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Wheat Experiments of Two Decades

A FEW days ago the Ohio station harvested a series of plots of wheat which have yielded on the average only 5.8 bushels per acre for the past ten years. A few rods away we harvested another tract which has averaged 34.1 bushels per acre for the same ten-year period. In these two tracts we have the extremes in wheat culture, as long-time averages, at the Ohio station; 5.8 vs. 34.1 bushels per acre. Both tracts are of the same soil type and were originally of the same production; seed and seed treatment has been the same; both tracts are thoroughly tile drained, climatic conditions, of course, identical. To what is this difference between the beggarly yield of 5.8 bushels per acre and the substantial yield of thirty-four bushels per acre due? This is my theme for the half hour at my disposal.

Crop Rotation.

First, let me call your attention to the bearing which crop rotation has upon wheat production. The low yield just mentioned was obtained in continuous culture; wheat following wheat for twenty consecutive years. If we compare unfertilized wheat in continuous culture with unfertilized wheat as grown in a five-year rotation of corn, oats, wheat, clover and timothy, we find that the latter (rotation wheat) exceeds the former by forty-two per cent. Or, if we compare continuous wheat with wheat in the three-year rotation of corn, wheat and clover, the rotation wheat leads by fifty per cent. Where both have been manured well—the continuous wheat manured much heavier, however, the rotation wheat leads by over twenty-five per cent. These figures are the average of twenty consecutive years.

Last season the Ohio Station harvested its first wheat crop in some fifty different rotations in which wheat follows a number of different crops, but always receives the same treatment in each rotation. In ten rotations wheat follows corn, and the average yield of wheat was 28.2 bushels per acre. In three rotations wheat followed oats and the average yield was 37.2 bushels. In five rotations wheat followed potatoes, and the average yield was 38.2 bushels, while in six rotations wheat followed soy beans and the average yield of wheat was 38.5 bushels per acre.

Rotation, then, does have some bearing upon wheat yields, and is worthy of our consideration.

Use of Fertilizers.

A second factor in making up the difference in yield in the extremes to which attention has been called is the use of fertilizers. It probably goes

Address Delivered at the Wheat Congress, Held at the Michigan Agricultural College on August 1, by Prof. C. G. Williams, Agronomist of the Ohio Experiment Station.

without saying that wheat is one of the most profitable crops on which to use commercial fertilizer. The question then is, what kind of fertilizers should one use? The choice this fall will evidently lie between acid phosphate and acid phosphate plus nitrogen.

The Ohio station has long time tests at four widely distributed points in Ohio and on different soil types, in which wheat is being fertilized with acid phosphate, and also with acid phosphate and nitrogen. There has been an average gain of 6.2 bushels of wheat per acre from the use of acid phosphate, or 4.4 bushels for each 100

pay for itself. With wheat at \$2 per bushel there would be a small margin of profit in the use of nitrogen in the form of nitrate of soda at \$90 per ton, under the conditions of this test. The question arises, will the average farmer get as good a net return from the use of nitrogen? It is exceedingly doubtful, for two reasons. First, he pays more for nitrogen in the customary 2-12 mixture which he buys, and second, he does not use it on land in as great need of nitrogen as that in the above tests; for this land has had nothing but acid phosphate for a period of twenty-three years—no manure—no leguminous catch crops; the con-

wheat at \$2.00 per bushel. The prudent thing would seem to be to depend upon manure, clover and other legumes for nitrogen this fall and winter, applying no commercial fertilizer this fall except sixteen per cent acid phosphate, at the rate of 200 to 300 pounds per acre. Then in case the wheat shows the need of nitrogen in the spring, i. e., is unusually small and thin, apply a moderate amount of nitrate of soda in April or May, if the price of wheat and of nitrate of soda justifies such application.

But, it may be asked, is not the continued use of acid phosphate likely to ruin the land? The Ohio station has five plots in its oldest fertility work which have received nothing but acid phosphate for upward of twenty years. If the yield of wheat for the first ten years be compared with the yield for the second ten years it will be found that average for the second ten years is thirty-nine per cent greater than for the first ten, and if all the crops of the rotation be compared it will be found that the net value of the increase from the use of acid phosphate is seventy-four per cent greater for the second period than for the first. It is apparently not the use of acid phosphate that is ruining Ohio land, but the failure to use it. There are localities where it is reported acid phosphate cannot be had save on condition that an equal tonnage of something like a 1-8-1 be purchased. Under such conditions I should be disposed to use a raw rock phosphate. When mixed with manure it has not been far behind acid phosphate in our Ohio tests—about four bushels less corn and 1.68 bushels less wheat per acre. If used apart from manure it will be well to apply considerably larger amounts—probably 600 to 1000 pounds per acre.

Stable Manure.

The use of stable manure should be emphasized as the third factor in making up the difference in yield between the 5.8 vs. thirty-four bushels per acre. Eight tons of manure per acre applied as a topdressing to wheat at Wooster has increased the yield of wheat over the unfertilized plots by 11.8 bushels per acre, or 110 per cent, as a twenty-year average. And if the second ten-year period be compared with the first, the same cumulative effect is found in the use of manure, the gain for the second period being 104 per cent, all the crops of the rotation being considered.

Lime.

Another factor which has had much to do in making up the difference in yield between the extremes mentioned is lime. The re-



Two Hundred Pounds of Acid Phosphate on Heavy Soil. Unfertilized Strip in Center.

pounds of acid phosphate when the latter has been used alone. At twenty-three cents per bushel for wheat the increase from the acid phosphate will more than pay for the fourteen per cent acid phosphate at \$20 per ton.

The addition of nitrogen in the form of nitrate of soda (the most effective carrier of nitrogen, by the way), to acid phosphate at the same four points in the state has increased the yield of wheat 3.16 bushels per acre, or 2.63 bushels for each 100 pounds of nitrate of soda.

Nitrate of soda is today costing about \$90 per ton. At \$1.71 per bushel the increase from nitrate of soda would

ditions of the test would not allow this, and was consequently very hungry for nitrogen.

Nor are the results of the Ohio test exceptional. In a test at the Pennsylvania station extending over a period of thirty-five years, the addition of nitrogen to phosphorus has increased the yield of wheat but 3.8 bushels per acre, and wheat would have to bring \$1.89 per bushel to pay for the nitrogen used.

The point of all these facts is this: Nitrogen increases wheat yields very materially, but at the present price of commercial nitrogen the margin of profit in its use is small even with



Good Culture and Liberal Fertilization will Help in Campaign for 40,000,000 Bushels of Wheat in 1918.

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CURRENT COMMENT.

National Food Control. After weeks of discussion of its various phases by Congress, the Food Bill was finally enacted into law and received the President's signature last week. Differences of opinion were so well settled that in the Senate where the principal fight on the bill was staged, the final vote was sixty-six to seven. Immediately after the passage of the food control bill the first administration food bill providing for a food survey was also passed and both were approved by the President.

These bills confer very broad powers upon the President, which may be briefly summarized as follows: They give the President control over foods, feeds, fuel, (including fuel oil and natural gas), fertilizer ingredients, farm machinery and tools, and direct him to expend \$10,000,000 for nitrates which are to be sold to farmers at cost. They direct the President, when emergency exists, to fix a minimum price on wheat, a price of \$2.00 per bushel for No. 1 northern wheat being fixed for the 1918 crop, and allow him to advance the duty on foreign wheat to bring it up to this price standard. Authority is given the President to buy, store and sell wheat, flour, meat, beans and potatoes in order to stabilize the markets of these staple necessities. The laws provide for the punishment of hoarding and destruction of food stuffs and of speculation, and allow the President to close grain exchanges, boards of trade, etc., to prevent speculation. Authority is given the President to requisition supplies for the army and navy, and he is empowered to license business and plants and to revoke these licenses, farmers and stock raisers being exempted in this provision.

The use of foods, fruits, food materials or feeds in the manufacture of distilled spirits is forbidden, and the President is authorized to limit the alcoholic content of malt or vinous liquors. The President is authorized to commandeer existing stocks of distilled liquors for war uses at prices to be fixed by the courts.

The bills also authorize and empower the President through the federal

trade commission to take over and operate coal mines, to fix prices on coal and coke, also permit him to take over factories, packing houses, pipe lines, mines or other plants and operate them. The powers granted by this bill will cease at the expiration of the war.

Following the enactment of the law, Mr. Hoover was at once appointed as food administrator, and has announced that the first move of the food administration will be to bring about changes in the distribution of wheat and in the manufacture and sale of flour and bread. It will then take up the production of meats and dairy foods. In his initial statement outlining the administration's food policy he briefly outlined his view of the scope of food control work as follows:

"The hopes of the food administration are three-fold: First, so to guide the trade in the fundamental food commodities as to eliminate vicious speculation, extortion and wasteful practices and to stabilize prices in the essential staples; second, to guard our exports so that, against the world's shortage, we retain sufficient supplies for our own people and to co-operate with the allies to prevent inflation of prices, and, third, that we stimulate in every manner within our power the saving of our food in order that we may increase exports to our allies to a point which will enable them properly to provision their armies and to feed their peoples during the coming winter.

"The food administration is called into being to stabilize, and not to disturb conditions, and to defend honest enterprise against illegitimate competition. It has been devised to correct the abnormalities and abuses that have crept into trade."

The powers granted under this bill are the broadest ever delegated to the administrative branch of our government. From the experience of foreign countries engaged in the war, the necessity of the delegation of such authority has become apparent. It is to be assumed that, properly administered, this food control work will be a benefit to both producers and consumers. During the period of war emergency the elimination of speculation in food stuffs is of vital importance to both classes. The task of administration should be lightened so far as possible by the co-operation of both producers and consumers along lines suggested by the food administrator.

Federal Farm Loans.

The Federal Farm Loan Board appointed under the Rural Credits Act has just completed its first year of service. Within this last year the task of organization has been accomplished, the twelve federal land banks have been established, and their offices and the necessary land bank appraisers selected and the machinery for the actual making of loans has been in operation about two and a half months. During this period more than 800 farm loan associations have been chartered, representing total loans approximating \$40,000,000. About twenty-five farm loan associations are being chartered daily, each association representing about \$50,000 of loans. The average number of farmers of each association is eighteen, and the loans to date have averaged \$2,300 in size. It is estimated that the additional farm loan associations now being organized throughout the country will run the total of loans applied for this year far beyond the \$100,000,000 mark.

As has been explained in previous comments, all mortgages are made on the amortization plan with annual payments running generally for a period of thirty-six years. The annual payments made under this plan are equal to six per cent interest on the amount borrowed. This is sufficient to wipe out both interest at five per cent and the principal at the end of the thirty-six years. The borrower, however, has the right to pay all or any part of his mortgage after same has run for five years.

It was estimated from the testimony compiled when the Federal Farm Loan Act was pending in Congress, that the

total volume of farm mortgages in the United States is nearly \$4,000,000,000, and that the average interest rate is 7.4 per cent. It has been estimated that if all these mortgages were transferred to the federal farm loan system on the above plan, it would result in an annual saving in interest charges to the farmers of the country of nearly \$100,000,000.

So far, Michigan farmers have not availed themselves of this form of loans in any considerable number. For the purpose of land purchase, the development of new lands, refunding of existing indebtedness, purchasing of live stock or equipment, this type of farm loan possesses advantages which Michigan farmers should carefully consider, particularly in communities where there is a shortage of available capital and a relatively high prevailing interest rate.

Crop Conditions and Prospects.

Notwithstanding the late and unfavorable spring, crops are above the average for the country, according to the general review of crop conditions for August just made public by the United States Department of Agriculture. In this report the combined condition of all crops in Michigan—100 being taken as the average—was, on August 1, 100.3, a gain of three per cent during July. The combined condition of all crops in the United States on the same date was 99.8, a gain of 1.9 per cent during July. Prospects for the total crop production in the country are most satisfactory. The August 1 estimates show that as compared with last year the total product of corn promises to be 123.5 per cent, wheat 102 per cent, oats 116.3 per cent, barley 112.2 per cent, rye 118.1 per cent, buckwheat 168.6 per cent, potatoes 163.9 per cent, sugar beets 125.5 per cent.

This excess of production is largely due to increased acreages of these staple crops, with which the farmers of the country responded to the appeal to their patriotism for larger production in the present emergency. Undoubtedly a like response will be made in the sowing of an increased acreage of wheat this fall. With the composite condition of all crops only 0.2 per cent below the ten-year average on August 1 and 4.9 per cent higher than the final estimates last year on a total acreage of cultivated crops considerably exceeding that of last season, and a prospect of increased acreages of winter grains, the farmers of America will demonstrate in a practical way their ability to give effective aid in the supplying of staple food stuffs of which there is a world shortage due to the present war emergency.

The Seed Grain Supply.

Now that the threshing season is on, every farmer should keep track of the grain yields in his community. Where an especially good yield is secured and investigation shows the seed to be pure as well as of a good variety, a good source of seed grain will be found near at hand. While emphasis is now being generally placed upon pedigreed varieties of grain which have given uniformly good results in the hands of farmers, yet the supply of these pedigreed grains will not be sufficient to seed any considerable portion of the crop of fall grains which will be sown in Michigan within a few weeks.

There are many excellent varieties of grain which have been thoroughly tried out, and which are giving high yields upon the soils of practically every county in the state where good cultural methods have been practiced. It will be the part of wisdom for every farmer to keep himself informed upon grain yields in his community. The new threshers' license law which requires threshers to keep an accurate record of the crops threshed will afford accurate data upon per acre yields. Any thresher will be glad to

report upon inquiry exceptionally good yields of grain which he has threshed. By this means the extent of any farmer's information upon grain yields in the surrounding country can be greatly enlarged. This is the season of the year when such information should be sought and the seed of prolific, high-yielding varieties of grain be secured for fall sowing.

HAPPENINGS OF THE WEEK.

Foreign.

The European War.—Unfavorable weather is hampering the aggressive operations of the Allies in Flanders, but in southern Moldavia the fighting between the Russo-Romanians and the Teutons continues with increasing ferocity. The Russians have retreated to the villages of Maraschti and Furtezni on the Sereth river, on account of the strong pressure caused by Von Mackensen's troops. Berlin reports the capture of 6,700 prisoners, beside considerable equipment. The indications are that the Germans are preparing to retreat to their second line defenses in the Flanders district. The Allies have been carrying on heavy artillery work, and as soon as weather permits, a drive is anticipated. Frankfurt-on-the-Main, 160 miles within the German lines, has been bombarded by French aviators in reprisal for German raids against Nancy and regions north of Paris. About twenty German aeroplanes raided the southeast coast of England Sunday evening. The result of this raid is twenty-three persons killed, mostly women and children, and fifty injured. The Belgian government has asked further credit from the United States for the purchase of materials for rebuilding railroads. They are confident that the Allies' drive will break through the German lines in Belgium.

The Socialists of Alsace Lorraine, in answer to the French Socialists who proclaimed that the lost provinces should be returned to France by a vote of the people, state that the Alsacians have given sufficient proof of their feelings of their anxiety to be restored to their mother country.

Uruguay has issued a call to Latin-American countries to stand by the United States in the present crisis. The anti-German feeling is also running high in Brazil, Argentine and Peru.

On account of being menaced by Von Mackensen's troops in their sweep across the Suchita river, King Ferdinand of Roumania will move the seat of government to the Russian city of Rostov, at the mouth of the river Don.

The Russian food minister Pletchkanoff says that the Russian crops promise to be about normal. However, the transportation situation is bad and should an early winter close the waterways, the food situation would be serious.

National.

Herbert C. Hoover, the nation's new food chief, announced that he is ready to seize this year's wheat crop if necessary to insure fair cost to consumers and allies. The establishment of purchasing agencies at principal terminals, licensing of elevators and mills, fixing of a fair price, regulation of middlemen and grain exchanges, and elimination of trading in futures are chief features of the new plan.

A Dallas, Texas, restaurant makes extra charge if there is any molasses left on the customer's plate after he consumes his hot cakes. This and the giving of pennies in change—an unusual thing in the southwest—are food conservation rulings which this restaurant has put into effect.

Sympathizers of the car strikers in Kansas City deported 600 strike breakers in an orderly fashion. Rioting has ceased and amicable settlement is in sight. After a strike of three weeks the car men of Springfield, Ill., have returned to work, having received recognition of the union and higher wages.

What has undoubtedly been the last Indian camp meeting in northern Michigan was held this week at Northport. The attendance was very small and consisted mostly of Ottawas and Ojibways. Tuberculosis has so thinned the ranks of the redmen that very likely there will not be enough left for another meeting.

Through government influence the American seamen and their employers have come to a full agreement on wages and working conditions.

The Thirty-first Michigan infantry entrained for the military training camp at Grayling last Sunday.

Nineteen Portuguese fishermen of Provincetown, Mass., were drowned when the dories in which they were fishing were swamped by a gale which came up suddenly late Friday noon.

Seed Selection and Crop Improvement

By N. A. CLAPP

IN the issue of the Michigan Farmer of July 7, on the first and third pages there was considerable space given to articles on seed selection. In two articles there is a good deal of emphasis placed on the use of the fanning mill, as an instrument with which to select seeds.

There is a great difference of opinion in regard to what is considered the best methods to pursue in seed selection in order to secure the best results. To me it seems very evident that many people have a wrong conception as to all that is and may be accomplished by depending entirely on the fanning mill in selecting seed. The fanning mill is but a machine and a valuable one, too, when the object sought is to blow chaff and dirt out of the grain, and to screen out the small, shrunken kernels, which are not desirable for seed. The fanning mill itself has no intelligence to enable it to select seed with the object of the best results in view; it may be a detriment in some ways, as I believe I am able to show. The statement has been repeatedly made by seed grain breeders and improvers, that farmers are constantly causing their wheat and oats to "run out," as they call it, by relying entirely on the fanning mill in selecting their seed grain.

The plumpest and largest kernels are not always the best source through which the best and most desirable results may be obtained as emphasized by Mr. Carr. A rank growth of stalk does not always insure a heavy yield of grain; there may be a tendency toward stalk and not grain production. All observers have undoubtedly noticed that from a single kernel of wheat there is a stool from which has grown three rank stalks on which there may be three short heads. If the kernels in each head are counted it will be found that each head contains thirty kernels, all of which are large and plump, making in all ninety kernels. Near by may be found a stool which has sent up six stalks on which there are six long heads. On counting the kernels in each head it is found that there are sixty kernels in each head, making in all 360 kernels. If the kernels from each stool of wheat are placed side by side, it may be discovered that the kernels from the three short heads are larger than those from the six heads, and yet the number in the six heads is four times that in the three heads.

The Kind of Seed to Save.

The question naturally arising is, what does the fanning mill do in such cases? The answer is, it saves the kernels from the short, low producing heads, and lets the kernels from the long, heavy producing heads go into the number two wheat which is generally sent to the grist mill to be made into flour. The other question is, which line of breeding is it better to follow, the large, plump kernels which produce ninety kernels to the stool, or the stools which have the characteristic of productiveness within them and produce four times as many kernels of medium size? Most of us will say, "Take the kind that stools out well, sends up several stalks on which grow long heads in which there are a large number of kernels to the head. In other words we will say, "Let us breed from and maintain such a variety up to the highest possible standard of excellence, that has within it the inherent characteristic of prolificacy in grain production, instead of the tendency to stalk production."

The differences in stalk and seed production are often very pronounced with different crops. The big stalk of corn with only a short ear clinging close to it, and the medium sized stalk with a large ear hanging out from it, the rank growing bean stem with a

few pods in which are a small number of large beans, and the medium sized stalk on which there are a large number of pods, in which there are a large number of beans, are examples. Similar examples are numerous with the different kinds of grain, and the observing man has seen them. Some pass such things and do not notice them. They have eyes but see not.

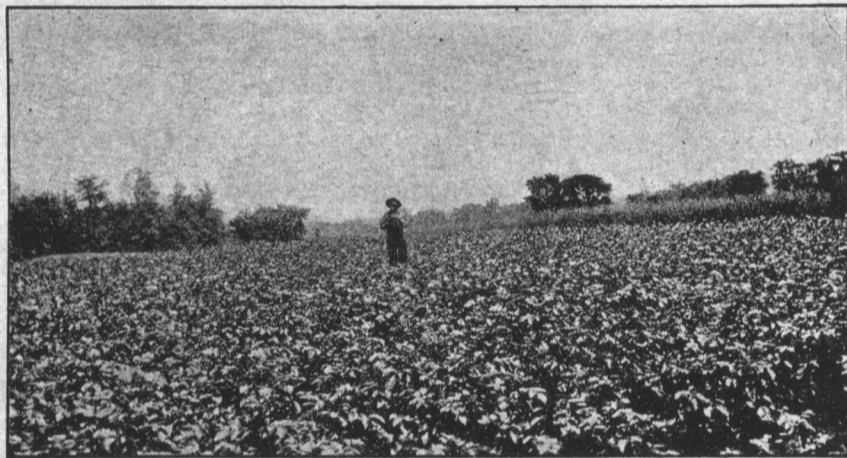
Hand Select Seed for the Seed Breeding Plot.

The question naturally arises as to what plan can be followed in order to secure better results. I will suggest that one can bring into use his perceptive faculties and by the use of a little common sense and good judgment practice hand selection of seed, and follow the method of plant breeding as carefully as he would a careful selection of his breeding animals. If one selects the best heads of grain from the stools that have the largest number of stalks, he can begin to establish a breed of grain that has already started to improve on the characteristic of productiveness. A careful selection of heads until several bundles are accumulated, which, if threshed and sown by itself, will give one a start in the right direction. Then by following the plan

best heads from the best stools of grain, sowing the selected grain in a seed plot by itself, making rigid hand selection from the same the next year and sowing it by itself, using the yield from the seed plot for seed for the general crop, and so on indefinitely, that greater progress can be made in not only maintaining the standard of excellence of the variety, but improving the productiveness of the same, than can be done by the fanning mill method.

Mr. Jackman, a grain breeder of Batavia, N. Y., who has studied the methods of grain breed improvement in person in Europe, told me that the hand selection plan was universally followed in those countries where large yields of grain are secured. He quoted cases of remarkable prolificacy, which show the great possibilities in that direction. One case mentioned was a stool of oats that had sent up fifteen stalks, all of which were well laden with heads—a case of an increase of a thousand fold.

This matter of seed selection is one of great importance and should receive careful consideration. To practice it in an intelligent manner, with the use of good common sense and good paying results can be obtained. We have been drifting with the common custom, and in many cases secured indifferent results. Patriotic enthusiasm



A Good Patch of Early Rose Potatoes Grown by E. Alsbro, of Lenawee Co.

From this one-fourth acre patch the grower sold \$80 worth of potatoes, the first being marketed on July 4. This record, and the appearance of the vines in the photograph, shows that this old standard variety is still dependable when given a good chance.

of rigid selection of the best heads from the descendants of the same, the desirable characteristics can not only be maintained, but greatly improved along the lines toward which you are breeding; and the longer the plan is followed the greater will be the ancestral influences and the closer the adherence to the ideal toward which the breeding has been followed.

The plan is not a new one. Grain breeders have worked under that and similar methods, bringing forward new breeds or kinds and sold them to the farmers for a good price, each of which are neglected and run out and new kinds are secured to take the place of the older ones.

What Well-bred Seed Has Done.

The value of well selected and well bred seed has been demonstrated in Michigan in the remarkable yields of oats during the last two years. The summer of 1915 was a favorable one for the oat crop. The ordinarily handled kinds yielded well, reaching sixty, seventy and seventy-five bushels per acre which pleased the farmers, but when the crops from the seed of the pure-bred kinds approached and reached one hundred bushels per acre they were astonished. The season of 1916 was not a favorable one for the oat crop and the yield per acre from seed, of what is called the old varieties, dropped to thirty to forty bushels per acre, while the yields from seed of some of the pure-bred varieties held up to sixty-five and seventy-five bushels per acre.

It seems very evident that by the hand selection method, selecting the

ought to stimulate and encourage a desire to follow better methods.

TIMOTHY SOD FOR WHEAT.

I have four acres of new seeding of timothy and clover, not very heavy stand, in a ten-acre field, the remainder of field is plowed for summer fallow, expecting to sow wheat. Would it be a wise plan to plow the land which has the hay removed from it, so as to seed to wheat this fall? My object is to get the field together again, that is, all to the same crops. Would I get a good wheat crop from these proceedings if conditions were favorable? I know this is not usually the crop to follow a sod, but it is not a heavy sod, thus I thought it might work. It being quite an advantage to put field all into one crop.

Lapeer Co. L. M. C.

The particular objection to sowing wheat on timothy sod is that there is rarely enough work devoted to the preparation of this sod to make a good seed bed for wheat. Ideal conditions for wheat are two or three inches of fine, mellow soil on top and the soil below firmly packed. When timothy sod is plowed there is always an air space left between the plow furrow and the subsoil. This breaks the capillary connection so that it is impossible to get moisture to come from the subsoil by capillary attraction. If, however, a great deal of labor is put into tillage by way of harrowing and rolling, this timothy sod can be packed and compressed so that the air spaces between the plow furrow and the subsoil are eliminated. When you once get a good seed bed for wheat there is no particular objection in sowing wheat on timothy sod. Splendid wheat has

been raised under just such conditions. Now, in your case, I should think it would be an excellent thing to put this whole field into wheat and by plowing it just as soon after you cut the hay as you possibly can and taking pains to work it down well, I don't think you will have trouble in getting a good crop, providing the season is favorable.

COLON C. LILLIE.

ROAD BUILDING IN MICHIGAN.

Ottawa county is trying out the motor truck patrol system for maintaining roads and if it works well more trucks will be placed in service.

Boyne City voted bonds for \$21,000 to build a cement highway sixteen feet wide and a bridge over Boyne river, connecting the Charlevoix and Boyne Falls road.

Manistee has let the contract to James Kenney for grading the first mile of the Eastlake highway, which will form a part of the scenic drive around Manistee Lake. On the West Michigan pike south of Oak Hill the stone road is being surfaced with asphalt. Road work in the county is being delayed by inability to get stone, no vessels being available for trans-lake shipments.

Marquette county is undertaking no new road work this year but the Ishpeming-Marquette road will be resurfaced.

Saginaw county has adopted the patrol system of road upkeep and twelve districts have been laid out. Each patrolman will cover six miles and will go over his "beat" once or twice a week, filling all holes. The state reward paid for repairs under this system is double the old style and equals \$40 a mile for stone roads and \$20 for macadam.

A bad stretch of nine miles of road between Montague and New Era will be improved this year by Muskegon and Ottawa counties.

The Kent county commission has let a contract for seven and a quarter miles of concrete road in Byron and Wyoming townships for \$99,172. Work starts at once and the road will be finished by August 1, 1918.

Oakland county let a contract to build fourteen and one-half miles of gravel road from Birmingham village to Orion township for \$88,712.50; also to build five miles of concrete road, 16 feet wide, in Farmington township, for \$116,972.30. Both contracts are under the provisions of the Covert law and are let subject to sale of the bonds.

All road intersections in Schoolcraft county will be provided with signs, giving directions and distances, the work of the Chamber of Commerce of Manistique.

Barry county is trying the experiment of using motor trucks in hauling gravel for road building. Two trucks are in use on the Rutland-Hope road, each truck having hauling capacity of four square yards, and it is possible to lay gravel on a mile of road in a week or ten days.

Calhoun county voted \$800,000 for good roads but there is not much road building activity. It is hard to get men and teams, even at \$3.50 a day for shovelers and \$6.00 for man and team. The Marshall-Albion highway is being completed and a road near Bellevue is getting attention. ALMOND GRIFFEN.

"The Modern Gas Tractor, its Construction, Operation, Application and Repair," by Victor W. Page, M.S.A.E., is a practical treatise covering every branch of up-to-date gas tractor engineering, driving and maintenance in a non-technical manner. It considers fully all types of power plants and their components, methods of drive and speed mechanisms, describes design and construction of all parts, their installation and adjustment, as well as practical application of tractors in the field. It is a book of 500 pages profusely illustrated. Published by the Norman W. Henley Publishing Co., of New York. Price, through the Michigan Farmer, \$2.00.

Farm Notes

A Platform for Farm Wagons.

