

"His education, his former life, the civilization in which he has been reared; he has lived among gentlemen."

"Gentlemen!" she echoed the word in scorn. "His associates have been principally gamblers and rounders. He is notorious in New York, and his money alone gives him entrance to decent circles. He doesn't know what the word gentleman means. I fear him more than all the others—he has more to lose if this tale is ever told than these poor sailors he has duped. If there is treachery behind this, it will be the plan of Fergus McCann."

"You know him better than I."

"I know of him longer; I have heard more tales, yet surely you saw what he was in the boat?"

"A coward, a liar—vengeful, unforgiving—"

"Is any act of crime beyond a character like that?" she exclaimed, looking me straight in the eyes. "Will that kind of a man leave evidence behind him if he can avoid it? If he can induce those men with him to sink this ship there will be no evidence—they will never dare talk, for if they do they face a charge of murder."

"You believe then the intention is to scuttle the vessel?"

"Yes, I do."

"And leave us helpless on board?"

"Yes, Mr. Hollis."

I drew a deep breath, at this direct verification of my own secret suspicion.

"So do I," I returned in a whisper, "although I had no thought of telling you."

"You have some plan then? You have considered what to do?"

"No; hardly that. There will be two days, at least, before we shall be close enough to the coast for them to take to the boats. Much may happen within that time; we may be spoken by some other vessel, even overhauled by a warship, and manned by a prize crew."

"You hope for this?"

"St. John's is a naval base; the closer we approach the harbor the more apt we are to encounter a British cruiser. I shall give them a course as far south as I dare, but cannot venture to deviate much, for McCann knows enough about navigation to check my figures."

Her fingers grasped my sleeve.

"But, Mr. Hollis, if all these hopes fail, and there should be no rescue, is there not something we can do? Must we remain here helpless, just waiting for death to come?"

I took the little hands in mine tenderly, and, with an effort, controlled my voice.

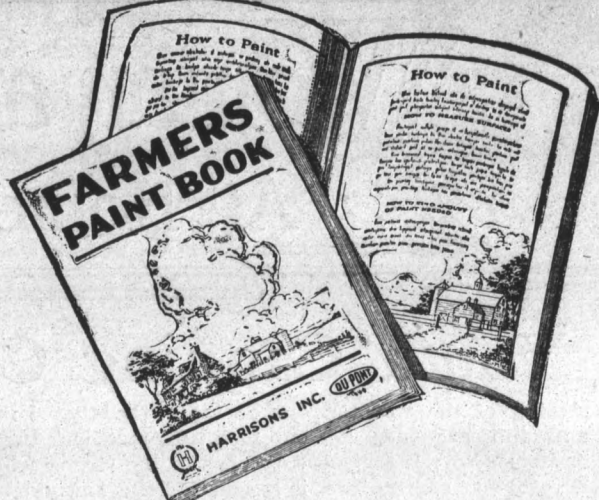
"Perhaps so, but we cannot be too cautious. Our only chance is to retain our freedom, and arouse no suspicion that we are plotting together. It is scarcely probable that we shall have another opportunity to be alone; but you will be less apt to be watched than I. Can you learn where the others are confined, and get the word to me?"

"Yes," she said. "I—I think I can."

"What is it you think you can do, Miss Carrington?" said a voice quietly.

(Continued next week.)

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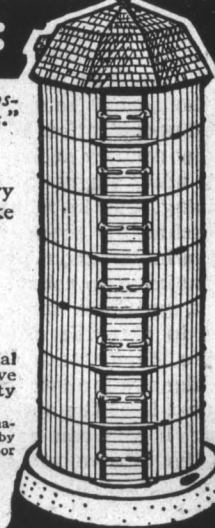
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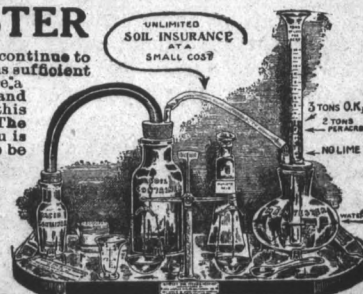



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"Specifically, may I not suggest that every woman do her share to call meetings of members of organizations to which she belongs, for the discussion of the subject of conservation of perishable products. At these meetings women skilled in canning, preserving, etc., might give demonstrations. Do not stop with one meeting. All during the coming weeks, so long as there is anything to can, these gatherings would be helpful."

In the District of Columbia, and in many cities throughout the United States these meetings are being held in the school houses. In Lansing, Michigan, women bring their own fruits and vegetables to the meeting place and are given help by trained demonstrators. In some places grocers are simply ordered to deliver the produce at the school house or church where the demonstration is to take place.

Few country school houses are equipped with stoves and appliances for canning, but in many rural churches a kitchen for suppers and "sociables" is available for just this sort of work. If you have no school or church equipment, patriotic farm women will be glad to give the use of their kitchen and a demonstrator will be sent in Michigan wherever twenty-five women request it of the state agricultural college. If you can not rally enough to get the demonstrator, have your own canning "bee," using what bulletins you have and the directions which have been given in the Michigan Farmer and your other magazines. To paraphrase the practice line given to aspiring stenographers, "Now is the time for all good women to come to the aid of the world." I say "world" instead of country, as we need a patriotism broad enough to cover humanity.

If you have no bulletins write immediately for "Home Canning of Fruit and Vegetables," and "Drying Fruits and Vegetables in the Home." In writing specify whether you wish the canning bulletin for use in the north or in the south.

Early in the season we were told there was to be a shortage of glass jars. Now we are assured that glass companies are ready to distribute enough containers to hold 18,000,000 quarts of fruit and vegetables. It is estimated that enough more will be manufactured during this canning season to hold 2,000,000 pecks of vegetables and fall fruits. Preserves, marmalades, jellies, any extra sweet preparation, may be put up in wide-mouthed bottles and sealed with paraffin.

As so much depends upon good rubbers, be sure that yours are right. For the average pint and quart jars they should be not less than one-fourth nor more than five-sixteenths of an inch wide, and two and one-fourth inches on the inside diameter. Twelve placed

one on top of the other should measure one inch. To test, jerk the rubber. If it returns to the same inside diameter it is good. Fold, and pinch firmly between thumb and finger. It should not crack nor remain bent.

Bottle your surplus fruit juice without sugar. Extract the juice as for jelly and heat, almost to boiling. Pour at once into sterilized bottles, cork and seal with paraffin. This may be used for punch, pudding sauces, etc. Or it may be boiled to a thick syrup and used in place of maple or sugar syrups, or converted later into jelly.

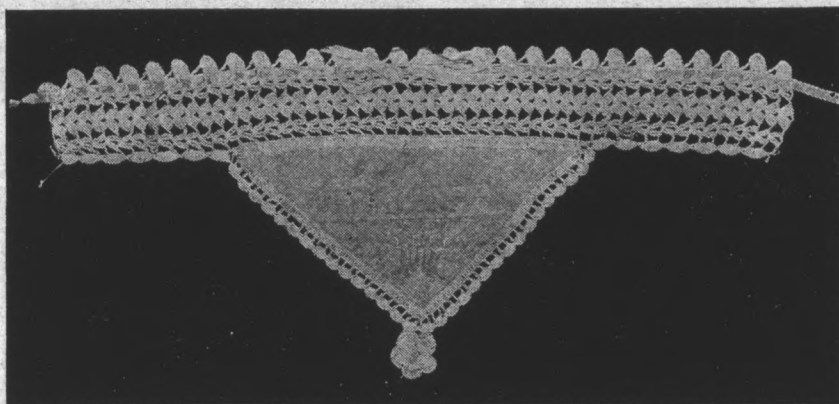
Raspberries are off the market, but blackberries and huckleberries may still be canned in some localities. These are done the same as raspberries, as are dewberries and blueberries. To can these berries make your syrup in the proportion of three parts sugar to two of water and boil for five minutes. Fill the jar only to within three-eighths of an inch of the top.

Make tomato paste of some of your tomatoes. This is fine for use in soups, sauces, and with beans and spaghetti or macaroni. It can be put up in jars, corked and sealed, thus saving cans. To make, cook tomatoes and strain as for soup. To every quart of pulp add one slice of onion, four tablespoons of chopped sweet red pepper or one teaspoon of paprika, half teaspoon of salt, one teaspoon of sugar and one tablespoon of mixed spices. Tie the spices in a bag. Cook over boiling water for three hours, or until the paste is thick enough to hold the shape of a spoon when tested by dipping out a spoonful. In sealing, force the cork below the edge of the neck of the bottle and seal with wax or paraffin.

A DIFFERENT YOKE.

BY GRACIA SHULL.

A dainty design that will appeal to women and girls who delight in cro-



A Unique Yoke for Corset Cover or Gown.

chet trimming for undergarments is a yoke that will be suitable for corset cover, chemise or nightgown in side or back fastening or in slip-over style. The monogram lends daintiness to the work. Number fifty (50), cordonnnet crochet cotton is used although finer may be used if desired.

To make yoke begin with the long strip across top. Work from the end as shown in illustration. Make a chain (ch) of twenty-six (26) stitches (st), ch four (4) and turn. Treble crochet (tc) eight (8) in the twenty-sixth st, ch two (2) to two in third st from point formed after turn, ch two

and to two in same place. Ch 2, skip four and to four in next st. Ch two and to four in same place. This forms a shell. Ch two, skip (sk) two, to two in next st of ch. Chain two and to two in same place. Ch two and to one in first st of chain. Chain seven and turn. Form shell in shell, ch two, form shell in shell, ch two, again form shell in shell, ch two, to one in last to of point, ch two and to one in same place, ch four, turn and repeat as for first row on chain.

The triangle-shaped piece of linen on which the monogram is embroidered is evened up neatly and a narrow hem is turned and basted firmly. It is finished around the entire edge with double crochet.

The two lower edges are finished with a beading made thus: Double crochet (dc) one in end of work. Ch two, skip two and dc one in the next st. Repeat around edge.

With needle and thread sew the upper edge of the triangle to the lower edge of the upper part, employing the overcasting stitch.

To finish the extreme lower edge make a series of scallops thus: Insert

hook in work with thread over, fasten firmly, dc seven st in first loop, slip stitch (sl st) one in second loop, proceed until seven scallops have been made, next, on the beading on triangle make the scallops two st smaller, or, employing only five stitches in each scallop. Repeat around triangle and finish other end of upper part same as the first or, seven dc, one sl st, etc.

To make the rose at the point of the yoke make a chain of five stitches and join to form a ring. Chain three, one dc in ring. Repeat until five loops have been formed. One dc, five tr c, 1 dc in each loop. Chain three, sl st to center between rose petals, then one dc, seven tr c, 1 dc in loop formed by second chain of three. Repeat until five outer petals have been made. Join the rose to lower point of yoke with crochet or with needle and thread.

The ribbon run in beading at upper edge of yoke may be used to adjust the yoke when garment is being worn. A crochet drawstring with small roses (crochet) at each end may be used in place of the ribbon if desired and is very attractive.

How You Can Help Us

I HAVE just received from the food commission in Washington a list of questions designed to aid these hard worked officials in reaching the farm women of the United States. Among the questions these two stand out:

"What subjects do you desire to be treated especially by this office on women's relation to food production, distribution and conservation?"

"Please offer any suggestions as to what way this office can co-operate with you and aid us in reaching your readers."

I know of no better way to get at this information than to pass the questions up to the readers. What sub-

but with so many different climates, productions, nationalities and sorts of experience it is a difficult task to write so as to reach everyone.

When you stop to consider that some farm homes are presided over by domestic science graduates who have every labor-saving device to work with, while other farm women have only an elementary schooling, backed by experience, and in some cases not even a paring knife as equipment, is it any wonder that some readers cry "Bosh" to what others applaud?

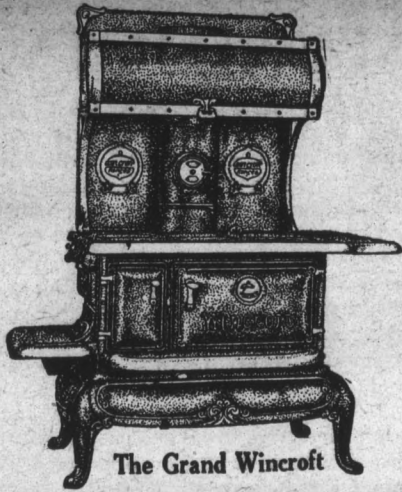
But the department wants to help every individual reader. It stands ready not only to furnish articles on every subject regarding food you can conjure up, but it is willing to answer questions as well. How can you best be served?

Have you tried the cold pack method of canning? If so, what success have you had? Does it seem to you easier than the old way of cooking in a kettle on the stove? Are your fruit and vegetables in better condition when put up this way? Or does the old way satisfy you just as well? Are you drying any fruit and vegetables? Have you used any of the ways suggested by the government or in this paper? Or have you a way of your own? If you have a method of your own, write us about that. It may be an improvement on the one suggested by the government experts.

What the food commission wants, and what the editor of this department yearns for, is to hear from readers who are "at the front" in the food campaign. We have no end of theories. You have the practice. How do the theories work out?

It seems an imposition to ask a busy farm woman to stop just now and write to the paper. But take five minutes off and tell us your needs and your experiences. It will help us, and we may be able to help you in a more enlightened manner.

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Automobile Warning

Hardly a day passes but what some farmer or business man driving to the city of Detroit leaves his car upon the public streets and it is stolen.

Recently an automobile owner from Dimondale, one from Tuscola County, Holly, Port Huron, and Genesee County have lost valuable cars on the streets of Detroit. Conditions are such that it is extremely careless to leave an automobile upon the public streets of any large city. Locks will not protect and it costs but little to put them in a garage.

Many accidents occur by driving against blinding lights, in a fog, or cloud of dust. Stop at once when you cannot see ahead, always signaling for any car which may be coming behind.

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Grange.

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THE CITY AND THE FARM JOIN HANDS.

Several hundred persons gathered at the home of Mr. and Mrs. F. H. Crawford, near Mt. Pleasant, for a royal dinner, jolly good time and a rousing program, all planned and carried out by the farmers. This gathering was the outcome of a dinner and good time furnished by the business men of the city to the farmers last winter.

The return dinner and the welcome were of the type you can only find when the farmers were bound to outdo the other fellow, and to say they did it is putting it mildly. The dinner



Good Fellowship Between Urban and Rural Folks was Stimulated Here.

consisted of a dozen things found on the city banquet table, to which was added the touch of the farm in chicken pies, mashed potatoes, all sorts of pies and cakes, yellow cream and home-made ice cream. The speeches, from the welcome to a masterly address by Hon. J. C. Ketcham, master of the State Grange, were equal to the occasion and full of the spirit of the times.

"These two events have done more to establish the spirit of good fellowship between the farmer and city man than any dozen efforts hitherto attempted," was the comment of an observing individual. To establish a real friendship work must be done for each other, often we find the city doing something for the farmer, but when we find the latter reciprocating there is a real bond between them—a relationship that will mean something to the community in the future for our strength lies in our pulling together.

The people from the city for days before the event, wondered whether the farmers would be equal to the task but the latter demonstrated that in planning, co-operating and executing they are second to none. Half of our criticism of the other fellow is due to the fact that we don't know him, we can not establish co-operation until the farmer and the city man get to know each other, not only in the store, but on the farm, in the church and in a social way. The farmers of Isabella county have set a worthy example, have done something that they may well be proud of, and given an event that will long be remembered by all concerned.

MYRON A. COBB.

Farmers' Clubs

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

A NEIGHBORHOOD CHURCH CLUB.