Will you please illustrate and describe in the Michigan Farmer the best way to make a platform rack for farm trucks? I have seen a number of different kinds of racks advertised but not platform racks that would be good for hauling ensilage corn, potato crates, etc. I would like to make one with standard in front and rear to keep the corn from coming off. Is it best to have bottom boards matched, or would they be better a half inch or so apart to let sand through? Would like bill of different pieces of lumber needed as I will have to buy all of it. Manistee Co. SUBSCRIBER.

A platform wagon is a great convenience about the farm, and is easily and quickly made. The writer has built several platforms for farm wagons, all on practically the same plan.

The first essential is two sills or bed pieces, preferably of pine 3x6 inches and at least fourteen feet long. These should be placed on the wagon bolsters in the proper position, and the platform built right on the wagon, as this is the easier method. These sills or bed pieces should be placed on edge the full width of the bolster at the rear end, tapering together to about two feet apart at the front end. To hold them firmly in position they should be bolted to a false bolster at the proper distance from the front end. Then a suitable number of cross pieces of 2x4 or 2x6-inch material are laid crosswise of these bed pieces and bolted to them.

The floor of the platform is laid preferably of matched lumber, on these cross pieces. The cross pieces will be sufficiently strong if laid flatwise on the bed pieces, for any ordinary farm hauling. If the wagon is not a low truck, it will be necessary to box over the rear wheels. This does not interfere greatly with convenience in using a platform wagon of this kind. For ordinary use a platform bed six feet wide is the best, although one foot wider is more satisfactory in hauling hay and grain.

A short standard which may be made either permanent or hung to the front end of the platform with hinges, is very convenient. Heavy band irons bolted in loop form around the rear end of the bed pieces will afford a convenient method for the insertion of a rear standard or end gate to be used when drawing hay or grain. This should have cross boards or slats at the proper distance above the floor of the platform to afford attachment for the ends of sling ropes used when loading hay or grain. Rub irons should be attached to the bed pieces at the proper point underneath.

Such a platform can be quickly and easily built by any farmer, and will prove so great a convenience about the farm that it will be seldom changed for the standard wagon box. Provision can be made for side boards, making a box of large capacity, and a stock rack can be attached by the fastenings provided for this purpose.

Sowing Rye and Vetch for Green Manure.

Please give me some information in regard to sowing rye or rye and vetch in corn, when should it be sown, how much, etc.? Corn is two and a half feet high now. Soil is sandy loam. Would rye and vetch plowed under each year and planted to corn maintain present fertility without manure or fertilizers?

Montcalm Co.

R. B.

Rye or rye and vetch should be sown in corn at any favorable time from this date on, although it should be gotten in in August for best results. It is best sown just after a good rain, which will insure the early germination and uniform growth of the plants. A bushel of rye and ten to fifteen pounds of vetch seed will provide a good growth to plow under for green manure the following year, especially if good inoculation of the vetch is secured.

It would not be a practical plan,

however, to plant corn on the same land each year, depending upon a green manure crop of this kind to maintain soil fertility. If vetch does well on your soil it will add to the nitrogen in the soil to some extent, but will not add any other elements of plant food not already contained in the soil. As practically all Michigan soils are deficient in phosphorus, it is very essential for the maturing of grain crops, obviously this plan would not maintain the fertility of the land.

If a liberal application of acid phosphate or other fertilizer containing a high percentage of available phosphorus were given each year to supplement the green manure crop, then much better results would be secured. A rotation of crops, however, is most desirable, since the fertility of the soil can be more easily kept in balance, and the insect and fungous enemies of the crops grown will not prove as serious as under a one-crop plan.

PULLING STUMPS WITH A TRACTOR.

I read with much interest Mr. Belden's article, "Clearing Land with a Tractor," which appeared in a recent issue of this paper. Having had some experience along this line myself, I believe that I may add a few words of value on the same subject. I refer to our pulling stumps with our twenty horse-power traction engine.

Mr. Belden's leveling device is a new one on me, but it sounds very reasonable, especially when there are not too many green roots and snags to interfere; if I have occasion in the future, I shall try it.

Several years ago my father cleared five hundred acres of land in one tract and all at once; this entailed a great deal of work and presented many problems in clearing, as part of it was of heavy clay soil and part was quite light sand, and there was many degrees and combinations of soil between these two extremes. We found that we could make the most headway by burning everything that two men could handle with the brush at the first burning; and then the logs were piled in low flat piles, the brands from the first burning were piled on top of them and this made the base for the stump piles—if the stumps had not been green they would have burned fairly well without this. When the stumping was all done we allowed a few days for the piles to dry out and in the burning process we usually had a clean job; we found that the larger the piles the cleaner they burned.

Our usual process of stumping is to blast the stumps with dynamite and then go over the ground with a team and pull the roots and snags that are left; but owing to the fact that most of our stumps were green, we were often meeting with roots that the team could not pull; this condition brought us to try the engine as a snag pulled. We pulled small and old stumps whole, very much as Mr. Belden did; we always pulled with the draw-bar—never tried pulling from the front of the engine; our plan of action was about as follows:

We attached a fifty-foot, three-fourth-inch wire cable to the engine, and on the end of this we attached a three-foot piece of heavy chain with a round hook on the end; this would hang onto a snag better than the regular cable hook such as is used on stump pullers, and was handier for fast work. We put two men on the end of the cable to hitch, unhitch and throw the snags out of the way; then with a third man at the throttle, it was a case of "back-up-and-go-ahead," and an enormous amount of stumps could be pulled in a day. The fifty-foot cable permitted a great deal of reaching about, and a great many stumps could be pulled from one spot; then, when all that could be reached

were pulled, the engine was moved to a new group of stumps and the performance repeated; and the men who hauled and piled the stumps and snags found no time to play.

I soon learned that a light charge of dynamite, just enough to split the stump, was all that was required; this, of course, meant a great saving in powder, for the engine would pull half a stump as readily as it would pull a root.

I wish to call attention to the fact that the above account relates to that part of our clearing where clay soil prevailed and the engine had good footing. When we reached the corner of the clearing where the sand was light we learned that we had a different problem to face; here we found that when we hitched to a stump that was pretty solid the engine would dig herself in, that is, the drivers would revolve and throw out the sand from under them until the fire-box rested on the ground; then we had a job of carrying rails and digging her out. Possibly the present-day farm tractors with their wide tread would not "dig in" so readily as our old steam tractor would.

At the time that we were using this engine as a stump puller I gave it little thought, but now, at the present high prices of labor and dynamite, those who own farm tractors may save many dollars by putting them to work as stump pullers.

Otsego Co. G. F. DE LA MATER.

WHAT IS FARM MANURE WORTH?

Just what the farmer can pay for a ton of manure or for hauling and taking care of it varies with different conditions. For ten years the University of Missouri College of Agriculture has been investigating this question. Field tests have been made in thirteen different parts of the state. Different soils, seasons, and kinds of manure have been included under ordinary methods of farming.

In practically all cases eight tons of manure to the acre was applied once in four years and plowed under before the corn crop. No manure was applied on the following crops of oats, wheat and clover, but the yields were all recorded. The increase in crop yields caused by the use of eight tons of manure per acre, were as follows: Ten and a half bushels of corn, five and a half bushels of wheat, four bushels of oats, and about 7000 pounds of hay. This is an average from sixty tests on corn and a somewhat less number on the other crops. Figuring these increases at normal prices they are worth about \$16, or about \$2 a ton for the eight tons of manure applied. With present prices which are almost double those of normal times, manure is worth correspondingly more, or about \$4 a ton.

WHEAT EXPERIMENTS OF TWO DECADES.

(Continued from first page).

Results which may be expected from the use of lime depend upon the need for lime. Some land does not need liming; much land needs it badly and cannot be made to produce satisfactory crops until its lime requirement is satisfied.

A wheat crop was harvested at Wooster in 1916 from adjoining areas, one of which had never been limed and the other had been limed in 1903, 1909 and 1914 at an average rate of two tons per acre. Portions of each tract had been farmed continuously without fertilizers of any kind, while other portions had been treated with a great variety of materials. Wheat on the unlimed, unfertilized area yielded 10.59 bushels per acre. The addition of lime as above mentioned increased the yield to 21.8 bushels; a gain of 11.2 bushels per acre, or 105

per cent. Lime applied to land which had received acid phosphate only, increased the yield sixty-seven per cent. The range of increase for liming on the variously treated fertilizer plots was from four to 114 per cent, being largest on the plot receiving its nitrogen in the form of sulphate of ammonia. On the manured land the increase for lime was 7.4 bushels per acre, or twenty-six per cent. Apparently no treatment in the way of fertilizers or manures made the liming of so-called acid soils unnecessary.

So much for the fertility side of increasing the yield of wheat. Other factors which have an important bearing on increasing the yield of wheat which were emphasized are early plowing; drilling as compared with broadcasting; rate of seeding; date of seeding and good varieties. "Heredity in wheat means as much as in animal breeding. The Red Rock wheat originated and distributed by the Michigan Experiment Station will render the state a service the cash value of which will exceed the entire expense of the experiment station since its foundation."

THE NEW THRESHERS' LICENSE LAW.

The following is the text of the threshers' license law enacted by the last Legislature and now in force.

The People of the State of Michigan enact:

Section 1. On or before the first day of July of each year, or within five days before beginning to thresh, every owner or lessee of a threshing machine or clover huller who shall thresh for hire, shall file with the Secretary of State an application for license containing the name and postoffice address of such owner or lessee, together with the name and make of the threshing machine. Such application shall be on blanks to be furnished by the Secretary of State. On receipt of such application it shall be the duty of the Secretary of State to register such threshing machine and to issue a license for the operation thereof, good for one year from the date of issuance.

Section 2. In lieu of a fee for the registration and licensing of such threshing machine it shall be the duty of the owner, lessee or operator of such machine to file at least once each week with the Secretary of State a statement showing the amount and kind of grain or seeds threshed during such week, together with the name, county and township, and postoffice address of the grower of such grain or seeds, the number of acres of each so grown and the yield of the crops so grown. Upon the failure or neglect on the part of any owner or lessee to file the statistics required by this act, it shall be the duty of the Secretary of State to revoke the license for such machine and no new license shall be issued during the current year.

Section 3. It shall be the duty of the Secretary of State to provide each registered thresher with suitable blanks for the recording and return of such crop statistics. Such blanks shall be in triplicate, one copy of which shall go to the owner as a receipt for the grain or seed threshed, one copy to be filed with the Secretary of State and one to be retained permanently by the registered thresher. Sufficient number of such blanks shall be furnished each thresher as may be necessary for his needs, together with stamped and addressed envelopes for the weekly mailing of such statements. Statistics so received by the Secretary of State shall be tabulated and made a matter of public record in such form as the Secretary of State shall prescribe.

Section 4. All blanks and other material required by this act shall be furnished the Secretary of State, upon his requisition, by the Board of State Auditors and paid for as other state printing and binding is paid for.

Section 5. Any person or persons, firm or corporation operating any threshing machine for hire, which machine has not been licensed as by this act provided, shall be guilty of a misdemeanor and upon conviction shall be punished by fine of not to exceed twenty-five dollars or by imprisonment in the county jail for not to exceed thirty days or by both such fine and imprisonment in the discretion of the court.

Summer Care of Berry Fields

THOSE of us who raise berries will do well to look after the fields now. Now is the time of year when berry fields require lots of work. Blackberries, raspberries, strawberries, each king of its own season, will pay tremendously well, or but poorly, or not at all, exactly in accordance with the amount of care and cultivation given them.

This is also the age of power farming and for farming on a large scale. Whereas, once we did the work in the berry fields altogether by hand, now we must enlarge them and bring in the horses so as to get the work done cheaper.

Renewing Strawberry Fields.

Most all of the work of renewing the old strawberry field may be done with the horses. You can plow them down to a row about six inches wide with a disk cultivator or small turning plow. The process being the same as bar plowing little corn by throwing the dirt away from the plants and piling it up in the middles.

When this has laid a week to ten days so as to completely smother all vegetation in the middles those ridges should be leveled. You can do this easily and quickly by harrowing a few times with the two-horse harrow. Then when it is leveled, turn and cross-harrow two or three times. This will remove most of the weeds and practically all of the very old strawberry plants, leaving only the young, strong plants to make runners for next year's crop. For the harrow will hardly remove a single plant that has a good strong root system. Then what few weeds are left in the row may be pulled out by hand. And for the rest of the season the plants may be cultivated with the corn cultivator.

You should cultivate deep for two or three times to loosen up the ground and put some life into it. When we have time enough we cultivate them as much as three or four times the same day. Then our deep cultivating is done for the season. Afterwards we only rake the top to keep the weeds from getting a start. The shallow cultivation also helps to hold moisture and to keep the runners in the row rather than to let them spread out all over the middles.

The Care of Bramble Patches.

The blackberry and raspberry canes should be cut out at once and cultivating begun. It is so much easier to do this work next winter that many are tempted to put it off. But you pay most dearly for such neglect. Because intense cultivation is the thing that berries need more than anything else. You must cultivate them well during the summer and fall or they can't bear much fruit next season. And you can't cultivate them well until you get the old canes out of the way. Also if left they interfere seriously with the growth of young plants. If you get the old briars out of the way the young plants can grow better and you can trim them up better.

We never take time to go over the fields and pinch the buds off when the canes are just so high. This is a waste of time. But we remove the old canes soon as the berries are picked and then trim up the young plants to suit our fancy. This is done by going over the fields with a very sharp corn knife and trimming not only the tops but the sides as well. By this means you get a nice, neat, square-shaped row which resembles a well kept hedge. It admits of thorough cultivation and will get in shape for bearing maximum crops. Remember that this severe pruning is done but once, and afterwards only the top is pruned when shoots reach up too high. When doing this we are careful to keep our knives very sharp and to strike upward always so as to make a nice clean cut

without haggling or splintering the canes.

The cultivation of berries is very important, so much so that you can't raise many berries without cultivating well. But there is a better reason yet for removing the old canes as soon as possible after the berries are picked. They are a means of communicating diseases and pests to the young plants. Most of the diseases and pests are to be found on the old canes. And, of course, the longer they are left the better the chance for the young plants to become infested or to contract the plant diseases. Lately we have taken over a small field of blackberries in which the old canes were never removed until winter or early spring. This is very fine soil and the briars are very large and strong, but they are so badly affected with anthracnose that they bear but little fruit and that little of very poor quality. It will take no end of time, trouble and money to get this field back on a paying basis. It has only been bearing for about four years and should not be in such poor shape. But most of the trouble was caused by the failure to remove the old canes each year as soon as the berries were picked. All who neglect their berries in this way especially may expect the same trouble without fail. And this is the time when you can least afford a failure.

Indiana.

E. GREGORY.

TROUBLE DEPARTMENT.

Tomato and Raspberry Diseases.

Can you spray tomatoes with anything at any time that will prevent dry rot? Also, my raspberries are dying, sometimes a branch, here and there, and again the whole plant. Is there any kind of a disease forming black knots in the roots that would cause this? The wet weather seems to aggravate it. Can anything be done to stop the disease spreading or to prevent it?

Shiawassee Co. Mrs. G. A. W.

The dry rot on tomatoes is very difficult to control, especially in a season when conditions are favorable for the development of fungous diseases.

A thorough spraying with Bordeaux mixture frequently enough to keep the vines thoroughly covered will usually keep the disease in check. The staking of the tomato vines so as to keep the fruit from touching the ground is also a preventive measure.

It is difficult to tell what is troubling your raspberries, as you do not give a thorough enough description of the trouble. There is a crown gall which attacks raspberries, which sometimes brings on the symptoms you mention, but more likely the disease is raspberry cane blight.

This trouble is very difficult to control, and the only thing to be recommended that is of known value is to cut out the dead and diseased canes and burn them. Any cultural methods such as cultivating or fertilizing, which will improve the vigor of the plants will make them more resistant to the disease.

Lice on Turnips.

Can you tell me if there is any preventive for the turnip louse?

Macomb Co.

M. L. K.

This year has been so favorable to the development of lice that they have been found on plants on which they are not commonly found.

The best remedy for aphids of all sorts is nicotine sulphate, which can be bought in commercial forms. It should be used according to the directions on the receptacle in which you buy it.

Apple picking is made easier if the weeds are mowed in the orchard and the place kept clean. Pickers are disgruntled and do poor work where they have to wade through weeds and briars wet with dew or autumn rains.



OIL BANKING

How shrewd motorists save money

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But today the roads are toured by millions of veterans. These veterans have learned how to test words. They know how to prove or disprove claims.

If you are a veteran you know this: An oil that burns up rapidly or breaks down quickly cannot be really cheap. Though it may be low-priced by the gallon, it is bound to prove high-priced by the mile.

You know that a wrong-bodied oil raises your gas consumption. Instead of saving your oil pennies it eats up your gas dollars.

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In recent years no oils have made such steady progress toward

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Because now-a-days the great bulk of lubricating oil is sold to automobile veterans—men who have learned that gasoline saving depends largely on thorough piston-ring seal—who know that the piston-ring seal depends solely on the body and character of their lubricating oil.

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Mobiloils
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CORRECT AUTOMOBILE LUBRICATION

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

Gargoyle Mobiloil "A"
Gargoyle Mobiloil "B"

Gargoyle Mobiloil "E"
Gargoyle Mobiloil "Arctic"

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

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

Model of	1917	1916	1915	1914	1913
CARS	Summer	Winter	Summer	Winter	Summer
Abbott-Detroit (8 cyl.)	Arc	Arc	Arc	Arc	Arc
Allen	A	A	A	A	A
Apperson (8 cyl.)	A	A	A	A	A
Auburn (6 cyl.)	A	A	A	A	A
Briscoe (6 cyl.)	A	A	A	A	A
Buick (8 cyl.)	Arc	Arc	Arc	Arc	Arc
Cadillac (8 cyl.)	A	A	A	A	A
Chevrolet (8 cyl.)	A	A	A	A	A
Chrysler (8 cyl.)	A	A	A	A	A
Cole (8 cyl.)	A	A	A	A	A
Daimler (8 cyl.)	A	A	A	A	A
Dodge (8 cyl.)	A	A	A	A	A
Dort (8 cyl.)	A	A	A	A	A
Empire (8 cyl.)	A	A	A	A	A
Federal (8 cyl.)	A	A	A	A	A
Ford (8 cyl.)	A	A	A	A	A
Franklin (8 cyl.)	A	A	A	A	A
Grant (8 cyl.)	A	A	A	A	A
Haynes (8 cyl.)	A	A	A	A	A
Hudson (8 cyl.)	A	A	A	A	A
Hupmobile (8 cyl.)	A	A	A	A	A
I.H.C. (water) (8 cyl.)	A	A	A	A	A
Interstate (8 cyl.)	A	A	A	A	A
Jeffery (8 cyl.)	A	A	A	A	A
King (8 cyl.)	A	A	A	A	A
Kissel (8 cyl.)	A	A	A	A	A
Laurel (8 cyl.)	A	A	A	A	A
Lexington (8 cyl.)	A	A	A	A	A
Leominster (8 cyl.)	A	A	A	A	A
Marmon (8 cyl.)	A	A	A	A	A
Maxwell (8 cyl.)	A	A	A	A	A
Mitchell (8 cyl.)	A	A	A	A	A
Moline (8 cyl.)	A	A	A	A	A
Monroe (8 cyl.)	A	A	A	A	A
Moon (8 cyl.)	A	A	A	A	A
National (8 cyl.)	A	A	A	A	A
Oakland (8 cyl.)	A	A	A	A	A
Oldsmobile (8 cyl.)	A	A	A	A	A
Overland (8 cyl.)	A	A	A	A	A
Packard (8 cyl.)	A	A	A	A	A
Pontiac (8 cyl.)	A	A	A	A	A
Reo (8 cyl.)	A	A	A	A	A
Stearns-Knight (8 cyl.)	A	A	A	A	A
Studebaker (8 cyl.)	A	A	A	A	A
Stutz (8 cyl.)	A	A	A	A	A
Velie (8 cyl.)	A	A	A	A	A
Westcott (8 cyl.)	A	A	A	A	A
White (8 cyl.)	A	A	A	A	A
Willis-Knight (8 cyl.)	A	A	A	A	A
Willys-Knight (8 cyl.)	A	A	A	A	A
Winton (8 cyl.)	A	A	A	A	A

YOUR TRACTOR

also may be lubricated efficiently with Gargoyle Mobiloils. On request we will mail you a separate Chart specifying the correct grade for each make and model of tractor.

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NEVER before in the history of the country will farmers need their prosperity tanks filled as this coming season. The usual hay crop will be short, the corn crop will be nothing to brag about, and grain is certain to be high. The far-seeing dairyman will prepare now for next winter's needs by preparing to have the silo as full as possible.

Under normal conditions the best time to cut the corn for silage is when the kernels are well dented, and about one-fourth of the husks, and the lower leaves are drying up. More mature corn has a greater nutritive value and will make better silage than too green corn, providing it contains enough moisture to insure good fermentation. Corn cut too green makes dark colored, sour silage which is very apt to cause animals to scour. In case of extreme drought, such as oftentimes occurs, it may be necessary to cut the corn much earlier than usual. The best guide to time of cutting under unfavorable conditions is when the corn ceases to grow.

Cut Dry Corn Fine.

Corn in good condition to be put into the silo will give good results, if cut as short as three-fourths of an inch in length. Corn that is quite dry should be cut into pieces not over one-half inch in length. The finer the cut the better it will pack down in the silo, and furthermore, there will be less wasted in feeding as the stock will eat the fine cut silage more readily. As it is quite difficult to pack corn that is rather dry, it should in such cases be cut finer. All corn in the silo should be carefully and thoroughly tramped down so as to exclude as much air as possible.

There is a wide difference of opinion as to the time required to fill the silo. The system to be used is determined by the amount of silage to be cut up by one set of machinery. Where a thirty-foot silo is filled rapidly, the silage will settle considerably, frequently as much as five or six feet. This makes it necessary to refill in a week or ten days. The rapid filling is the cheapest method and also gives a more uniform quality of silage. Where slow filling is practiced it is almost necessary for the farmer to have a cutter of his own, otherwise some of the corn at the beginning of the silo filling season would have to be cut too green, and some at the end of the season, cut too dry.

Community Silo Filling Practical.

Slow filling makes it possible to utilize the full capacity of the silo, as by the time the silo is filled it is also quite well settled. Nearly all argue, however, that slow filling is more expensive than rapid filling. A method often used, is for a community of from three to six farmers to own a large cutter jointly and fill their silos rapidly. They then make a second round and refill the silos if necessary. I know three neighboring farmers in western New York, each of whom has subscribed to a fund of \$50, and purchased a large ensilage cutter and engine, and with this they fill their silos as they desire, and fill them on time. The first year they paid for the machine, for it costs at the rate of \$10 a day for an outfit and one man to run it. By changing off work, there is no labor expense.

Distribute and Pack Silage.

The packing of the corn is a very important part of the work. Thorough packing gives better silage and insures a more economical use of the silo because more of it can be put into the silo if well packed. The chief points to remember are: That the light and heavy portions of the corn should be evenly distributed; that the corn should be uniformly packed and tramped in all parts of the silo. The distributing can be most easily and cheaply done by attaching a distributor to the end of the blower elevator. Thorough packing can best be secured by keep-

Filling the Prosperity Tanks

ing the surface of the silage about two feet higher on the sides than in the center. With this method, the center, where the corn drops and the men stand most of the time, becomes very solid. When filled in this manner the silage is wedged solidly against the sides in such a way as to prevent air spaces near the wall. The chief reason why silage spoils around the edge is because it is not packed well enough and the air is permitted to enter. The characteristic silage fermentation takes place only in the absence of air.

The silage should be wet after it is in the silo, and if it is not in this condition, water should be added. Corn cut at the proper time need not be artificially moistened to make good silage. If, however, the corn is too dry at the time of cutting, water should be added. The silage should be cut in pieces not over half an inch in length and an extra effort made to have it properly packed.

Adding Water at Filling Time.

There are two convenient methods of adding water to silage. These are: First, by allowing a continuous stream to flow into the blower pipe at the time

dairymen prefer to wait from two weeks to a month before starting feeding silage. But with this practice there is a waste. The corn can be fed immediately after the silo is filled, but it will merely be cut corn. It will take several days' feeding before the real silage will be reached. And starting feeding immediately means no top waste.

The cost of filling the silo, including the cutting of the corn in the field, hauling it to the cutter, putting it through the silage cutter, trampling, leveling, and covering the silo, varies from about fifty-five cents to \$1.25 per ton.

E. W. GAGE.

BREECHY CATTLE.

Perhaps nothing is more exasperating to the busy farmer than to learn that the neighbor's corn or grain field has been entered by cattle from his pasture. Of course, much of the outcome depends upon the neighbor, but no matter how good natured the latter, one cannot but feel that some more secure method of confining the stock would be desirable when they are mak-



A Means of Keeping Cows from Going Through Fences.

ing themselves a nuisance generally by getting into fields where they are not wanted.

In the newer parts of Michigan, barbed wire is utilized extensively. Now cattle have been seen to walk very gracefully through a barbed wire fence, without getting their tempers ruffled, or their skin scratched. An animal will begin, perhaps, by reaching his head through the fence to steal the other farmer's grass, then follows one front foot after the other, and if the fence is at all slack, the breechy animal will force his way through the fence and into the adjoining forbidden field.

Usually certain ones of the herd are more venturesome than their mates. The farmer locates these, and decorates them with a medal of honor in the form of a poke, as shown in the illustration. Almost every farmer who lets his cattle run without much attention on a piece of new land will use this device to prevent the bolder "critters" from getting through the fence. Since the forked stick prevents the animal from getting his head through an opening between the wires, he is forced to content himself with his own allotted feeding ground.

While the device is very effective and cheap, and apparently causes the animal so controlled little discomfort, yet on farms where stock is kept regularly, it would seem advisable to use more substantial fencing and let the animals have the free use of their heads.

Experience shows that greater gains of flesh or milk are made where the cattle are given an environment tend-

ing to their utmost comfort and peace. That an animal is breechy is perhaps an indication that he is a good feeder, and that if he were freed from the yoke of a restraining poke, and confined with a harmless woven wire or other substantial fence, and well fed, he would respond to the treatment given by making greater returns in the form of meat or milk than would be the case were he tantalized by seeing tempting feed on the other side of the fence and yet not being allowed to eat it.

Benzie Co.

E. H. BROWN.

MILKING THREE TIMES A DAY.

The question is quite frequently being asked by progressive dairymen, "does the frequency with which a cow is milked have any effect on the quantity or quality of milk which she gives?"

Last season we experimented some in this line and have been led to the conclusion that up to certain limitations the oftener a cow is milked, the more milk she will give, but we are not so certain that she will produce more butter-fat. Our experiment was made when the cows were on pasture, from the first of June to the first of July. The cows were three in number and were grade Jerseys.

The cows all increased in flow to some extent, the increase depending largely on the time of freshening. The governing factor seemed to be, the further along in the period of lactation the cow was, the less increase the flow. One cow increased from thirty pounds daily to forty pounds. One increased fifteen pounds and one only ten pounds. Whether the increase could have been maintained any considerable length of time, we are, of course, unable to say.

The pasture was blue grass and timothy and was of the best, as there were frequent rains, as is usually the case during the month of June. The cows had free access to all the clean water they desired and were given salt every day. We have no doubt that it would pay to milk three times a day in the case of heavy producing cows, provided there were a number of them. Most farmers would no doubt argue that they have too much to do to carry on any experiment of any kind long enough to get reliable data.

Indiana.

D. LEATHERMAN.

FIGURING THE VALUE OF MILK AND BUTTER.

After noting what Mr. Lillie tells M. A. S. in the issue of June 30, in answer to his inquiry about selling whole milk for \$1.85 per hundred for 3.5 per cent milk, or butter-fat at \$0.47 a pound, I want to suggest a little different way of figuring it.

In the first place, his price for butter-fat is high in proportion to the price for milk. Our prices so far this month for butter-fat have been \$0.36 and \$0.37 and milk \$1.92 for 3.5 per cent milk. Suppose you sell 3.5 per cent cream at \$0.37; 100 pounds of milk would bring you \$1.30 and you would have the skim-milk. Selling this test whole milk at \$1.92 would give an advantage in price of \$0.62, and we will call this the price of that 100 pounds of skim left when you sell cream. Statistics show that there are but eight pounds of solids in 100 pounds of average skim-milk. The rest is nothing but water, so the eight pounds of solids at \$0.62 per hundred for skim-milk are costing better than \$0.07 a pound, \$140 a ton. Pretty expensive feed for my calves. Calf meal is only \$70 a ton.

Now, figuring on the basis of M. A. S.'s prices: Whole milk \$1.85, and milk selling cream \$1.65, difference of \$0.20 per hundred for skim, \$50 a ton for the solids, as compared with ground corn and oats at \$68 and calf meal at \$70. J. W. SOUTHWELL.

DAIRY PROBLEMS.

Silage Spoils at Foundation.

I own a 10x30-ft. wooden silo, set on an eight-foot wall, four feet in the ground and four feet above. About one and a half feet of the silage next to the concrete wall always rots. Last year the silage was none too green when put in, so it was a little worse than usual. The inside of the silo is flush with the inside of the wall, so much so, in fact, that I am afraid to tighten the silo hoops too much for fear the silo will settle into the wall. I suppose you will say that that is the trouble, but how can it be, when the silage rots almost to the bottom? I

H. M. H.

The presence of air in the silo is always the cause of spoiled silage, since the bacteria which cause decay can only work effectively in the presence of air or oxygen. The scientific reason for the preservation of silage in a wholesome and palatable state is that in the first fermentation which occurs after the silo is filled the heat generated is sufficient to destroy the harmful bacteria present in the green mass. Then if the silo is sufficiently tight to prevent the ready access of air there will be no active bacteria present to start decay in the silage after this heat from fermentation has subsided. The more nearly air-tight the silo the better the silage will keep, but there will be comparatively small losses from small air leaks in the silo wall for the reason that the silage is packed so solidly inside the wall of the silo as to almost perfectly exclude the air from the silage itself. But in a condition such as is described, where the silo pit is slightly larger than the silo itself, there is bound to be a loose condition of the silage around the outside as the silage settles into the pit, and as it is most difficult if not altogether impossible to perfectly exclude the air at this point, the decay of the silage is the natural result.

This trouble might be remedied in two ways. The pit portion of the silo might be plastered with a rich mortar of cement and sand to bring it out flush with the silo at the bottom, which would tend to make the wall air-tight if the trouble is due to its porous structure, or an extra stave might be put into the silo to accomplish the same result, the wall being waterproofed if necessary.

Ropey Milk.

Could you please explain the cause and how to prevent stringy, ropey milk? After the milk sets a while it is stringy, also the cream. SUBSCRIBER.

Ropey, or stringy milk, is caused by a special bacteria that gets into the milk and produces this effect. For instance, one kind of bacteria gets into milk and turns the milk sour; this is lactic acid bacteria. Now, the ropey milk bacteria gets in and makes it stringy and slimy and prevents it from souring because this bacteria overcomes the effect of the lactic acid bacteria.

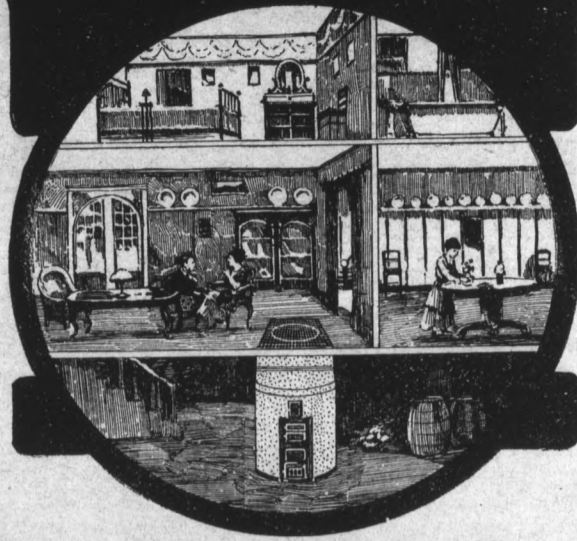
Ropey milk bacteria are more apt to be troublesome during rainy seasons, or the rainy portion of any season. They are usually present in mud-holes and stagnant water. Cattle that pasture in wet fields, especially those that during wet time travel through mud in going to and from the pasture, are more liable to be troubled with this bacteria. Where cows don't have to go through wet places and mud and have all upland pasture there is rarely any trouble from this cause.

The difficulty can be overcome with very little trouble and expense. If the udders of the cows are washed in a weak solution of carbolic acid, say a five per cent solution or even weaker, this will destroy the bacteria. The hands of the milker also ought to be washed in water containing a little carbolic acid and the dairy utensils, milk pails, etc., ought to be rinsed in this water before the final rinsing. If a little pains is taken for two or three days, I think the trouble will entirely disappear.

COLON C. LILLIE.

Why You Want the Mueller Pipeless

THERE'S a lot of difference between "Mueller Pipeless" and just "pipeless". The Mueller Pipeless Furnace is a *real* furnace, of exactly the same construction as the old reliable Mueller line, only without pipes or flues. It is the result of 60 years' experience in the building of heating systems of all kinds, and it has behind it the Mueller name and reputation.



**MUELLER
PIPELESS
FURNACE**

LAST winter's unusual cold gave the Mueller Pipeless Furnace a severe test—a test which effectually proved the entire success of the system. Many good-sized houses were kept warm and comfortable in the coldest parts of the country and in the most exposed locations, with the thermometer at 20 and 30 degrees below zero for days at a time.

Interesting Book About Pipeless Heating—Free

You should know all about this new and improved method of heating homes. Just tear the corner of this advertisement, write your name and address on the margin and mail to us for interesting, illustrated booklet about pipeless heating, with name of nearest dealer who can tell you all about the Mueller Pipeless.

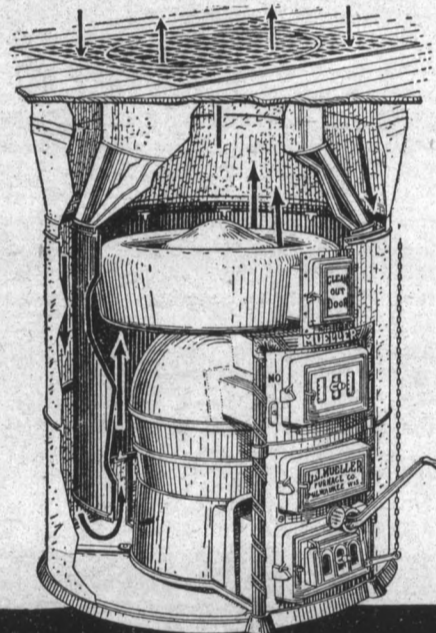
The Mueller Pipeless Furnace is easily installed. No tearing up of walls for pipes or flues. Just the thing for small or partial cellars—even where there is no cellar it is an easy matter to dig a pit big enough. Does not heat the cellar, preventing storage of fruits and vegetables. Saves 35% in fuel—burns hard or soft coal, coke or wood.

The Mueller Pipeless Furnace will heat all the rooms in your house at a comfortable temperature, from one register, without pipes or flues, providing a continual circulation of warm air through all the rooms and insuring perfect ventilation.

Just leave the doors between rooms open and Nature's laws do the rest. The warm air rises, displacing the cold air, which is drawn into the furnace to be reheated.

With this continual circulation of air, your home will be kept warmer, more healthful, more comfortable—and at smaller expense.

The entire furnace is of solid cast iron, radiator is one piece, grates are of triangular duplex pattern, ash pit is large and high, double jacket is rust-proof. The Mueller Pipeless burns hard or soft coal, coke or wood—effects a saving of 35% in fuel.



With the Mueller Pipeless Furnace you are freed from the disagreeable job of putting up the stoves every fall and taking them down every spring—from lugging in coal to each stove and carrying out ashes. Your house is clean, with no room taken up by unsightly stoves. Your heating plant is in the cellar, where it belongs, and where it stays the year 'round.

The L. J. Mueller Furnace Company has on file thousands of letters from persons who have passed through several winters with Mueller Pipeless Furnaces and who tell of the greater comfort, convenience and economy they have given.

Send for the Booklet Now

L. J. Mueller Furnace Co.
Makers of Heating Systems of All Kinds
Since 1857

195 Reed Street Milwaukee, Wis.

No Silo Too High

"We have had another satisfactory year filling our three silos, ranging in height from 83 to 90 feet, with your 19 inch Cutter", writes S. B. Mason, Lexington, Kentucky. "This is the third year we have used the Papec Cutter and have found it satisfactory in every respect." The Papec runs on 1-5 to 1-3 less horse power than any other blower cutter.

A Papec soon pays for itself, for this reason: Suppose your silo holds 100 tons and you depend upon the cutter crew. Suppose the crew reaches you 2 weeks too early or 2 weeks too late. The food value of the corn is reduced about \$1 a ton. You have lost \$75 to \$100. Again, the silage settles, leaving the top quarter of the silo empty. You lose an additional \$75 to \$100 since you could refill that space if you owned a PAPEC.

Sizes for 3 H. P. engine and up—capacities 2 to 30 tons per hour. Fully guaranteed.

Write today for new catalog.

Papec Machine Co.
50 Main Street, Shortsville, N. Y.
25 Convenient Distributing Points.



"It Throws and Blows"



Free Catalog in colors explains how you can save money on Farm Truck or Road Wagons, also steel or wood wheels to fit any running gear. Send for it today.
Electric Wheel Co.
35 Elm St., Quincy, Ill.

When writing to advertisers please mention the Michigan Farmer.

SELF-OILING WINDMILL

With INCLOSED MOTOR
Keeping OUT DUST and RAIN—Keeping IN OIL

SPLASH OILING SYSTEM
Constantly Flooding Every Bearing With Oil, Makes It Pump In The Lightest Breeze And Prevents Wear

OIL SUPPLY REPLENISHED ONLY ONCE A YEAR

DOUBLE GEARS—Each Carrying Half the Load

Every feature desirable in a windmill in the

AUTO-OILED AERMOTOR

Gasoline Engines—Pumps—Tanks

Water Supply Goods—Steel Frame Saws

WRITE AERMOTOR CO. 2500 12TH ST., CHICAGO

GOOD PROFITS IN MAKING CIDER

Mount Gilead Cider and Grape Juice Presses produce 10 to 400 barrels daily. All sizes, hand or power. No need to feed apple culls to the hogs.

Fully Guaranteed
We make cider evaporators, apple-butter cookers, vinegar generators, cider and vinegar filters. Write for catalog.

Hydraulic Press Mfg. Co.

131 Lincoln Ave. Mount Gilead, Ohio

FREE
Wonderful Money Saving Fence Book. Over 150 Styles. 13¢ Per Rod Up. Gates—Steel Posts—Barb Wire. DIRECT FROM FACTORY—FREIGHT PAID. All heavy DOUBLE GALVANIZED WIRES. 13¢ per rod up. Get free Book and Sample to test. THE BROWN FENCE & WIRE CO., Dept. 49, Cleveland, Ohio

Important Phases of Live Stock Advertising

By H. L. ALLEN

A GLIMPSE over the advertising pages of any of the publications devoted to agricultural interests will indicate to anyone who has made a study of the principles of advertising the lack of information which the average live stock advertiser possesses on the psychological phase of advertising. Dropping the more complex phases of psychology it may be said that its application to advertising consists in the ability of the advertiser to comprehend in advance, the state of mind which will mark that portion of the buying public from whom his customers may be expected to come; and also, by skillful suggestion, to arouse in the mind of the possible buyer, the need which he has for that which the advertiser has to sell.

The men who conduct the advertising campaigns of the big industrial concerns and those who look after the advertising of the city department stores, are trained advertising men who fully understand the psychological phase of the work they have to do. They must know months in advance what portion of the goods their advertising covers will be wanted during a certain period; must gradually direct the minds of their possible customers to the coming of that period and then, with its appearance, give them the fullest information possible regarding the ability to fill their orders.

Advertising Should be Seasonable.

Perhaps no commercial advertising gives a better illustration of what may be called "seasonable" advertising than may be found in the work of the trained men who are connected with the big hardware stores in any of our large cities. A large part of the goods handled in the big hardware stores is salable, to any great extent, only during a brief portion of the year. In early autumn they will commence to jog the public mind about stoves, weather stripping and other articles which winter will call for. As the days commence to lengthen and the snows of winter to disappear it will be paint, wire fencing, agricultural implements and garden tools that their advertisements will talk about; and a little later it will be lawn mowers, garden hose, etc.

Another respect in which the advertising men of the big city stores use their knowledge of the psychology of advertising is in the arrangement of copy for papers differing radically in the character of their readers. For instance, in nearly every big city there will be a section—call it the "west side"—where the homes of the wealthy are located, and the "east side" where the poorer class lives. As a rule the newspaper having a big circulation on the "west side" will have few readers on the other side of the city where the widely read paper will be one which circulates but lightly among the west siders. Now, note the difference in the wording of the advertisements of the same store in those two papers. The trained advertising man knows that it would be a waste of space and money to advertise \$50.00 domes or electric chandeliers in the east side paper, and just as flagrant waste to advertise bargains in wash boilers or tin kitchen ware in the west side paper.

Emphasize Goods, Rather than Names.

One other thing to be noted in the newspaper advertising of the class mentioned is the uniformity with which the writers subordinate the name of the firm to the main subject of the advertisement. If it is lawn mowers that the hardware store is calling attention to the type in which "lawn mowers" is set will be five or six times as large as that in which the name of the store or firm is set down at the bottom of the ad. And

oftentimes on opening the morning paper the words "negligee shirts" will fairly emblazon themselves on your mind, such prominence are they given in the type display of a clothing store ad. and to strike a reader "right in the eye" with the name of whatever you want to sell is a fundamental principle of advertising that any advertiser may well remember.

These observations are but a preliminary leading up to some of the shortcomings to be noted in the advertisements of live stock breeders in the agricultural papers. Those who are directly interested in the subject are requested to look over the advertisements in this paper and note the number in which the copy could be changed to more seasonable copy, to the great benefit of the advertiser and the paper. Then take your pencil and make a note of the large number in which the big display line is the name of the farm with the offering hidden away in small type.

The man who wishes to buy a highly bred Holstein bull calf to use in his herd will overlook an ad. of "Sun-bright Farm" in big type, even though it is stated in small type that this farm has some highly bred Holstein calves for sale. But if the same advertiser would have his copy read, "Holstein Calf For Sale from Record Herd," in big type, the intending purchaser of a calf will find the name of the farm and address, even if it is in small type.

It is a mistaken idea which many have that the advertising medium used will sell the advertiser's offerings for him. At best the paper used can only introduce the advertiser to its readers. The impression the introduction will make will depend largely on the wording and type display of the advertisement. And the business connection that may be formed through that introduction will last only as long as the advertiser will be able to keep absolute faith with his customer.

The Seller's Obligation.

In selling live stock, especially, by the mail order method, it is essential that the customer be treated with the utmost sincerity. One dissatisfied customer will be able to make worthless many dollars spent in advertising, in his locality. Perhaps the most satisfactory way to sell on description is to do so under the understanding that a customer not satisfied with the animal purchased may return it, upon payment of express charges, and receive the purchase price back. Such a rule demonstrates the good faith of the seller and permits the buyer to see the animal at less expense than a trip to the advertiser's farm would entail, in the great majority of cases.

Now, as to seasonableness. It is a waste of money to advertise male animals for breeding purposes at a time of the year closely following the close of the natural breeding time. One can no more expect returns from such advertising, at that time, than could be expected from an advertisement of seed wheat just after the sowing season. Advertising of males for breeding purposes should be planned well ahead and it should appear at least a couple of months preceding the breeding season. It is an excellent plan to specify one animal in such an advertisement, mentioning merit of ancestry and placing a price on him. If more than one is for sale change the copy every week or so, but always having the breed and sex of the animal the outstanding line in the ad.

Females are, as a rule, salable the greater part of the year and advertising may be devoted to them at such times as the space is not wanted to dispose of the males. If more than one is for sale it will be advantageous,

however, to concentrate on one at a time. Call attention to breeding and merits of one for a week or two and then replace with another. The most senseless waste of money, and the one most frequently to be noted is an ad. in which the copy is never changed from one year to another. That is on a par with the city merchant who would fill his display window with goods and allow them to remain without change indefinitely.

Some Examples.

A good example of an ad. which is sure to catch the eye of any reader in the market for a Holstein heifer and in which something concrete appears to encourage the opening of correspondence is the following taken from the Michigan Farmer:

3 Holstein Heifers 30.21 lbs. sire. Their dam's dam A. R. O. sister to dam of 35 lb. cow, bred to 3/4 brothers to 30 lb. 4 yr. old. Terms if wanted.

From another agricultural paper is clipped an ad. which is so worded as to appeal to the minimum number of readers. It offers the would-be buyer nothing specific and the general reader would pass it over without noting what is being advertised. This ad. is here reproduced, the advertiser's name and address, as in the first presented, being omitted for obvious reasons:

WOODSIDE STOCK FARM.

Shorthorns and Polled Durhams with milk and beef

In selecting a medium to carry advertising the advertiser should also use judgment. A paper devoted principally to gardening or fruit growing will not bring the live stock advertiser's offerings to the class of buyers which he wishes to reach. Therefore, select a medium for the sale of live stock which pays considerable attention to that branch of the farming industry. There is a certain psychological phase to be observed in selecting mediums for advertising purposes and the intelligent reader will be able to judge with a fair degree of correctness of the relative value of each, in that particular field he wishes to reach.

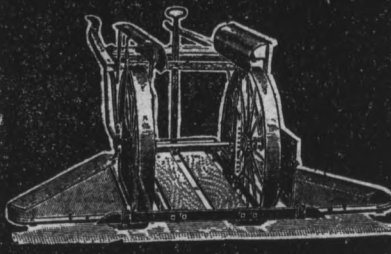
Protect the Interests of the Buyer.

Where an advertisement brings a buyer it devolves upon the advertiser to perform certain duties that will

(Continued on page 125).

INSTANT POSTUM
as coffee's successor on the family table makes for better health and more comfort.
Preferred by Thousands
"There's a Reason"

CUT YOUR CORN WITH



AKRON SULKY CORN CUTTER

The old way requires considerable help and takes a long time. The AKRON SULKY CORN CUTTER saves time, money, and much labor; is absolutely safe; inexpensive; efficient; light draft; only one horse required; saves twine; cuts one or two rows at a time; adjustable for height of cut. We want you to know more about our Corn Cutter, but this space is too small for that, so we have published an illustrated booklet containing full description and testimonials which we will mail free to all interested readers of this paper. Send us a postal card request at once and you will receive this booklet by return mail. We will also tell you what dealer in your neighborhood handles our Corn Cutter, so you can go and see this complete machine. Write now. Right now.

THE AKRON CULTIVATOR CO.
AKRON, OHIO.

The Cow Knows—but SHE can't talk. Ask the Dealer.



DON'T let your cows suffer from the torture of flies. When their energy is used to switch the flies from their backs they cannot give the maximum amount of milk. It makes them irritated and run down. Use

SO-BOS-SO KILFLY

—a sure and effective preventive against fly torture. A boon to the cows and a bane to troublesome milking. Spray with SO-BOS-SO KILFLY twice a day to keep the flies away. Will not blister the skin nor gum the hair. Has been the farmer's friend for more than 17 years. Used all over U. S. and in many foreign countries. Tried and proven. Sold in gallon cans—enough for 200 cows or for one cow 100 days. Your dealer will sell you SO-BOS-SO KILFLY. Send for descriptive circular.



Get the "SHIP-LAP" Joint
The quality construction in vitrified tile. End of each block overlaps onto the next. Make a stronger silo wall with less mortar line exposed. Smoother wall inside—better looking outside. Reinforced with twisted steel—continuous doorway—big ladder rungs. Hip roof gives extra footage in height.
Write for Catalog and Prices
J. M. PRESTON CO., Dept. 309, Lansing, Mich.
Also get our offer on Climax Silo Fillers and Bidwell Thrashers

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.

DOGS

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

Please Mention The Michigan Farmer When Writing to Advertisers

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.

THE clay cut at the foot of Park-view avenue, was one of the worst jobs the Emory Construction Company had ever taken in charge. The foundation for the new pumping station was to be laid thirty feet below the surface, and mud, quicksand and bad weather had combined to hinder progress.

"At this season of the year, I can hardly get help enough to pump out the water," Walton, the foreman said, one late October day, to Mr. Emory, the contractor. "The men won't stay long enough to get used to the work." "Twenty men asked for their time last night," he went on, "and here I am with only half a force today."

The contractor thought a moment, and groaned as it brought up its regu-

lar load from the bottom, swung it over to one side and dumped the watery mass in the waiting wagon. The contractor watched the process and smiled in approval as he turned to Walton. "You've got one good man on the job, anyhow," he said. "That old crane comes up as if the man handling her knew his business." "Well," said Walton, "I've been afraid Thomas would quit, too. He got into a dispute with his assistant the other day and I am sure one of them will go."

Over the Bank

By EARL R. RICE

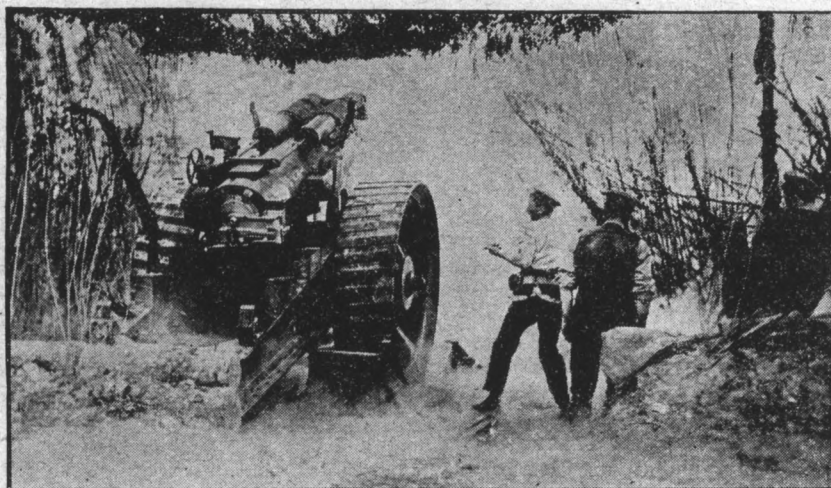
"Do the best you can. Perhaps the work will improve in a day or two," was the contractor's comment as he left.

But Walton's fears came true. The assistant engineer asked for his time that day at the close of work. Walton called up the office, "I must have a man in the morning," he said. "All right," said the contractor, though he did not know where he would find one. "What do you think of it, Jack?" he said to his eighteen-year-old son that night, as he told him of the progress of the work. "I wish I could give Walton a good lot of encouragement. The best thing I could send him would be a man who would stick." "Say, dad," he broke out, "what do

WORLD EVENTS IN PICTURES



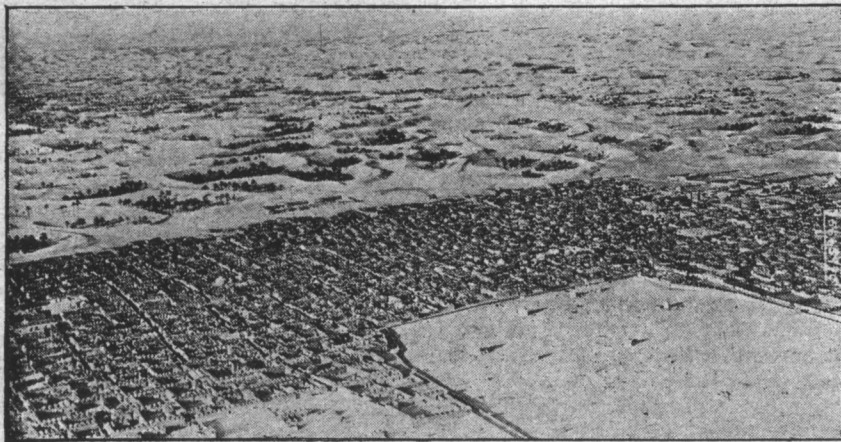
Loading Supplies on One of Uncle Sam's Men-of-War.



Powerful Howitzer in Action During Recent Battle at Messines Ridge.



Showing Relative Size of a Fourteen-inch Projectile.



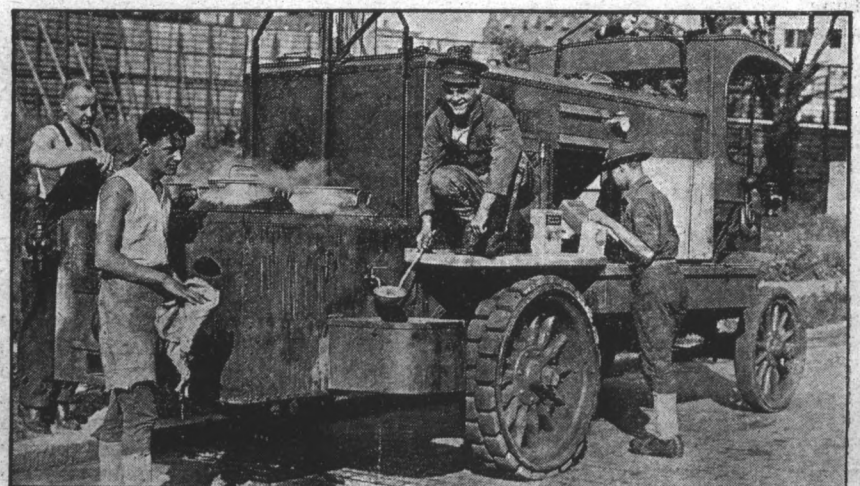
Sahara Desert About Guemor Photographed from an Aeroplane.



British Infantry, Cavalry and Tank Ready for Another Drive.



Logs from the West to Build Merchant Ships and Army Cantonments.



Army Motor Kitchen Provided with Refrigerator, Storeroom, Oven and Range.

Copyright by Underwood & Underwood, New York

you say to sending me down there for a while? I'd like nothing better than helping with that old crane for a week or ten days."

"Never would do." His father shook his head. "Walton wouldn't want you on the job."

"He needn't know who I am," said Jack, "just send me down as a new man. If I don't make good, take me off."

"Well, all right. Report in the morning for the muddiest time of your life. Let's see what you've got."

Jack was on hand at the cut at an early hour the next morning.

"I'm to take the place of the man who left yesterday," he informed the engineer.

"Just give me a little practice in handling the crane, I want to see how it goes."

The engineer looked him over. "Pretty green stuff to send us," was his comment. But he put the lad to work, nevertheless.

"It is a tough job, all right," Jack said that night to his father. "But I don't think the men quit because it's muddy and sticky. There's another reason."

"What's that?" came the quick question. "Doesn't Walton treat them all right?"

"Walton's O. K." said Jack. "He didn't know me, but he gave me plenty of attention. He said he was glad to have me there and hoped I'd stay. I think he's a brick. The men all like him too. They quit because they're afraid of the cut."

"What do you mean?" asked the contractor. "Afraid of the cut?"

"Yes," said Jack, "you see it's like this. That cut runs right along the side of the Berry Canal. The men are now working at least twenty feet below the water level. If that bank between the cut and the canal were to give way it would be mighty bad for the men! I heard two of the men talking about it yesterday."

"We've thought about that," returned Mr. Emory. "And we set a line of oak timbers clear along that side, before we began the work. I told Walton to watch it. I'll have a look at it myself in the morning. Glad you told me, Jack."

The contractor went down in the morning as he had promised Jack. He and Walton together went over the narrow strip of ground in question. The clay bank was six feet wide at the top, re-inforced by strong oak piles, and looked strong enough to resist any strain that might come from the canal side.

"I think it's safe," said Walton, "but it will bear watching."

"Keep an eye on it, and at the first indication of danger get the men out of the cut," said the contractor. "Men first is the rule."

Early that afternoon Walton had additional ladders put down on all sides of the cut.

"It's a safe thing to do, anyhow," he said, and was pleased that the men on the job seemed less relentless for the balance of the day.

The following day was bright and warm with a clear sky. The work began as usual with fifty or more men in the cut. Along the side of the excavation a steady stream of wagons moved. They came empty and went away filled, the arm of the great crane working with precision under the direction of Thomas. Up and down the bucket swung, each time bringing up its full measure of loosened earth.

Walton took advantage of the fair day to lower as rapidly as possible the floor of the cut in a particularly bad place near the upper end. At four o'clock a strip twenty feet wide across that end had been put down ten feet below the rest of the bottom, and thirty men were working there. So smoothly had everything gone that day that all, from foreman to the latest

man on the job, were apparently happy over the amount of work done.