In January, 1917, the farmers of the Grace Church neighborhood in Eaton county, under the leadership of the pastor, Rev. C. W. Corman, met and formed an organization known as the Community Club, at the Grace church. The purpose of this organization is to create the feeling of brotherhood among its members, the social uplift of the neighborhood, and the betterment of the entire community. Its meetings are held the second Tuesday of each month. During the winter and spring speakers from the Michigan Agricultural College, Charlotte and other places, have given interesting and instructive talks.

Organize Live Stock and Produce Shippers' Association.

In June the Club voted to form a co-operative live stock and produce shippers' association. The following were elected as directors: Frank Abel, Lee Winn, Earl Norton, Silas Philipps, Wm. Plastring, Rolla Strickling and Chas. Fry. The board of directors met and elected Earl Norton as president of

the board, adopted a set of by-laws, and appointed Rolla Strickling as the secretary and Herbert Jackson as the manager of the association. I believe the Club adopted the by-laws, not the board. The association expects to be in shape to begin shipping very soon from Eaton Rapids, and all farmers who use Eaton Rapids as a shipping point, are urged to join the association and are also cordially invited to attend the meetings of the Community Club.—Irene H. Norton, Cor. Sec.

CLUB DISCUSSIONS.

"Cutting Corners in Housework," was discussed by Mrs. Ralph Carr at a recent meeting of Conway-Handy Farmers' Club. She thought that conveniences in the kitchen were a great help in cutting corners. System in housework is one great help, but too much makes work mechanical. Housewives should forbid themselves doing unnecessary work. There should be a correct balance between work and recreation. Keeping cool is a great help in all work. Push hurry and worry out of the door. Systematize housework. Use labor-saving devices. Do not keep fire unnecessarily. Use oil stoves to avoid over-heating. Put the mind one one day's schedule of work and cut down the tasks where possible. Use shade when work can be done there. Try to do only one day's work in a day. Keep happy and healthy and the problem is solved. Make home a place of peace and rest. The topic was also discussed by Mrs. Snyder. She thought there were many short cuts. People should live, and can live, with less fuss. Young mothers with several in the family should save in the washing where there is a possible chance. They should have conveniences in the kitchen. An elevator is helpful in saving steps.

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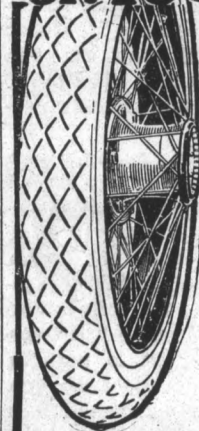
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31x3 1/2	10.55	11.60	2.90
32x3 1/2	11.50	12.95	3.10
34x3 1/2	12.15	13.35	3.55
31x4	14.75	16.60	3.70
32x4	15.15	16.85	3.80
33x4	15.75	17.20	3.80
34x4	16.10	17.55	4.10
35x4	17.00	18.60	4.50
36x4	17.20	18.65	4.30
34x4 1/2	21.65	23.65	4.90
35x4 1/2	22.70	24.70	5.00
36x4 1/2	23.05	25.15	5.15
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Success With a Cooperative Creamery

By W. F. TAYLOR

WE do not say that a good home dairy will not produce as fine a quality of butter as a creamery. If one has the means of properly regulating temperature, if he will be methodical regarding all the little things that must be done and done accurately in order to turn out a perfectly good product, he ought to make even better butter at home than is made at the creamery. But few people are situated to do this, and in many cases it would not pay to do it even if one were prepared.

The co-operative creamery manufactures butter for the community, and requires no thought, no labor, on the part of the patron after his cream has been satisfactorily delivered at the plant.

The first requisite of a successful creamery is cream. Our little creamery made nearly twenty-six thousand pounds of butter in May last, and it cost only a few dollars more than it would have cost had we made only half that amount. It costs practically two and a half cents a pound to make the butter on an average. In May it cost considerably less than that, while in the winter when the patronage is lighter it costs more.

Little Plants Not Economical.

The little plant that receives only cream enough to make five or six thousand pounds a month can not make butter economically, and so can not return its patrons as much per pound for their fats. Where two or three people in the same little town are buying cream, and someone is trying to run a local creamery, you may take it from me every time, that the farmers who sell cream in that town, are getting poor prices for their product.

The dealers are not making too large profits, perhaps they are forced to perform the service for nearly nothing. The creamery is making little or nothing out of it, because not cream enough can be had to permit of economical manufacture. So this is the situation. The dealers make little, the creamery is making next to nothing and the farmers are getting from two to four or five cents per pound less than they should for their butter-fat. What is the trouble? It is just this: Those farmers do not act together. If the local creamery got all the cream, it might run much more economically. Thus it could pay more for cream, and this would encourage the patrons to take better care of it, and so produce a better product. Better cream would mean better butter, and better butter would bring a higher price, and that would result in still better prices for cream.

Good Cream Essential.

Next to quantity, the most important thing affecting the success of a co-operative creamery is the quality of the cream or milk out of which the butter is to be made.

When the hand separator first appeared in the dairy field creamery men were worried. I mean local creamerymen. The centralizer saw in it his opportunity. Or speaking more correctly, the hand separator made the centralized creamery possible, and we must admit, in some cases, well nigh indispensable. For there are localities producing a considerable quantity of cream where a local creamery is as yet not practical.

To the conscientious butter maker who is trying to make a high quality of butter the hand separator is still a matter of anxiety.

Our creamery has just contracted with the United States government to furnish fifty-five thousand pounds of butter. The price is good, but no better than it ought to be when the conditions are considered. The butter must be made during the hot weather

and every can of cream must come to the creamery sweet. A government inspector will be on the ground all the time to look after the making of the butter as well as the condition in which the cream arrives. Our creamery has always made a high quality of butter, else it could not have secured this contract. But all our cream has not been delivered sweet. Nor can we truthfully say that all of it has been good cream. But it has been good enough to bring a good price in the market, and to compare with other butter in a way to make us proud of our neighbors.

Good Business Stimulates Interest.

Still we might have done better. If all our cream were as good as a part of it, we might get a still better market for our butter, sell it even easier than now it is sold, and each patron might share in an increased price.

It is interesting to see the enthusiasm over this new contract. It is inspiring to see how large a number of our people are not afraid of the requirement to deliver sweet cream.

We imagine that the necessity of marketing a much superior article in order to get that three and a half cents above New York Extras will result in the production of better stock after the contract has expired.

We realize that we must earn this extra price. The government is giving us no graft. Our butter must be worth the price or we can not sell it to Uncle Sam. But it is better to invest our energy, our interest and our thought in making a good product than to simply slide along with no ideal, and with no purpose except to milk cows and sell cream and live as easily as we can while we are doing it, taking neither delight nor interest in our work, but looking ever for our recreation and our happiness away from our business on the farm.

Where people do not deliver the cream at the creamery, but allow the cream hauler to take it from the home, they get rid of some labor, but often the cream suffers in transit.

The cream hauler can not help it, he is forced to drive long distances to secure his load. He is not to blame because two or three more men are driving over different portions of his route in search of cream. The patrons should have organized and looked after that matter, but they were too busy.

If cream haulers are to deliver the cream to local creameries the routes can be easily regulated, providing all send to the creamery. But while one sends to the creamery, another to some centralized plant, and yet another to some other market, and the next one sends his cream now to one place and then to another, it is pretty hard to lay out the routes in a way to get sufficient service.

With plenty of cream of good quality, any local creamery should prosper and render splendid service to the community, providing the butter-maker is competent to do his part, and the business manager is right.

To secure these results—plenty of cream, of good quality, a buttermaker who knows his business and will do his best, and management that is of a high order, requires first interest in the creamery on the part of the patrons. There is always a certain amount of really good cream delivered at a local creamery. This cream comes from patrons who are interested in the business. Interest has led to a knowledge of conditions requisite to the production of a good article and a willingness to do the right thing at the right time.

On the contrary, the poorest cream usually comes from farms where but

little is produced, and the interest is very low. There is so little of the cream that it does not amount to much, there is more work indoors and out than is likely to get done, and if the creamery does not want the cream the man downtown will buy it anyway, so what's the use in taking any special pains to keep it sweet? This is the way the question is settled in many homes. Of course, the people who market this inferior cream do not know much about caring for it, not because they are mentally deficient, nor yet ignorant in a general way, but simply because having no interest in the cream except to sell it with the least possible labor, they have not tried to find out how to take care of it.

Why Co-operative Creameries.

The co-operative creamery has one decided advantage over the best possible creamery, run by private capital, and that is the consciousness of part ownership in the plant. So long as this consciousness is felt it will do much to induce the patrons to do their best to produce a good article.

Co-operate, is the one word which means more and more as we get added experience in doing things together.

It is the lack of true co-operation that wrecks so many efforts of this kind. Some of the people who talk loudest and longest about co-operation are the first to "peter out" when really put to the test.

The failure of so many so-called co-operative creameries in the past, has not been the failure of co-operation, but has resulted because of the lack of it.

The one object of a co-operative creamery should be to make butter economically and sell it wisely and advantageously.

The profits resulting from it should not be on account of any investment of money, but on liberal amounts of good cream, delivered by those who own the plant, and for whom this cream is manufactured and sold.

Everyone should be in the venture for profit, but not on the capital invested. All should understand that profits will be realized in proportion to their loyalty to those with whom they are associated—a loyalty which finds expression in the largest amount of good cream they can furnish, in good words for the creamery everywhere, in confidence in those who have been chosen officers, and in the best possible understanding with the buttermaker.

Confidence in the Business.

Co-operation is the word. A lack of confidence in each other, is often the rock on which efforts at co-operation go to pieces. Suspicion must be guarded against at every turn, and in every possible way if any co-operative venture is to succeed.

Publicity is oftenest the cure for suspicion. Our creamery has handled a hundred tons of gluten meal within the last year. Every patrons knows, or may know, what has been charged for handling this meal. The writer has delivered and sold a larger amount within that time, of grain of other kinds, and it has always been his practice to say just what he has charged for handling this grain.

The only way in which a company of people on the farm, or anywhere else can get along together, is by having no secrets pertaining to business in which all are concerned.

The matter of the test of cream causes more suspicion than any other thing connected with a creamery, and this might be avoided in large measure by a little more effort at publicity.

Were I a buttermaker, and did I

know that anyone suspected that I had not tested his cream accurately, I would not rest until I had tested a sample in his presence, providing he could be induced to come to the creamery and see it done.

Personally, I very seldom question the test of my cream, even in thought. I know our buttermaker is just as honest as I am, and while mistakes are possible, they are not likely to occur in testing. The one thing I do want to know is, that the cream has been properly stirred before the sample was taken out. For otherwise, a correct sample can not be gotten.

If patrons of local creameries would but keep close enough to the butter-makers there would be little trouble over the test. Not only would they have more confidence in the buttermaker, but he would be able to tell the patrons many things about the causes of variations in the test which would tend to lessen their suspicions in a large degree.

Then, too, there is always the opportunity to suggest ways of caring for cream with the least labor, and for getting it to the creamery in the best condition.

One decided advantage in farmers delivering their own cream is, that they get to the creamery often, and so come in contact with the management much more directly.

In cases where it is not possible for patrons to deliver their own cream, they should meet together three or four times each year, in order to promote the spirit of true co-operation. Not simply sustain a principle, but because co-operation pays. By thus coming together, differences will be ironed out, much practical knowledge will be gained, interest will be increased, and mutual confidence will be strengthened.

All this will lead inevitably to larger patronage, a better product, and a more satisfactory price.

At these meetings, the breeding of better cows, the cow-testing association, and other matters of dairy progress may be considered, and it will not be long before some of them will materialize in the community thus organized.

In closing, permit me to say that I believe every community in which cows enough are kept to produce one hundred and fifty thousand pounds of butter in a year should build a co-operative creamery. Nobody should go into the enterprise to make money out of the creamery directly. It should be purely co-operative. The object should be to manufacture and sell butter at the least possible cost to the producer. Enough should be put aside to pay interest on the cost of the plant, to run the business, and provide for depreciation, and the rest should go to the patrons on the basis of the amount of butter-fat delivered.

This idea is constantly gaining ground. A number of such creameries are being built each year, and very few of them fail now because those who are members of these companies are co-operating in a truer sense than formerly.

But much poor butter is still being made, owing to conditions that might be cured by just a little more co-operation.

Better cream would mean better butter, better butter would bring better prices, and all around it would pay.

A short time ago C. B. Drake, of Westfield, Ill., marketed in Chicago a carload of yearling steers which tipped the scales at 938 pounds for \$13.60 per 100 pounds. These steers were cattle of his own breeding and fattening and of the Hereford breed. Mr. Drake had planned on a later marketing after they would be good and heavier, but as they were not doing as well in the feed lot as they should, he decided to market them at once.

Storing Surplus Products

The following suggestions will be helpful in showing readers ways of keeping different perishable products in condition for winter consumption:

Food Preserved by Outdoor Storage Cellars.

Outdoor storage cellars or caves are excellent for the storage of many late vegetables. Vegetables can be more conveniently placed in such a cellar than in the storage room in the basement of a dwelling.

The proper type and construction of such cellars vary with the geographical location. In northern sections, outdoor cellars are made almost entirely below the ground and covered with sufficient earth supplemented by straw, manure, etc., to prevent freezing.

Save Late Vegetables by Basement Storage.

A cool, well-ventilated cellar under the dwelling offers good conditions for the storage of late vegetables. In cellars that are too warm on account of containing a furnace for heating the dwelling, a room may be partitioned off, either in one corner or at one end of the cellar where the temperature may be controlled by means of outside windows.

Barrels, crates, boxes or bins may be used as containers for the various vegetables, but movable containers are preferable to built-in bins, as it is possible to remove them for cleaning. It is advisable to construct shelves or a slat floor to keep the crates, boxes, baskets, and other containers off the ground. This is highly desirable to insure a free circulation of air and to prevent the containers from harboring mice, rats and vermin. Shelves for canned goods along one side of the room need not be more than six inches wide.

Parsnips All Winter.

Parsnips may be allowed to remain in the ground and dug as needed, as freezing does not injure them.

As it is a difficult matter to dig them when the ground is frozen, it is advisable to store a small quantity in the storage room in the basement of the dwelling or in the outdoor storage cellar for use during the winter periods when the ground is frozen.

Fresh Beets in Winter.

The beets should be placed in ventilated barrels, loose boxes, or, better still, in crates. They should be pulled and the tops cut off when the soil is dry. If sufficient space is available in the cellar, it is a good plan simply to place them in small piles along the wall. Storage in large piles should be avoided, as it is liable to cause heating and decay.

Late Beets Can be Pitted.

Select a well-drained location, make a shallow excavation about six inches deep, line it with straw, hay, leaves, or similar material, and place the beets in a conical pile on the lining. Make the bottom of the pile about the same size as, but not larger than, the bottom of the excavation.

Cover the beets with the same material as that used for lining the bottom of the pit and carry it up several inches above the apex of the pile of vegetables, having it extend through the dirt covering. This serves as a ventilating flue, and it should be covered with a piece of tin or a short board as a protection from rain.

The dirt covering should be two or three inches thick when the vegetables are stored, and it should be increased as severely cold weather approaches until it is a foot or more in thickness, or sufficient to protect from freezing. In finishing the pit, the dirt should be firmed with the back of the shovel in order to make it as nearly waterproof as possible.

The shallow trench around the base of the pit should have an outlet for carrying off the water. Supplement

the dirt covering with clover chaff, manure, straw, corn fodder, or other protective material. Use several small pits instead of one large one, as vegetables keep better in small pits, and the entire contents may be removed when the pit is opened.

Lay in Supply of Winter Onions.

A dry, well-ventilated place, such as an attic, furnishes a good storage place for onions in winter, as slight freezing does not injure them, provided they are not handled while frozen.

To keep well, onions must be mature and thoroughly dry. Put them in ventilated barrels, baskets, crates, or loosely woven bags, as good ventilation is essential to the keeping of onions.

NEW LAW MARKS DOWN PRICE OF SMUTTED WHEAT.

Smutty wheat, or any of the grain showing signs of this disease, will, in the future, be marked down fifteen cents per bushel, according to a letter which James N. McBride, state director of markets has received from Henry H. Goeman, one of America's leading grain dealers.

Mr. Goeman, referring to the grain standards act, now on the statute books, said: "The United States grain inspectors are licensed by the federal government and must grade the grain as the law requires. Where smut is found the wheat is graded lower than it would be if it was clean, and the grower gets fifteen cents less per bushel."

"This positive loss suffered by the farmer who raises smutty wheat should be an incentive to him to plant clean grain. No grower can afford to sow untreated wheat this fall."

For the control of smut, accordingly, the Michigan Agricultural College is recommending the following treatment:

"Use formaldehyde at the rate of one pint (cost about twenty-five cents) to fifty bushels of grain. Put the fresh formaldehyde just as it comes from the druggist, into a pint or quart hand-sprayer (cost seventy-five cents) and spray the grain which has been spread out on the barn floor. Spray the grain as it is shoveled over and over. Keep the sprayer close to the grain and the penetrating odor of formaldehyde will give no discomfort."

"When the right amount of formaldehyde has been applied shovel the grain into a heap and cover for exactly four hours with canvas or blankets. Sprinkle the seed box of the grain drill also."

"The grain should then be spread out for a few hours' airing. It may be sown at once or stored in clean or disinfected sacks."

Manistique, in the upper peninsula, will open a city market August 24 and business men are offering prizes to farmers as an inducement to bring in their produce. Market day only once a week is being planned there.

Manuel Sylva, of Pierre, South Dakota, accompanied a shipment of three carloads of range cattle to the Chicago market a short time ago, and he sold 50 head of steers which averaged 1094 pounds for \$9, and 20 head of cows which averaged 932 pounds for \$7. He said the country was greatly in need of rain, although thus far crops remain uninjured. Most of the wheat and oats have been harvested and show good yields. He reported corn as doing well, with a very large acreage. Grass is generally good, but there are some districts where rain is much needed, and in such localities cattle are plentiful, with many going to market.

A stabilizer invented by a Californian has been purchased by the United States government and is to be used on airships. It is claimed that the device will maintain the equilibrium of aeroplanes while in flight without the aid of a pilot.

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Indiana, Indianapolis,	Sept. 3 to 7
Minnesota, Hamline,	Sept. 3 to 8
Wisconsin, Milwaukee,	Sept. 10 to 15
Kansas, Topeka,	Sept. 10 to 15
Michigan, Detroit,	Aug. 31 to Sept. 9
Canadian National Exhibition, Toronto, Ont.,	Aug. 25 to Sept. 10.

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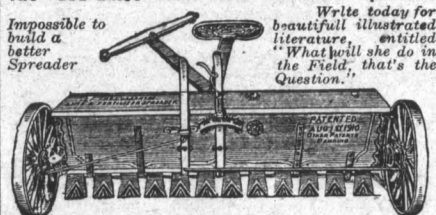
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Married man, small family, wishes to rent for cash or on shares, farm for a term of years. Will keep stock. Have had several years experience managing sy-to-date farms. George Q. Eby, South Haven, Mich.

FOR SALE at a bargain by owner. Large Birmingham. Rents for \$55. In excellent repair. \$5,000 cash. \$5,500 on time. 17 mi. from Detroit. 15 minute car service. A. G. BRACE, Birmingham, Mich.

Markets.

GRAINS AND SEEDS.

August 21, 1917.

Wheat.—Comparatively little attention is being given the wheat trade by dealers these days owing to the uncertainty of the position the government will take in the market. Consequently trading has been largely with those who are in immediate need of the grain. The flour situation is not helping the market just now because users of flour are merely buying to supply their wants from day to day. Dealers have reduced their supplies and when they and the bakers begin buying flour this fall the demand is likely to overtax the capacity of the mills to get it out on time. Threshing in the winter wheat belt is progressing favorably. Farmers are planning on sowing a large acreage this fall. One year ago the price paid here for No. 2 red wheat was \$1.54½ per bu. Last week's Detroit quotations were:

	No. 2	No. 1	Sept.
Wednesday	2.20	2.15	2.03
Thursday	2.18	2.13	2.03
Friday	2.15	2.10	2.05
Saturday	2.15	2.10	2.05
Monday	2.15	2.10	2.05
Tuesday	2.15	2.10	2.05

Chicago.—September wheat \$2.10 a bushel.

Corn.—Weather conditions are bringing the corn crop along rapidly and hopes of escaping frost are growing stronger as the season advances. This has encouraged a downward course of prices and holders of the grain have been selling freely the past few days. The change however has renewed interest in stock feeding and it would not be surprising if a substantial increase in the amount of grain used for this purpose resulted. The short hay crop and the lateness of the corn season has also stimulated the building of large numbers of silos which will eat into the commercial corn supply to some extent. Last year's price for No. 3 corn was 89½¢ compared with the following quotations for Detroit for the past week:

	No. 3	No. 3
	Mixed.	Yellow.
Wednesday	1.89	1.90
Thursday	1.94	1.95
Friday	1.86	1.87
Saturday	1.84	1.85
Monday	1.84	1.85
Tuesday	1.84	1.85

Chicago.—December corn \$1.08½ a bushel; May \$1.07.

Oats.—There is real active trading in this grain and large quantities are going into consumption, it being substituted for other feeds in many instances. The crop is large and now that the new grain is reaching the markets in volume quotations are off for the new grades, which sold locally at 58¢ on Monday for standard grade. A year ago standard oats were quoted at 47½¢ per bushel. Detroit's last week's quotations for old oats were:

	No. 3	White.
	Standard.	
Wednesday	80	79
Thursday	80	79
Friday	80	79
Saturday	80	79
Monday	80	79
Tuesday	80	79

Chicago.—September oats 52½¢ per bu.; December 53½¢; May 57½¢.

Rye.—Further declines have occurred in this deal, with cash No. 2 now quoted at \$1.70 per bushel and September at \$1.67.

Beans.—Cash beans are down but October delivery still holds at \$6.50 per bushel with the local demand slow. At Chicago prices show no change, with Michigan pea beans quoted at \$8 @8.50 for hand-picked, and \$6 for red kidneys.

Seeds.—Prime red clover \$11.90; October \$12.90; alsike \$11.50; timothy \$3.90. Seed prospects are generally discouraging.

FLOUR AND FEEDS.

Flour.—Jobbing lots in one-eighth paper sacks are selling on the Detroit market per 196 lbs., as follows: Best patent \$12.50; seconds \$12.20; straight \$12; spring patent \$14.80; rye flour \$12 per bbl.

Feed.—In 100-lb. sacks, jobbing lots are: Bran \$42; standard middlings \$50; fine middlings \$52; cracked corn \$74.50; coarse corn meal \$73; corn and oat chop \$61 per ton.

Hay.—In carlots at Detroit: No. 1 timothy \$16.50@17; standard timothy \$15.50@16; No. 2 timothy \$14.50@16; light mixed \$14.50@16; No. 1 mixed \$14@15; No. 1 clover \$13@13.50.

Pittsburg.—No. 1 timothy \$18.50@

\$19 per ton; No. 2 timothy \$16.25@17.25; No. 1 light mixed \$16@16.50; No. 1 clover, mixed \$15@15.50; No. 1 clover \$15.50@16.

Straw.—In carlots, on track Detroit, rye straw \$10.50@11; wheat and oat straw \$9.50@10.

DAIRY AND POULTRY PRODUCTS.

Butter.—Prices are unchanged and market is firm. Offerings of high-grade stock small. Fresh creamery extras 39½¢; fresh creamery firsts 37½@38¢.

Chicago.—The feeling still continues quite firm, with prices 1¢ higher than last week. The business is good on all grades. Creamery extras are quoted at \$40½¢; extra firsts 40¢; firsts 38@39½¢; packing stock 33½¢.

Elgin.—Market is a little firmer at Eggs.—On Monday good quality eggs were firm at unchanged quotations. Fresh firsts were quoted at 34@36¢.

Chicago.—Market steady for good stock. Fresh Michigan firsts in new cases sell for 34@36¢.

Poultry.—Market steady and quiet, with prices lower. Best broilers 25@26¢; Leghorns 24¢; hens 22@25¢; ducks 20@21¢; geese 15@16¢; spring 18¢; geese 14¢; spring geese 16@18¢.

Chicago.—The market is firmer at prices about 1¢ higher than last week. Fowls sell from 19@22½¢; spring chickens 22@24¢; ducks 17@19¢; geese 12@14¢; spring geese 16@18¢.

FRUITS AND VEGETABLES.

Fruits.—Sour cherries \$4@4.25 per bu.; raspberries, red \$6@6.50 per bu.; huckleberries \$5@5.25 per bu.; peaches \$3.50 for Elbertas.

Chicago.—Sour cherries \$1.85@2 per 16-qt. case; currants \$1.25@2.25; black raspberries \$2.25@2.75; blueberries \$3 @3.25; red raspberries \$2.50@2.75 per 24-pt. case; other fruits in 16-qt. cases.

Apples.—At Detroit Harvest apples are quoted at \$6.50@8 per bbl. At Chicago Michigan Duches sell for \$1 @1.25 per bu., or \$3.50@4.25 per bbl; Astricans \$1 per bu.

Potatoes.—Potatoes are scarce and firm with quotations of \$1.80 per bu. At Chicago home-grown potatoes sell for \$1.15@1.20 per bushel.

WOOL.

Determining the conditions of the contracts through which the government's supply of wool is to be secured, occupied some attention of the trade the past few days, but had no influence upon prices, which are holding firm. Many farmers still hold their wool surplus and small quantities are gradually finding their way into commercial channels at prices well around 70¢ to the producer.

GRAND RAPIDS.

Potatoes are selling at \$1 to \$1.20 and are going rather slow. Early apples are beginning to come, Duches bringing around 75¢. The season for berries is almost over. The egg market is firm at 34¢ and dairy butter is quoted at 32@33¢. The mills quote both wheat and corn at \$2; rye and barley at \$1.50; oats 80¢. Hay is now bringing \$12@14.

DETROIT EASTERN MARKET.

Large quantities of produce were offered at the city markets on Tuesday morning where the buying capacity seemed to be of equal proportions, which resulted in the maintaining of prices on most offerings. Potatoes at \$1.60@1.90 per bu.; tomatoes \$4@5; string beans \$2.50@2.75; cucumbers \$1.25@3 according to size; eggs 50¢ per dozen; huckleberries 25¢ a quart; cabbage 50¢ per bushel. Nothing doing in the hay trade.

LIVE STOCK MARKETS.

Buffalo.

August 20, 1917.

Receipts here today as follows: Cattle 200 cars; hogs 20 d. d.; sheep 13 d. d.; calves 1650 head.

With 200 cars of cattle here today we had a very uneven trade. What few prime cattle were here sold about steady but the bulk of the medium and butcher grades of steers sold 25@50¢ lower, with the best cows and heifers about steady and some of the medium and common grades lower. There was also a good call for the stock bulls and they sold readily at good strong prices. There was a good demand for the good weighty bulls that were good enough to go for butchers and they sold steady, with the medium and common ones, on the bologna order, slow and a little lower. We look for a fair run of cattle next Monday and if anything little easier prices.

We had a very scant run of hogs

today, about 20 double decks, demand fairly good and prices 15@25¢ higher, bulk selling around \$19.25, with a few selected up to \$19.40; pigs and lights \$16.50@17.50, as to weight and quality. Roughs \$17@17.25; stags \$14@15. Everything sold at the close and with western markets extremely high looks like higher trade for the next few days.

With a light run of lambs today our market opened up slow and prices \$1 per cwt. lower than the close of last week. All sold and we look for steady prices balance of the week.

Lambs \$15@16; yearlings \$12.50@14; cull to common \$11@15; wethers \$10@10.75; ewes \$9.50@10.25; bucks \$7@8; best calves \$16.25@16.50; common and light \$13.50@15.50; heavy \$12@15; grassers \$6@8.50.

Chicago.

August 20, 1917.

Cattle. Hogs. Sheep.
Receipts today..30,000 18,000 14,000
Same day 1916..25,165 28,838 24,555
Last week.....48,347 66,439 57,383
Same wk 1916..49,609 136,989 86,065

Only 66,439 hogs were received last week, and of these 15,915 were re-shipped east, while only 9,046 cattle were shipped from here, comparing with 13,621 a year ago. Shipments of sheep and lambs from here were 7751 head, comparing with 16,620 a year ago. Hogs received averaged 235 lbs.

Hogs were irregularly higher today under meager offerings, the top being \$19.65, or 65¢ higher than the best sales of Saturday. A few prime cattle sold as high as ever, the best bringing \$15, but the unusually liberal supply caused others to sell irregularly lower. Sales took place as a rule much later than usual, and prices were called largely 25@50¢ lower, with some reports claiming an ever greater decline for the commoner kinds. A strong sheep market was witnessed, with range lambs sharply higher for the best, prime killers and feeders moving up to \$16.75.

Cattle prices continue on their rapid course, with a demand last week for nearly all kinds in excess of the offerings. There was a rather sharp reaction on Thursday, when the previous advance brought in a much larger supply than is usually seen on that day, and prices broke as much as 25¢ for the commoner steers and butcher stock, but on the same day distillery fed cattle sold at \$14.65, the highest price ever paid for that class of beeves. On Wednesday, the high day of the week, beef steers went largely at \$11.25 @14.25, with the best fat steers carrying plenty of weight going at \$14.25@15, the top price being 65¢ above the top price paid heretofore. Steers classed as good brought \$13@14.20, while a medium grade sold at \$11.75@12.95, with ordinary to fair light weight killers taken at \$10@11.70, and sales made to a limited extent of inferior little steers all the way down to \$7.50@9.50. Yearlings at all desirable in quality found an outlet at \$13 and upward, a choice kind bringing \$13 and upward, and sales ranged all the way down to \$10@11 for the commoner yearlings. Butcher stock shared in the general upward course of prices, with cows taken at \$7.10@11, although very few were choice enough to bring over \$10.25, while heifers sold at \$6@13.50, with prime yearling heifers very scarce. There was a good outlet for cutters at \$6.10@7, with canners selling at \$5.15@6 and bulls at \$6@10 usually. Light weight veal calves had a sharp advance, with sales of the best up to \$15 per 100 lbs., and sales ranging down to \$6.50@12 for heavy ones, the commoner light vealers going at \$13 and over. The stocker and feeder trade was lessened by inadequate offerings and advanced prices, the former selling at \$6.50@8.75 and the latter at \$8@9.25. Late receipts of cattle brought the week's receipts up to good numbers, and at the close prices for cows, heifers and bulls were no better than a week earlier, while the steers were steady to 50¢ higher.