Walton came over to the engineer and said:

"Thomas, you are in charge from now until quitting time. I want to go up to the office. Keep them going."

"You'll be an engineer, some day," he said as he passed Jack.

The work went on for half an hour longer with undiminished speed, and Jack in a moment's pause, walked over to the canal side. As he glanced along the embankment he thought of former fears on the part of the men and was glad nothing had come from them. Turning back a little later his attention was drawn to the passing craft in the river, forty rods down, where the water of the canal merged with the main course.

As he looked a coal barge with a heavy load sheered in toward the canal and came slowly up on its way to the coal docks above. A black cloud of smoke floated slowly along, keeping pace with the heavy craft. It was by no means a novel sight to Jack, and he could not afterward tell why he watched it with intense interest, even failing to hear Thomas as he called him back to duty.

As the barge came up a private yacht swung over to the opposite side of the canal and Jack saw that the coal boat would pass close to the embankment of the cut. Its displacement sent a heavy swell lapping along the side of the canal and when opposite the cut this was so high that its top went over into the digging. Involuntarily all hands stopped work and some of the men started for the ladders. Down in the lower level at the end of the cut, almost out of Jack's sight, the men waited for the next descent of the bucket, and wondered why it was delayed.

Noting the nearness of the barge Jack megaphoned his hands and shouted to the master on the vessel's bridge and motioned him to swing out into the stream. The big ship turned slowly and headed over. As she did so her stern swung in close to the embankment. Closer and closer she came, her hull towering like a house above the workers in the cut.

"Keep off! Keep off!" shouted Jack, and Thomas, now alive to the danger, raved at the captain.

Too late! With a grinding crash the stern of the barge struck the bank a hundred feet away from where Jack stood. Its massive weight crumpled the oak posts like so many straws and ripped open the bank for thirty feet.

The barge forged ahead and as it did so a deluge of water poured over and through the opening, the swell from the big boat, six feet deep, surging in like the waters of a mill-race.

The twenty men on the floor of the cut dropped tools and raced for the ladders. They gained them and Jack watched as they fought for chances to struggle up to safety.

Then he caught sight of the men down on the lower level. There were thirty of them, and alarmed at the noise of the crash and the voices of their companions, they, too, rushed for

higher ground. But those who gained the edge of the narrow pit deepened by the day's labor, were met by a rush of muddy water which swept them off their feet and back against the end of the cut. On the slippery floor of clay not a man could reach the ladders along the side, and those at the ends had been taken away to facilitate the afternoon's work.

A panic seized them. Some clawed desperately at the clay bank. Others shouted to men on the bank above. With fruitless and frantic efforts they pushed and stumbled as the water swirled down upon them, and Jack groaned as he saw a man flounder and then fall.

"They'll be drowned like rats in a trap!" shouted Thomas as he realized the danger. He shook his fist at the master of the barge, who was bringing his ship to a stop over in the canal.

"He's lowering a boat!" he cried to Jack. "Fine help a boat will be to us."

Jack turned as the ship's boat struck the water and sped over toward the break in the embankment. It gave him a moment's hope, but only a moment, as he surveyed the fall of twenty feet necessary to reach the water in the cut. No boat could pass through the cataract at the gap and be of any service afterward.

The mate in charge of the boat took one look, backed away, and pulled toward Jack.

"I can't get through!" he shouted to Jack.

Then the inspiration came to Jack that saved the lives of thirty men.

"We'll hoist you over!" he said as the oars bumped against the bank. "Catch our ropes and fasten them in the blocks at the ends of your boat!" Already, with almost lightning speed, he had dashed over to Thomas.

"Swing the crane over here!" he prompted. "We'll put the ship's boat over into the cut!"

Thomas never worked faster in his life. The engine snorted, the drums whirled, the cables screamed as the great arm swung over to the canal side.

As the bucket struck the ground Jack leaped up and, unhooking the swinging handle, threw into the hook a coil of rope. The ends he threw to the men in the boat. A moment later he signalled Thomas, "Lift!"

The boat bumped along the oak piles as the drums were reversed and the cable strained up.

"Swing!" and the boat swung off into space and poised an instant over the cut.

"Lower!" said Jack, and down it sank.

"Steady!" he signalled as he bent out over the bank, and the boat came to rest beside the imperiled men.

The mate and his men did the rest. They caught the hands of struggling men and pulled them in one by one. They got them to a man, hauling the last one, water soaked and gasping, to safety, amid the cheers of all.

"You saved me some unpleasant advertising Jack!" said Mr. Emory, that night. "I'm glad I took you on!"

disappointment and chagrin made her ill. But again her elastic nature came to her rescue and she rallied once more. This time she wandered off to a distant creek as the weather had become warmer, and began making her nest of dried grass and leaves. This was in an old wheat field. Here she found sufficient grain to live upon and water was close at hand. Being so charmingly located her responsive temperament made her so happy that she could scarcely refrain from cackling most of the time. Hopeful and elated beyond measure, she began business with renewed courage, and succeeded in hatching a nest full of fine chicks. While some were hardly escaped from the shell and others were not fully dry, she thought to rest herself for a moment by taking a short stroll. But alas! on her return she found that a bloodthirsty weasel or mink had devoured all.

Now she was actually prostrated, but when able to reach the barnyard she sought out a quiet old Plymouth Rock who had the reputation of being both wise and comforting. She certainly was so calm and complacent in appearance that naturally she would attract one like White Leghorn whose temperament needed a more reposeful one to rest upon. Besides that, she was much superior to herself in age and experience and bore the name of being an excellent counselor.

One by one, and with dramatic effect Mistress Leghorn related her troubles. But what was her surprise and chagrin to find that at every turn she was confronted with, Eggsactly, eggsactly, my dear. That was nothing at all. I have been through more sieges than that. Your temperament magnifies your ills. Cultivate composure and look on the bright side like myself."

Just here a couple of schoolboys passed through the barnyard. "I wonder what a philosopher is," said one. "Well," replied the other, "I don't know, only what I have heard Aunt Martha say, 'A philosopher is a person who bears other people's troubles with fortitude.'"

"You certainly belong to that cult," said White Leghorn, and turning her back on her consoler she walked away.

The Robin and the Worm

By ROSE COLEMAN

THE theory has lately been advanced by some prominent ornithologists that the success of the robin in extracting the earthworm is due to a keenly developed sense of hearing. Careful observance of the bird's method of procedure seems to make the theory plausible. Watch the robin as he hops quietly about on the lawn. He stops, turns his head to one side as though listening, hops on a short distance, stops and listens again. Suddenly he breaks into the soil with a few swift strokes of his stout beak, and immediately drags forth the unfortunate victim. It may take the robin several minutes to locate the work, he may do it in one minute or less. One careful observer claims to have seen a single robin take from the soil ten worms and feed them to a nest of young birds in a nearby tree, the process consuming not over ten minutes.

Part of the earthworm's work consists in burrowing out, with his specially constructed body, millions of small tunnels in the earth, and when he, in passing through the tunnels, or in burrowing out fresh ones, comes near enough the surface of the ground to be detected by the robin, he is in great danger of losing a part, if not all, of his body. Since it is believed to be impossible for the robin to see the worm in his underground activities, and since the bird's method bespeaks an absolute certainty of the worm's whereabouts, it naturally follows that he must depend on his auditory nerves to determine with such accuracy the lodging place of the small tunnel.

Little Farm Fables--By AUNT QUILLIA

MADAM WHITE LEGHORN was fair to look upon. Slight of build, sensitive, highly organized was madam, it is true, but that is said to be characteristic of the nervous or mental temperament, through which, phrenologists claim, most of the fine work of the world is accomplished.

It goes without saying that she was restless, eager, and always in a hurry. She ate faster than others, flew more rapidly over fences, and was the first to see when a hawk darkened the horizon.

One spring she set about housekeeping long before any other hen had

thought of it. Stealing her nest she began laying before the first of March, but when she had laid a dozen eggs a blizzard came on and froze every one. This disappointment quite unnerved her and made her really ill for a few days. True to her nature, however, she soon rallied and selecting a warmer spot in the barn began again.

She had just completed her full quota of eggs and had commenced sitting, when one evening, having left her nest for a drink of water, a couple of greedy barn cats laid hold and sucked the whole lot.

Upon her return she nearly collapsed at being thus outwitted. Again

"Contraband" RANDALL PARRISH

It was a pleasant hour we passed at the table, Leayord relieving Olson, but the girl and I lingering in rather idle conversation. She had learned, from Dade I presume, something of Bascom's present condition, and I felt obliged to answer her questions frankly, although I excused the man as much as possible, and led the talk into happier channels. However, she told us more of his history and family, relating in some detail her former acquaintance. The conversation drifted idly, and, when assured that Dade was safely beyond earshot, we spoke briefly of our plans and outlined our future. Even Leayord had lost his suspicion of the men forward, and expressed his belief that our voyage would be without further serious internal trouble. I gave him instructions to change the vessel's course, and order an increase of speed when he returned to take charge of the deck, and a few moments later noted with satisfaction that the tell-tale compass overhead indicated that we were headed straight into the north, and could feel the throbbing of the engines, and straining of the hull as we raced forward.

In spite of the pleasant day, and that the sun was still visible in the western sky, the air on deck was chill, and I returned below for a heavier coat, and also brought back with me a cloak belonging to the late commander with which to protect Miss Carrington. She laughed gaily as I wrapt it about her shoulders, for it was an old-fashioned garment, evidently picked up in some foreign port, and retained as a curiosity, but its warmth was welcome. The evening was a beautiful one, the sky clear, the sea calm, except for the long ocean swell. But for a faint trail of smoke far to the westward, barely visible as the sun sank below the horizon, no evidence was discernible of any other vessel in the wide circle. I hailed the lookout in the maintop, but the wisp of smoke was too far away for his eyes to determine the course of the distant steamer, although as he swept his glasses a bit farther northward, they became fixed and motionless. As I stared up at him, his voice reported:

"Sail ho!"

"Where away?"

"About three points off the port bow sir—a schooner's topsail."

"Very well, keep her in sight—a fishing vessel likely."

Leayord leaned over the poop rail.

"Shall I change the course, sir? She might prove something we wouldn't care to meet."

"Certainly not; we'll not attempt to dodge every fishing smack, and if that steamer is heading this way, we will be miles to the north before she reaches these waters. What is our rate now?"

"About seventeen knots, sir."

"Masters is getting the best he can out of the engines, I presume?"

"The old hooker has never done much better to my knowledge, sir. She never was no grayhound, but maybe, with the wind from that quarter, the sails might be trimmed to help 'some.'"

"The experiment is worth trying, Mr. Leayord. Send Olson forward."

"Aye, aye, sir."

Both watches were on deck, clustered in a restless bunch before the fore-castle, or overhanging the rail, evidently deeply interested in observing our efforts to get all possible speed out of the Indian Chief. The fading light gave me glimpse of their faces, and I noticed that both Liverpool and White were circulating freely from group to group. However, the men

responded readily enough to Olson's orders, and sang cheerily as they tailed onto the ropes, Liverpool himself leading the way up the ratlines and out upon the mainyard as they sheeted home. The job was rather smartly done, and the canvas bellied out so stiffly that I suspected there was more wind aloft than was felt on deck. Olson remained forward, and we could hear his voice assigning the men to various tasks as they returned to the deck.

"Is that all, sir?" asked Leayord from above.

"All at present; very smartly done at that; not a bad crew now they're sober."

"There are sailormen among 'em, sir. Shall I send the port watch below now?"

"Not yet; Mr. Olson seems to be finding work for all hands, and they are better off kept busy. Perhaps the ship would ride easier, Mr. Leayord, if you let her head off a point—there is some danger of straining the steering gear."

"Aye, aye, sir—let her off a point, Carlson; easy now."

The stars began to pop out in the arch of sky above, silvering the waters, and we could no longer perceive what was taking place forward. The night shades settled about us, and the staunch Indian Chief drove her sharp bows through the black waste of sea in a race to cross the zone of danger before coming of another dawn. Apparently everything was in our favor, and I stood there, leaning against the rail, chatting with Miss Vera, our conversation drifting idly. Darkness shadowed us, with only a bit of deck revealed by the faint light streaming through the glass of the companion. The riding lamps were lit, as I preferred to take chances, assured that we were alone in that expanse of ocean. Things grew quiet forward, and Olson returned aft, pausing a moment to report to me, before clambering up the ladder to rejoin Leayord.

It must have been after nine when the girl left, complaining of being chilled even in the protection of the great cloak. I crossed the deck with her to the head of the stairs, and our hands clasped as we lingered there a moment, the dim light revealing her face uplifted toward mine.

"Your are not going below, then, Mr. Hollis?" she questioned. "Surely all goes well?"

"So remarkably well," I admitted, "as to rather puzzle me. No, I shall remain on deck until morning; not that I really anticipate trouble, but the entire responsibility rests with me."

"You do not feel that your officers are efficient?"

"Only within their limits of knowledge. I like the men, and trust them, but at that they are only promoted from before the mast in an emergency. Neither possess any real knowledge of seamanship. You can go to your berth and go to sleep, Miss Vera, assured that the ship will be in safe hands."

"I know it will, if you remain on deck," she answered earnestly. "I—I have learned to trust you."

"In seamanship?" I asked bantering-ly. "Why my ability in that line has scarcely been tested as yet."

"I do not mean seamanship altogether. Yet I have had experience enough at sea to recognize a sailor. But it is in everything I trust you, Mr. Hollis. Really I—I think I have felt that way from the first."

"On the Esmeralda?"

"Yes, even then. That was only a lark, a joke, and I had to keep hidden until the right moment. I did not avoid

you from any lack of faith in your discretion—but to remove you from temptation."

"Very nicely put; but the real temptation was not to reveal your presence on board."

"You confessed you questioned my father."

"True, yet in a most indirect manner. My sole object was to keep your discovery to myself."

"Isn't that foolish! I have heard of you before, Mr. Hollis, but never as a lady's man."

"Yet surely I am not so old as to be exempt. No doubt my gray hairs—"

"Oh, have you any?"

"You pretend not to notice, but I am quite well aware of their existence myself. Probably deep down in your consciousness I am considered almost an antediluvian."

"Why? Am I such a child?"

"The point of view, you know. You are young enough so that fifteen years must seem to you an age."

"Are you fifteen years older than I?"

"I suspect as much, and the thought of what that must mean to you is—well, almost embarrassing."

She laughed, withdrawing her hand from mine, and resting it on the stair rail.

"Why, really I never once thought of that. Do you know I have not associated very much with those of my own age, so, perhaps, I fail to realize that a few years constitute a barrier. You—you have been so nice to me, Mr. Hollis, I have never noticed a single gray hair."

"Nevertheless they are there to be seen."

"I do not care, sir! If you were as gray as my father you would be just the same man you are to me." She hesitated, as though suddenly realizing that she was speaking very freely. "Perhaps I venture too far, but we did not meet in a drawing-room; there are no strict social rules out here to prevent my speaking the truth. You have served me, Mr. Hollis; you are serving me now, and I am grateful. I do not want you to think of me as a silly girl; I am a woman, and I feel and think as a woman."

"Did I appear to imply otherwise?"

"I thought, perhaps, you did. It may have been all imagination, but it has seemed to me that your whole manner has changed since you learned that I was Vera Carrington. When you considered me a mere nameless waif, a stowaway on the yacht, you were a thoroughly good fellow. We talked then with no constraint between us; we were just ourselves. Why should there be a difference?"

"You are Miss Carrington?"

"Well, what of it!" indignantly. "Is that going to rob me all my life of my freedom to be a real woman? Believe me, I get enough of that sort of thing ashore. What good are my father's millions out here, or my social position in New York? You did not save me from the sinking Esmeralda because I was Gerald Carrington's daughter."

"I do not mean to displease you," I said earnestly. "Surely you cannot consider me a snob, or any mere worshipper of wealth."

"No, I do not. You err the other way. You are so afraid that I might imagine you were interested in me because of these things, that you fail to be natural. You liked me on the Esmeralda, and when we were adrift in the boat?"

"I certainly did."

"You were not afraid to show it, or ashamed to let me realize. Now you are. Yet, Mr. Hollis, I am exactly the same woman. I am alone on this ship, dependent entirely upon your courtesy. The circumstances do not justify any misunderstanding between us; certainly no silly barriers of social rank, or wealth. I want the old friendship of the open boat, when I was merely Miss Vera to you—a waif of the sea. I—I

cannot explain what I mean, but—but this sort of thing maddens me."

I endeavored to answer, to stop her, but, before I could do either, she had flung open the companion door and ran down the stairs. The next moment, without even glancing about, the girl vanished within her stateroom.

I stared down into the dimly lighted, deserted cabin, startled by her impetuous words, her sudden disappearance. I had not previously realized that my actions toward her had so noticeably changed. I wanted to tell her so, and even took a step downward with the purpose of rapping at her closed door, yet conquered the inclination, and returned to the open deck. I could serve her best there; and tomorrow—tomorrow she should be made to know the depth of my interest. Never until then as I stood there alone, gazing out across the rail over the black sea, the memory of her face before me, did I grasp the influence she had upon me. Into the very depths of my being her words cut, and brought pain and joy.

CHAPTER XXI.

In the Hands of the Crew.

THE hours of the night gave me ample opportunity for thought, and careful consideration. The wind held steady, and while the sea roughened somewhat this slight change was not sufficient to diminish our progress, or cause any swerving from the course set. All remained quit forward, the watch on deck finding little to do other than their routine duties, and no member of the crew had any occasion to come aft, except those detailed to the wheel. There seemed no reason why I should remain on deck, as Leayord and Olson proved themselves thoroughly competent in handling the vessel, yet the responsibility rested upon me, and the importance of the night's run prevented my having any wish to retire below. However, I found no occasion to interfere with the operation of the ship, and remained mostly on the main deck, where my watchfulness assured me there was no communication passed between fore-castle and cabin.

Only twice during the night did we have evidence that we were traversing the steamer lane. Once a light shot out over our starboard quarter, but so far away as to give us no uneasiness. Again and again I watched it flash along the sky, possibly the reflection of some distant searchlight on a man-of-war, but, at last, even this vanished as we swept steadily forward into the north. Some considerable time after midnight the lights of a steamer east-bound appeared off our port bow, and we hushed our engines, barely holding steerage-way, until the great liner passed us at full speed, her ports darkened, appearing the merest gray shadow as she swept between us and the dim line of horizon. The officer on her bridge may have had a phantom glimpse of our outlines, for her siren suddenly shrieked a wild challenge across the black water. But there was no slackening of speed, and, within a few moments, the last glimmer of light disappeared, and we had resumed our course, with engines at full speed. Olson, on watch, leaned over the rail, and spoke to me on the main deck below.

"A Cunard liner, sir."

"That would be my guess, Mr. Olson; which proves that we are on the northern edge of the steamer lane. They had a glimpse of us."

"I doubt if they were quite sure, sir. A lookout saw our shadow, but they took no chances. They'll argue about it all day to morrow on those decks."

"Ay, and no doubt report a narrow escape from a German raider, in the log. Perhaps they are sending the news wireless now."

"It wouldn't have to travel far, sir. There's a warship somewhere out yon-

der—did you see the searchlight an hour ago?"

"Yes; but we ought to have the fellow hull down before daylight; we must be doing eighteen or nineteen knots now."

"All o' that, sir; an' if you notice it's mistin' up a bit."

This was true enough, as I verified by a trip to the port rail, and the fog grew steadily more dense, until at dawn we were steaming recklessly through a thick cloud of vapor, barely able to observe the surface of the sea, dull, sodden gray, a few yards in advance of our bow. The dense, watery folds swept along our sides, and the rigging dripped moisture onto the glistening deck planks. It was a gloomy, dreary morning enough, and, even as the light of early dawn strengthened, I could scarcely distinguish a thing forward of the main mast. However, there was no slowing up of speed, or sounding of siren. Convinced that we were now safely to the north of the usual course of ships, I preferred to take the chance of possible collision. The remembrance of that warship to the southwest, and of the wireless message which might have been sent out from the suspicious Cunarder, urged me to accept the unknown danger lurking amid the gloom ahead, rather than chance the more certain peril hovering astern. Silently, without a light glimmering, at the extreme of our speed limit, the Indian Chief plunged headlong through the gray, butting the mist aside. Occasionally Leayord, on watch, hailed the lookout forward, and the response came echoing back, a mere thread of sound. But otherwise there was nothing to hear, or see. Even the sails were obscured, the lower yards a mere shadow, wreathed about by gray mist, while the boats hanging in the davits appeared shapeless and grotesque.

My eyes were heavy from lack of sleep, and long staring out through the black night; my senses dulled by hours of inaction, during which nothing unusual had occurred to arouse me to a realization of impending danger. I no longer even suspected trouble, or any active hostility forward. If mutiny was being considered some symptoms would surely be apparent before now; an effort would have been made to communicate with McCann at least, and yet I was assured that no such attempt had been made. No one could have crossed that open space of deck unseen, either from fore-castle or cabin, and the light burning in the latter enabled me to see every foot of its interior. With the dawn the density of fog enwrapping us seemed to increase, and completely blot out every glimpse of sea and sky. Even Leayord leaning over the rail just above me, could scarcely be distinguished as a man, and evidently his eyes could not make me out at all, for he hailed doubtfully:

"Are you still on deck, Mr. Hollis?"

"Yes," I answered, staring up at his shadow. "A bad fog."

"It is, sir. Would we better reduce speed? It's a blind gamble what may be ahead of us."

"No, not yet; I am counting on open water, and would rather chance striking a stray, than risk being overhauled by a British cruiser. The sun will split this mist before noon, and meanwhile we must make all the northing possible. There is no storm brewing?"

"I think not, sir; the glass registered fair when I came on watch."

"I know; I looked at it myself an hour ago. We'll hold on then just as we are for the present. If my figures are right there ought not to be a ship yonder for five hundred miles."

"There's likely to be floating ice, sir."

"Scarcely so far down at this time of year, Mr. Leayord, and the drift would be nearer the Newfoundland Coast. We are well to the east of that

danger. I'll go forward, and have a word with the lookout."

I heard his "aye, aye, sir," as I crossed to the port rail. The vessel plunged a little in the roll of the waves, making a handhold safer when one could scarcely see a yard ahead, and the deck underfoot was slippery with moisture. I had reached a point nearly opposite the broken stump of the foremast, when I was suddenly confronted by two blurred figures, emerging noiselessly from the deeper shadow cast by a quarter boat swinging in davits. The fellows must have known who I was, and the path of my approach; no doubt had been close enough aft to overhear my conversation with Leayord. At least they were on me almost before I truly realized their near presence—the one gripping the arm I flung up in startled defense; the other driving his fist straight into my face, a sledge hammer blow which sent me crashing back full length on the deck. Stunned, dazed as I was by this vicious attack, I made an instant's struggle, but was quickly crushed back, a merciless hand gripping my throat. Almost at the same moment the revolver was removed from my pocket, the cold muzzle thrust against my cheek.

"Lie still," muttered a tense voice, and I knew the speaker for Jim White, "or I'll blow the whole top o' yer head off."

I retained sense enough to obey, White's knee pinning me to the deck, but some sound of my fall must have carried aft, for Leayord sung out through the fog:

"Forward there! What's all that racket about?"

White's fingers choked me into helpless silence, his knee crunching hard into my breast. It was Liverpool Red who answered sullenly:

"I knocked over a capstan bar, sir; never saw it in the bloomin' fog."

Leayord growled something, the words failing to carry to us against the wind, but a moment later, satisfied that no further investigation was to be made, Liverpool thrust White aside, and lifted me to my feet, his eyes glaring into mine.

"One whimper from you, an' yer overboard," he muttered hoarsely. "Take it from me we know what we're about. Come on now, an' don't attempt nuthin'. There's nobody forard here ter give yer a hand. Take him by the collar, Jim."

With White's hand gripping me, and my own revolver at my head, any attempt to break away would have been simply suicide. The thick fog hid the scene from those on watch aft, and that the two men were reckless and desperate, their plans well laid, was evident. The gray light revealed their faces, and there was no mercy in the scowling eyes.

"Forward yer go, sir!" growled White, his fingers twisted in the jacket collar. "It's little more yer'l have ter say aboard this hooker."

"What do you propose doing? This is mutiny, men."

"To h—I with the mutiny. It's war, an' we're Englishmen; this ship's loaded with war stuffs, bound fer Germany. That sort o' talk means nuthin—so come on, and stow the gaff."

They forced me around the bulk of the windlass to the head of the fore-castle steps, slid back the door in its grooves, thrust me staggering down into the murky depths below. A slush light, swinging to a blackened beam in the deck above, cast a ghastly yellowish glare over the interior, revealing to me at least two-thirds of the crew, clustered about, evidently awaiting some such event. Hairy faces peered out from bunks, and men were sprawled about on boxes and the deck. The place was damp and smelly, the odor of oil mingling with bilge water, and sodden clothing clinging swinging to wooden hooks on the side walls. For an instant the dirt and filth, com-

bined with sharp swaying of the vessel under foot, almost sickened me, and I grasped the upright of a berth to keep erect, my eyes seeking to distinguish the faces, rendered scarcely visible by the miserable light. White held to my collar, but Liverpool closed the entrance, shutting out even that faint breath of pure air, before speaking a word.

"Well, we've got the main guy, lads, an' no shindy," he said cheerfully, "an' a gun came with him. Now a few o' us will see if we can persuade the first mate into taking a trip forward."

"Where's Billy Olson?" asked a voice.

"Oh, he's asleep below; there's lots o' time to attend to him, an' we'll let the engine-room gang alone till we get control o' the deck. Simms, you an' Harris better come along with Jim an' me on this job. Leayord is a husky buck, an' we might not get him foul like we caught Hollis here. We don't want to hurt nobody unless we have to. Where's the nigger, Watson?"

"Right hyar, sar."

"Come on, then; it's your trick at the wheel in five minutes; the rest o' you fellers know yer business."

The five men slipped out cautiously, sliding the door shut behind them, and I stared about into the faces of those left with me, still dazed by the rough handling to which I had been subjected, yet fully aroused to the fact that the attack on me had come from no sudden impulse, but was the first step in a carefully formed plan to gain possession of the ship. Whatever might be the secret purpose of those leading the revolt, their first intention was to overpower the officers, and attain control. My duty was to warn the men aft of the approaching danger. How should I act? What possible course could I pursue to win my liberty? In a vague way I knew most of the faces of those grouped about me, but could recall only a few names. They were a rough lot, typical foremast hands, many of them of pronounced foreign appearance, yet there was nothing especially vicious about them. Ordinarily they would obey orders without a complaint, but now they were evidently under full control of their leaders; yet the expression of their faces bespoke curiosity rather than hatred. Determined to test them I straightened up, and placed a foot on the lower step.

"None o' that now," a voice growled as a hand gripped my arm. "Turn him around, Bill, so he won't be tempted none to make a fool o' himself. Now, Mister, you don't want ter git hurt, do yer?"

I faced the speaker, a big two-fisted giant with a red face, and a slow drawl in his voice.

"You mean to hold me here?"

"Sure; we've gone too far on this job now fer to back down. The lads are off ter bag the first mate. Thar'd be a fine time if we turned you loose."

"You're an Irishman?"

"'Twould be hard for a Dugan to deny that, sor."

"Well, Dugan, yook here—you and your mates. You are sailormen, and know the rules of the sea. This is mutiny, and a mighty serious affair to be caught in, lads."

"We're not lookin' at it that way. Mister Hollis. We shipped fer a peaceful voyage, not to run no cargo o' contraband fer the Dutch. This yere Indian Chief is chock full o' munitions o' war—ain't that the truth, sor?"

"Yes," I admitted, "but shipped before war was declared. The sick man back there in the cabin has his whole fortune in this venture."

"What do we care fer him, an' his fortune. The point is, we're not Dutchmen, an' in wartimes it's no mutiny fer a crew to capture an enemy's ship."

"Who told you that?"

"Never mind who told us; it's the truth, ain't it?"

"Under some circumstances it might

be," I said, casting my eyes about the ring of faces. "But the present conditions do not justify any such action. Now look here, Dugan; you fellows are in a mighty bad boat in this matter. You're merchant seamen; you've signed on, for a peaceful voyage, and it is no business of yours what's below hatches. That's for the warships to find out. The Indian Chief is under American register. She's a neutral boat, and your act is mutiny on the high seas. You know what that will mean to you, and your mates, don't you, if you're ever caught?"