Hogs passed another eventful week, with advances of as much as 25¢ a day of frequent occurrence, and on Wednesday the bulk of the sales showed advances of 25@35¢. Prices were far higher than during the preceding week and enormously above prices paid in any former year. With such extremely high prices paid in the markets of the country, the marked falling off in the receipts was regarded as a pretty good indication that matured hogs were mostly out of the way, but advices from various districts were that a great many young hogs and pigs are being fattened for the future market. Most predictions of high prices have been reached and even exceeded, but now there are fresh predictions of much higher values, and it is an interesting question how high hogs can go without stopping in great measure the consumption of fresh and cured hog products. All lines of fresh

pork and provisions are abnormally high, and there are large accumulations of cured hams in western packing centers. Prices on Saturday were at their highest, with the best class selling at \$18.50@19 and the commoner lots at \$16.25@17.50, while pigs brought \$12.25@16.25. A week earlier top hogs brought \$17.25.

Lambs, yearlings, wethers and ewes were marketed last week day after day in such greatly decreased numbers that sellers were able to obtain much higher prices for fat lots, there being an active general demand. Much of the largest advance took place in fat lambs, while feeders also sold much higher, the offerings being greatly inadequate. Nevada as well as Oregon, Washington and Idaho, contributed some trainloads of lambs and yearlings. Closing prices were 75¢@1.25 higher for lambs than a week earlier, while sheep and yearlings advanced 50@75¢ and feeding lambs \$1.50@2. Prices closed as follows: Lambs \$11.50@16.50; feeding lambs \$15.75@16.50; yearlings \$9.75@13; wethers at \$9.50@11.50; ewes \$4.50@10; breeding ewes \$9@15.

Horses were marketed last week in far smaller numbers than for the corresponding weeks in recent years, but the general demand was correspondingly light, and prices showed no improvement, inferior horses showing a weakness. Shippers bought sparingly, and on some days there were no army inspections. Inferior to fair horses sold on the basis of \$60@125, with drafters salable at \$185@265 and desirable drivers at \$125@175.

MICHIGAN CROP REPORT.

Wheat.—The average estimated yield per acre in the state is 17 bushels. The estimate at present indicates that the state yield will be very close to 12,225,000 bushels.

The estimated number of bushels of wheat marketed and used by farmers during the 11 months ending June 30 was 11,750,000 and as the estimated yield for 1916 was approximately 12,400,000 bushels, it is very evident that the wheat crop of 1916 has been disposed of by the growers.

Oats.—The estimated average yield of oats in the state is 38.33 bushels per acre. This estimate indicates that the state yield will be about 73,000,000 bushels.

Rye.—The estimated average yield of rye in the state is 14.38 bushels per acre, which makes the estimated yield very close to 6,000,000 bushels.

Corn.—The condition of corn as compared with an average is 71 in the state, which is exactly the same as reported one year ago.

Potatoes.—The condition of potatoes as compared with an average is 92 in the state, one year ago the average was 72.

Beans.—The condition of beans as compared with an average per cent is 72 in the state; one year ago the average in the state was 86, but they were severely damaged by the excessive hot and dry weather which followed.

Sugar Beets.—The condition of sugar beets as compared with an average is 81 in the state. The condition one year ago was 93.

Chicory, Mint, Cabbage and Celery.—The condition of chicory in the state is 89; mint 55; cabbage 83, and celery 91.

Pasture.—The condition of pasture in the state is 92, one year ago the condition was 77.

Hay and Forage.—The estimated yield per acre of hay and forage, in tons is 1.50 in the state. The above estimate indicates that the state yield will be about 3,431,000 tons.

Apples.—On the first day of July the prospect for an average crop of apples in the state was 53 per cent, but owing to unfavorable conditions during the month of July the prospect has been reduced to 40 per cent.

Recent marketings of cattle from the south show marked improvement in feeding methods. A short time ago a carload of Mississippi fed fat cattle which averaged in weight 1566 lbs. was sold on the Chicago market for \$14.35 per 100 lbs. They were purchased in the neighborhood of the feeder last autumn when they averaged around 1000 lbs. and cost \$7 per 100 lbs. They were wintered on shock corn, on blue grass up to the close of February, when they were furnished all of the corn they would eat, with ten pounds of molasses feed a day per head. The hogs which followed the cattle made good gains.

A short time ago two carloads of prime Iowa fed cattle brought on the Chicago market \$14.35 per 100 lbs. having been bought as stockers last fall for \$7.90 per 100 lbs. when their average weight was 600 lbs. They were started on stalks and later on a full feed of corn on grass.

THIS IS THE LAST EDITION.

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

DETROIT LIVE STOCK MARKET.

Thursday's Market.
August 23, 1917.

Cattle.

Receipts 2,976. Market steady at last week's opening prices on all the grades; closing active.

Best heavy steers \$10@10.50; best handy weight butcher steers \$8.50@9.50; mixed steers and heifers \$7.50@9; handy light butchers \$7@8; light butchers \$6.50@7.50; best cows \$7.25@7.75; butcher cows \$6.50@7; common cows \$5.50@6; canners \$4.50@5.25; best heavy bulls \$7.50@8; bologna bulls \$6.50@7; stock bulls \$5.50@6; feeders \$7.50@8.50; stockers \$6@7.25; milkers and springers \$4@9.00.

Bishop, B. & H. sold Hyman 8 butchers av 575 at \$6.25; to Converse 2 cows av 960 at \$5.25, 4 do av 900 at \$5.50; to White Bros. 30 stockers av 600 at \$6.15; to Newton P. Co. 1 cow wgh 1020 at \$5.25, 5 do av 850 at \$5.25, 4 butchers av 950 at \$7.25, 3 do av 1050 at \$7, 2 cows av 940 at \$6; to Kamman B. Co. 22 steers av 1000 at \$9; to Parker, W. & Co. 19 butchers av 700 at \$7.25, 6 do av 875 at \$7.25, 8 do av 800 at \$7.25, 2 do av 635 at \$6, 25 do av 700 at \$7; to Hammond, S. & Co. 1 steer wgh 1000 at \$9.25; to Cohen 3 cows av 750 at \$6; to Kazmer 1 bull wgh 940 at \$7.10; to Kull 4 feeders av 800 at \$7.50; to Goose 23 butchers av 522 at \$6.25; to Conway 12 stockers av 566 at \$6.25; to Mich. B. Co. 20 steers av 1936 at \$9; to Hull 13 feeders av 761 at \$7.75; to Bresnahan 21 cows av 923 at \$6.25; to Parker, W. & Co. 9 steers av 1022 at \$8.50; to Newton P. Co. 3 bulls av 943 at \$7; to Thompson 23 steers av 1026 at \$9.15; to Mich. B. Co. 3 do av 843 at \$8; to Parker, W. & Co. 24 do av 1067 at \$10; to Sullivan P. Co. 8 do av 794 at \$7.75, 22 do av 821 at \$7.60, 25 do av 836 at \$7.60, 17 do av 1010 at \$9, 23 do av 931 at \$9.10, 20 do av 960 at \$10; to Hammond, S. & Co. 11 do av 944 at \$8.50, 8 do av 815 at \$7.50; to Sullivan P. Co. 20 do av 960 at \$10, 6 do av 736 at \$7.

McMullen, K. & J. sold Goodgold 14 butchers av 522 at \$6.35, 11 do av 700 at \$6.75, 5 cows av 974 at \$6.25; to Mason B. Co. 4 cows av 1005 at \$4.95, 19 steers av 787 at \$7.35; to Thompson 16 do av 905 at \$9, 1 do wgh 1070 at \$8, 4 bulls av 1470 at \$7.50; to Goose 8 steers av 771 at \$7, 15 butchers av 520 at \$6.40; to Conway 6 stockers av 600 at \$6.50; to Hammond, S. & Co. 8 cows av 943 at \$5.90; to Bresnahan 28 steers av 843 at \$8.50, 6 do av 891 at \$8.45; to Brighton D. M. Co. 6 cows av 841 at \$6.25; to Nagle P. Co. 1 bull wgh 1030 at \$7.50; to Newton P. Co. 4 do av 800 at \$6.50, 1 do wgh 1210 at \$7.75, 1 do wgh 1250 at \$7.50; to Hammond, S. & Co. 8 butchers av 737 at \$7.25, 7 cows av 850 at \$5.10, 27 butchers av 730 at \$7.25, 14 do av 760 at \$7.50, 3 bulls av 1170 at \$7.75; to Parker, W. & Co. 6 steers av 915 at \$8, 8 do av 1046 at \$10, 12 do av 772 at \$7.25; to Thompson 11 do av 902 at \$8.35; to Brighton D. M. Co. 5 cows av 1020 at \$6.50; to Nagle P. Co. 3 steers av 887 at \$8, 6 do av 1166 at \$10, 3 do av 1117 at \$8.50, 1 cow wgh 1280 at \$8, 3 steers av 700 at \$7.50, 5 do av 814 at \$8.50.

Veal Calves.

Receipts 586. Market steady on good; heavy dull; good \$1 higher than last week. Best \$15.50@16; others \$8@14.

Bishop, B. & H. sold Sullivan P. Co. 3 av 145 at \$11, 17 av 160 at \$16, 3 av 290 at \$12, 4 av 145 at \$16, 2 av 125 at \$10, 4 av 125 at \$15.75, 7 av 135 at \$15.50, 2 av 180 at \$15.75, 1 wgh 220 at \$10; to Newton P. Co. 5 av 125 at \$11, 6 av 150 at \$15.75, 4 av 125 at \$15.50; to Sullivan P. Co. 9 av 160 at \$14, 5 av 165 at \$16; to Hammond, S. & Co. 8 av 155 at \$16; to Newton P. Co. 5 av 200 at \$15.50; to Hammond, S. & Co. 5 av 140 at \$16.

Sheep and Lambs.

Receipts 2443. Market steady. Best lambs \$15@15.25; fair lambs \$14@14.50; light to common lambs \$11@13.50; fair to good sheep \$7.50@8.25; culls and common \$5@7.

Erwin, S. & J. sold Mich. B. Co. 94 lambs av 79 at \$14.75; to Nagle P. Co. 18 do av 80 at \$15; to Nagle P. Co. 10 do av 70 at \$15, 4 yearlings av 85 at \$10.50, 27 lambs av 80 at \$15; to White Bros. 42 lambs av 55 at \$13.75.

McMullen, K. & J. sold Mich. B. Co. 87 lambs av 65 at \$14.85, 24 do av 70 at \$15, 5 sheep av 125 at \$8, 2 do av 85 at \$6; to Costello 49 lambs av 60 at \$14.

Hogs.

Receipts 750. Hogs very dull and 50c lower than on Tuesday for mixed pigs; mixed hogs selling at \$18@18.50; pigs \$15@15.75.

GOVERNMENT SHOULD FIX DEFINITE PRICES.

A minimum price of \$2.00 per bushel on wheat, fixed by the government, and a maximum price of \$2.65 fixed by the Chicago Board of Trade, if both stand without any change, will give the speculators a play of sixty-five cents per bushel. In other words, when the demand is active the price will be \$2.65, when the market is dull and easy the price will be around \$2.00, with the greatest portion of the sixty-five cents going to swell the bank accounts of the big speculators. There ought to be one established price to the producer on grain of all kinds, delivered at any primary market. This would cut out speculation and stop the hoarding and piling up of grain in elevators for speculative purposes. An established price, based on the actual supply and demand in both the United States and the allied countries, which could be easily figured out of, say \$2.00 per bushel on standard wheat, \$1.25 for corn and sixty cents for oats, all things considered, ought to be high enough. Winter wheat and oats have been practically secured and if nothing happens to disturb the present brilliant outlook for spring wheat and corn, the United States ought to have an exportable surplus on this crop of wheat, corn and oats, of around nine hundred million bushels. I think I am well within the mark when I estimate this year's crops as follows:

Wheat, bushels	850,000,000
Corn, bushels	3,250,000,000
Oats, bushels	1,500,000,000
Barley, bushels	250,000,000
Rye, bushels	50,000,000
Potatoes, bushels	450,000,000
Beans, bushels	15,000,000

To move nine hundred million bushels of grain to the seaboard will require 600,000 cars loaded with 1,500 bushels each, and 3,000 vessels, each carrying about 10,000 tons, or 300,000 bushels, to carry it across the ocean. It certainly looks as though the transportation problem would cut more figure than the question of supplies.

The elimination by the government of speculation, gentlemen's agreements, community interests, 100 per cent profits, etc., would help to materially reduce famine prices.

Wayne Co.

T. G. CRAIG.

HAPPENINGS OF THE WEEK.

(Continued from page 134).

tacks.—The southern fronts and those in Asia Minor have furnished no news of interest the past fortnight.—Aeroplane activity is growing apace. By increasing the number of planes on both sides the importance of this phase of the fighting is becoming more apparent. In a single day the French and British airmen brought down 24 enemy planes behind his lines on the western front.

Former Czar Nicholas of Russia, has been transferred by the provisional government to Siberia. Since being deposed he and his relatives have been under guard at Tsarskoe-Selo from whence they were removed on August 14.

The German reichstag general committee convenes this week for consideration of the recent peace proposals made by Pope Benedict. The committee will also be called upon by the social democrats for a statement as to their peace aims of the government.

There is little hope of averting the threatened railroad strike in England where the locomotive engineers are demanding an eight-hour day. In the recent settlement of differences between the railroads and employees a truce was declared in which it was agreed among other things that the shorter day issue should be left for consideration until after the war is over. The engineers now contend that the railroads have broken their side of the agreement and they therefore are determined to press their demands by walking out.

National.

Nearly 10,000 veterans of the Civil War gather in Boston this week for the fifty-first annual encampment of the Grand Army of the Republic. Every one of the forty-four departments in the country will be represented.

The coal market situation is now getting the attention of both state and federal officials. Last week our state government made a request upon dealers for information on the present status of supplies and prices. But from published reports it appears that the dealers are preparing to oppose any movement to compel them to show their books.

If the city officials will grant permission it is probable that Detroit will have auto-bus lines operating in the more congested sections. Such lines are now in commission in Chicago.

Oliver the Choice at Fremont



At the National tractor demonstration at Fremont, Oliver tractor plows and other Oliver products were drawn by forty-two different tractors. The same reason that caused sixty-five per cent of the tractor manufacturers not making plows to pull Oliver products in order to secure the best results from their tractors is the reason why you should insist upon an Oliver implement for use with your tractor.

Oliver tractor plows are furnished with two, three or four bottoms for light tractor use; in larger sizes for heavy tractors.

The Oliver tractor disk harrow and roller pulverizer are especially adapted for tractor hitch.

Tell your plowing needs to the nearest Oliver dealer or write us for information on the plow best adapted to meet them.

Oliver Chilled Plow Works

Plowmakers for the World

South Bend, Ind.

Pedigreed Grains

Red Rock wheat, Rosen Rye and Michigan Winter Barley are fall sown grains developed at the Michigan Agricultural College. They have been grown with satisfactory results by hundreds of farmers. For lists of men who have inspected pedigreed seed of these varieties for sale, write the Secretary of the Michigan Crop Improvement Association.

J. W. NICOLSON, East Lansing, Michigan

EGGS

We paid 4c to 6c above Detroit quotations last week for New Laid Stock. If you have real Fresh Eggs and want premiums, write us.

A. AMERICAN BUTTER & CHEESE CO. Detroit, Mich.

Ontario Veterinary College

110 University Ave., Toronto, Canada
Under the control of the Department of Agriculture of Ontario. Affiliated with the University of Toronto. College Reopens, Monday, Oct 1, 1917, Calendar Sent on Application.

E. A. A. Grange, V.S., M. Sc.,
Principal

HAY Ship To The Old Reliable House
Daniel McCaffrey's Sons,
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FRUIT We want your entire crop. Write for rubber stamp. The E. L. Richmond Co., Detroit, Michigan.

EGGS, ETC. Small consignments from producers in your territory bring very attractive prices. Returns day of arrival. Refer to Dun or Bradstreet. Zenith Butter & Egg Co., 170 Duane St., New York, N.Y.

ROSEN RYE. (Recleaned), \$2.25 per bu., bags extra.
GEO. F. HEATH, R. 1, Lawrence, Michigan.

HOGS

Large Type Poland Chinas A few choice spring pigs, either sex for sale.
HOWARD RUSSELL, Osceola, Mich.

HAMPSHIRE Boar pigs only for sale \$15 and up to age.
JOHN W. SNYDER, R. 4, St. Johns, Mich.

Hampshire Weanling Pigs from good breeding. Priced for quick sale.
A. E. BACON & SON, Sheridan, Mich.

FOR SALE Yorkshire Sows and Gilts, bred for fall farrowing. Also boar pigs for full service. Waterman & Waterman, Meadowland Farm, Ann Arbor, Mich.

SHEEP

Shropshires Big, early, reg. ram lambs, for coming fall trade, sired by imp. Nook ram. Milo M. Gibson, R. 5, Lapeer, Mich.

For Shropshire Yearlings or Lamb Rams and Ewes, write or call on
ARMSTRONG BROS., R. 3, Fowlerville, Michigan.

OAKDALE STOCK FARM. Shorthorn Cattle and Shropshire Sheep. Stock for sale. W. J. Lesiter, Belding, Mich.

WANT to buy 4 young Oxford rams ready for service this fall. Please write description and price to
CARL E. SCHMIDT, Oscoda, Mich.

Hickory Knoll Rambouillets. For sale a good heavy stock ram. A. E. Green, Orchard Lake, Mich.

Western Ewes—Several hundred good grade ewes, two year olds and yearlings. A few registered rams. Barnard Sheep Ranch, R. 5, Clare, Mich.

HORSES

For Sale Reg. Black Percheron Stallion Colt

Weighing 1600 pounds at 24 mos. old Sired by a Stallion Weighing 2100 pounds well bred and priced to sell. M. A. Bray Est., Okemos (Ingham Co.) Mich.

SHEPTELAND PONIES

200 head to select from. Special prices on colts for August and September. Write Dept. E. The SEADYSIDE Farms, North Benton, Ohio.

REGISTERED PERCHERON Mares and Stallions priced to sell. Inspection invited. L. C. HUNT, EATON RAPIDS, MICH.

Percherons, Holsteins, Angus, Shropshires, Durocs
DORR D. BUELL, Elmira, Michigan.

\$140 Sell or Trade for milk cows a 4 year old big Blind Black Mare Sound. C. A. JOHNSON, Alma, Mich., P. O. Address Kalamazoo, R. 9, Box 73

Spanish Jack For sale Spanish Jack seven years old good size.
E. J. ALDRICH, Tekonsha, Mich.

Feed the Fighters! Harvest the Crops!

Win the War! Save the Yields!

On the battlefields of France and Flanders the United States boys and the Canadian boys are fighting side by side to win for the World the freedom that Prussianism would destroy.

While doing this they must be fed and every ounce of muscle that can be requisitioned must go into use to save this year's crop. A short harvest period requires the combined forces of the two countries in team work, such as the soldier boys in France and Flanders are demonstrating.

THE COMBINED FIGHTERS IN FRANCE AND FLANDERS AND THE COMBINED HARVESTERS IN AMERICA WILL BRING THE ALLIED VICTORY NEARER

A reciprocal arrangement for the use of farm workers has been perfected between the Department of the Interior of Canada and the Departments of Labor and Agriculture of the United States, under which it is proposed to permit the harvesters that are now engaged in the wheat fields of Oklahoma, Kansas, Iowa, North Dakota, South Dakota, Nebraska, Minnesota and Wisconsin to move over into Canada, with the privilege of later returning to the United States, when the crops in the United States have been conserved, and help to save the enormous crops in Canada which by that time will be ready for harvesting.

Help Your Canadian Neighbors When Your Own Crops are Harvested

Canada wants 40,000 Harvest Hands to take care of its
13 Million Acre Wheat Field

One cent a mile railway fare from the International Boundary line to destination and the same rate returning to the International Boundary. High wages, good board, comfortable lodgings.

An Identification Card issued at the boundary by a Canadian Immigration Officer will guarantee no trouble in returning to the United States.

AS SOON AS YOUR OWN HARVEST IS SAVED, move northward and assist your Canadian neighbor in harvesting his; in this way do your bit in helping "Win the War".

For particulars as to routes, identification cards and place where employment may be had, apply to Superintendent of Immigration, Ottawa, Canada, or to

M. V. McINNES, Canadian Government Agent, 178 Jefferson Ave., Detroit, Mich.

Please mention the Michigan Farmer when you are writing to advertisers and you will do us a favor



It's Natural for a Hog to Wallow

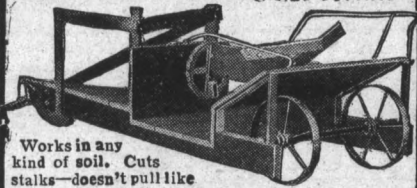
Here's a good thing to do: Provide a wallow close to the feeding grounds to which add Dr. Hess Dip and Disinfectant. As the hogs pass back and forth from the wallow to the feed trough, the **DIP** will kill the lice and cleanse the skin, while the **DRIP** will destroy the disease germs and the worms that pollute the ground. That will mean a clean, healthy skin, freedom from lice, a safeguard against disease and larger, better porkers.

Dr. HESS & CLARK
Ashland Ohio

DR. HESS DIP
and
DISINFECTANT

The PERFECT CORN HARVESTER

Sold Direct \$19.50 JUST THE THING for SHOCK or SILO CUTTING



Works in any kind of soil. Cuts stalks—doesn't pull like other cutters. Absolutely no danger

Cuts Four to Seven Acres a Day

with one man and one horse. Here is what one farmer says:

Hillsdale, Mich., Nov. 4, 1916.

Your harvester is perfectly safe for horse and man, which is worth the price of the machine. If I had not had the harvester it would have cost me almost the price of it for hired help. George H. Todd.

SOLD DIRECT TO THE FARMER

Send for booklet and circulars telling all about this labor-saving machine; also containing testimonials of many users. Send for this circular matter today.

LOVE MANUFACTURING COMPANY

Dept. 11 Lincoln, Illinois

DEATH TO HEAVES

NEWTON'S Heave, Cough, Distemper and Indigestion Cure.
Some cases cured by 1st or 2nd \$1 can. Three cans are guaranteed to cure heaves or money refunded.



The original and the up-to-date Standard Veterinary Remedy for Heaves; free booklet explains fully. 35 years sale and veterinary use.

CURES HEAVES BY CORRECTING CAUSE—INDIGESTION. IT'S A GRAND CONDITIONER AND WORM EXPELLER

Safe. Most economical. Excellent for Cattle and Hogs. \$1.00 per can at dealers, at same price by parcel post.

THE NEWTON REMEDY CO., Toledo, Ohio



MINERAL HEAVE COMPOUND
CURES HEAVES

Booklet Free
\$3 Package guaranteed to give satisfaction or money back. \$1 Package sufficient for ordinary cases.

MINERAL HEAVE REMEDY CO., 403 Fourth Ave., Pittsburg, Pa.

LEARN AUCTIONEERING at World's Original and Greatest School and become independent with no capital invested. Every branch of the business taught in 5 weeks. Write today for free catalog.

JONES' NAT'L SCHOOL OF AUCTIONEERING, 28 N. Sacramento Blvd., Chicago, Ill. Carey M. Jones, Pres.

FERRETS. Both colors. Write for price list.
HUGH KEPHART, Dowagiac, Michigan.

When writing to advertisers please mention The Michigan Farmer.

Keep the Pigs Growing

By N. A. CLAPP

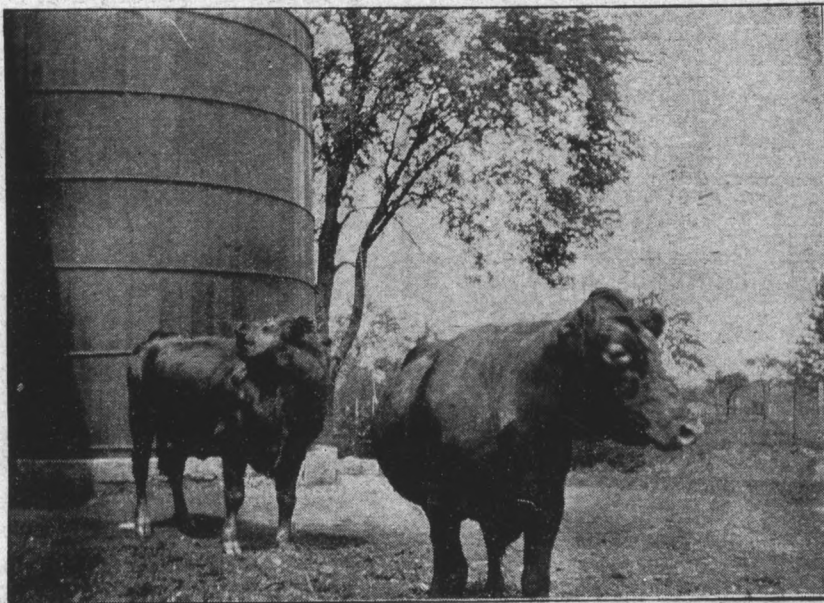
AN unusual effort is being made on the part of the Department of Agriculture at Washington, D. C., to avert a pork and meat shortage. They have appealed to farmers to save their brood sows and breed them for fall litters and to add to the size of their breeding herds by saving the young sows from last fall litters and also breeding them to farrow pigs the coming fall in order to do all that can be possibly done to increase the number of pigs to eat a part of the grain now growing and will soon be harvested, to help keep up the supply of pork meats that will be needed to meet the demands of the people at home and supply the armies of the allies in the field in the European war.

Notwithstanding the appeals, according to the market reports, many brood sows that have just weaned their spring litters and are not half fattened are being sent to market. The appeal of the prevailing high prices at the present time has induced farmers to part with the "goose that lays the golden egg," so to speak, and is aiding to make it less possible to meet the needs of the people in our own country in the future, and is helping to make it more difficult to supply the soldiers in the field that

them strong and healthy—fit instruments or machines with which to make healthy, delicious and marketable meat.

We also long since learned that "variety is the spice of life," in many ways, and that a great variety of feeds yield much richer and more abundant returns in the shape of growth and profits on our animals than can be secured by a narrow diet, or a strict limitation to one or two kinds of feeds. The pasture feeds add variety. They are consumed because they are relished. They bulk up the mass of feeds in the stomach, making digestion more certain and complete, furnishing an economical addition to the grain consumed. The pasture feeds are of a succulent nature, yield their nutritive elements readily and furnish to the pigs what is needed to build up their bodily systems harmoniously. In very many ways pigs are benefited by being kept constantly in the pasture fields in the summer time.

In addition to pasture the pigs should be provided with shelter from the storms and the burning rays of the midday sun. In other words, they should have a chance to make themselves comfortable. Their sleeping quarters should be clean and sanitary.



Polled Durham Heifers Fattened Almost Exclusively on Silage.

These heifers were fed by Wm. Mackley, of St. Clair County. Their ration consisted of silage and only about one quart of grain per day. More silage in the ration for beef production will be good farm economy this year.

need the meat to help sustain them when the pinch of cold winter comes on, and they are required to endure the hardships of marches and the strain of the struggle in the trenches and actual contact with the enemy. It sometimes looks as though the patriotic spirit is being smothered in order to increase the possibilities for immediate gratification of the desire to realize on what is in hand regardless of what may be the outcome in the future.

In their Weekly Letter of July 18, the Department of Agriculture makes an appeal to the farmers to keep the spring pigs growing. They urge the use of the pasture. That advice is repeated several times as though it is necessary in order to fix it on the minds of the farmers in a way which will induce them to heed it.

To a practical farmer and pig raiser, it does not seem as though the advantages of keeping pigs on the pasture need to be emphasized so strongly. Our experiences and observations have fixed those things so firmly in our minds that a repetition of them, by high authority, is not required to make us understand them. We learned, much earlier in life that pigs need an abundance of exercise in the open air in order to develop their bony, muscular and nervous systems, and make

made cheaper, while the pigs are growing, than the same weight in fat can be made later in life.

Wayne Co.

N. A. CLAPP.

THREE POINTS TO BE CONSIDERED IN SILO BUILDING.

Three big points, knowledge of which may enable builders of silos to foresee problems they are likely to encounter, are mentioned by the farm mechanics department of the Michigan Agricultural College as worthy of remembering.

First. Impervious walls. The fundamental principle in the preservation of silage is the retention of moisture within the silage and the exclusion of air. For this reason, the silo wall must be non-porous. Moisture must be prevented from passing out and air from passing in.

Second. Strength of walls. The walls of a silo must be strong enough to resist the bursting pressure of the silage, which acts outward in all directions as the silage settles. The friction of the silage on the walls and the weight of the material of the walls produce a crushing action which is great near the bottom of the silo.

Third. Smoothness of walls. To permit the silage to settle freely, and to prevent the formation of the air pockets, the walls should be smooth on the inside and not have any shoulders or offsets. Air pockets result in more or less spoiled silage.

HINTS ON CARE OF BULL.

I have a thorough-bred Jersey bull and I want to give my experience with caring for bulls in the summer.

I have a box stall 12x14 feet, well bedded with straw and an out-door yard 14x24 feet, made four planks high. Planks are ten inches wide with four-inch cracks, making the fence about five feet high. The four-inch cracks make it so Mr. Bull can see all that is going on and that makes him good natured. I also have in the yard a post set in the ground about three feet, and five feet out, and at the top I fastened a small chain with a staple and a ten-inch block of soft wood fastened at the other end of chain so it will swing and he plays with it hour after hour.

Never use a fork on the bull. If you wish to make him mind take a sharp whip but never use it unless necessary. Treat him the same as you do your heifers. They love kindness and petting just as well as any animal. I think with this treatment you will always have him kind and good natured. Another thing, I think only one person should have the care of a bull, or some one they are accustomed to seeing every day.

Ingham Co.

J. B. YOUNG.

Milton H. Brown, of Sangamon county, Ill., marketed in Chicago a short time ago a carload of prime little yearling steers which averaged only 934 pounds for \$13.65 per 100 pounds, there being 22 of them. For many years Mr. Brown has made a specialty of baby beeves, and he makes it a practice to market several carloads every year, having found it to be a profitable industry. He makes it an invariable rule to breed his own cows, being able in this way to obtain choice calves of even flesh, conformation and quality. It is impossible to purchase calves of this description on the market unless they are selected from several lots; and while it may be possible to buy bunches of good calves on the market, their cost is considerable more than that of home-grown calves.

W. H. Robinson, of Fulton county, Ill., sold a carload of 1367-pound fat steers of his own feeding on the Chicago market a short time ago for \$13.65 per 100 pounds and a carload of choice hogs for \$16.15. He remarked that the crops of oats was turning out from 50 to 80 bushels to the acre and bringing from 65 to 67 cents per bushel, while corn prospects were highly promising.

Breeding Ewes Need Good Care

By PROF. GEO. A. BROWN
Michigan Agricultural College

WHILE the 1918 lambing season is still eight months distant, its success or failure for the sheepman will be quite largely determined by the care given the breeding ewe flock during the next two or three months. The breeding ewe that has done her duty by producing a good lamb at this time of the year in a more or less run-down condition and in no shape for the mating season which in many sections will start within the next few weeks.