"Who says that?"

"I do; and I know more of sea law than any of those fools who are steering man on board here, and it is murder, ing you into this trouble. You kill a and the whole bunch of you can be made to swing for it. Men have got life for less than you have done now. But I'll give you a chance."

"What chance, sor?"

"To stand by the ship. Set me free now, and back up the officers in maintaining discipline aboard, and not one of your names goes into the log."

"An' sail the bloomin' hooker to Hamburg?"

"Of course; that's the port you signed on for."

There was an uneasy shuffling of feet, and a muttering of voices. The light was too poor to enable me to decipher the expressions on the faces of the men, yet I felt that my words were wasted. Dugan, however, voiced the prevailing sentiment.

"Not a one ov' us is fer makin' that voyage," he said, grimly. "So stow yer tongue, mate." He winked at me facetiously, then glanced about at the others. "There's bigger wages comin' to us now than ever we signed on for."

CHAPTER XXII.

Held a Prisoner.

THESE words, and the laughter with which they were greeted, made clear to my mind the whole truth of the uprising. It was not so much the destination of the ship, or the nature of our cargo, which accounted for the widespread spirit of mutiny aboard, as it was the McCann money. These other things had been used to influence the men, to convince them that they had a right to seize the vessel, and refuse to continue the voyage, but it was the glitter of the McCann gold which had won converts to this theory.

Liverpool and White were playing for high stakes, no doubt with a fixed sum offered for their services; perhaps had already been handed enough to scatter among the crew to inflame their passions. That would be easy, as no large sum would be necessary to induce them to repudiate a voyage already distasteful to the most of them. The sight of a little real money, coupled with the promise of more, would be sufficient to turn the trick. One thing was certain—no argument of mine, no threat of punishment, would have any present effect on the fellows. While there might be among them some who would listen to reason, this big Irish brute of a Dugan had control, and he could only be overcome by physical force.

There flashed through my mind a vision of what was already occurring on deck—the five men creeping silently aft through the fog until they attained the nearest sopt possible without being observed by Leayord. Of the negro climbing the side-ladder, ostensibly to take his trick at the wheel, the first mate never suspecting any other purpose in his approach. No doubt the other wheelsman was in the plot, and stood ready to give a hand, and it was quite likely Watson would have my revolver hidden in his shirt. At the first sign of action the four men below would swarm up the ladder, and Leayord, taken completely by surprise, a gun at his head, would be in their

power before he could strike a blow, or sound an alarm.

The very thought maddened me, drove me to desperation. We had been outwitted, completely deceived. The one, and only hope, lay in my escape; in my raising an alarm in sufficient time to warn Leayord of danger. He was a fighting man, and armed; one cry would put him on his guard, and his position on the poop would enable him to put up a strong defense. These thoughts flashed through my mind as I stood there, staring into Dugan's face. I dared not glance about, or seem to harbor any plan of escape, yet I knew that all was clear between me and the three steps leading to the deck, and that the sliding door was not hooked. The fellows were gathered closely about us in a half circle, Dugan alone being within reach of my arm. The only weapon I saw was a sea boot beside a chest to the right. The fellow must have felt some vague glimmer of my purpose, for he gripped my shoulder, his iron fingers pinching the flesh.

"None o' that now," hoarsely. "You can't fight the whole—"

I struck him with all the force I could throw into the swift blow, and he went staggering back into the ring of men, his hands clawing at the air. But for their bodies the fellow would have measured his length on the deck. The force of his fall, the unexpected suddenness of it, for the instant stunned the others, and gained me opportunity. With one leap I had the heavy boot in my hand, and swung it crashing against the face of the fellow between me and the lower step. He went over like a stricken bullock. A hand gripped for me, but missed its hold; there was a roar of anger, a rush of bodies, and above all other sounds Dugan's voice howling madly:

"Stop him, yer tarriers! Crack him on ther head."

I stumbled over the body on the lower step, yet had reached the door, before the first man gripped my leg. I broke loose from his fingers, yet the instant of delay blocked escape. They were on me, their faces barely visible in the dim light, and I fronted them, fighting for life, striking fiercely with the great sea boot, its ironed heel a terrible weapon. Twice men fell, but there were too many of them, nor could I protect my rear. They swarmed to either side, and clambered up behind me; the low beams of the upper deck permitting no swing to my arms; one fellow gripped my feet, and another leaped at my throat. I was tripped, and flung headlong, the full weight of a man's body crashing down on top of me. Then came oblivion.

How long I remained unconscious I never knew, but it must have been some hours, for when I struggled back to a vague sense of life once more I was alone, lying on a mattress in a bunk. It was with a decided effort of will that I succeeded in opening my eyes, although I had been conscious for some time of the steady pulsations of the engines, and the rising and falling of the vessel, as though we were combatting a heavy sea. My head throbbed with pain, and I managed to lift one hand, assuring myself that my hair was matted with blood. I felt drowsy, dazed, scarcely interested; nor could I for the moment recall exactly what had occurred. Where was I? Had I met with some accident? It was only gradually that the vision began to reflect upon my mind—the attack on deck; the struggle in the fore-castle, and then Vera Carrington. It was her face, her memory which aroused life, and gave me back the strength to struggle. The fate of the ship was of small importance to me, but the girl left alone and helpless among these ruffians, was a thought so filled with horror as to draw me back from the very gates of death. What had hap-

pened? Was the Indian Chief already in the control of the mutineers? How long had I been lying here unconscious, and where were we in the great solitude of ocean?

I forced my eyes open, finding at first the light blinding, and for an instant stared up through a red mist. Gradually normal sight came back, and I realized that I rested in a bunk, gazing upward at the white-painted bottom of another. There was a splash of sunshine on the side wall, and I slowly turned my head toward the open port through which it streamed. Then I knew where I was lying—in the captain's stateroom. Why had I been brought there? What object could those villains have for giving me these quarters if they were really in control of the ship? Perhaps they were not; perhaps Leayord and Olson had been warned of danger in time to overcome them, and still retained command. That would account for my presence—but, if this was true, why was I left alone, uncared for? I could not reconcile myself to be thought that the girl would fail to be beside me if she was free. I had served her, and she was not the kind to desert a friend. And she was my friend; if nothing more I could at least claim, and rely upon her friendship.

Then what? I must be a prisoner, helpless, left alone to recover, or die, however the affair terminated. No, hardly that. No doubt the fellows knew that my wounds were not mortal; that I had received merely bodily blows and would return to consciousness without aid. But why had they brought me here? Gradually the conception of their purpose dawned—a navigator; the need of a navigator. Without me they were helpless; without my knowledge and skill not one on board could tell where they were, or how to shape the course of the vessel. I was a necessity to them; in a way I held the villains still in my power; they dare not let me die—not yet! I cannot explain the new life this thought brought to me. I seemed to feel the strength of it injected into my veins, and I rose up on one elbow, and then, encouraged by this effort, swung my feet over the edge of the bunk, and rested them on the deck. The hands of my watch told me it was after eleven, and, through the port hole, I could see the great green surges, their crests tipped with white spray glistening in the sun. The early fog had vanished, and the sky was deep blue. Nothing in the stateroom appeared disturbed, but occasionally I could hear the crunch of a heavy foot overhead on the deck. I got to my feet, clinging to the berth, and swaying weakly at first, but gaining strength with every movement. The chart still lay on the deck, our course pricked on it up until noon of the day before, and the telltale compass told me the ship's bow was still pointed northward. I clawed my way across to the door, and tugged at the latch. It was locked.

This discovery vanished the least doubt. The men had won, and were in full possession. Whatever had been the fate of the others, of Leayord, Olson, Masters, Bascom, or any remaining loyal; whether they were dead or alive, they had been rendered helpless. Fergus McCann was in control by virtue of his money, and his chosen lieutenants were Liverpool Red and Jim White. What their object might prove to be remained to be learned; but they must seek some obscure port, or some safe spot for shipwreck, sacrificing everything else to their own safety—and to accomplish this they must use me. Lord! I gripped that idea strongly enough, my brain clearing as I realized the important part I must still assume in this odd sea tragedy. Perhaps I could not save the Indian Chief, but there was hope yet that I might be instrumental in preserving the lives of those whom my carelessness had im-

periled. It would have to be wit I must rely upon—not weapons, or physical strength. I must meet these scheming villains with a clear head, and a carefully thought out plan.

There was water in the chocks of the iron wash stand, and I bathed my face, scrubbing as best I could the congealed blood from my hair. The wound on my head had bled freely, but was not serious, and the application of cold water lessened the pain, and helped to restore my faculties. A fine breeze swept in through the open port, and I sat down on a stool to gather together in my mind every detail which might prove of future value. I was still sitting there, but by then alert and ready, when a key turned in the lock, and the door was cautiously opened. McCann's face appeared in the opening, but his eyes were upon the bunk, and he failed to observe me where I sat beyond the desk. He took a step within, still staring at the rumpled blankets, and I had a glimpse of the inflamed countenance of Liverpool just beyond his shoulder.

"Great scott!" he ejaculated in a startled voice. "The fellow's not here; he's got away!"

Red laughed, and pushed past, but still blocked the door with his great body.

"Got away! where could he have got to with the door locked? He's here all right."

I stood up and faced the two, the desk still between us, but took the precaution to grip the stool by one leg.

"I am certainly present," I said coldly, "if your reference is to me; but I advise you both to keep your distance. I'll brain the first man who attempts to lay hand on me."

Red must have felt the challenge of my words, and I could tell he was in liquor by the vivid flame of his face. An oath broke from his lips.

"You tried that before; 'twill pay yer to be civil now."

"There were some ragamuffins who tasted the weight of my blow," I answered, "and I only hope it may be your turn next, you dirty dog of a mutineer."

"You'll git no chance to ever break yer stool on me," he roared, jerking a revolver from his jacket. "Do yer see that? Well, we've got the ship—"

McCann grasped his sleeve.

"Let up on that, Red," he said shortly, his voice having a tone of command in it, which surprised me. "We didn't come here to beat up Hollis, but to talk with him. This is my game."

The other did not resist, only to mutter behind his teeth. The gun still glistened in his hand, but I felt no fear of the fellow, and returned the stool to the deck.

"Tell me what you mean, and be brief about it."

McCann's eyes met mine, and I read in them uncertainty. He was not yet quite sure that he had my measure; how far I would resist, or what form my opposition would take. Perhaps for the moment money did not seem to him quite so important a weapon as he had found it elsewhere.

"I'm sorry the crew beat you up the way they did," he began apologetically. "They are a rather rough set—"

"Don't waste your time over that," I interrupted in disgust. "I can deal with an out-and-out fighter, and still respect him, but your kind only engenders disgust. There is no love lost between us, Fergus McCann, so state your purpose plainly and without lying."

"All right, I will," he snapped, "and I'll put it straight enough this time to satisfy you. The only reason I don't let Liverpool kill you is that you are more valuable to me alive. I've hated some in my time, but there never was a cur I despised worse than I do you."

"Thanks," I said quietly, "I am honored."

(Continued next week).



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Woman and Her Needs

At Home and Elsewhere



Art In Its Various Forms

I UNDERSTAND it was Ruskin who discovered that art does not consist of pictures and statuary; that the artist is not necessarily one who makes either pictures or statues, but that art consists in putting ourselves into our work, whether the work be painting a picture or making a mixing bowl.

I do not remember that Ruskin went farther and said that the woman who made a fine loaf of bread, or canned beans and peas so they would keep indefinitely and be satisfactory in flavor is also an artist. But I know that were he here to be asked about the matter he would unhesitatingly say "Yes." He would go farther and apply the rule to every line of human endeavor. For art can find its expression in any form of work.

We had a cooking teacher in college who washed dishes like an artist, and, much to the disgust of some of the girls, insisted that they do likewise. There was a regular way to do it, certain towels for glass, others for silver, others for fine china, others for porcelain, and, of course, still others for pots and pans. Needless to say, there were two or three dishcloths, and no end of polishing and scrubbing. Some of the girls took kindly to the method, they were the artists. Others slighted their work as much as possible and sniffed at so much "puttering," but the girls who took pains didn't "just hate dishwashing." They actually enjoyed it. And their finished work showed that they did. No fear of putting a half-dried or greasy dish before company when those artists did the work. And contrariwise, those who half did the work hated to do it, and their work showed it. It fell far short of "blue ribbon" merit.

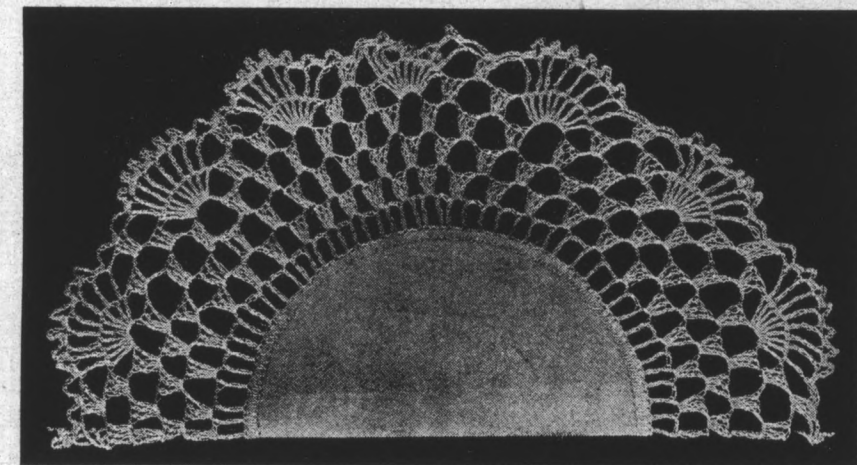
Have you ever noticed that good workers always love their work, and that men and women who are shiftless and slight their job always hate what they are doing? Perhaps they do not hate work as work; they may not be lazy. But the thing in hand evidently is not the task at which they can best express themselves. They are not artists in their profession, but merely inept copyists. Perhaps if they were given something else to do they might put themselves into it. And without a doubt if they put themselves into what they were doing, if they did not only their best but tried to do a little better than anyone else they would develop a liking for their task and in the end become artists.

That is why there are so many poor housekeepers today, so many women who do not like their chosen or appointed task. They do not put themselves into their work. Just plain housekeeping is so deadly prosaic. It is not half so fascinating as marching and organizing and lecturing and preaching and singing, or just, even just pleasuring. But it's ever so much more important. And it gives ten times as much opportunity to display one's talent as any of the other fields of labor outside of the arts strictly so-called.

What is more beautiful in color than a glass of currant jelly perfectly made? And isn't the brown of a "done to a turn" loaf of bread as "warm and de-

lightful" as any of the browns of woods and fields that artist folks rave about? Best of all, these works of art are useful aside from their aesthetic value. A slice of home-made bread, real butter and currant jelly is far more apt to lead a sinner to repentance, if he happens to be hungry, than a dozen poor copies of the Madonna.

There is an artistic way to make a bed. Who can not conjure up a vision of pleasant dreams at sight of a bed with sheets and coverlets smoothed free of wrinkles and neatly spread in place? I'll grant you that one can imagine nightmares, too, just by looking at a bed with coverings wrinkled and pulled awry, and pillows jammed down any old way. But the art dis-



Nine-inch Plate Doily.

played in the latter case would have to be classed as cubist.

Art is the expression of one's self through our work, broadly speaking. In that case, what sort of a self are you expressing? Is it one to be proud of, as revealed in perfectly done tasks, however simple? Or are you of the class who begin to make excuses when the Master Artist passes along to inspect your work?

DEBORAH.

LUNCHEON SET IN CROCHET.

Housewives very frequently hesitate about undertaking anything in the fancy work realm so seemingly pretentious as a crocheted luncheon set because of a lack of leisure time, much as they delight in the possession of such articles. The illustration shows a bread and butter plate doily from such a set which can be made in a comparatively short time, and without the close attention to detail which is necessitated by patterns requiring the counting of many stitches. The design is equally satisfactory for single pieces, and one of the very desirable features is the ease with which the pattern may be increased or diminished for any sized doily or centerpiece, the work being built up directly from the linen center. After the routine has been learned from one of the smaller doilies it will be an easy matter to continue with the others. For the little tumbler doilies, which should measure about six inches across, one or two rows of the triple crochet may be omitted. The centerpiece, which may be increased by a row or two of the triple crochet and an extra row of the long

treble scallops, should measure twenty-four inches. The plate doilies should measure twelve inches, and may have the same edge as the nine-inch size.

The illustrated doily measures nine inches in diameter, its linen center being four and a half inches across. This circle may be marked out with a compass or any circular object. Place the linen in the sewing machine, from which the thread has been removed, and stitch very close to its edge, using these holes through which to make single crochet stitches (sc sts) around the edge.

For the next row chain (ch) 5, and triple crochet (tc) 1 into the 2nd st in advance. Ch 2, tc 1 into 2nd st in advance again, and continue to do this all around the circle.

Third Row.—Ch 3, tc 2 into space between two of previous tc sts. Ch 2,

tc 3 into space between 2nd and 3rd tc sts in advance, and proceed to ch 2 and tc 3 between alternate tc sts round the entire circle.

Fourth Row. Make like the 3rd row, except that the tc sts are placed over the ch sts of former row, and 3 ch sts are made between each group.

Fifth Row.—Make the tc sts over the ch of previous row, using 3 ch between as before, except after every third group when a ch of 4 should be made.

Sixth Row.—Make 3 tc over each ch of 3, and 9 tc over each ch of 4, making a ch of 3 between groups of 3 only.

Seventh Row.—Crochet 3 tc over ch of 3 between groups; ch 2, and long treble crochet (ltc) 1 between 1st and 2nd tc sts in group of 9. Ch 2, and ltc 1 between next tc sts, etc., until 8 ltc sts are made. In making the long treble crochet the thread is thrown over the hook three times before the hook enters the work; then draw the thread through, making five stitches on the hook, and work off by twos in the usual manner. After the 8 ltc sts have been made ch 2, and make another group of 3 tc, and then the scallop of ltc again, alternating thus around the doily.

For the 8th and last row, ch 3 from the group of tc, and sc 3 between 1st and 2nd ltc. Ch 3, and sc 3 between next ltc, and so on until the scallop of ltc is finished. Then ch 3 and sc 3 in central tc of group of 3. Ch 3 and proceed with scallop of ltc as before.

HOW TO CAN TOMATOES.

Select firm, well-formed tomatoes. Scald one and a half minutes or until skins loosen. Dip quickly into and out

of cold water. Peel and remove stems and cores. Pack directly into cans or hot jars. Press down with a table-spoon (add no water). Add a level teaspoonful of salt per quart. Put the rubber rings and caps of jars into position but do not tighten fully. Seal tin cans completely. Place the packed containers on a false bottom in a vessel of water sufficiently deep to cover them by one inch and allow to remain at a boiling temperature for twenty-two minutes when using hot water bath canners.—Government Bulletin.

HYGIENE IN THE KITCHEN.

BY JENNIE M. WILSON.

In no part of woman's work as a housewife is there so great a call for wisdom and foresight as in the culinary department, because the health of the household depends to a great extent on what they eat.

Fresh, ripe fruit is considered healthful and an excellent aid to digestion, but when preserved by antiseptics it is a source of much evil and too much can not be said against the custom. Having had a little experience in this line, I will give it, in hopes of thereby benefiting other housewives. One season just as we had commenced canning our strawberries there passed through the neighborhood a gentleman (?), selling a recipe for preserving fruit, meats, butter, cut flowers, and vegetables, said to be the same as were used in preserving the premium fruit of World's Fair fame. A sample of various kinds of fruit and vegetables was exhibited, which were simply perfect. Accompanying this was shown a certificate to which was attached the names of several physicians who testified that they had examined the preservative and found it perfectly harmless for family use, which went a long way toward making a sale. Ours being a fruit section, it is needless to say that he reaped a rich harvest. I purchased with the rest and had a chance to test my recipe in canning strawberries. The recipe was simply different proportions of salicylic acid for the different fruits or vegetables to be preserved.

I used it through the canning of small fruit and was very proud of my display, but one day it came to my ears that a certain physician, being asked his opinion of the use of salicylic acid, emphatically condemned its use. Now it so happened that his name was one among those on the list of testimonials carried by the agent, who must have placed it there himself. It was perfect in appearance, but the acid had hardened it to such a degree that I felt certain it must affect its digestibility. Consequently I postponed further use of the recipe until I could investigate more fully, and my decision is, if we want anything to preserve fruit for exhibition, salicylic acid is all right, but we do not want it in fruit for our tables. As the use of the acid is becoming so general, too much can not be said on this subject.

One medical work in speaking on this subject says: "The use of cheap adulteration of food is deleterious, but worse than all is the use of powerful antiseptics to prevent food from decomposing." Another says: "Salicylic

acid has been used for the preservation of various kinds of food but the employment of it should be interdicted." A commission by the French government reports that its prolonged use even in small quantities is dangerous, especially to the aged. So, as we have the means of preserving our fruit successfully by heat, it is the part of wisdom to be on the safe side.

A few years since a recipe similar in its nature to the one of which I have spoken was very generally advertised and quite extensively used. An examination of the compound showed that it was composed of sulphur, charcoal, nitrate of soda, cane sugar and salt. The salt, it was said, might have been an impurity of the nitrate of soda. The directions for the use of this recipe were that the compound should be burned in a closed space and the fumes arising from the burning should be absorbed by water placed in suitable vessels, and that the fruit, in some cases, should also be exposed to the fumes. Finally the fruit was to be placed in the water which had absorbed the fumes of the burning compound and the vessel closed. The burning of the compound resulted in the production of sulphur dioxide, also known as sulphurous acid, and it was this substance which exerted the preservative action in the process. The other materials were simply used to aid in the burning of the sulphur.

Now sulphur dioxide is a very poisonous gas and its use as a food preservative is prohibited in European countries. There is no doubt that it will, like salicylic acid, preserve fruit perfectly, but there are grave objections to its use in food. As the use of sulphur is frequently employed in the bleaching of dried apples, every housewife should thoroughly understand its effect.

HOW TO STORE FLOUR.

Buy flour in small quantities and protect it carefully from spoilage, is the keynote of a suggestion from the United States Department of Agriculture. Housekeepers on the farm and in the city should purchase flour in accordance with their needs only. Any storage of flour in excess of the consumer's needs constitutes hoarding, which, under present circumstances, is an unethical and reprehensible practice, of no profit to the individual who practices it, and injurious to the best interests of the people.

There are three cardinal principles of flour storage. Flour should not be stored in the cellar, since the cellar is rarely free from dampness, even though special flour bins have been built in. Flour should not be stored in the attic of the usual type. The temperature is too high in summer, there is no circulation of air, and the flour is likely to acquire a musty odor. Flour should not be stored in the pantry or kitchen, except in small quantities, since the temperature is certain to be uneven and the flour is likely to be contaminated by odors.

If practicable every household should possess a small room for storage. Such a room is best located on the north side of the building. It should be ventilated and have a cool and even temperature. Where such a room is not available a closet may fit the requirements well. The bins or containers should be kept clean, and when an old stock of flour is exhausted, the container should be carefully cleaned before a new stock is placed.

A HELPING HAND.

Here is one way in which to offset the loss of strength in rural communities by reason of our boys migrating to the cities. Every week there are boys from eight to twelve years of age becoming homeless. There are great

possibilities for good in these lads. They would make good farmers if taken early into the family and brought up through the next few years.

These are not delinquent boys, but boys who by no fault of their own have been cast upon the mercy of the world. They deserve a chance to win success. The Michigan children's home society has a goodly number of such promising lads coming continually into their care. The superintendent of that society is especially favorable to the rural home for these boys. The State Grange has endorsed this organization as doing a high-grade work for children.

Scores of our readers in Michigan rural homes could to advantage avail themselves of this opportunity to do a kindness and at the same time help themselves. Only the families of the best standing will be accepted as the proper guardians for these prospective farmers. All who are interested may address the Michigan Children's Home Society at St. Joseph, Michigan.

FOR THE FARM WOMAN'S HUSBAND.

The following is part of a farmer's creed, written by the county agent, I. J. Mathews, of Pulaski county, Ind.: "I will remember that my wife has contributed as much toward my success as I have, and therefore, for every new machine I buy for the farm, I will buy one to make her housework lighter. Yea, verily, will I invest at once in a washing machine, a wringer and a vacuum cleaner for my wife; her tubs shall run over with pure water pumped by a gasoline engine. All this that my children and I may dwell forever and ever in the good county of Pulaski and it shall wax an exceedingly nice county in which to live."

CANNING OUTFIT MADE IN FIVE MINUTES.

All you need: A wash boiler, a false bottom for it, made of laths or sticks, or of corrugated tin with holes punched in it; a square of cheesecloth to hold fruits or vegetables when dipping into hot water; a kettle.

Principles of home canning fruits and vegetables: Wash and cleanse the food; blanch by placing it in boiling water; plunge immediately and momentarily into cold water; pack food in hot jars, add boiling syrup or boiling water; place rubbers and tops in position half air-tight; submerge jars in boiling water and cook; tighten the tops.

HOME QUERIES.

Household Editor:—Please tell me how old one must be to take up nursing, where is a good place to go, how to enter. Also, how does the Red Cross differ, can a sixteen-year-old girl join, to nurse the soldiers? Does the race count? Please explain Michigan Farmer. I think the advice would help other girls as well as myself.—Michigan Girl.

Different hospitals require different ages. However, none of them take girls of sixteen. No one but graduate nurses can nurse soldiers. Anyone else, at any age, who goes can only scrub floors, clean rooms and do the general hard work which must be done about sick-rooms, thus leaving the trained nurses free to take care of the sick and wounded. Harper Hospital, Detroit; Butterworth Hospital, Grand Rapids, and the hospital in Ann Arbor are all good places to go. If you wish to enter write directly to the superintendent of the hospital with which you would like to be associated. Race does not count. A Red Cross nurse is no different from any other, as all Red Cross nurses must be graduates of some hospital. However, the Red Cross does a great deal of work beside nursing, such as sewing for the boys at the front, furnishing supplies, etc.

A Big Washing With Little Work

That's the result when you use 20 Mule Team Borax. It softens the water—it helps the soap do its best work—it whitens the clothes and makes your linen take a glossier ironing. But the laundry is only one of the many places where



MULE TEAM BORAX

has a big use. Take the kitchen for instance. 20 Mule Team Borax makes dish washing easy. It cuts the grease—puts a shine on china and glassware. And in the bath tub you find this Borax a splendid soother, pore cleanser and antiseptic.

20 Mule Team Borax Soap Chips

Soap in chip form. Saves you soap cutting. Blended in the right proportions, one part Borax to three parts of pure soap. Not a substitute for Borax but a time, labor and money saver that will pay you to use every wash day. See the picture of the famous 20 Mules on each of the above packages. Sold by all dealers.



APOLLO Galvanized Roofing

Highest quality Roofing for all classes of farm buildings. Made from the well known APOLLO-KEYSTONE Copper Steel Galvanized Sheets. Supplied in all standard patterns of Formed Roofing and Siding. Fireproof, durable, reasonable in cost—accept no substitute. Look for the Apollo stencil with the added Keystone. These sheets are also unexcelled for Culverts, Silos, Tanks, Cisterns, Sheds, and all forms of exposed sheet metal work. Send for free "Better Buildings" booklet. AMERICAN SHEET AND TIN PLATE COMPANY, Frick Bldg., Pittsburgh, Pa.

MICHIGAN FARMER PATTERNS.

Be sure to give proper pattern number and size of pattern desired. Address all orders for patterns to The Michigan Farmer, 39-45 West Congress Street, Detroit, Mich.



No. 2152-2153—A Stylish Gown. Waist 2152 cut in six sizes, 34, 36, 38, 40, 42 and 44 inches bust measure. Skirt 2153 cut in six sizes, 22, 24, 36, 28, 30 and 32 inches waist measure. It will require 6½ yards of 44-inch material to make the entire dress of one material for a medium size. The skirt measures about 2½ yards at the foot, with plaits drawn out. Two separate patterns, 10 cents for each pattern.

No. 2136—Ladies' House Dress. Cut in seven sizes, 34, 36, 38, 40, 42, 44 and 46 inches bust measure. It requires seven yards of 36-inch material for a 36-inch size. The skirt measures about 2½ yards at the foot. Price, 10 cents.