After the lambs are weaned the ewe flock should be run on scanty pasture for a week, or until the ewes are all dried off, and should be carefully looked over every third day to see that milk does not accumulate in the udder and make milking necessary. After this time the flock should be given the best possible pasture the farm affords, for a change is advisable at this period even though there is plenty of grass in the pasture where they have spent the summer. The aftermath on the meadows or clover seeding, if not pastured too closely, is particularly excellent for the flock at this season.

Where a change to better pasture is not available it is the practice to feed the ewe flocks some grain, from one-half to one pound per head daily to start the ewes gaining in flesh and to promote activity in the reproductive organs. But if it is obtainable, the writer strongly advocates the use of

Where only a small flock is kept, or the purchase of a dipping tank is not possible, the tick and louse may be kept under control by placing the sheep on its back, pouring the dip the full length of the middle of the body, and holding the animal in this position for at least one minute. Then the application should be repeated the full length of the back and neck.

All sheep purchased should be thoroughly dipped before being allowed to mingle with a clean flock.

HOW TO TELL THE AGE OF A HORSE.

The writer's experience has shown him that there are a good many farmers and farmer boys that do not know how to accurately estimate the age of a horse. It is with the hopes of furnishing such persons with a guide, that this article is written.

The only way to estimate the age of a horse is by careful examination of the teeth. It requires considerable experience to be quick in recognizing the age of an animal, but by practice the age may be determined with considerable accuracy up to eight years; beyond this one can only guess at the age.

In the colt, seven or eight days after birth, two incisor teeth appear at the front and middle of both the upper and lower jaws. In about five or six



Good Care Now Makes for Prolificacy in Breeding Ewes—This Ewe Raised the Four Lambs at Her Side in a Single Season.

good pasture rather than grain at this period. The breeding ewe gaining in flesh and condition as a result of good pasture will at mating time be more apt to conceive at the first service, will produce a stronger lamb and give a better milk flow next spring than will the ewe that is in a thin, run-down condition at mating time. A larger percent of twin lambs will also be obtained from a ewe in a thrifty condition when mated.

Aside, however, from the advantages enumerated above, it is a matter of economy to give the flock proper care and to get them into the best possible trim before going into winter quarters. Much less feed is required to winter the breeding flock that goes into the winter in the best shape. No amount of roughage and grain during the winter will entirely make up for poor feed and attention during the fall months. Every flockmaster should, therefore, give his proteges especially good care, beginning at least four weeks before the mating season and continuing until they go into winter quarters.

Exterminate Ticks and Lice.

Flock owners should also examine their flocks for ticks and lice. When either ticks or lice are present, the flock should be dipped twice, at regular intervals of three weeks, before going into winter quarters, preferably during August or September, or at least before the weather becomes cold, with a standard coal tar dip. The sheep should be held in the bath for from one to one and one-half minutes (depending on the length of the wool), and the head completely immersed before the sheep is permitted to leave the bath.

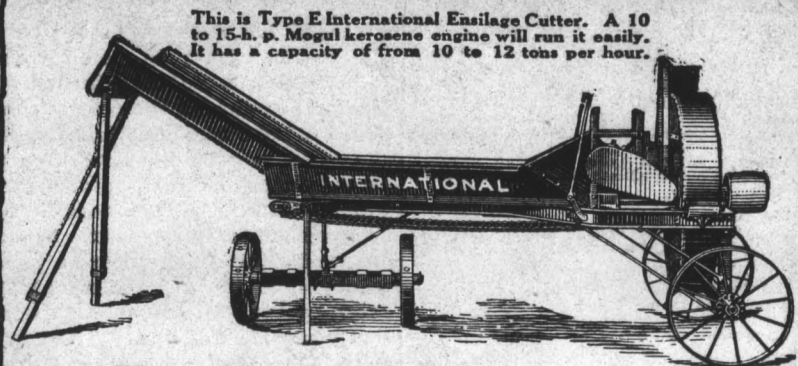
weeks, two more teeth appear in each jaw, one on either side of those already present. In the period between the sixth and ninth months, two more take their places, one on each side of the outer teeth already present. In all, there are now six pairs. These are called "nippers" or "milk teeth," and are only temporary. They are usually quite uneven at first, but in the course of the following year, they become quite smooth and uniform.

The cups in the first pair of milk teeth are of dark center at first; in the second year they wear light of color, and become smaller than those of the other four. At three years of age, the first permanent incisors appear. These teeth are larger than the milk teeth. At four years, the second pair of permanent teeth appear. At five, the last pair of colt's teeth in each jaw is replaced by permanent teeth. At this age the teeth known as "tusks" appear in the male. The "tusks" have roundish points and lie a short distance back of the front teeth. There is one pair on each jaw.

After the fifth year the age of the horse is determined by the appearance of the wearing surface of the tooth. At six years, the cups of the two central teeth are worn off. At seven, the second pair is smooth, and at eight, the last pair is worn nearly level. From here on, the age can only be estimated by the general appearance of the teeth or of the animal, and such estimates cannot be accurate. The older the horse the sharper the angle taken by the teeth and the more stale and worn the teeth appear. From twelve to sixteen the teeth usually become three-sided.

Clinton Co.

A. L. M.



This is Type E International Ensilage Cutter. A 10 to 15-h. p. Mogul kerosene engine will run it easily. It has a capacity of from 10 to 12 tons per hour.

For Your 1917 Corn Crop

THE International Ensilage Cutter shown above is a good size for individual use, or for neighborhood use wherever a medium-capacity machine is required. Note how simple and compact it is, and how safely the gears are housed.

Then there are both smaller and larger Internationals. Type F is the lightest-running cutter made—you can run it with 4 to 6-h. p.; capacity 3 to 6 tons per hour. The larger sizes will put up to 25 tons per hour into the silo, and a 25-h. p. engine will handle the heaviest loads.

Corn growers everywhere know that International Ensilage Cutters cannot be beat for uniform cutting, high elevation, safety and durability. They fill silos at the lowest power cost. Every feature of these cutters, the knives and blowers on the same flywheel, the carefully machined bearings, the complete oiling system, the absence of all unnecessary gears and sprockets, the steady feed arrangements, all tend to make them easy running and power saving.

The International you choose—of whatever size—will do the good work it was built for, at the lowest cost. That you may feel assured of. Our catalogues will tell you of all the details. Write the address below.

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This Company is backed by more than 500 of the best live stock farmers of the state, and we have more than \$100,000 deposited with the State Treasurer as a guarantee of the Company's responsibility.

We insure all live stock—horses, cattle, sheep and hogs against death from any cause.

We issue individual and blanket policies covering any and all conditions—herd policies, feeding policies, shipping policies, 30 day foaling policies, etc.

We want a local agent to represent us in every community in Michigan.

We want every farmer in the State of Michigan to insure his live stock with us.

We will give you a square deal.

Write for information.

Colon C. Lillie, Pres. and Supt. of Agts.
Harmon J. Wells, Secty. and Gen. Mgr.

BREEDERS' DIRECTORY.

Change of Copy or Cancellations must reach us Ten Days before date of publication.

We Offer a Few Special Bargains
In S. C. White Leghorn cockerels, Rambouillet rams, Hampshire pigs (either sex) and Holstein bulls. A good chance for a small investment to reap the benefit of a large expenditure of capital and years of expert breeding.

Flanders Farm, Orchard Lake, Mich.

CATTLE.

Aberdeen-Angus

Herd established in 1900, Trojan—Ericas and Black birds only. Bulls in service: Black Brandon 208932, Enos of Woodcote 19382. Also breeders of Percheron and Saddle Horses.

WOODCOTE STOCK FARM, Ionia, Mich.

ANGUS CLOVERLY STOCK RANCH. Bulls, Cows and Heifers for sale. GEO. HATHAWAY & SON, Ovid, Mich.

CHOICE Angus Bulls for sale. Have several well bred, excellent type Angus Bulls at reasonable prices. M. L. Smith, Glenwood Farm, Addison, Mich.

Registered Guernseys

Stock always for sale. May Rose Strain—Herd Tuberculin tested annually. Never had a reactor—no abortion. J. M. WILLIAMS, North Adams, Mich.

Guernsey Bulls of service age and calves from choice. Adv. reg. breeding. T. V. HICKS, Route 1, Battle Creek, Mich.

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

GUERNSEYS Bull calves for sale, from A. R. dams and cows on test. GEO. N. CRAWFORD, Holton, Mich.

Registered and Grade Guernsey cows, bulls, yearlings, heifer calves; will sell 20. Some with records; choice of 45; must reduce herd; tuberculin tested. Avondale Stock Farm, Wayne, Mich.

Registered Holsteins. Very fine Young bull five months of age A. R. O. breeding. Satisfaction guaranteed. W. B. Jones & J. F. Lutz, Cohasset, Mich.

FOR SALE Seven reg. Guernsey heifers and one reg. Guernsey bull, no kin. All nicely marked and fine specimens of the breed. G. F. COLE, Bancroft, Mich.

REG. HOLSTEINS: Herd headed by Albina Bonte Butter Boy No. 93124. Dam's record at 6 yrs. butter 28.53 lbs. milk 619.4. Yearly record at 2 1/2 yrs. butter 802 lbs. milk 18622 lbs. W. B. READER, Howell, Mich.

OAK LEAF FARM

Herd Sire
Ypsiland Sir Pieterle De Kol
Service bulls all sold. Buy a calf and raise it. Fine individuals 4 and 5 months old. E. H. Gearhart & Son, Marcellus, Mich., R. No. 4.

Buy Your Bulls From Parham's Pedigree Stock Farm
Choice Registered Holstein calves from A. R. O. cows. RAY B. PARHAM, Bronson, Michigan.

842 Lbs. BUTTER

Is the average of the semi-official records of our herd bull & dam (at 2 yrs.), his grand-dam (at 3 yrs.) and his great grand-dam. Three choice young bulls from A. R. O. dams. Herd tuberculin tested annually. Holsteins of course. Peaceland Stock Farm, Three Rivers, Mich. Chas. Peters, Herdsman. C. L. Brody, Owner, Port Huron, Mich.

PURE bred Holstein Bull born July 15, 1917, not eligible to record, 15-16 white, a good one. \$35.00 and delivered anywhere in state. Newton Barnhart, St. Johns, Mich.

CLUNY STOCK FARM

100 REGISTERED HOLSTEINS 100

For Sale:—17 mos. old bull whose 7 nearest dams average 560.1 lb. milk and 25.679 lb. butter in 7 days. Sire is by the son of a 32.9 lb. cow and from a 31 lb. 4 yr. old cow. Dam is a 22.5 lb. Jr. 3 yr. old daughter of a 26.5 lb. Jr. 4 yr. old cow, whose dam is a 27 lb. cow.

Ready for immediate heavy service. Priced to sell immediately. Send for pedigree and price.

R. BRUCE McPHERSON, Howell, Mich.

WINNWOOD HERD REGISTERED HOLSTEINS

Holton, Mich.

Reference: Old State Bank, Fremont, Mich.

Flint Maplecrest Boy sire in service
His sire is Maplecrest Korndyke Hengerveld, his 3 Nearest Dams each over 30 lbs. of butter in 7 days. His dam and grand dam both made over 1232 lbs. of butter in 1 year. It is the yearly cow we are looking for to deliver the goods. Flint Maplecrest Boy's Dam is Gluck Vasser Bell, 30.51 lbs. of butter in 7 days and 120 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 8 months old for sale at dairy farmers' prices all out of A. R. O. Heifers. Write & tell us the kind of a bull you want.

John H. Winn, (Inc.), Holton, Mich.

Additional Stock Ads. on Page 155

POULTRY.

Homestead Farms

We have a special offer that will interest poultry people who want Laying Hens for winter. Since we do not feel that we can dispose of any more Pullets, we have decided to offer for immediate sale:

300 Laying Yearling White Leghorn Hens

These are from our choice colonies which as Pullets began laying last September (see descriptive circular), and which are still laying. Favorable prices in lots from 6 to 50 for immediate sale. Also other stock as follows:

Yearling Hens

Brown Leghorns, Barred Plymouth Rocks (limited), White Wyandottes, Rhode Island Reds, Rose Comb Black Minorcas.

Yearling Cocks and Cockerels

Barred Plymouth Rocks, Rhode Island Reds, White Wyandottes, Single Comb Black Minorcas, White and Brown Leghorns, Anconas.

Geese and Ducks

50 fine Young White Pekin Ducks.
30 Young Toulouse Geese.

All of these are pure breed practical poultry which daily proves its practical value in the direct market for poultry and its products which we have begun to build up.

Everything we sell is guaranteed; every customer is to be fully satisfied. Do you want some of these Yearling Hens or some of the Young Ducks or Geese? They are to be sold at once.

We are now making plans for a more extensive sale of Day-Old Chicks next Spring.

HOMESTEAD FARMS, Bloomington, Mich.

2000 - Pullets - 2000
"200 Egg" Pedigree White Leghorns.

"Bred-to-lay" Strain.
These vigorous, April-hatched pullets will be laying in a few weeks. These birds of quality are the choicest ever offered for sale. Prices in hundred lots, \$1 each now—\$1.25 August 15th—\$1.50 September 1st—\$2 September 15th. Book your order at once. Thousands of satisfied customers. Catalogue.
MICHIGAN POULTRY FARM, Lansing, Michigan
"Michigan's Largest Poultry Farm."

Yearling Hens For Breeders

S. C. White, Buff and Black Leghorns at \$1.00 each.
SUNNYBROOK FARM, Hillsdale, Mich.

JOHN'S big beautiful hen-hatched Barred Rocks, good layers. Breeding pens (5 birds) \$10 to \$20. Eggs \$3, \$2.50; 100, \$7. Circulars. Photo. John Northon, Clare, Mich.

Barred Rocks: EGGS FROM STRAIN with records to 297 eggs a year, \$2 per 15. Delivered by parcel post, prepaid. Circular free. Fred Astling, Constantine, Mich.

Barred Rock Hens. Great Layers first class breeders 10 for \$25.00.
W. C. COFFMAN, R. 3, Benton Harbor, Mich.



Ferris White Leghorns

A real heavy laying strain, trapnested 17 years, records from 200 to 264 eggs. Get our special summer prices on yearling hens, breeding males, eggs for hatching, 8-week old pullets and day old chicks. We ship C. O. D. and guarantee results. Catalogue gives prices; describes stock; tells all about our farm and methods; results you can get by breeding this strain. Send for your copy now—it is free.
GEORGE B. FERRIS 934 Union, Grand Rapids, Mich.

COCKERELS

Can furnish some fine Young's Strain White Leghorn cockerels at \$1.00 to \$2.00 apiece. Will make fine breeders. W. Van Appleton, R. 7, Holland, Mich.

Fowlers Buff Rocks. Eggs one half price for bal. of season \$.75 for 15; \$1.50 for 30; \$2.00 for 50; \$3.50 for 100.
R. B. FOWLER, Hartford, Mich.

Buff Leghorns. August sale 25 hens one dollar each. 16 two dollar hens and cock bird for \$20.00.
Dr. William A. Smith, Petersburg, Mich.

Laybill S. C. W. Leghorns. Large, great layers. Pure white. Bargains in choice breeding hens now. Everfresh Egg Farm, Ionia, Mich.

Pine Crest S. C. White Orpingtons, special sale of year old cocks and hens, also young cockerels. MRS. WILLIS HOUGH, PINE CREST FARM, Royal Oak, Mich.

RHODE ISLAND REDS and PLYMOUTH ROCKS. Males 5 to 12 lbs. according to age \$2 to \$5; P. R. hens weight 5 to 10 lbs., eggs 15 for \$1.00; 100, \$5; 120, \$6.00. Mammoth Bronze Tom Turkeys, 8 to 88 lbs. according to age \$6 to \$25, 10 eggs \$3. A. E. Cramton, Vassar, Mich.

R. C. Br. Leghorn c'krls. \$1.00 each from Kelp and Gale strains. Eggs \$4.00 per 100.
MRS. CLAUDIA BETTS, Hillsdale, Michigan

R. and S. C. Reds. Good breeding hens at \$1.50 each for short time. Also Belgian Hares. O. E. Hawley, Ludington, Mich.

R. I. Red Summer Sale. Rose Comb cocks and hens. Single comb hens and pullets. All at bargain prices. Cockerels after September 15th.
INTERLAKES FARM, Box 39, Lawrence, Mich.

Silver Spangled Hamburg Eggs setting \$1.50. Balance season, young Belgian Hares pedigreed \$6.00 pair. Pedigreed Persian Kittens great hunters \$10 each. Send stamp. Riverview Farm, Vassar, Mich.

S. O. W. Leghorn hens for breeding \$1.50 each. Cockerels from trap nested stock we have them priced \$3 to \$5 each. O. S. Sturtevant & Sons, Ypsilanti, Mich.

SILVER Golden and White Wyandottes. Choice breeding stock of sale after Oct. 1st, a few bargains in yearling hens. C. W. Browning, R. 2, Portland, Mich.

S. C. W. Leghorns. April Hatched. Standard Bred Cockerels on free range at \$2.00 each. White Line Poultry Farm, Hillsdale, Mich.

WHITE Wyandottes. A. 1 layers. Eggs for hatching, \$1.25, \$3 for 15, \$7 for 100. Special matings \$5 for 16.
DAVID RAY, 709 Norris St., Ypsilanti, Michigan.

DOGS

Fox Hounds of all ages, Skunk and Rabbit dogs
W. E. LECKY, Send 2c stamp. Holmesville, Ohio

When writing to advertisers please mention the Michigan Farmer.

Reducing Egg Production Cost

SINCE the increase in the cost of feeding grain to poultry, many breeders have tried to find some method of reducing the cost of the ration. Wheat has been high in price and some experiments have been conducted in an effort to produce eggs without wheat. They seem to have been successful in a measure but some practical poultrymen report a serious reduction in the number of eggs produced without wheat. One breeder recently said: "I disliked to feed wheat at the present price and began feeding equal parts of corn and oats. The egg record immediately went down fifty per cent." He resumed wheat in the ration at the end of the week and the production within a few days returned to its former average. Of course, this does not prove conclusively that wheat is necessary or unnecessary and it looks as if every breeder will have to determine that question by individual investigation. Many breeders still believe that wheat is necessary, even at the present price and they are feeding it and making a profit on their hens.

Wheat an Essential in the Egg Ration.

In our own experience we have found that wheat seems to have a good effect on the egg records and without wheat the hens have not seemed to lay so well. In raising young stock we find wheat very necessary in assisting the birds to make a rapid growth. If growing chicks can make a fine development on wheat it seems as if it is equally as valuable in making hens lay eggs. For a time last year I favored salvage wheat as it seemed a sure method of reducing the cost of eggs. However, last winter several poultrymen in our district seriously injured their flocks by feeding salvage wheat and there is certainly much danger in using it because of the danger of feeding grain that is sour and mouldy. I do not believe in risking the use of salvage wheat on a flock that is good enough to make a profit on first-class grain.

Some poultrymen use screenings as poultry feed as there is some saving in such a purchase, although the saving is not as great as many have thought. There is nothing like first-class sound grain for poultry feed and it is difficult to find a substitute for first-class wheat.

Beef Scrap an Economical Food.

Beef scrap has not increased in price to any extent and the use of high-grade beef scrap can be recommended in the ration of the laying hen. Sour milk should be used whenever it can be produced on the home farm or purchased of neighbors. Frequently neighbors having a surplus of sour milk will be willing to sell it at a very reasonable price and it is an excellent feed for the laying flock. Milk depots and creameries sometimes have a supply of sour milk which they will gladly sell the poultryman for a fair price.

The farmer who is feeding high-priced grain to hens must remember that grain should not form their entire ration. Now is the time to prepare for a supply of green food next winter. Mangels can be grown in large quantities on a small patch of ground and they will save money in the winter ration and enable the hen to lay more eggs. Clover and alfalfa make excellent green food in the winter ration and help to reduce the cost of producing eggs.

Good Cheap Feeds Not Available.

In general this problem of reducing the cost of feeding hens is difficult to solve. It must be considered from another angle. Corn and oats are almost as expensive as wheat and they are necessary in the ration. Wheat is high but it has an important place. I often believe that we must feed our flocks exactly as we fed them before the present high prices of grain and depend on a better price for our eggs

and stock to make up the difference. The best method of fighting the high cost of grain is to cull severely and improve the quality of the hens that are to eat the grain. There was no profit in keeping poor hens even on cheap grain and of course this is doubly true under present conditions.

Some experiments recently conducted by the Department of Agriculture prove that good egg records can be obtained by using corn and oats as a scratch mixture if they are given a mash in addition which contains twenty-five per cent beef scrap. We have never fed our hens as much as twenty-five per cent beef scrap in the mash and will try it. Possibly we have not given the flocks a fair trial without wheat and maybe we have become prejudiced in favor of wheat because of good results from it in past years. It seems that every farmer has to figure out these things for himself, depending somewhat on local conditions although the results of the experiment stations are of great value and much appreciated. It will be interesting to know the experiences of farmers in managing their flocks without wheat and also if good results can be obtained in raising young stock with no wheat in the ration.

Ingham Co.

R. G. KIRBY.

DOES THE FARM HEN PAY?

A farm hen which will earn \$3.47 above her feed cost is a valuable asset. M. P. Hollar, of Missouri, had 133 hens which averaged that amount for a year, according to figures supplied by him to the University of Missouri College of Agriculture. Mr. Hollar started his test April 1, 1916, and produced during the twelve succeeding months \$468.84 worth of eggs and \$235.60 worth of birds. His feed cost for the year was \$242.05, which left a net profit of \$462.39. His hens averaged 141 eggs during the year.

Some farmers contend that poultry is profitable only when it lives on waste material and that feeding will result in loss. The college has been co-operating with a few farmers in the state to determine what returns may be expected from a well managed flock on the average farm. Records on all the flocks have not been compiled but reports which have been received indicate that proper feeding methods will return a worth-while profit.

Two other records are not so good as that made by Mr. Hollar, but they show that the birds returned a good profit above the feed cost. Mrs. Nimrod Nance had 240 hens and produced \$295.02 worth of eggs and \$285.63 worth of birds. The feed cost for the year was \$246.08 which left a net profit of \$334.57. Her hens averaged ninety-five eggs each and she realized a net profit of \$1.39 on each bird.

Mrs. H. R. Spaht produced \$197.46 worth of eggs and \$258.66 worth of poultry from her flock of 160 hens. She spent \$217.59 for feed. This gave her a profit of \$238.53 over feed cost which gives an average profit of \$1.49 per hen. The hens averaged eighty-eight eggs each.

These three records are the only ones that are complete for a year but a number of other co-operators have started keeping a profit and cost account of other poultry and all are obtaining good returns on the money invested.

CAPONIZE LATE HATCHED COCKERELS.

"It is my judgment that capons will bring more money this year than ever before," says Herbert Brownell, president of the Ohio Poultry & Egg Shippers' Association, concerning poultry prices. There is only one possible kind of figuring that could lead to any

other conclusion. The cost prices of food have been forced so high that people are looking for a cheaper kind of food. This might lead some to think that capons would be cheaper because people will turn to cheaper meats. On the other hand, the same argument leads me to believe that capons will be very high. We find that on account of the high price of turkeys, people have turned to capons, because a good capon weighs less than a good turkey and a good company dinner can be produced cheaper with capon than with turkey.

"I think one will find on examination that all cheaper kinds of food have risen in price much faster than the high-priced kinds. I know of no poultry that has risen in price so fast as old roosters; but, taking the whole situation into consideration, I believe capons will be higher priced this year than ever before."

The principal advantages of caponizing, according to the College of Agriculture, are that the capons grow larger than cockerels, make more economical growth, are more easily handled, sell for higher prices and are more economical for the consumer on account of less waste in dressing and cooking. In addition, the flesh is of better quality.

A statement from the college says: "Do not sell late-hatched cockerels as broilers unless of the Leghorn or other light weight breeds. Caponize them and market after the holidays at weights of six to ten pounds each. Increase the supply of poultry meat and make a larger profit on the chickens you raise."

QUALITIES OF A POULTRY HOUSE.

The question, "How much open front and how much glass should be employed?" is one arising frequently in the mind of the builder of a poultry house. A house twenty feet by twenty feet, or having a floor area of 400 square feet and intended to house 100 hens for winter, should have fifty square feet of wire screen, one-fourth inch mesh, and twenty-five square feet of glass. An opening twenty feet long and two and one-half feet wide, placed ten inches from the floor is about right. Cover this opening with one-fourth inch mesh galvanized wire, the kind of screen used by masons for sifting sand. The use of this mesh prevents snow from drifting through and keeps the rain from beating in. Four window sashes, with nine lights, each eight by ten inches, will serve for windows. Place the windows either above the screen or in the west end of the house.

Use a good gravel floor, one that can and will be renewed every year, or use boards or cement. If gravel is employed, cover the floor with one-inch mesh poultry wire and then fill in eight to ten inches of gravel. This wire will prevent rats from gaining admittance to the house from below. If a board floor is used, put the house up ten inches to a foot above the ground and leave it open beneath. If a cement floor is used, build it with a rough surface and cover it eight to ten inches deep with straw.

Ag. Col. Prof. C. H. BTRGESS.

POULTRY NOTES.

As the chicks grow they need more room. It does not pay to let them crowd.

Beware of musty, mouldy, sour, or decayed food. It is sure to cause trouble.

Tough grass is of no value as a green food. Better sow some quick-growing crop.

Feed hoppers greatly reduce work. If they are kept filled, the chickens will never go hungry.

If your chickens are not doing well something is wrong. Look out for lice and for worms in the intestines.

Veterinary.

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

Pigs Have Piles.—Have two pigs that weigh 30 or 40 pounds, which are troubled with piles. Their pasture is oats, field peas and rape, with middlings for grain. E. K., Adrian, Mich.—Dissolve 1 oz. of acetate of lead, 1 oz. of sulphate of zinc and 1 oz. of tannic acid in a quart of water and apply to piles twice daily. Surgical removal is very often the best and only successful treatment for an ailment of this kind.

Chronic Cough—Asthma.—I have a mare twelve years old with a chronic cough. She has coughing spells and almost chokes; breathes much like a horse that has a bad attack of heaves. The moment her throat is pinched she commences to cough. Mrs. E. R. B., Birmingham, Mich. Apply equal parts of turpentine, aqua ammonia and raw linseed oil to throat twice a week, or as often as you believe it necessary. Give her 1 oz. of glyco heroin at a dose in feed or drinking water three times a day. Feed no clover or dusty, musty, badly cured fodder; grain and grass is the best summer feed you can feed her.

Bone Spavin.—Some time ago I wrote you regarding a case of lameness which our local Vet. and myself located in whirlbone, but you thought we were mistaken. Now, we are satisfied that the horse suffers from bone spavin lameness and would like to know what remedy you recommend. C. Y., Harrisville, Mich.—First of all, when treating bone spavin lameness, it is well to keep in mind that if the ailment is not hereditary, it is usually brought on by heavy pulling, accidental injury, or concussion; therefore, an important part of the treatment is absolute rest. Clip hair off and apply one part red iodine mercury and four parts fresh lard every two weeks. It is unfair or rather unreasonable to expect a remedy to effect a cure, if the horse is worked or exercised.

Hernia.—My four-year-old cow which has been fresh about a month, is showing a soft bunch around the navel about the size of two hands and is three inches deep in the center. When this bunch is squeezed, it feels as though it contained liquid. There is also a hard swelling about six inches wide running back of fore leg to this soft bunch. This hard bunch is a little tender. The cow bore twins, cleaned well and seems to be in good health now. J. W. S., Portland, Mich.—I am somewhat inclined to believe that the bunch near navel may be hernial; if so, it had better be left alone. The cow milked until she goes dry, then fattened; however, if the bunch contains fluid, it should be opened, its contents allowed to escape, then she will soon get well. A case of this kind should be examined by a person capable of differentiating between an abscess and a rupture. Give the cow 1 dr. of potassium iodide at a dose in feed or drinking water twice a day. This medicine will act as an absorbent and has a tendency to reduce the bunches.

Navel Infection.—I have a colt seven weeks old which appeared to be well and lively at birth and remained in this condition for a week. Soon after that I noticed it had a leaky navel. Our local Vet. treated colt but it grew weaker and weaker, and has remained down ever since. The navel has not yet healed and I would like to know if the colt can be saved. Mrs. J. H. L., Mancelona, Mich.—Give your colt 5 grs. of quinine, 5 drops fluid extract of nux vomica and 60 drops tincture gentian at a dose three times a day. Paint navel with tincture iodine occasionally and dust on boric acid freely. You could have prevented this colt's sickness by treating its navel at time of birth, but the writer is inclined to believe that your colt will not recover. A case of this kind should be treated by your Vet.

Bruised Hock.—Impure Blood.—I have a four-year-old gelding that has a badly swollen hock joint with the swelling extending upward. This enlargement is not painful, not feverish, and was caused from kicking the stall posts, when stabled, some time ago. This same horse has been bothered with surfeit buds, especially when in a heated condition. Our local Vet. prescribed equal parts of saltpeter and ashes for his blood. Showering with cold water and liniment to be applied to hock. O. A. C., Williamsburg, Mich.—Apply equal parts tincture of iodine, camphorated oil to swollen hock and leg three times a week. Give him 30 grs. of potassium iodide and 3 drs. of Fowler's solution at a dose in feed or drinking water twice a day.

HOLSTEIN BULLS

6 to 10 months old.

From cows with A. R. O. records—Sired by a Son of Spring Farm King Pontiac 6th.

The Great Young Holstein Bull
His first 14 tested daughters average over 20 pounds butter in 7 days.

The past year there were 14 bulls sold for \$10,000 or more.

The half sisters of the sire of these bulls, I have for sale, won as much prize money, as all the daughters of those sold for \$10,000 combined. Priced from \$75 up.

Bigelow's Holstein Farms,
Breedsville, Mich.

King Korndyke Sadie Vale

has 2 grandsons from 17 lb. and 23 lb. 3 yr. old dams for sale or for veal within 2 weeks. Born Feb. 8 and July 31. Price \$50 and \$150. A. B. Eastman, Howell, Mich.

For Sale A Yearling Heifer, pure bred Holstein, Sire, Colantha Johanna Cream-elle Lad, Dam, Elizabeth Segis Lyons. If you want something good, write, Geo. D. Clarke, Vassar, Mich.

I Always Have Holsteins To Sell

If wanting Registered cattle write me your wants before placing your order elsewhere.

L. E. CONNELL, Fayette, Ohio

A HOLSTEIN BULL

ready for service from a 20.45 lb. A daughter of King Sigis and a 30-30 lb. bull for \$150. Have several at \$80. Some higher. Long Beach Farm, Augusta, Mich.

Butter Fat Counts

Holstein Bull Calves from a 20.45 lb. 6.53 Sire. Dam are grand daughters of the King of the Pontiacs. Their dams grand daughters of Sadie Vale Concordia the first 30 lb. cow. Edwin S. Lewis, Marshall, Mich.