No. 1977—Ladies' Apron. Cut in four sizes, 34, 38, 42 and 46 inches bust measure. It requires 7¼ yards of 36-inch material for a 38-inch size. Price 10 cents.

No. 2143—Girls' Middy Dress. Cut in five sizes, 4, 6, 8, 10 and 12 years. It requires 4¼ yards of 27-inch material for an eight-year size. Price 10 cents.

No. 2161—Child's Play Dress, Shade Hat and a Flower Basket. Cut in five sizes, 2, 4, 6, 8 and 10 years. Size four years will require 2¾ yards for the dress, ¾ yard for the hat, and ¾ yard for the basket, of 36-inch material, for a four-year size. Price 10 cents.

Potato Growers Eliminate Speculation

By EARL W. GAGE

LONG Island is rated as one of the world's greatest potato fields.

This fish-shaped piece of land, only one hundred and twenty-five miles in length and twelve miles wide has given a recognition to the potato marketing problem that will aid farmers everywhere in disposing of their crop. The soil is a sandy loam—ideal for potato growing—and is worth \$200 to \$350 per acre—when you can buy it. The farmers here are as prosperous as can be found anywhere, and producing as they do, about 3,000,000 bushels of spuds per year, must naturally watch out for No. 1, as New York is filled with crooks who are looking for an opportunity to "do the hay-seed."

For the past two hundred years, agriculture on Long Island has been steadily progressing. Every since the Hollanders landed, farming on an intensive scale has been followed, though the land has been so well managed that it retains a high productive power. The limit of production is today about reached, about one-half of the cultivated land being devoted to potatoes, while the other half is growing vegetable crops that bring good prices, chief among which is the cauliflower.

Local Dealer Problems.

Until a few years ago Long Island potatoes were marketed through local dealers or brokers, and these brokers pretty nearly broke the farmers. From one to four were to be found at every small shipping point, glad to buy potatoes. The local buyer was supposed to buy and load the potatoes for three cents a bushel, and it made no difference whether they were bringing 25 cents or \$1.00 a bushel, Mr. Broker got his three cents just the same. Many times when the local buyers received orders to buy potatoes at advanced prices he would tell the farmers that the market was over-supplied. These buyers were never known to raise their price unless the farmer put in a kick, and they were never known to refuse to pay a higher quotation for good potatoes when the farmer stated that he had a ready buyer. But they always whispered in said farmer's ear, quietly, "Don't tell the other farmers about this. It might cause trouble."

In these irksome days, local dealers knew no more about the market conditions than did the farmer, except that dealers had some inside information that helped them to judge when to stop buying. But in feeding 5,000,000 New Yorkers, there is no limit for potatoes, so he always bought all he could see. The farmers were always ready to unload a large crop when the market was about to "fall," and to be sure the dealer's knowledge of human nature always caused him to whisper about that the market was about to tumble just as Long Island farmers were in the height of their harvest. The dealers repeatedly took advantage of the situation, and the amount that was actually stolen from the farmers can not be calculated.

The Awakening.

As Lincoln said: "You may be able to fool all the people some of the time, but you can not fool all the people all the time," so also did some Long Island farmers get wise. The farmer awoke to find that no one was looking out for him, only to "skin" him. In 1908 a remedy was procured, for the farmers had determined to form an organization for selling their produce and buying supplies. They had had a plain demonstration of the advantage of co-operation through the lack of it. Already the Long Island Cauliflower Association had fully demonstrated what co-operation could do. Meetings were held at every shipping point in Long Island, and speeches made pointing out just what was to be done for the farmers. Briefly, this movement

aimed to do the following things, and such others as presented themselves:

1. Establish conditions whereby anyone desiring may buy Long Island produce true to name. To brand each package as coming direct from Long Island fields, thus building a demand for a specially produced product.

2. Develop present markets and find new ones for all products. By judicious advertising, secure increased demand for Long Island products.

3. Ascertain the conditions of growing crops throughout the season and furnish this information to members.

4. Secure pure seed at as low a price as consistent with best quality.

5. Buy and sell or manufacture all kinds of supplies.

6. Buy and sell and consign all kinds of farm produce and establish uniform grades of same.

7. Own or operate storage warehouses and packing houses for produce.

8. Arrange for the transportation and handling of all produce in the best possible manner.

9. Eliminate from the list of customers those wholesale dealers who unjustly dock the shippers on weight or who make a practice of turning down cars of produce on a falling market."

Substantial Saving Effectuated.

In fact, everything was done that would possibly shut out the middleman and his profit, and make the farmer really independent. Long Island potatoes being a specially good product of limited production, meant that by placing the entire crop in the hands of one selling agent, that this agent would know just the requirements of the market and would be able to accordingly regulate the supplies to a certain extent, and prevent the former flim-flam methods by which farmers had been fooled into selling the greater part of the crop at low prices during the high priced season.

During the time since the organization of the Potato Exchange, the crop has been largely marketed through the organization channels. The members have been told repeatedly by city wholesalers to whom the crop is sold, that they could thank the association for receiving from ten to twenty-five cents more per bushel. This saving

to the farmers of Long Island has averaged between \$1,000,000 and \$2,000,000 per year, while fully \$500,000 is saved for the farmers on the fertilizer and seed purchased through the organization.

The Long Island potato has a place all its own throughout the east, particularly in New York City. This is due largely to the careful sorting and the co-operative selling plan, which enable the farmers to secure from twenty-five to thirty-three per cent more for their potatoes than do farmers from other communities.

Another Illustration.

Over in New Jersey, in Monmouth county, the farmers awoke to the needs of a co-operative association the same year that Long Island farmers organized, and so in 1908 the Monmouth County Farmers' Exchange was organized, being incorporated under the laws of New Jersey, the purpose being to market the products of the 1,275 farmer members. It was capitalized at \$100,000, 20,000 shares at a par value of \$5.00 each.

This organization operated over a highly important agricultural district, the territory being 500 miles square in central New Jersey, extending through the counties of Monmouth, Middlesex, Mercer, and parts of Ocean and Burlington counties. This section is one of the largest producing centers of farm products in New Jersey, and the output of the Monmouth Exchange in 1913 was nearly 3,000 carloads, consisting for the most part of Irish potatoes, though apples, pears, asparagus, berries, melons, sweet corn, pickles and other miscellaneous crops were included.

The Organization.

The general supervision of the entire business is under the direction of a board of fifteen directors who are annually elected by the stockholders or members. But the administration of the details of the business is left to the general manager who is appointed by the board. The system pursued is as simple as possible, and for the immense operations has proved satisfactory.

The Exchange has today about fifty shipping points that extend forty miles west from the general office located at

Freehold. All stations are connected with the office of the general manager by telephone, while an agent-inspector will be found at each shipping point during the season who is in charge of all shipments and the inspection at each loading point.

The farmers deliver their produce to the agent-inspector, receiving a receipt for them showing gross, tare and net weight. The products are immediately loaded into the waiting cars for shipment according to grade placed on them by the inspector, who reports to the general manager's office at the close of each day regarding receipts. The general manager's chart shows the probable proportions of each day's shipments, which places him in an excellent position to judge where the best market conditions will exist for each station's consignment. The manager telephones billing directions to the local agent-inspector at the close of each day, and the night fast-freight collects and delivers the loaded cars, leaving a new supply for the coming day's work.

Have Expanded their Markets.

The territory supplied by the New Jersey potato growers extends as far west as the Mississippi river, including every principal consuming center. The manager and his assistant daily issue quotations by telephone or telegraph to all salesmen and wholesale buyers. These quotations are based upon the demand and supply of large markets, information from these locations having been secured daily from representatives in the respective markets.

This placing of the marketing of New Jersey potatoes upon a solid business basis has meant that New Jersey potato growers no longer ask the time-worn question: "How much will you give?" but they telegraph: "Pay so much, or I'll ship elsewhere." And the buyer can not cry back: "Your potatoes were rotten; half price," for the New Jersey farmers have these inspectors on the job to stop that leak. A bank draft, with bill of lading attached, follows each consignment, so that the farmers receive their pay before the potatoes are unloaded. If the firm to whom the shipment is sent has a business failure before the shipment arrives, the general manager promptly sells the carload to another house, collecting the market price for the same. Expenses are met by charging the farmers a very small commission on each bushel of potatoes handled through the Exchange.

After each day's work is completed, the agents telephone in the names and grades of each member, and the farmers are credited with the market price per bushel or per barrel. The farmer promptly receives his check, as the bank account of the Exchange is sufficient to meet all bills against the organization each day.

Results Have Been Large.

Beginning business in July, 1908, the Monmouth County Farmers' Exchange had a paid-in capital of \$7,000 and a membership of only 300 farmers, and did a first-year business of \$454,414.11. It increased in volume each year until today the business amounts to a million and a half in sales, bringing a net profit to members of nearly \$20,000. It has paid a dividend of five per cent for four years, and since 1913 a six per cent annual dividend. Since organization was effected, this Exchange has handled about \$7,000,000 worth of farm produce at an average expense of 1.82 per cent and have paid members an average of sixty and a half cents per bushel, or \$1.66½ per barrel of 165 pounds.

Between 1902 and 1907, for sake of comparison, the average price paid the farmer for his potatoes was only forty-



The Soo Co-operative Mercantile Association was formed January 15, 1913, for the purpose of operating a grocery store. The association has a capital stock of \$10,000, divided into one thousand shares of ten dollars each. At present there are about one hundred stockholders. During 1916 business to the amount of \$30,000 was done. Two-fifths of this business was with stockholders and three-fifths with non-

stockholders. Net earnings amounted to \$1,600, which amount was used to counterbalance losses occurring during the first two years the store was in operation. Now the management is able to discount bills for purchases. It is expected to pay patronage dividends in the early future. These will be on the basis of twice as large dividends to stockholders as to non-stockholders, which should bring new business.

two and a half cents per bushel, or \$1.16½ per barrel, a difference of fifty cents per barrel, or eighteen cents per bushel in favor of co-operative effort in the sale of farm crops. In addition to the advantage in higher prices for their crops the value of farm lands have increased from \$100 to \$300 per acre.

In addition to aiding the farmer in receiving the highest price for his fruit and vegetable crops, the Monmouth County Farmers' Exchange is also deeply interested in buying the seed potatoes, grass seed, insecticides and fungicides, hampers, barrels, lime, manure and other needful goods, and manufacturing fertilizers from the purest and highest grades of chemicals that are to be procured.

DIRECT MARKETING EFFECTS A SAVING AT BOTH ENDS.

Poultry products can be made to net the producer larger profits and enable the city man at the same time to buy at lower prices, if direct connections are established with city customers and express carriers are used for delivery, the experience of an M. A. C. poultryman has demonstrated.

"Our own experience has taught that this method is good business," says Prof. C. H. Burgess, of the M. A. C. poultry department. "The producer should try to establish a trade with city customers. By doing this myself, we have been able to supply customers with eggs at a lower price, and a higher profit to ourselves, than was possible for either of us under other methods. The consumer paid twenty-seven cents a dozen, plus express, which was about three cents a dozen. The consumer formerly paid thirty-five cents a dozen for these eggs. This was a gain of six cents to the producer over the usual method of selling to local stores, and a saving to the consumer of five cents a dozen. The eggs were shipped in crates of twelve dozen. Some of the customers divide the eggs with their neighbors.

"There are, of course, disadvantages to the direct method of selling, but if express charges could be fixed at so much per dozen, disregarding the size of the crate, it would encourage the shipment as well as the direct method of selling. As prices are now it encourages the farmer to take his eggs to the local shipper and receive just the same price and no more than the farmer who has poor eggs to sell. It costs about the same to ship a twelve-dozen crate of eggs as it does to ship a thirty-dozen one. It costs nearly as much to ship a thirty-dozen crate as it does to ship two thirty-dozen ones.

"Again, there are certain seasons of the year when the producer has a surplus number of eggs for which there are no customers, and finally there is occasionally an item of cost in collecting or a possible loss from bad accounts.

"But when we compare the direct method of selling with the indirect the former undoubtedly promotes and maintains a higher degree of quality in the product marketed, for when the producer sells direct to the consumer, his eggs must possess a high quality if the customer is to be retained. Anything other than best quality reflects directly upon the producer."

IMPORTANT PHASES OF LIVE STOCK ADVERTISING.

(Continued from page 116).

make the sale a further advertisement of his stock and his business principles. The duties of the seller with relation to description and privilege of return if the animal does not satisfy have already been touched upon. It is the seller's duty, moreover, to crate the animal in such a way that it will be shipped with no danger of injury

and also as lightly as possible to keep the express charges down to the lowest figures. A shipper should never send an animal away without first asking the express agent to show him his tariff sheet—he must do so if requested—and then when the amount of charges is learned get a duplicate of the way-bill to mail to the buyer. The express companies require some value to be placed on an animal shipped and for each kind they have a minimum on which damages may be recovered in case of death or injury while in transit. If the shipper places a valuation higher than this minimum on the animal the charges will be proportionately higher. It is well to place the minimum value only on all animals except in the case of those of exceptional value.

Comply with Sanitary Requirements.

Every shipper of live stock should also familiarize himself with the sanitary requirements governing the admission of live stock into the different states. A pamphlet giving these requirements may be secured from the United States Department of Agriculture at Washington. Horses, cattle, sheep and hogs will require a health certificate from a federal veterinarian, a state veterinarian or a qualified veterinarian who is endorsed by federal or state veterinarian, to secure their admission in most states. This certificate must be attached with the bill of lading which accompanies the shipment. This should not be overlooked. Tell the express agent of the necessity of having the certificate attached to the bill of lading for there are many agents who are entirely ignorant of it.

By doing everything possible to avoid delay in the shipment of an animal and contributing to its arrival at its destination in good shape and with no annoying details for the consignee to look after, the seller will have gone a long way towards satisfactorily completing the transaction which was given its original start by proper advertising.

GOVERNMENT CROP REPORT.

A summary of the August crop report for the state of Michigan and for the United States, as compiled by the Bureau of Crop Estimates (and transmitted through the Weather Bureau), U. S. Department of Agriculture, is as follows:

Corn.—State.—August 1 forecast, 51,400,000 bushels; production last year (December estimate), 45,375,000 bushels.

United States.—August 1 forecast 3,190,000,000 bushels; production last year (December estimate), 2,583,241,000 bushels.

All Wheat.—State.—August 1 forecast, 14,100,000 bushels; production last year (December estimate), 13,600,000 bushels.

United States.—August 1 forecast 653,000,000 bushels; production last year (December estimate), 639,886,000 bushels.

Oats.—State.—August 1 forecast 58,600,000 bushels; production last year (December estimate), 42,690,000 bu.

United States.—August 1 forecast 1,460,000,000 bushels; production last year (December estimate), 1,251,992,000 bushels.

Barley.—State.—August 1 forecast, 3,190,000 bushels; production last year (December estimate), 2,450,000 bu.

United States.—August 1 forecast 203,000,000 bushels; production last year (December estimate), 180,927,000 bushels.

Rye.—State.—August 1 forecast, 5,180,000 bushels; production last year (December estimate), 4,648,000 bu.

United States.—August 1 forecast 56,000,000 bushels; production last year (December estimate), 47,383,000 bushels.

Potatoes.—State.—August 1 forecast 41,700,000 bushels; production last year (December estimate), 15,360,000 bushels.

United States.—August 1 forecast 467,000,000 bushels; production last year (December estimate), 285,437,000 bushels.

All Hay.—State.—August 1 forecast, 3,580,000 tons; production last year (December estimate), 4,423,000 tons.

United States.—August 1 forecast 100,000,000 tons; production last year (December estimate), 100,000,000 tons.

(Continued on page 126).

The Scales With A 10 Year Guarantee



Be your own weighmaster. A dependable, all-purpose scale on your farm makes and saves you many a dollar which otherwise you would lose without knowing why or where.

McDONALD—The Original Pitless Scale

Sold under a positive 10-year guarantee of accuracy. Solid steel frame locked at corners, solid steel joists, knife edge bearings protected against frost and clogging, and other distinctive features in design and construction make the McDonald trouble-proof, repair-proof and permanently reliable. Many of them in use over 20 years are giving satisfactory service today.

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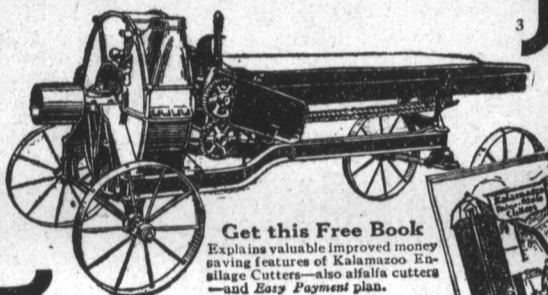
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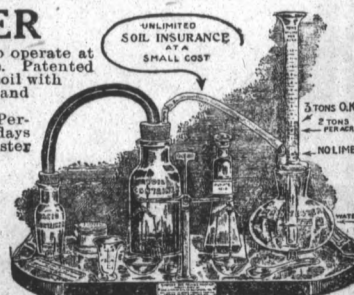
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Markets.

GRAINS AND SEEDS.

August 14, 1917.

Wheat.—While cereal quotations have shown a decided slump during the past week, it must be remembered that there has not been the customary decline in values so far this season. The declines for wheat usually start with July, but the lateness of the crop has aided in delaying the event until the present. No doubt the government's plans are having a temporary influence on prices, as buyers are not anxious to be found with any large quantities of grain when they do not know under what conditions they may be obliged to dispose of it. Threshing returns are reported as quite satisfactory. The visible supply for the past week shows a decrease of 601,000 bushels, which is unusual for the second week in August. A year ago No. 2 red wheat sold locally at \$1.41½ per bushel. Last week's Detroit quotations were:

	No. 2	No. 1	Sept.
Wednesday	2.43	2.38	2.24
Thursday	2.43	2.38	2.22
Friday	2.40	2.35	2.18
Saturday	2.35	2.30	2.16
Monday	2.33	2.28	2.10
Tuesday	2.23	2.28	2.07

Chicago.—September wheat \$2.04.

Corn.—Corn suffered a decline of 30c on the local market Monday and large exchanges throughout the country experienced similar reactions. The failure of distillers to take the grain has been held out as the one reason for this big drop. However, the decline will likely attract buyers and no doubt with the present run of stockers in the big live stock markets, any considerable breaking of corn prices will induce a larger amount of stock feeding. The new crop is making splendid progress, considering the handicap of late planting. One year ago the local market paid 87½c for No. 3 corn. Last week's Detroit quotations were:

	No. 3	No. 3
	Mixed.	Yellow.
Wednesday	2.38	2.39
Thursday	2.34	2.35
Friday	2.29	2.30
Saturday	2.19	2.20
Monday	1.89	1.90
Tuesday	1.94	1.95

Chicago.—December corn \$1.15½; May \$1.13½.

Oats.—Values in this department have declined with those of corn and wheat. There is a good crop being gathered; however, both the home and foreign demand is active. A year ago standard oats were quoted at 44½c a bushel. Last week's Detroit quotations were:

	Standard.	No. 3
		White.
Wednesday	81	79
Thursday	81	79
Friday	81	79
Saturday	81	79
Monday	78	77
Tuesday	78	77

Chicago.—September oats 57½c per bu; Dec. 57½c; May 61½c.

Rye.—The new crop is beginning to move with cash No. 2 now quoted at \$1.85, which is 10c below last week's figures.

Beans.—The demand improved somewhat the past few days, and cash beans advanced, although on Monday a portion of the increase was lost. Cash beans are now quoted at \$7.90; October \$6.50. At Chicago Michigan pea beans hand-picked, are quoted at \$8.50; red kidneys \$6.

Seeds.—Prime red clover at \$11.90; October \$12.90; alsike \$11.25; timothy \$3.85.

FLOUR AND FEEDS.

Flour.—Jobbing lots in one-eighth paper sacks are selling on the Detroit market per 196 lbs., as follows: Best patent \$13.20; seconds \$12.90; straight \$12.50; spring patent \$14.80; rye flour \$12.50 per bbl.

Feed.—In 100-lb. sacks, jobbing lots are: Bran \$42; standard middlings \$52; fine middlings \$54; cracked corn \$88.50; coarse corn meal \$87.50; corn and oat chop \$71 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 \$14.50; No. 1 clover \$13@13.50.

Pittsburg.—No. 1 timothy \$18@18.50 per ton; No. 2 timothy \$16@17; No. 1 light mixed \$15.50@16; 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.—Market quiet. Fresh creamery extras 39½c; fresh creamery firsts 37½@38c.

Eggs.—Market is a little firmer at a price 4c higher than last week. Price based on sales 39½c.

Chicago.—The feeling continues quite firm, with prices ¾c higher than last week. The business is good on all grades. Creamery extras are quoted at 39½@39¾c; extra firsts 38½@39c; firsts 37½@38c; packing stock 33c per pound.

Eggs.—On Monday good quality eggs were firm, the lower grades were easy. Fresh firsts were quoted at 34@36c.

Chicago.—Market steady for the best graded stock and weak for cheaper lots. Eggs should be candled. Firsts 31½@33c; ordinary 27@30c; at mark, cases included 27½@32½c.

Poultry.—Market is steady and quiet. Best broilers 28@30c; Leghorns 27@28c; hens 22@23c; ducks 20@21c; spring ducks 23c; geese 15@16c; spg geese 18c; turkeys 24@25c.

Chicago.—The offerings are larger and there is a good demand. The feeling is steady. Fowls sell from 18@18½c; broilers, 2 lbs. and over, 23@24c; under 1½ lbs. 21@22c; ducks 18c; geese 14c; spring geese 16@18c.

FRUITS AND VEGETABLES.

Fruits.—Sour cherries \$3.75@4 per bu; raspberries, red \$6@6.50 per bu; huckleberries \$5@5.25 per bu.

Chicago.—Sour cherries \$2@2.25 per 16-qt. case currants \$1.75; black raspberries \$2@2.25; blueberries \$3.25@3.50; red raspberries \$2.50@2.75 per 24-pt. case; other fruits in 16-qt. cases.

Apples.—At Detroit this fruit is quoted at \$3.00 per bushel. At Chicago, Illinois No. 1 Transparents are quoted at \$5@5.50 per bbl; Astricans \$3.50@4; Duchess \$4.50.

Potatoes.—Potatoes are scarce and firm with quotations of \$1.75 per bu.

WOOL.

Boston.—Increased activity due to renewed interest by manufacturers who, because of the large prospective purchases by the government feel obliged to replenish supplies, has characterized the market the past fortnight. Prices are as firm as ever with the only possibility of changes in an upward direction. Farmers are holding probably more wool than usual. In Boston fleeces sold last week at prices ranging from 55@85c per pound.

GRAND RAPIDS.

Potatoes sold in small lots the first of the week, at \$1.25 to \$1.40 but are likely to go lower with the increasing supply. Huckleberries have held up so far at around \$3 per crate and other stuff on the city market sells as follows: Green corn 30c per dozen; cucumbers 50c; wax beans \$1.25 per bushel; cabbage 50c. The egg market is steady at 33½c. In live poultry, fowls are worth 16c. New hay is quoted at \$12@14. The mills pay \$2 for No. 2 red wheat.

DETROIT EASTERN MARKET.

The market was unusually large on Tuesday morning, although many of the seasonable products were not offered, at least in quantities. Cabbage 40c per bu; lettuce 40c; medium to large cucumbers \$2; potatoes \$1.75; tomatoes \$2 per 16-lb. basket; red raspberries 35c per qt; eggs 48@50c per dozen; no hay in sight.

LIVE STOCK MARKETS.

August 13, 1917.

Buffalo.

Receipts here today as follows: Cattle 120 cars; hogs 20 d. d.; sheep 7 d. d.; calves 1300 head.

There were around 120 cars of cattle here today and we had a sky rocket market. There were very few weighty shipping cattle here, the best of them selling about 25c higher, the best here at \$13.75, but if there had been any strictly dry lot prime cattle they would have sold for considerable more, as all the packers wanted some prime heavy cattle. The medium weight cattle, butcher cattle and heifers that have been selling so mean for the last three weeks sold a big \$1 a hundred higher, in some cases more. There was a strong demand for the cows, the best about 50c higher, with the medium and common grades 15@25c higher. There was a good demand for the stockers and bulls but very few here and bulk of them 2½c higher. These light receipts and extreme high market is apt to bring a liberal run of cattle here next week and not quite so good a market, but we can handle a liberal run to fair advantage.

Disappointingly light receipts of

hogs at all markets shoved prices to a new high record, a few selected lots selling at \$17.85, bulk from \$17.50@17.75; pigs and lights \$15.50@16; roughs \$15.50@16; stags \$12.50@13.50. The trade was active and everything was sold at the close of the market.

With a light run of lambs today our market opened up active and prices steady with the close of last week. All sold and we look for steady prices the balance of the week.

Lambs \$15@16; yearlings \$12.50@14; cull to common \$11@15; wethers \$10@10.75; ewes \$9.50@10; 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 13, 1917.

Cattle. Hogs. Sheep.
Receipts today..13,000 25,000 10,000
Same day 1916..18,731 47,807 29,968
Last week.....31,586 105,977 49,251
Same wk 1916..49,609 136,989 86,065

All of the live stock markets were booming today under small receipts and a brisk general demand. Cattle showed further advances of 15@25c, with sales of 127 head at \$14.50, one carload averaging 1403 lbs. and most of the remainder around 1500 pounds. Three head of prime steers brought \$14.75. Hogs advanced 15@25c, with a \$17.50 top, the better class of swine advancing most. Hogs received last week averaged 232 lbs. Lambs were in small supply and prime Idaho lambs sold up to \$15.65, an advance of 45c. No native lambs offered were prime enough to bring over \$15.

Cattle sellers experienced a much better week than a week earlier, a marked improvement in the general demand enabling them to obtain decidedly higher prices for all desirable offerings. The upward movement embraced steers selling at \$9 and over, as well as butcher stock, bulls, good cutters and canners, stockers, feeders and calves. Previously to last week no cattle had sold over \$14.15, but last week saw sales at \$14.25@14.35, and on Wednesday the greater part of the steers offered went at \$10.50@14, with not much trading below \$10. Choice beefs went at \$13.60 and upward, with a good kind of steers salable at \$12.50 and over and a medium grade of steers taken at \$11 and upward. Ordinary to fair killing steers of light weight sold at \$9 and upward, with small scattering sales of inferior little steers down to \$6.50@8.50. Yearlings of desirable quality were purchased around \$12@14, with sales down to \$9.50@10.50 for the poorer lots. There were three sales of prime beefs at \$14.35, including 53 head averaging 1566 lbs; 16 averaging 1440 lbs., and 20 averaging 1214 lbs. A string of over 300 head of branded western steers and heifers mixed brought \$12.75. Butcher stock had a good sale at \$6.60@11 for cows and \$6@12.50 for heifers, with cutters selling at \$5.60@6.50, canners at \$4.75@5.55 and bulls at \$5.50@10.25. Calves were in active demand at \$7@13.75, with rough heavy calves selling down to \$5.50@6.50. Stockers and feeders had a larger demand, the former selling usually at \$6.25@8.75, with nice little yearlings going highest, while feeders were salable at \$7.75@9. Milkers and springers sold usually at \$7.50@100 per head, although prime cows were salable at higher figures and common cows at lower figures. At the week's close cattle sold largely 50c@1 higher than a week earlier.

Hogs were in excellent demand during the past week, with an especially strong inquiry for desirable corn-fed offerings, prices soaring to far higher figures than were ever chronicled before. Most stockmen having hogs on the market were taken by surprise by the way the market advanced, and those who had poorly finished hogs and pigs for sale could see how much better they would have fared had their offerings been kept longer and fed on corn freely. The advance was in the face of a restricted eastern shipping demand, although shipments east were much larger than a week earlier. On Friday hogs advanced about 25c, and there was a similar advance on Saturday. It was the general impression that the packers were looking for an excuse to boost prices for the large stocks of provisions in store cut from much lower-priced hogs. Closing prices for hogs stood at \$15.60@16.50 for rough to good heavy packing up to \$16.85@17.25 for the better class of hogs, with pigs selling at \$11.50@14.75, pigs weighing up to 135 lbs. going highest. A week earlier hogs brought \$14.75@16.45.