Registered Holstein Friesian Heifers. 3 to 6 mos. old. Some from 30 lb. sires. Priced to sell. Fred J. Lange, Sebawaing, Mich.

3 Holstein Heifers 30.21 lbs. sire. Their dam's 35 lb. cow, bred to 1/4 brother to 30 lb. 4 yr. old. Terms if wanted. M. L. McLAULIN, Redford, Michigan.

Registered Cows, heifers and heifer calves. Priced reasonable. Noted breeding and good individuals. B. B. Reavey, Akron, Mich.

On Our Easy Payment Plan we will ship you Holstein Bull calf in our stables. Any registered Ypsilanti Farms, Ypsilanti, Michigan.

RINKLAND HERD BULL CALVES from A. R. O. prices. JOHN A. RINKE, Warren, Mich.

For Sale 2 Reg. Holstein cows 7 years old due to freshen Sept. 7 and 8. Well marked, price right. C. L. HULETT & SON, Okemos, Mich.

REG. Holstein Bull Calf. The last one until winter. A good one with A. R. O. backing. Write for pedigree and price. Elmer E. Smith, Redford, Mich.

Holstein Bull Calf two months old. Dam sixty pounds milk A. R. O. Sire from 30 lb. cow. A. R. GRAHAM, Flint, Mich.

FOR Sale One registered Holstein bull calf. Sire's twenty nearest dams have 7 da. records av. 25.63 lb. butter. Dam to be tested. A finely marked, growthy individual. Long Veil Farm, R. 3, Box 10 A, Rochester, Mich.

HEREFORDS

Sires in service, Governor by Prince Donald Militant Farmer by Farmer (Imp), Bonnie Brae Jr. by Bonnie Brae 24th. Inspection invited.

ALLEN BROS., PAW PAW, MICH.

Wanted Fifty head high grade Hereford heifers—Calves or yearlings. Kindly specify breeding and price. W. E. MOSS, 710 Union Trust Bldg.

For Sale 50 head of high grade Hereford breeding cows, 2 to 6 years old. Also registered Hereford bull. Henry F. Rohes, M. D., Napoleon, Ohio.



Get This Book

Dairymen!—The Truth
You may be prejudiced against the Jersey because you don't know her. Look her up. She's the Money Cow.
Get This Book—a history of the breed and full of very interesting tests and facts. It proves conclusively that for pure dairy type, economy of production, richness of milk, long life and adaptability to feeds and climates—all these combined—she stands way above them all. This book "About Jersey Cattle" is free. Get your copy now. You'll find it mighty good reading.

The American Jersey Cattle Club
346 West 23rd Street, New York City

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

Jersey Bulls for sale, ready for service. Out of good producing dams. Prices right. R. B. FOWLER, Hartford, Mich.

Hillside Farm Jerseys. For sale ten months old bull backed on both sides by R. of M. dams with high official records. O. & O. DEAKE, Ypsilanti, Michigan

Maple Hill Farm Registered Jersey Cattle Stock under 2 1/2 years old sold! J. R. Worthington, R. No. 7, Lansing, Michigan

The Wildwood Farm Breeder of Line bred Majesty strain of Jersey Cattle. Herd on R. of M. test. Tuberculin tested. Bull calves for sale. Type & Production is our motto. Alvin Balden, Capac, Mich.

Jerseys and Duroc Jerseys

The most important thing in buying a Jersey bull is to get one backed up by generations of high producers.

Brookwater offers to sell a few choice bull calves of this kind.

H. W. MUMFORD,
OWNER

BROOKWATER FARM

O. F. FOSTER,
MANAGER

Ann Arbor, Mich., R. 7.

Little Farmstead Jersey Cattle. Bull calves from B. L. of M. Cows, also heifer calves and several bred heifers for sale. Colon O. Little, Coopersville, Mich.

For Sale Two registered Jersey bull calves. Splendid individuals. Good pedigrees. Priced to sell. Long Veil Farm, R. 3, Box 10 A, Rochester, Mich.

Maple Lane R. of M. Jersey herd offers for sale tuberculin tested cows, bulls, bull calves and heifer calves, carrying the best R. of M. blood of the breed. IRVIN FOX, Allegan, Mich.

St. Clair County Jersey Cattle Club. We have for sale 5 Bulls old enough for service and Bull calves, from best status of Jersey Cattle. Majesty's, Noble of Oaklands, Combination's Premier, etc. Write for Pedigrees, price and particulars. Fred A. Brennan, Sec. Capac, Mich.

Notten Farm Jerseys also a few Duroc Jersey pigs for sale. NOTTEN FARM, Grass Lake, Mich.

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

FOR Sale—Reg. Short Horn Bulls by Maxwellton 1st Monarch 2nd, a son of Avondale, from 1 to 9 mos. old. John Schmidt, Reed City, R. No. 5, Michigan.

Francisco Farm Shorthorns

Big Type Poland Chinas

"They're rugged—They pay the rent."

Nothing for sale at present.

P. P. POPE, R. R. 3, Mt. Pleasant, Mich.

Bidwell Shorthorns

"For Beef and Milk"
This heifer at 6 months has bone, size and quality—our own breeding. The blood of Scotch bulls, Imp. Shentone Albino and Imp. Villager. Registered stock always for sale.

BIDWELL STOCK FARM,
Box B, Tecumseh, Michigan.

FOR SALE two bulls (two & four years). General Clay strain—sire breeders. Prices reasonable or exchange for pure Percheron mares. GEORGE SEELEY, West Branch, R. 2, Mich.

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

Richland Shorthorns Largest and best herd in the state. Tuberculin Tested by the state. IMF. Lorne one of the Sires in service. Entire Herd of Reg. Angus cattle, including the show cattle for sale at a bargain. Mostly Ericas and Blackbirds. Office Tawas City, Mich. Herd at Prescott, Mich. O. H. PRESCOTT & SONS.

For Sale Shorthorn Bulls 3 mo. to 2 years old from good milking cows. R. R. Clyde Station, H. J. DeGarmo, R. 6, Milford, Mich.

SHORTHORNS Maple Ridge Herd. Established 1897. No stock for sale. J. E. Tanswell, Mason, Michigan.

Shorthorns for sale, 5 bulls Scotch top 10 to 14 mos. 13 roan, 1 white, 1 red, price \$150. to \$250. Son of Maxwellton Sultan, 19 mos. \$350. O. Carlson, Leroy, Mich.

Cattle For Sale Loads feeders and two loads yearling steers. Also 2 can show you any number 1, 2 and 3 years old from 600 to 1200 lbs. Isaac Shanstun, Fairfield, Iowa, R-8.

FOR SALE Registered Brown Swiss bulls old enough for service. LAMB BROS., Springport, Mich.

HOGS.

Durocs and Victorias

Heavy bone, lengthy Spring Boars and Gilts from prize winners sired by one of the best Sons of the Great Defender & other noted strains. M. T. STORY, Lowell, Mich.

BERKSHIRES

We Are Not Going to Show This Year and Therefore Offer:

A few choice boars and sows from our Champion and first prize Sows at State Fair 1916. These pigs are mostly April farrow. They cannot be beat for type. You do not often have the opportunity of purchasing this class of spring pigs.

They will be large enough for breeding and service by December. We can furnish a trio unrelated.

All stock guaranteed as represented

SWIGARTDALE FARM
PETERSBURG, MICH.

Berkshires, Boars, serviceable age, best blood lines. Registered. ELMHURST STOCK FARM, Almont, Mich.

Berkshires. Bred gilts and sows for fall farrowing. Also Spring pigs, either sex. A few boars serviceable age, reg. Chase Stock Farm, R. 1, Marlette, Mich.

Berkshire Pigs going fast \$15.00 & \$20.00 each three months old. Registered & transferred, richly bred. Riverview Farm, Vassar, Mich.

Duroc Jerseys

Spring pigs, either sex, not akin. Sired by Jennings Pilot Wonder and Orion Chief Perfection. Write for pedigrees and prices. The Jennings Farms, Bailey, Mich. V. M. Shoemith General Manager.

Duroc Jerseys bred gilts for sale priced to sell. Carey U. Edmonds, Hastings, Mich.

Duroc Spring Boars sired by Orion Cherry King Col. and Brook Avenir Col. One 2 year old sow by Cherry King's Rival due to farrow Nov. 1st. farrowed 15 pigs last May raising 12. NEWTON BARNHART, St. Johns, Mich.

Duroc—Jerseys One Yearling Cherry King Boar, Gilts bred for fall farrow. J. H. BANGHART, East Lansing, Mich.

Duroc Sows and gilts bred to Eureka Cherry King and Crimmon Critic son of Critic Model 1916 champion Iowa Fair. W. C. Taylor, Milan, Mich.

Duroc Jerseys. Fall Boars & Gilts all sold. I have some extra good heavy boned spring pigs for sale pairs not akin. F. J. DROBT, R. 1, Monroe, Michigan.

Dobson's Durocs; Pigs at weaning time; breeding. Collie Pups. Orlo L. Dobson, Quincy, Mich.

DUROCS A few choice spring boars. Write for description & price. E. D. HEYDENBERK, Wayland, Mich.

Reg. Duroc Spring Boars and Ox-ford Ram Lambs ready to ship. Exp. Paid, Fine Stock. J. B. HICKS, St. Johns, Mich.

Durocs, Good Spring pigs by Defender's Cherry King at reasonable prices. E. E. Calkins, R. D. 6, Ann Arbor, Michigan.

Durocs A few good males sired by Joe Orion 2nd Dam by Orion Ch. King Jr. A. FLEMING, Lake, 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 5 months old. Write for my plan—More Money from Hogs. G. S. BENJAMIN, R. F. D. 10, Portland, Michigan

Chesters Bred Gilts all sold. Special prices on March boars, also 6 months Holstein Bull. F. W. ALEXANDER, Vassar, Mich.

Big Type O. I. C.'s, & Chester Whites
Special prices on all boar pigs for the next 30 days. Will sell sows only when bought in pairs. These pigs are sired by our three Champion boars that have not an equal in the country. School master King of the breed Crandell's wonder & Callaway Add both champions. All stock shipped on approval, satisfaction guaranteed. Get our catalogue. Harry T. Crandell & Son, Cass City, Mich.

O. I. C. & Chester White Swine
Strictly Big Type, with quality. One yearling sow & two gilts bred for Sept. farrow. Guaranteed safe with pig. I have the finest lot of early Spring pigs I ever raised. can furnish a few in pairs not akin. Address: NEWMAN'S (STOCK) FARM, Marlette, Mich. R. 1.

O. I. C. An extra fine lot of last spring good, growthy pigs, either sex and not akin, from Otto B. Schulze, Farm 1/4 mile west of depot, Nashville, Mich.

CHOICE SPRING PIGS
Ready to ship. The big smooth, growthy type, sired by noted boars. Registered and shipped C. O. D. J. CARL JEWETT, Mason, Mich.

O. I. C. Boars and Gilts all sold. I am booking orders for March and April pigs either sex, single, or in pairs not akin. A. J. BARKER, Belmont, Mich. R. R.

O. I. C. Thorough bred O. I. C. Swine all sold out except fall pigs. O. D. Somerville, Grass Lake, Mich. R. D. 4.

O. I. C.'S. All sold. Booking orders for the best of our winter and spring pigs. C. J. THOMPSON, Rockford, Michigan

O. I. C.'s. Spring pigs and Reg. Holstein heifers from 5 to 15 months old. O. L. OYER LEAF STOCK FARM, R. 1, Monroe, Mich.

P. C. SWINE Big boned Apr. boars. Sows bred for fall farrow. Satisfaction guaranteed. R. W. Mills, Saline, Mich.

O. I. C. 'S. Gilts bred for Aug. and Sept. farrow. Also a few choice spring farrowed boar pigs. Geo. P. Andrews, Dansville, Mich.

O. I. C. boar pigs of May farrow. Will be suitable for service by Nov. 1st. Satisfaction guaranteed. ROSSMAN BROS., Lakeview, Mich.

BIG TYPE POLAND CHINAS

Boar Pigs from the CHAMPION and GRAND CHAMPION and our other GREAT HERD BOARS and big STRETCHY SOWS of very best breeding and individuality. HILLCREST FARM, F. B. Lay, Mgr. Kalamazoo, Mich.

"War is —"
So is starvation, every one should do their bit. You can raise more pork on less feed if you breed Butler's big type Poland Chinas. Sows bred for fall farrow. Boars ready for service. J. C. BUTLER, Portland, Michigan, Bel' Phone

Large Type P. C.
Fall pigs and bred gilts all sold. Nothing for sale at present. W. E. LIVINGSTON, Parma, Mich.

Big Type Poland Chinas: April and May pigs, healthy and growthy. Priced right. L. W. BARNES & SON, Byron, Mich.

LARGE Strain P. C. everything sold except 1 husky yearling boar that is long, tall & deep. I extra choice fall boar. H. O. SWARTZ, Schoolcraft, Mich.

LARGE type P. C. Some very choice summer gilts bred to farrow in August. Will sell 1 of my yearling herd boars. W. J. Hagelshaw, Augusta, Mich.

Large Stiled Poland China, fall and spring pigs. at farmers prices. B. P. Rock eggs \$1.50 per 15. Robert Neve, Pierson, Mich.

POLAND Chinas bred gilts all sold, still have some choice fall pigs of large and medium type, at farmers prices. P. D. LONG, R. 8, Grand Rapids, Mich.

Big Type Poland Chinas Sept. farrow, either sex, sired by A. A. WOOD & SON, Saline, Michigan

Big Type Poland China boar now ready to ship, buy now and get choice. G. W. HOLTON, KALAMAZOO, MICHIGAN.

Additional Stock Ads on Page 151

FISK

(World Standard)

Tire Sundries

Have the Confidence of Motorists Everywhere

—a confidence bred by years of thorough acquaintance with Fisk quality and dependability.

In the purchase of such products bear in mind that dependable quality is absolutely essential. A patch that won't stick is worthless—a cement that doesn't hold is worse than none at all. To spend money for sundries just because they are cheap is like buying shoes with paper soles.

Every Fisk Sundry made is backed by the Fisk trademark of highest quality and economy, and the pride of the manufacturer in maintaining this high standard of value.

When you buy Fisk Sundries you pay a trifle more in some cases—but you get what you pay for and you can bank upon the quality of what you buy. That is the essence of true economy and sensible buying.

**This New Cementless Patch
Is an Evidence of
Fisk Initiative
in the Sundry Field**



—an aggressiveness that has been characteristic of the Fisk Company nearly twenty years. The Fisk Molded Patch is diamond shaped. It will cover a larger cut, but, because all waste rubber is eliminated, costs less. It has strength

where strength is needed—built up heavy in the center. Can be applied easily and when you put it on your tube you know it will stick. Unquestionably the most efficient and best value cementless patch on the market.

6 for 25c—A New Patch—A New Package—A New Price—6 for 25c

Fisk Sundries include besides the above:

Emergency Patches	Tube Splices	Air Bags	Uncured Stocks
Pure Para Cement	Air Hose	Air Valves	Valve Pads
(in tubes, large and small cans)	Fabric Patches	Bead Mold Filler	Bead Strips
Repair Kits	Tire Tape	Flaps	Soapstone
	Fabrics	Vulcanizing Cement	Bead Cavity Filler

THE FISK RUBBER COMPANY
of N. Y.

General Offices: Chicopee Falls, Mass.

*Fisk Branches in Detroit, Grand Rapids, Saginaw, Toledo, Dayton, Lima, South Bend, Fort Wayne, Indianapolis and Chicago (4 Branches).
Fisk Dealers Everywhere* (1)