Lambs comprised most of the offerings in the market last week, with flocks from the western ranges offered in much larger volume than heretofore. Early sharp breaks in prices were followed by later advances, feeders sharing in the rise in values. The

receipts were much smaller than a year ago, and late in the week prices advanced sharply, best range lambs selling for \$15.20, comparing with \$14.40 on Monday. Prices closed as follows: Lambs \$10.50@15.20; feeding lambs \$14@14.50; yearlings \$8.50@12.50; wethers \$8.75@11; ewes \$4.50@9.25; breeding ewes \$8.75@15; bucks \$6.50@7.50.

Horses were in light supply and in small demand last week, with no marked change in prices. Sales were made on the basis of \$60@100 for inferior to fair horses of light weight, with fair to choice drafters salable at \$185@265 and drivers selling mainly at \$100@200. Choice horses were scarce.

LIVE STOCK NEWS.

George Travelut, of Colfax county, Nebraska, was on the Chicago market recently with four cars of steers from his 1400 acres of land in Fremont county, Iowa. The shipment included 67 head of steers which averaged in weight 1306 pounds and brought \$13.60 per 100 pounds. Mr. Travelut said corn in western Iowa and Nebraska is now in good shape, and if there is a favorable growing season from now on, the yield will be large, as the acreage is immense.

Wayne county, Iowa, is harvesting the biggest crop of oats in its history, according to A. Shriver, a widely-known stock farmer of that region, who appeared on the Chicago market a short time ago with two carloads of cattle of his own feeding. He reported the country as a little short on hay, but pastures are in good condition, he added. While Mr. Shriver is of the opinion that there are about the usual number of cattle on grass in that part of the country, he said practically all of the good corned cattle and fat hogs have been marketed.

V. M. Scott, a large and widely known stock feeder of Paris, Ill., was in the Chicago stock yards on a recent day with a shipment of nine carloads of his famous black steers. He said that corn was getting along in that region finely, while the high cost of old corn results in many stock feeders marketing their cattle earlier than ordinarily.

Everybody is kept wondering how much higher wool prices will go. A short time ago a clip of 65,000 pounds of regon wool brought 72½c a pound, being similar to our native wool, and sales have taken place in some of the Oregon markets at 60 to 62½ cents.

"We are long on crops, but short of live stock in my part of the country," said J. C. Hanna, of Des Moines county, Iowa, who showed up recently in the Chicago market with a shipment of stock to be sold. He reported oats as a fine crop, all having been harvested, with a very large field. In some places, he said, oats are running as high as one hundred bushels to the acre. The crop of corn is a little backward, but the recent appearance of hot weather has brought it along in fine shape, and an occasional shower will bring about the largest crop ever harvested. Mr. Hanna said: "Grain prices must go lower, or the country will be without live stock." He reported close marketing of aged hogs from his part of the country, whereas in normal times they would be held for breeding purposes. He said men were sacrificing their stock rather than pay the high prices for corn.

(Continued from page 125).

(December estimate), 19,786,000 tons. Apples (Agricultural Crop).—State.—August 1 forecast, 2,930,000 barrels of three bushels; production last year (December estimate), 4,160,000 bu.

United States.—August 1 forecast 62,600,000 barrels of three bushels; production last year (December estimate), 67,415,000 barrels.

Peaches.—State.—August 1 forecast, 810,000 bushels; production last year (December estimate), 2,010,000 bu.

United States.—August 1 forecast 42,690,000 bushels; production last year (December estimate), 36,939,000 bushels.

Beans.—State.—August 1 forecast, 6,610,000 bushels; production last year (December estimate), 3,102,000 bu.

United States (5 states).—August 1 forecast 19,400,000 bushels; production last year (December estimate), 8,846,000 bushels.

Prices.—The first price given below is the average on August 1 this year, and the second the average on August 1 last year.

State.—Wheat, 225 and 112 cents per bushel; corn, 192 and 78; oats, 79 and 42; potatoes, 162 and 97; hay, \$12.20 and \$10.70 per ton; eggs, 32 and 23 cents per dozen.

United States.—Wheat, 228.9 and 107.1 cents per bushel; corn, 196.6 and 79.4 cents; oats, 73.7 and 40.1 cents; potatoes, 170.8 and 95.4 cents; hay, \$13.42 and \$10.68 per ton; eggs 24.3 and 20.7 cents per dozen.

\$100.00 Reward

For the Return of Either
of the Following Auto-
mobiles to the

**Citizens' Mutual Auto-
mobile Insurance Co.,
Howell, Mich.**

Oakland Light Six, License No. C-919, factory serial number 1347-334; said car stolen from J. Earle Brown, an attorney at Lansing.

Oakland Light Six, License No. H-2284, serial number 1805834; said car owned by John J. Ormond, Milford.

Jeffery Six, License No. 69822, factory number 90975; car owned in Genesee county.

Dodge car, factory number 101-268, motor number 153124; Michigan license 5497-M; owned in Oakland county.

Buick Light Six, factory number 295471, state license 26773; owned in Washtenaw county.

Paige Big Six, factory number 62653, license D-1786.

Ford, factory number 1838879, license A-3702, owned by Sylvester Pheney, Holly.

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in your community, notify us.

With fire, theft and liability
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Howell, Michigan.**



Better Than Whitewash

"We did not have to go to town for lime, wait for it to slack or strain it. We just mixed the Carbola with cold water. In less than five minutes it was ready—and it went through the sprayer without any clogging. It went on fine with the brush too. The next day it rains we will use what is left to paint the chicken houses and cellars."

Carbola keeps—doesn't spoil by standing. Make your stable sanitary and bright, clean and attractive with

CARBOLA
The Disinfecting White Paint

A FINELY POWDERED mineral pigment combined with a germicide 20 times stronger than carbolic acid. Not poisonous or caustic. Used by thousands of farmers.

Dries out a Pure White

Will not blister, flake or peel. No odor to taint milk. Kills infectious disease germs, lice, mites, fly eggs, etc.

10 lbs. (10 gals.), \$1.00 and postage.

20 lbs. (20 gals.), \$2.00 delivered.

50 lbs. (50 gals.), \$4.00 delivered.

Trial package, that covers 250 square feet, and descriptive booklet for 25c postpaid.

Get some from your dealer. If he has none, send your order direct with his name.

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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.

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FOR SALE. Red Rock Wheat and Rosen Rye, inspected and approved by Professor Sprague of the M. A. C. ORANE & ORANE, Eaton Rapids, Michigan. Members Michigan Crop Improvement Association.

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 16, 1917.

Cattle.

Receipts 3169. Good grades of bulls and cows steady; all other grades 25c to 50c lower than last week. Great many common in receipts.

Best heavy steers \$10@10.50; best handy weight butcher steers \$8.50@9.25; mixed steers and heifers \$7.50@8.50; handy light butchers \$7@8; light butchers \$6@7; best cows \$7.50@8; butchers \$6.50@7; best cows \$7.50@8; \$6@6.50; canners \$5.25@5.50; best heavy bulls \$7.50@8; bologna bulls \$7@7.50; stock bulls \$6@6.50; feeders \$7@8; stockers \$5.50@6.50; milkers and springers \$4@90.

Bishop, B. & H. sold Bresnahan 4 cows av 925 at \$5.50, 4 do av 940 at \$6.50, 4 do av 807 at \$5.25, 1 do wgh 1260 at \$8, 1 do wgh 930 at \$6, 2 do av 1000 at \$7.25, 5 do av 980 at \$7; to Mason B. Co. 3 bulls av 1157 at \$7.50; to Sullivan P. Co. 17 steers av 756 at \$8, 15 do av 817 at \$7.75; to Breitenbeck 24 do av 973 at \$8.60; to Parker, W. & Co. 26 do av 915 at \$9, 21 do av 700 at \$7; to Hammond, S. & Co. 6 do av 861 at \$8, 12 do av 770 at \$7.60; to Mich. B. Co. 22 do av 1008 at \$8.50, 4 do av 1155 at \$9, 15 do av 742 at \$7, 1 do wgh 1330 at \$10.50; to Parker, W. & Co. 3 do av 800 at \$8, 10 do av 838 at \$7.75, 16 do av 814 at \$7.75; to Garber 6 butchers av 871 at \$8, 10 do av 607 at \$6.75, 14 do av 755 at \$6.60; to Sullivan P. Co. 14 steers av 1071 at \$10.25, 11 do av 1016 at \$9.50, 9 cows av 1011 at \$7.50; to Mindick Co. 6 do av 1160 at \$5.75; to Nagle P. Co. 6 steers av 830 at \$8, 11 do av 965 at \$8.60; to Hammond, S. & Co. 2 bulls av 1230 at \$8.25, 16 butchers av 744 at \$7.75; to Parker, W. & Co. 20 do av 730 at \$7.40; to Mich. B. Co. 21 steers av 1083 at \$10.50, 9 do av 1200 at \$9, 2 cows av 945 at \$7.50; to White Bros. 18 feeders av 894 at \$8.40; to Thompson 2 steers av 1225 at \$10.25.

McMullen, K. & J. sold Kamman B. Co. 9 steers av 1033 at \$9.50, 26 do av 893 at \$9, 27 do av 774 at \$7.55; to Rogers 24 feeders av 964 at \$8.50; to Mason B. Co. 5 steers av 1080 at \$10, 1 do wgh 1040 at \$9; to Thompson 27 do av 904 at \$8.90, 2 do av 825 at \$7; to Applebaum 7 heifers av 681 at \$6.50; to Golden 12 butchers av 662 at \$6.50, 15 do av 671 at \$6.75; to Goose 18 do av 600 at \$6.60; to Bresnahan 4 cows av 875 at \$5.75, 10 do av 1039 at \$7.10, 2 do av 1200 at \$7.25; to Mich. B. Co. 15 steers av 936 at \$8, 24 do av 769 at \$8.65, 21 do av 830 at \$8.25; to Hammond, S. & Co. 8 do av 856 at \$8; to Bresnahan 7 cows av 880 at \$5.75; to Sullivan P. Co. 18 butchers av 700 at \$7.35; to Nagle P. Co. 7 steers av 900 at \$9.25, 8 do av 926 at \$8.25; to Mich. B. Co. 23 do av 1183 at \$9.50; to oose 6 do av 520 at \$6.50; to Bray 7 cows av 800 at \$5.50, 2 do av 1185 at \$8.

Veal Calves.

Receipts 1032. Market 50c lower than Monday. Best \$15; others \$9@12.

Sandel, S., B. & G. sold Parker, W. & Co. 2 av 205 at \$15; to Sullivan P. Co. 3 av 155 at \$15, 7 av 115 at \$10, 15 av 150 at \$15.50; to Bernfeldt 6 av 145 at \$12.50; to Hammond, S. & Co. 10 av 153 at \$15, 9 av 165 at \$15.25; to Shipiro 9 av 160 at \$15.50; to Nagle P. Co. 3 av 175 at \$11, 11 av 200 at \$15.

McMullen, K. & J. sold Parker, W. & Co. 3 av 190 at \$14, 20 av 210 at \$15; to Hammond, S. & Co. 6 av 150 at \$14.60; to Goodgold 2 av 195 at \$9; to Nagle P. Co. 4 av 155 at \$12.50.

Erwin, S. & J. sold Thompson 9 av 180 at \$15, 24 av 175 at \$15.25; to Hammond, S. & Co. 3 av 260 at \$14; to Rattkowsky 3 av 135 at \$13.

Sheep and Lambs.

Receipts 2705. Market steady. Best lambs \$14.75@15.25; fair lambs \$13.50@14.50; light to common lambs \$11@12; fair to good sheep \$7.50@8.50; culls and common \$5@7.

Bishop, B. & H. sold Mich. B. Co. 16 lambs av 60 at \$12.50, 36 do av 70 at \$14.75, 6 sheep av 90 at \$6.50, 1 lamb wgh 80 at \$15, 8 do av 75 at \$15.25, 19 do av 65 at \$15.25, 18 sheep av 100 at \$15.

Receipts 1860. Market 15@20c higher. Pigs \$15@15.50; mixed grades \$17@18.

\$6.50, 45 lambs av 68 at \$15, 2 do av 80 at \$11, 11 sheep av 80 at \$6.50.

SEED WHEAT BULLETIN FREE

Valuable information about New and Tested varieties—Kharkov—Harvest Queen—Fultz, etc.—Timothy, Alfalfa, Clover and all field and grass seeds. Gives valuable planting instructions. Describes heaviest producing varieties—how best crops are grown. Gives money-making ideas about fall planting. Read it before you buy. No charge. Write today. **AMERICAN MUTUAL SEED CO., Dept. 1131 Chicago**

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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LIMESTONE**

95% Through
50-Mesh
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Carbonates

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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 "Truog" 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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USE:—your head, USE:—our preparations, we will USE you right.

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ALFALFA SEED

\$3.00 per bushel. Good purity and germination but dark color. Better grades for more money. Write for free samples and prices. Henry Field, Shenandoah, Iowa.

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130 Acre Farm \$3500

4 Acres Corn, Acre Potatoes

15 Acres Grain, 8 Cows, Pr. Horses

5 calves and heifers, hens, wagons, buggies, sleds, sleigh, harnesses, mower, rake, roller, grain drill, plow, harrow, cultivator, cream separator, tools, dry stove wood and hay from 25 acres all thrown in by owner if taken now so that he can move at once to smaller farm. 15 cow pasture; a good bunch of wood; pears, plums, cherries, and 25 apple trees, 8 room house, telephone, 46 ft. cattle barn, horse barn, granary and poultry house, 1/4 miles to school, a mile to stores and churches, cream collected at door. \$3500 takes everything. Easy terms if desired. See page 18 Strout's Summer Catalogue of 400 bargains throughout a dozen states. Write today for your free copy. **E. A. STROUT FARM AGENCY, Dept. 101, 150 Nassau St., New York, N. Y.**

SMALL farm of 27 acres for sale, 1 1/2 mi. from Blackstone Va. 3 room house, small stable. Enquire of owner. **A. B. SKADDEN, Blackstone, Va.**

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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. Brooding 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.

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**Ferris White Leghorns**

A real heavy laying strain, trap-nested 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. Catalog 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 344 Union, Grand Rapids, Mich.

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Can furnish some fine Young's Strain White Leghorn cockerels at \$1.00 to \$2.00 apiece. Will make fine breeders. W. Van Appledorn, 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; \$3.00 for 100. R. B. FOWLER, Hartford, Mich.

Buff Leghorns. August sale 25 hens one dollar each. 16 two dollar hens and cock bird for \$30.00. Dr. William A. Smith, Petersburg, Mich.

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We now offer for immediate delivery the following pure bred practical poultry: Yearling stock—White Leghorn Hens, Brown Leghorn Hens Barred Plymouth Rock Hens, Rose Comb Black Minorca Hens, Rhode Island Red Cocks, White Leghorn Cocks, Cockerels—White Leghorn, White Wyandotte, Ancona, Barred Plymouth Rock, Young White Pekin Ducks. We have no more pullets for sale now. Here is offered some pure bred practical stock which is daily proving its value in the direct poultry product market we have built up. All this stock is guaranteed. Write to us for prices. HOMESTEAD FARMS, Bloomingdale, Mich.

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R. I. Red Summer Sale. Rose Comb cocks and hens. R. 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. C. W. Leghorns at a sacrifice, buy them now. Two-year-old hens \$1 each; Roosters \$1 and \$1.25. HILL-CREST POULTRY FARM, Ypsilanti, Mich.

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

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

Additional Stock Ads. on Page 130

Poultry Query Department**Ducks Affected by Heat.**

What is the matter with our young ducks? They are hearty and all at once they will twist their necks, run around in a ring, drop over and kick as though they have fits. Some die right away and others will linger for a day or two. Have lost 50 Indian Runners. They act as though they had a bug, or something, in their ears. We feed bran and corn meal or cracked corn. They have plenty of fresh water to drink and free range.

Isabella Co.

E. E. K.

The trouble with your ducks is probably due to exposure to heat, and to over-feeding. Young ducks are quite susceptible to injury from excessive heat, and should be furnished shade in hot weather.

Care should also be used to see that all the food they get is uncontaminated. Very often ducklings will not clean up all the food that is given them at one feed, and what remains soon becomes wet and sour. This will invariably cause digestive troubles.

Some of the most successful duck raisers feed everything, including dry grains, in pans of water, and as soon as the ducklings are through eating, what remains is thrown away. This method of feeding enables the ducks to get sufficient water at feeding time, and also gives them opportunity to keep their bills clean. When fed dry grains, ducks need something to help wash the food down.

Too Much Corn.

As I am having trouble in my flock of poultry, would be glad to have some advice along this line. The young chickens, about eight weeks old, seem to get red on the head and all the feathers disappear except the wings, and around the eyes are swollen and black. They droop around for a week or two, but seem to eat until the last few days and then die. I have several sick with this now, and several dead. I have greased their heads now, but do not know if it will help. I have fed oat meal when small. Later chick feed, composed of wheat, corn, oats, buckwheat, grit and sunflower, etc., now I feed cracked corn. They have no lice.

Newaygo Co.

K. W.

The ration you are feeding your chicks is undoubtedly the chief cause of their trouble. The use of cracked corn alone is not recommended for either chicks or hens, especially in warm weather, as it is a heating food. For chicks it does not contain the proper materials for the development of bone and feathers, and it is probably on this account that your chicks are nearly featherless.

I would continue feeding a combination of wheat, oats and corn in equal parts, and in a hopper feed bran with about ten per cent of beef scraps added. If you have available either sour milk or buttermilk you will find them one of the best foods you can give chicks, and if you can give the chicks all they want, you can cut down the amount of beef scraps about half.

Chicks Have Digestive Troubles.

I am losing my incubator chicks which I am brooding with a hen. They seemed all right at first, but now I am losing most of them. They get weak and dump for not more than an hour, then die. I feed them common chick feed with a little bran in it. They drink lots of water. What can I do for them?

Allegan Co.

M. E. W.

As you have not stated the age of your chicks, it is somewhat difficult to tell what the trouble is.

If they are less than three weeks old, they undoubtedly have white diarrhea, which is a very common disease of young chicks, but if they are older, probably the cause of the trouble is ptomaine poisoning which has been brought about by eating food or drinking water which has become contaminated by filth.

It is very essential to have the quarters in which you keep the chickens sanitary, and also to feed sweet clean food. If you feed any wet mash, be sure that the chickens clean up all that you feed them at one meal within

half an hour. Dry grains, if thrown on the ground and not cleaned up in a short time will also become contaminated, especially during rainy weather. The drinking water should be changed several times a day, and the receptacle for it frequently scalded out.

There is no satisfactory control for white diarrhea, except the feeding of sour milk to the chickens as soon as they are able to drink, and the only practical way that you can hope to get rid of the results of ptomaine poisoning is to get rid of the cause of it.

PROPER CARE NOW PRIMES HENS FOR WINTER LAYING.

Paying a little attention now to the diet and general welfare of Biddy, the hen, will return dividends by putting eggs in the nest during the winter season, poultrymen of the Michigan Agricultural College say.

"Provided poultry is given a little care now, there is no reason why hens cannot be made to lay more eggs this summer, put on their winter feathers early and get into condition for laying through the winter," according to Prof. C. H. Burgess.

"The first step should be to see that the hens are free from lice. Make certain that nests are clean and free from vermin, and see to it that plenty of good, cool, clean and pure water is supplied. A moist mash fed once a day, at noon, will tend to produce heavy egg production. Care should be exercised in the preparation of the moist mash. This can be made of equal parts by weight of wheat bran, corn meal, ground oats and middlings, to which is added fifteen pounds of meat scrap to every 100 pounds. Then thoroughly mix these ingredients. Next dissolve one-half pound of salt in sour, or buttermilk, and with the hands thoroughly rub the mash and milk till every particle of mash is moist with the milk. About twelve pounds will serve 100 hens.

"Also feed each hen a tablespoon of grain twice a day, morning and night. This grain ration may be made up of equal parts by weight of wheat, barley and corn. Grain should be fed whether the hens are on range or not.

"Another method for producing summer eggs is this: Grain should be thoroughly mixed in the following proportions: Thirty pounds of wheat, twenty-five pounds of barley, four pounds of buckwheat, fifteen pounds of cracked corn, twenty pounds of oats and six pounds of Kaffir corn.

"To make a mash mix thirty pounds of wheat bran, twenty-five pounds of ground oats, fifteen pounds of middlings, three pounds of oil meal (O. P.), and ten pounds of alfalfa.

"The above is fed in hoppers."

MONTH-OLD CHICKS.

Poultry-keepers with a day-old chick trade can increase their sales and profits by supplying month-old chicks. New England poultry keepers charged twenty-five and thirty cents each for the latter last spring, double the day-old chick prices, and found a new market for stock. Their equipment of the big coal-burning brooders was increased to meet the demand. Those expert in brooder management, possessing a sturdy strain, made very satisfactory profits, the size of which, of course, depended on per cent of chicks raised to selling age. Chicks do not eat a large quantity of feed during the first month, and on a per capita basis brooding costs are insignificant.

Such a trade furnishes an outlet for surplus chicks, a desirable adjunct of any day-old-chick business. Many orders come in while the eggs are in the machines, and most day-old chick men

make a practice of setting many more eggs than they have orders for. When demand does not meet expectation, month-old chicks—well advertised, because many people are not familiar with them—will convert a problem into profits.

Month-old chicks have decided advantages for beginners, despite the increased cost. Brooding problems, the downfall of so many novices, are obviated, and there is a fine chance to raise a large percentage of the purchase to maturity. There is a market for month-old chicks among people who will not undertake the handling of the "babies."

New Hamp.

J. T. BARTLETT.

FATTENING OLD HENS.

As the moulting season approaches many old hens will be culled from the farmer's flocks and shipped to market or sold to local dealers. The shipments are made at a busy time of the year and often little attention is given to finishing the stock so that they will bring top prices. Fattening is sometimes considered a long, expensive process and the hens are shipped to market in poor condition with their backs as rough and hard as a washboard. When a hen is plump with a little hump of fat on her back instead of hard and rough, she is apt to be in first-class market condition.

Fattening rations are not complicated or need not be to bring fair results. The principle of fattening is to reduce the exercise and increase the consumption of fat-producing food. If the farmer possesses a number of small shed-roof brood coops such as are used for sitting hens with chicks, these coops will be fine for fattening hens. Each coop will accommodate about five hens without crowding and they will have little opportunity for fighting or scratching. Feed them three times each day from a pan containing a sloppy mixture of sour milk and corn meal and allow the hens to eat all they will consume. After each feeding remove the pan so that any remaining feed will not become contaminated with dirt and cause the birds to lose their appetites. We have made old hens show excellent gains simply on this ration of corn meal and sour milk fed for a week or ten days. It does not pay to keep the hens confined over ten days or they may become ill, or at least lose their appetite for the fattening mixture.

Crate fattening is practiced with good results by some farmers and when a large number of old hens are to be fattened the crate will be more satisfactory than the brood coop method. In either case and regardless of the equipment the farmer may possess it will pay to make an effort to fatten old hens of the American or Asiatic breeds. They make gains very easily and the farmer who looks at the check returned for a crate of fat hens and compares it with the money received for a thin consignment will realize the market value of fat stock. We have not found that it pays to fatten Leghorns as the gains they are able to make in a short time do not seem to make the work worth while. A Leghorn hen that is in fair laying condition can be marketed to good advantage at the close of her laying period without fattening. Of course, the returns will not be large but Leghorns are active and nervous and we have not found that they respond well to close confinement and a fattening ration.

R. G. KIRBY.

In an experiment to determine the profit on ducks hatched in incubators, reared in brooders, and sold on the local market at from ten to twelve weeks old, 3.18 pounds of feed per pound of gain were required, the average weight at the end of ten weeks being four pounds, 11.2 ounces per duck.




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Grange.

SIX-COUNTY RALLY A SUCCESS.

Ideal weather and the assurance of spending a profitable day brought over one thousand Grangers to the six-county rally at Jackson, August 10, even though there is a great stress of work on most farms.

The day's activities were started by a large auto parade through the city to the Fair Grounds, at eleven o'clock, which was led by Wm. Sparks, Mayor of Jackson. After partaking of refreshments, the program proper was held in front of the grand stand. This was opened by a drill of Company L of the thirty-first regiment, which is encamped on the grounds. The drill indicated the efficiency of the American soldier, and gave the Grangers some idea of the training he receives.

State Master John C. Ketcham presided as chairman and in his able and forceful manner touched upon several phases of Grange work. He said that it was a compliment to Grange influence and Grange work that so many should be in attendance in such busy times.

The North Leoni Grange band demonstrated their musical ability in the rendition of several selections. The band also indicated that it came from a live and up-to-date Grange. Mrs. O. J. C. Woodman, of Paw Paw, chaplain of the State Grange, offered a prayer which was most impressive. Mr. C. F. Howland of the Board of Commerce, in welcoming the Grangers spoke of the change of feeling between the city and country from that of antipathy to one of co-operation. He also spoke highly of the county agent work.

Mrs. Dora Stockman, Lecturer of the State Grange, gave a very able response to this welcome. She spoke mainly of marketing methods and elimination of food waste. She said America had the worst market system in the world. In Washington, D. C., the annual cost of food delivery is \$900,000, which makes a delivery cost in the city of seven cents for every \$1.00 worth of food. The farmers of the country showed a fine spirit of patriotism when they used high-priced seed and increased food production one million acres with no knowledge of what they would get for their crops. The canning campaign has taken care of what seemed to be excess production of garden products and has kept the prices of these products from slumping. City people have taken to the canning idea so thoroughly that in Lansing the grocers had difficulty in filling the demand for canning products. The Lansing Gas Company's records also show that more gas was used during the month of July than any other preceding month.

Mr. A. E. Illenden, of Lenawee county, also gave a short response in behalf of the visiting Granges, after which Hon. Chase Osborne, of Sault Ste. Marie, gave the speech of the day. He touched upon state conditions and the seriousness of the war. He said that we were fortunate to get in this conflict with Germany when we had able allies, as in the past we have been on the verge of war with that government several times.

A very pretty drill was given by a team of twenty-eight girls from Harmony Grange, Wayne county, dressed in white middie and caps, with green ties, after which Miss Selina Deline gave a fine humorous reading. Munity Grange, the baby Grange of Jackson county, also presented a drill by a team of twelve young ladies and twelve young men. They were dressed in white and red. Both teams showed excellent training, the evidence of which was indicated by the frequent applause, especially by the boys in

Farmers' Clubs

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

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

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CLUB DISCUSSIONS.

What is Expected of the Implement Dealer?—The Conway and Handy Union Farmers' Club met at the home of Mr. and Mrs. O. E. Carr, August 3. The meeting was called to order by the president and was opened by selections on the phonograph, which were much enjoyed. Prayer was offered by Mr. J. B. Fuller. "The topic, 'What we farmers expect of the implement dealers,' was opened by Arwin Killinger. He thought that every dealer should be acquainted with the soil conditions in his locality and should study the tools best suited to his locality. The implement dealer should know how to set up and adjust every tool sold by him. The dealer can be of great service to both manufacturer and buyer. The dealer should become acquainted with all new tools and test them for serviceability to his own locality. Farm implements can be obtained at a lower cost if cash is paid, helping both dealer and the manufacturer. It is very necessary that implement dealers should keep necessary repairs on hand, especially at harvest time, insuring no delay which might result in loss of crop. The up-to-date dealer should have a sample of the machinery which he wishes to sell, for the inspection of customers. Mr. Killinger thought that demonstrations of the new machinery was a great help to buyers. The topic was discussed by Mr. C. Copeland. He thought that as the dealer did not make great profits, repair service should be consistent with profits. Cash is necessary to the dealer, and as a result of paying cash a lower price of machinery is secured for the customer. The topic was discussed by Mr. F. Rathbun, who believes that every dealer should have Service as a slogan. The dealer is occasionally called to adjust trivial troubles, which with a little careful inspection could be adjusted by the owner of the tool. Binder repairs should be carried by the dealer so that in case of breakage no delay will be necessary. The dealer should keep customers posted on raise in prices. If savings can be made for the customer the customer should be informed of it. The topic was discussed by J. B. Fuller, Alton Grant, John Snyder and Mrs. F. Rathbun.

khaki, who witnessed the drills.

The flag for the Grange coming the longest distance with the largest number of members, was awarded to Harmony Grange, Romulus, Wayne county, which brought fifty-five members sixty-five miles to attend the rally. The flag for the best decorated auto was won by a member of North Leoni Grange. Other prizes were awarded to the autos representing Jackson Pomona Grange and Hillsdale Pomona. The flags were donated by Jackson commercial organizations.

For the close of the program the Hawkins family, consisting of nine members, sang "Tenting on the Old Camp Grounds," and three of the boys of Company L sang several selections which met with considerable favor.

The rally was a rally in the true sense of the word. Enthusiasm and Grange interest was abundant and this coupled with a fine day, made the trip one of pleasure to everyone.

COMING EVENTS.

The Ionia County Grangers are very much alive, and are planning a big rally to be held at Lake Odessa on August 23, and through the columns of the Michigan Farmer wish to extend an invitation to grangers of adjoining counties to attend this meeting which promises to be unusually good. A splendid program is being prepared. Boy scouts will drill. Music by Clarks-ville band. Rev. Russell Bready as special speaker for the occasion.

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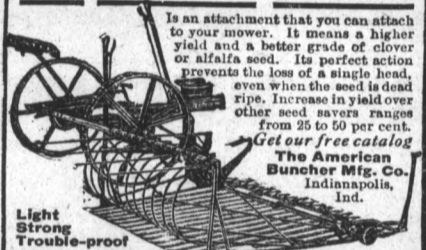
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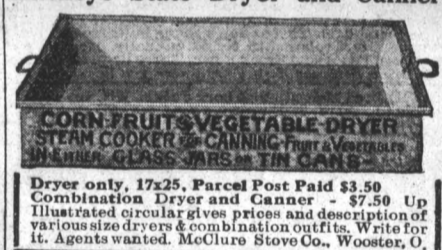


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Registered and Grade Guernsey cows, bulls, yearlings, heifer calves; will sell 20. Some with records; choice of 45; must reduce herd; tuberculin tested. Avondale Stock Farm, Wayne, Mich.

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

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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.

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Choice Registered Holstein calves from A. R. O. cows. RAY B. PARHAM, Bronson, Michigan.

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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.

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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, 30.57 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.

842 Lbs. BUTTER

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PURE bred Holstein Bull born July 15, 1917, not eligible to record. 15-16 white, a good one. \$35 crated & delivered anywhere in state. Newton Barnhart, St. Johns, Mich.

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Enthusiastic Holstein Clubs county, district and state, have been organized all over the country, and they are making wonderful progress in establishing testing associations, and in co-operative effort in eradicating disease among their animals. They inspire in their members a high standard of dealing, and in many ways accomplish the maximum of good for all breeders of Holsteins in their localities. There's big money in the big "Black and White" Holsteins.

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Holstein Bull Calves from a 30 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.

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Registered Holstein Queen Butter Boy A. R. O. and two daughters one ten days and one 11 months. C. G. Hine, Rochester, Mich.

FOR SALE Seven full blooded Holstein heifers from eleven to twenty one months old, also twelve head of grade Holstein cattle. The DECKER FARMS, Brighton, Mich.

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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 Bulls old enough for service and Bull calves, from best strains of Jersey Cattle. Majesty's, Noble of Oaklands, Combination's Premier, etc. Write for Pedigree, price and particulars. Fred A. Brennan, Sec. Capac, Mich.

Notten Farm Jerseys also a few Dutch 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 March 2nd, a son of Avondale, from 1 to 9 mos. old. John Schmidt, Reed City, R. No. 8, Michigan.

MAKE PORK WITH FOOD WASTES.

Even though the hog furnishes the most meat for a given amount of feed and will produce it in the quickest time, the Department of Agriculture points out that this meat should be produced mainly from food wastes and not from good grain that would furnish food directly to man. The great economy in pork production comes from the fact that pigs furnish a food by-product from these wastes and do not need the high-grade feeds that beef cattle must have.

Wastes on farms, and in the towns make good hog feed; by-products from canneries, bakeries, fisheries, packing plants and the like can be utilized as hog feed and to better economic advantage than in any other way. Dairy wastes are particularly valuable as hog feed and promote rapid growth with a good money return for every gallon fed.

The farm orchard furnishes large quantities of wind-fallen or defective fruit, which is relished by hogs, and is beneficial if fed in small quantities frequently, and not all at one feed. Garden wastes, tops of vegetables, culls of all sorts, even weeds, are readily eaten, and such as may not be eaten will be worked over, going into the bedding and adding to the manure.

Kitchen wastes are an excellent source of food for hogs, but should be kept at a minimum, because practically all food prepared for man's use should be eaten by him.

COLD FALL RAINS INJURIOUS TO COLTS.

The exposure of young horses to the short spells of severe weather which occur frequently during the fall, causes a shrinkage in live weight and is a hindrance to rapid and economical development. Older horses seem to stand this sort of treatment with less loss. It is doubtless true that animals become accustomed to winter weather but frequent changes from fine fall weather to bad storms retard gains in colts without shelter.

Four yearling Percheron fillies with an average weight of 1169 pounds on pasture, with a ration of six pounds of corn and oats (one-half of each by weight) daily shrunk an average of 32 pounds each during the spell of severe weather on October 18 to 20 of this year, at the University of Missouri. Aged mares in foal, lost only slightly during the same period.

Inexpensive sheds which will protect colts from wind, rain, sleet, and snow will prevent part of such loss in weight. Growing horses should not be housed too closely and prevented from taking plenty of exercise, but they should not be subjected to extremely bad weather if they are expected to make satisfactory growth.

E. A. TROWBRIDGE.

EWES FOR NEW FARM FLOCKS.

The demand for breeding ewes has exhausted the local supply in many sections, the United States Department of Agriculture finds. Western range ewes are being used to start farm flocks in the corn belt and in the east. In the corn belt these ewes have already proved their ability to produce market-topping lambs when mated to good rams of mutton breeds and when well cared for during the winter and after lambing. They may be expected to do well on the farms east of the corn belt, and on the hilly pastures of the Appalachian Mountain system.

In purchasing these ewes care should be taken to obtain those with sound teeth, udders that are soft and pliable, and teats that are sound and have no hard cores. Ewes from one to three years of age are to be preferred. These ewes may be in thin condition but should suffer no discrimination on

this account alone. If thin they cost less per head than if fat, and the flesh needed to put them in good condition can be put on by the purchaser more cheaply than it can be bought in the open market.

These ewes are usually free from stomach worms, and thanks to the regulations governing the interstate shipment of sheep, are free from sheep scab or other communicable diseases. They can ordinarily be purchased through commission men on such central markets as Chicago, Omaha, Kansas City, etc., or direct from the range breeders. Regardless of how they are purchased, the buyer should insist that the stock be healthy, sound of teeth, and have good udders and teats.

LIVE STOCK NEWS.

Central Wyoming reports a big yield of alfalfa hay this year, while cattle are in good condition. Sheepmen suffered severe losses the past spring, but otherwise everything is in good shape.

A short time ago the famous Rankin Brothers, of Nebraska and Missouri, had on the Chicago market in a single day 14 carloads of cattle from Nebraska and three cars from Missouri. The brothers utilize 30,000 acres of land, most of which is in Missouri and in the adjoining county of Fremont, Iowa. About one-half of their land is used for pasturage and most of the remainder for corn. The brothers own thirty silos and feed 8,000 head of cattle and from 7,000 to 8,000 hogs. One of the Rankins said that the live stock industry is a profitable one when a good sow will bring from \$25 to \$50, as sows have done this year. He added that, in his belief, high prices have lowered the supply of breeders to a point that will result in a serious shortage in the hog supply later on.

Such sheep markets as are witnessed this year were never known in former years, the small lamb crop having resulted in sending prices to higher levels than were ever seen at any former time in the history of the industry. Fluctuations in prices are frequently extremely wide, and the big packers make a common practice of bringing in large supplies of southern lambs direct to their Chicago plants in order to hold down prices on the open market.

Most of the corn-fed cattle recently headed for the Chicago and other western primary markets were fed in a short period and were shipped in from six to eight weeks earlier than they would have been had the cost of corn not been so nearly prohibitive everywhere. The unprecedentedly high price of corn has caused many Illinois farmers-stockmen to plow up their blue grass pastures for corn.

The Chicago hide market has been exceedingly active of late, with interest centering mainly in selections of packer hides taken on government option, some 21,000 native steer hides of June to July salting selling up to 33 cents a pound.

A short time ago the extension authorities of the Ames, Iowa, experiment station made a thorough trip through that state, and ascertained that there will be built this year about five thousand new silos, or an average of fifty silos to each county. This means that about one billion pounds of new silage will be conserved in these new silos. As hay is selling this year around \$15 per ton in Iowa, and silage fed with corn is worth \$6 a ton, the entire amount of extra silage is valued at approximately three billion dollars. It is figured that thirty per cent of the live stock feeding value of the corn crop is wasted when the stalks are left standing in the field; so that one-third of this new silage means absolute gains. In addition to these five thousand new silos, Iowa has about twenty-three thousand others built in former years. The total of these new and old silos, numbering twenty-eight thousand, will conserve 2,800,000 tons of silage, valued at approximately \$16,800,000; and it is estimated that it is sufficient for carrying a million head of cattle for a feeding period of one hundred days.

It has been known for some time that the Kansas pastures are unusually well stocked this summer with cattle; but it is now learned that these consist mainly of light weight young cattle placed on grass for the purpose of carrying them through the approaching autumn and winter on silage and roughness. Therefore, unless a severe drought is experienced, cattle marketed from that state will not be larger in numbers than usual.

Veterinary.

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

Scrotal Hernia.—I have a colt about four weeks old that is troubled with scrotal hernia, but this is not an extensive rupture; however, I would like to know how the case should be treated. W. J. P., Benzonia, Mich.—If the breach is not hurting the colt, leave it alone and very likely it will be well in sixty or ninety days; if not, operate on it as soon as it is weaned. If you believe that the colt suffers any pain, ask your local Vet. to operate on it at once.

Partial Paralysis.—I have a brood sow 18 months old that will weigh about 175 pounds. Recently she seems to have lost control of her hind legs. She appeared to be pretty well up to the time her pigs were five weeks old, since then she has not been able to stand on her hind legs. She has been in this condition for the past three or four weeks, but I do not believe that she suffers any pain. M. W., Carsonville, Mich.—Give your sow 15 drops of tincture nux vomica and 5 grs. of potassium iodide at a dose in feed or drinking water three times a day. She will perhaps never be able to handle her hind quarters in a normal manner again, but instead of feeding her corn feed her oats, oil meal, tankage, and grass. If she is in high flesh she should fatten rapidly and soon be in market condition.

Hernia.—I have a mule that developed a breech in left lower part of abdomen some time ago, and bunch appears to be gradually growing larger. This swelling is puffy and with pressure can be made smaller. The mule appears to be in good health and is fifteen years old. W. W. D., Clarkston, Mich.—Very little can be done to relieve your mule; however, she may remain useful for light work.

Malignant Sore.—I have a colt six weeks old with a sore on side of hock about three-quarters of an inch in diameter which discharges a yellow pus and refuses to heal. I forgot to say that the entire hock joint has been swollen for the past four weeks. This colt was weak at birth, unable to get up without a struggle and would frequently fall. This is when I thought the joint was injured. I have kept it greased with wool fat and applied peroxide. J. H. F., Montague, Mich.—You will obtain fairly good results by applying equal parts of powdered alum, tannic acid and boric acid to sore twice a day and occasionally paint the wound with tincture of iodine, and discontinue using ointment.

Black Mare Pants.—I have a black mare five years old, 1400 lbs., in foal which does not perspire but little during the hot weather, but pants a great deal. After stabling her she seems to break out in perspiration. Can she be cured? E. H. W., Monroe, Mich.—Your mare should be sponged off with tepid water three times a day. She should be fed enough grass or green food to keep her bowels open. Give her ½ dr. of fluid extract nux vomica and two tablespoonfuls of tincture of arnica at a dose in drinking water three times a day. A black horse usually suffers more or less from excessive heat and should not be over-exerted when the weather is exceedingly hot; besides, they should be rested occasionally in a shaded place. Their stable should be well supplied with fresh air and it will help them to wear a light, light-colored sheet over upper part of body, if the sun is shining.

Contagious Abortion.—Four of my cows have miscarried at seven month gestation period; our local Vet. was consulted, and pronounced them cases of contagious abortion. What do you advise me to do? E. W. H., Ionia, Mich.—It would perhaps pay you to have your Vet. treat your cows, for by doing so, they might yield more milk and be more likely to get with calf again. Doubtless you have made clippings of how to treat or stamp out contagious abortion from your herd, providing you care to do the work yourself. If your cows have been bred and are with calf again, they will perhaps carry their calves full gestation period. As you perhaps know, there has not yet been discovered a sure and certain remedy for above ailment.

Stifle Weakness.—We have a three-year-old filly that will weigh about 1300 pounds, but she appears to be wrong in both hind legs. When allowed to stand in stable overnight she becomes stiff and until she moves a few rods, does not walk natural. After she gets to going she appears to work as well as ever, but I am at a loss to know what is wrong. O. McG., Fremont, Mich.—The ligaments of both stifle joints are weak, allowing the cap

to partially slip out of position. Apply equal parts turpentine, aqua ammonia and raw linseed oil to stifle joints twice or three times a week.

Strangles.—My two-year-old colt had what our local Vet. calls strangles, lump formed under throat the size of a foot ball, opened inside and outside also. There are many pus pockets which fill, and other bunches are forming. The colt is running on pasture, eats and drinks all right, but I would like to know what had better be done for him. J. M., Stockbridge, Mich.—Paint bunches with tincture of iodine daily until they soften, then open them up freely to allow pus to drain out; then swab out center of abscess with tincture iodine occasionally. Keep your colt out in the pasture lot and he will get all right.

Umbilical Hernia.—I have a colt one day old with navel rupture, and I am sure it was in this condition at birth, and I would like to have you tell me what to do for him. C. B., Owendale, Mich.—Your colt will perhaps recover without treatment and if it does not, a simple surgical operation can be performed on him when he is a few months old that will make him well.

Collar Gall.—I have a horse that is troubled with a large collar gall, and simple home healing remedies, also commercial remedies fail to heal the sore. What had I better apply? S. W., Boon, Mich.—Apply equal parts of oxide of zinc and boric acid to the sore shoulder three times a day, but before doing so apply peroxide of hydrogen to free sore from pus. Give your cow that fails to come in heat, 1 dr. of ground nux vomica, 1 dr. of ground capsicum and 2 drs. of ginger at a dose in feed three times a day.

Sitfast.—My young horse has bunch about the size of a saucer on each shoulder, caused perhaps by a collar bruise. Will rest from work cure it, or shall I have it lanced? S. S., Adrian, Mich.—If the bunches are hard, have them cut out; if soft, have them opened up freely and swab out center with tincture iodine three times a week.

Congestion.—Have a cow that is coming three years old; always been in perfect health until three weeks ago. She was out on pasture and gave a good mess of milk in the evening. Next morning she appeared to be stiff, had lost her appetite, and I forgot to say that during the night there was a heavy electric storm and cold rain fell on her. I have been wondering whether or not she was struck by lightning. A. D. D., Prescott, Mich.—Doubtless your cow suffers from congestion and will be benefited by giving her 1 dr. fluid extract of nux vomica, 1 oz. of tincture arnica and 2 drs. of acetate of potash in a quart of water as a drench or in drinking water twice a day. She should be washed with warm water two or three times a day and allow the water to remain on her. This washing should be done while the sun is shining. Grass is the best food for her.

Indigestion.—I have a cow that suddenly dropped off in milk yield about the middle of May, and now seems to have a good appetite, is apparently healthy, but she gives very little milk. J. T., Rockford, Mich.—Mix together equal parts of salt, bicarbonate soda, ginger, gentian, powdered charcoal, give her two tablespoonfuls at a dose in feed night and morning. Feed her one part of ground corn, three parts bran and two parts of ground oats, twice a day. About all that can be done for these kind of cases is to feed them easily digested food that is nutritious, and see that she has good pasture.

Breeding Question.—I have a twelve-year-old mare which I bought last spring. For the past six years she has raised a colt each year until this season, but she came in heat, was mated, got with foal; since then she has occasionally passed some blood. Our local Vet. prescribed for her, but she is in much the same condition as she was before he treated her. O. G., Omer, Mich.—Give your mare a teaspoonful of acetate of potash at a dose in feed or drinking water once or twice a day. Also, feed her well and avoid working her too hard.

Short Winded.—Have a ten-year-old horse that has a light cough, but pants quite a bit since hot weather set in. He appears to be short-winded and I would like to know what can be done for him. J. J. S., Marion, Mich.—Feed your horse mostly grain and grass. Avoid over-exertion during extremely hot weather, rest him occasionally, select a shaded place, keep him in as cool a part of the stable as possible. Wet him occasionally with cold water, give 30 drops of fluid extract of lobelia, 1 dr. of muriate ammonia and 2 drs. of Fowler's solution of arsenic at a dose in feed or drinking water three times a day. The driver of a horse of this kind should think and avoid over-working him, especially if the animal is not perspiring freely.

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,
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BROOKWATER FARM

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Ann Arbor, Mich., R. 7.

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Francisco Farm Shorthorns Big Type Poland Chinas

"They're rugged—They pay the rent."
Nothing for sale at present.
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"For Beef and Milk"

This heifer at 6 months has bone, size and quality—Our own breeding. The blood of Scotch bulls, Imp. Shorthorn Albino and Imp. Villager Registered stock always for sale.

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

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

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SHORTHORNS Maple Ridge Herd, Established 1867. No stock for sale. J. E. Tanswell, Mason, Michigan.

Shorthorns for sale, 5 bulls Scotch top 10 to 14 mos., 3 roan, 1 white, 1 red, price \$150 to \$250, 1 son of Max, walton Sultan, 19 mos. \$500. C. Carlson, Leroy, Mich.

I Have a light roan, registered, shorthorn bull ready for service, also younger ones for sale. JAMES NEAD, Sunfield, Mich.

Cattle For Sale

2 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 Shantum, Fairfield, Iowa, R-8.

FOR SALE Sixty head of cattle yearlings and two year olds. Can sell and allow pasture till Sept. 30 or Oct. 1. 1½ miles from Chase, 4½ miles from Reed City. HERBERT LUSBY, Reed City, Mich.

Bull calf 8 mo. old. Out of Rose of Polled Durham. Sharon. Priced for quick sale. J. P. CLAXTON, Rushton, Mich.

HOGS.

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

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Spring pigs, either sex, not akin. Sired by Jennings Pilot Wonder and Orion Chief Perfection. Write for pedigrees and prices. The Jennings Farmers, 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 American 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 Crimston Critic son of Ortic Model 1916 champion Iowa Fair. W. C. Taylor, Milan, Mich.

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

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Durocs, Good Spring pigs by Defender's R. 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.

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I HAVE started thousands of breeders on the road to success. I can help you. I want to place one hog from my great herd in every community where I am not already represented by these fine early developers—ready for market at six months old. Write for my plan—More Money from Hogs. G. S. 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 Crandells wonder & Callaway Edd 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 pigs, either sex and not akin, from good, growthy stock. Farm ½ mile west of depot. Otto B. Schulze, 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. R. D. 4. O. D. Somerville, Grass Lake, Mich.

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. CL OVER 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 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. Prices right. L. W. BARNES & SON, Byron, Mich.

LARGE Strain P. C. everything sold except 1 husky yearling boar that is long, tall & deep. 1 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, Pierston, 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 Jumbo Wood, 800 lb. hog. 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.

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

WAMPSHIRES Boar pigs only for sale \$15 and up as 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 fall service. Waterman & Waterman, Meadowland Farm, Ann Arbor, Mich.

SHEEP

Shropshires Big, early, reg. ram lambs, for coming fall trade, sired by Imp. Nock 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. Lemiter, Belding, Mich.

Additional Stock Ads on Page 129

Farmers' Experience with Auto Trailers

Increased interest in the economy of gas power on the farm has led us to gather the following information from farmers who own automobile trailers. We are confident that this tabulation in which we have exercised care to interpret properly the answers made, will be a real aid to those who contemplate using their automobiles for business as well as for pleasure. The answers are arranged in the order in which they reached this office.

No. of Owner.	County in Which Owner Lives	Distance to Town or Market	Are Roads Level?	Give Character of Road Surface	Give Size of Your Farm.	What Products Are Sold Off Farm?	What Horsepower is Your Automobile?	When Did You Purchase Trailer?	How Many Wheels Has It?	With What Type of Bearings Is It Equipped?	Is It Provided With Solid or Pneumatic Tires?	Give Rated Capacity.	Give Weight of Heaviest Loads Hauled.	Do You Use Rear Seat of Auto For Additional Load?	Does Use of Trailer Harm Automobile?	Has Trailer Developed Any Weaknesses?	Give Amount of Annual Repair Bills.	What Do You Estimate the Life of Your Trailer To Be?	Enumerate Things You Have Carried On Your Trailer.	Are Products Delivered Better By Trailer Than By Wagon?	Does It Give You More Time On the Farm?	Would You Recommend That Farmers Purchase Trailers?	Brief remarks by these owners on the utility of the trailer in the business of farming.
1	Ingham	3 Miles	Yes	Gravel	40	Poultry, eggs	25	1914	2	Ball	Solid	Lbs. 1000	Lbs. 1500	Yes	No	No	None	Years 10	Poultry, eggs, lumber, pipe	Yes	Yes	Yes	With trailer I can make trips to town in one-third the time required with team.
2	Otsego	2 1/4	No	Dirt, gravel	60	None	22	1915	2	Roller	Pneumatic	.....	900	Yes	Uses more gas	No	None	Several	Sheep, calves, poultry, cement	Yes	Yes	Yes	In hauling loads under 1000 lbs, the trailer saves a great deal of time. With it one can undertake to haul longer distances.
3	Cheboygan	5	Yes	Gravel	.....	.....	45	1916	2	Roller	Solid	800	800	Yes	None	Tires wear	Tire expenses	Don't know	Groceries, trunks, etc.	Same	.....	Yes	The trailer saves taking teams from other work and one can travel so much faster.
4	Oakland	25	Some hills	Dirt, gravel, cement	100	Apples, potatoes, small fruit	22	Jan. 1917	2	Roller	Solid	2000	1600	Yes	Don't think so	No	None	20	Grain, feed, lumber, fruit, etc.	Yes	Yes	Yes	If a farmer does not have enough hauling to afford a truck he certainly should have a trailer. I now keep fewer horses and they do not need to be as good as when used much on roads.
5	Oakland	25	Nearly so	Gravel, cement	42	Fruit, potatoes	22	Aug. 1916	2	Roller	Solid	1000	1000	Yes	Don't think so	No	\$15 for tires	Don't know	Fruit	Same	Yes	.....	Trailers are very handy not only for going to market but for other purposes about farm. Draw all my fruit to Detroit, 25 miles away.
6	Oakland	25	Yes	Gravel	120	Apples, peaches, potatoes	22	Aug. 1916	2	Roller	Solid	2000	2400	Yes	None	No	None	10	Vegetables, fruits, poultry, calves	Yes	Yes	Yes	Much time is saved, besides horses can be kept in field instead of going to town for feeds and supplies.
7	Lake	.....	Nearly so	Sand	.....	.....	22	1916	2	Roller	Pneumatic	.....	1400	No	More gas	No	\$2.00	Many	.....	.....	.....	Yes	In doing a rural hauling business I find the trailer very convenient for handling the lighter loads.
8	Eaton	5 1/2	Some hills	Good	80	Wheat, beans, fruit	21	.....	2	Roller	Solid	1000	1000	Some	None	No	None	10	Wheat, beans, fruit, spray material	Yes	Yes	Yes	Can reach distant markets. Cannot see how a farmer owning an automobile can get along without a trailer.
9	Alpena	12	Yes	Gravel	168	Fruits, beans, potatoes, vetch, rye	.....	1916	2	Roller	Solid	2000	2400	Yes	None	No	\$15.00	5 to 6	Fruit, vegetables, seed, potatoes, etc.	Yes	Yes	Yes	Saves time in doing small errands. Gets fruit to market quickly. I regard trailer as an indispensable auxiliary to the automobile. Our trailer paid for itself last year.
10	Eaton	4	No	Gravel	480	Cattle, horses, sheep	45	.....	2	Ordinary	Steel	700	800	Some	None	Yes	\$2.00 to \$3.00	3	Tools, feed, stock	.....	Yes	.....	My trailer was homemade and the steel tires do not stand up under the strain.
11	Oakland	25	Fairly	Gravel, cement	80	Potatoes, fruit, milk	30	Aug. 1916	2	Roller	Solid	1000	1400	Yes	None	No	None	3 to 5	2500 bushels of potatoes	Yes	Yes	Yes	The smallness of the original investment and the great amount of time saved commends them to the farmers use.
12	Livingston	3	Hilly	Clay	80	Hogs, sheep	22	1914	2	.....	Steel	1000	1035	Some	None	Yes	None	5 or 6	Hogs, sheep	Yes	Yes	Yes	I can deliver stock direct to any point within a radius of 30 miles with trailers. Valuable to farmers.
13	Wayne	25	Some hills	Cement, gravel	320	Milk, grain, stocks, fruit	22	1916	2	Roller	Solid	2000	2000	Yes	None	No	None	(?)	Fruit mostly	Yes	Yes	Yes	I can take 40 bushels fruit to market which is all I can sell to advantage in a single morning. With larger loads I would have to stay over or sell at reduction.
14	Van Buren	.....	Hilly	Clay, sand	.....	.....	35	1915	2	Roller	Solid	1000	2000	Yes	None	No	\$5.00	5	Binders, mowers, tools	Yes	.....	.....	I deliver goods to farmers in this community and find the trailer a great time saver.
15	Oakland	36	Hilly	Clay, sand, gravel, cement	80	Potatoes, dairy products	22	Oct. 1916	2	Roller	Solid	2000	1600	Yes	It may	No	None	5	Poultry, chickens, hogs, calves, feed	Yes	Yes	Yes	Can deliver for about one-third the cost of delivering with team. Advise that one should not secure a trailer that is too light.
16	Oakland	25	Part hilly	Cement, gravel, dirt	160	Potatoes, apples, eggs, vegetables	22 1/2	Nov. 1916	2	Roller	Solid	2000	2000	Yes	Don't think so	No	None	10	Fruit, live stock, cement, fencing, etc.	Same	Yes	Yes	There is great economy in the use of trailer in saving time, money and horses. Should last ten years with judicious care.
17	Oakland	31	Hilly	Dirt, gravel, stone	95	Apples, potatoes, garden truck	22 1/2	1916	2	Roller	Solid	1250	1440	Yes	None	No	None	10	Apples, potatoes, grists, etc.	Yes	Yes	Yes	With trailer I can market 43 bu. apples in a half day in comparison with 70 bu in two days with team.
18	Oakland	22	Mostly level	Dirt, gravel, cement	80	Apples, potatoes	22	1914	2	Roller	Solid	1500	1500	Yes	None apparent	Tire trouble	\$4.00	(?)	Live stock, fruit, gas, etc.	Yes	Yes	Yes	I should be obliged to purchase a better team to do road work if it were not for the trailer. Can carry perishable products much better than in wagon.
19	Wayne	25 and 33	Mostly level	Dirt, gravel, cement	110	Grain, hay, pork, fruit	33	1917	2	Roller	Solid	2000	1700	Yes	None apparent	No	None	Don't know	Fruit, feed, machinery, live stock	Same	Yes	Yes	If one cannot afford both a truck and an automobile would advise the purchase of trailer. It saves time, and will take produce to market that could not go profitably by team.
20	Oakland	22	Mostly level	Clay, gravel, cement	80	Milk, potatoes, corn apples	22	1916	2	Roller	Solid	2000	2000	Yes	None	No	None	5	Apples, potatoes, live stock, meat	Yes	Yes	Yes	Would especially advise the purchase of trailers where one is on good roads. It saves time and team.
21	Wayne	27	Yes	Gravel	120	Wheat, fruits	25	1917	2	(?)	Solid	1500	.....	Yes	None	Wheels weak	\$20.00	3	Apples, lime, cider, etc.	Yes	Yes	Yes	I consider it costs about one-half what it does to haul by team. Trailer relieves the horses and saves time.