

MICHIGAN FARMER

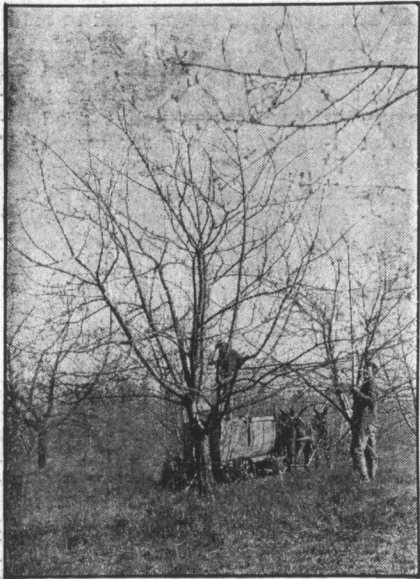
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50 CENTS A YEAR.
\$2 FOR 5 YEARS.



Modern Equipment Makes Spraying Easy.

THERE are three fundamental items of expense in controlling fungous insects in the large commercial orchard or the small orchard for home use. They are the cost of spraying equipment, the fungicides and insecticides, and the labor expense. During the past two or three years the orchard business has not been unusually profitable and for this reason there will be a tendency to neglect many of the expensive operations that are necessary in the production of first-class marketable fruit. This year as in the past, it will be the properly sprayed orchard which will bring the profit and in spite of recent low prices we must admit that the fruit business based on a ten-year average is not much more of a speculation than the majority of farm crops.

Spraying equipment is expensive, considering the number of days each year that it is used. For this reason first-class apparatus should be purchased and it should be carefully cleaned after use. If your spray tank and engine were used rather roughly last year it is now time to give them a careful overhauling and then order any parts that may be necessary. If equipment has been stored without proper cleaning it should receive a good flushing and oiling at this time. When you are ready to apply the dormant spray for scale you may find the machine will need at least one day of cleaning and then you may wait three days to a week for the repair parts. An ideal spraying day means that the work can be done efficiently with about half the work that will be necessary in bad weather with the wind in the wrong direction. There are usually a few good spraying days when the conditions are better than at any other time. This is especial-

Practical Spraying Methods

By R. G. KIRBY

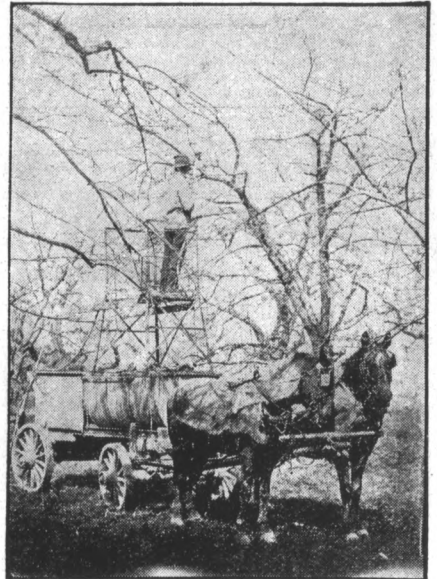
ly true of the dormant spray for controlling the San Jose scale as this must be applied when the weather conditions are very uncertain. Be ready for the ideal day.

The power sprayer is best as a pressure of at least two hundred pounds is necessary to throw the fine penetrating mist into the trees. The right amount of pressure cannot be produced with a hand pump and the labor of spraying an orchard with power generated by the strong arm method is never apt to receive the approval of the hired man. There are many orchards still being sprayed with the barrel pump, although they are large enough to make a gas engine sprayer a profitable investment. These machines have been perfected and reduced in price until the commercial orchardist cannot afford to do without them. If they are given good care and thoroughly cleaned after every spraying application they will give good service for at least ten years and their cost divided by ten leaves a fairly small amount to be charged up to the annual crop which the machine has assisted in producing.

A first-class brand of hose is a good

investment as the cheap brands cannot stand the effect of the spraying materials and they are soon ready for junk. Good hose properly flushed out after each spraying will last for several seasons, while poor hose is often scarcely good for one. Never economize in the length of hose used in spraying. The man on the ground should have about fifty feet of hose as he is then able to do a thorough job around each tree and he is not constantly jerked along behind the wagon before he has completed his work. If he is able to work thirty or forty feet from the wagon he will not be soaked by the misty spray thrown out by the man who is spraying from the tower.

On many farms there are small orchards which have been seriously injured by the scale and many of them are about ready to chop down, although they annually have produced some fruit which has been greatly appreciated for home use. The orchard of a few trees, of course, does not warrant the purchase of a power sprayer and in cases of this kind a fairly good job will result from work with a hand-power machine. There are sev-



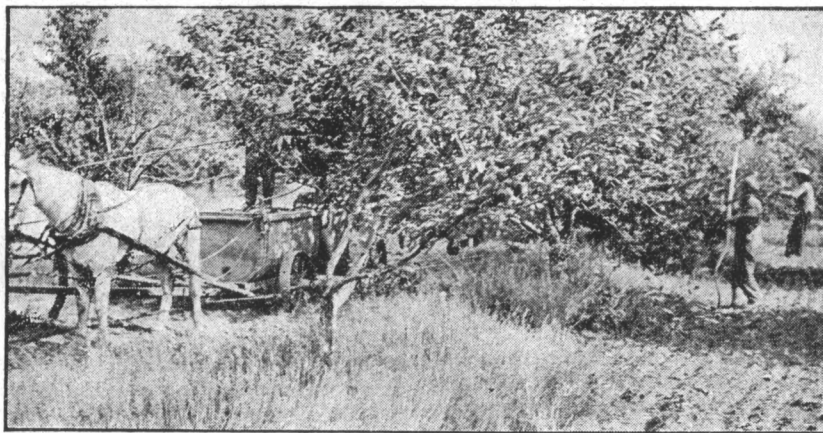
Protect Harness and Horses from Spray.

eral models which are practical. Most of them consist of a barrel and pump mounted on wheels, and they are not expensive and will last many years. Other kinds consist of a metal tank mounted on a wheel-barrow and they will also do good work. These small hand-power machines are not suitable for use in the large commercial orchard, but they are valuable on the small general farm where a great variety of products are raised. They can be used for spraying the fruit trees, grapes, potatoes, etc., and also for disinfecting stables or spraying lice-killing materials in the hen house.

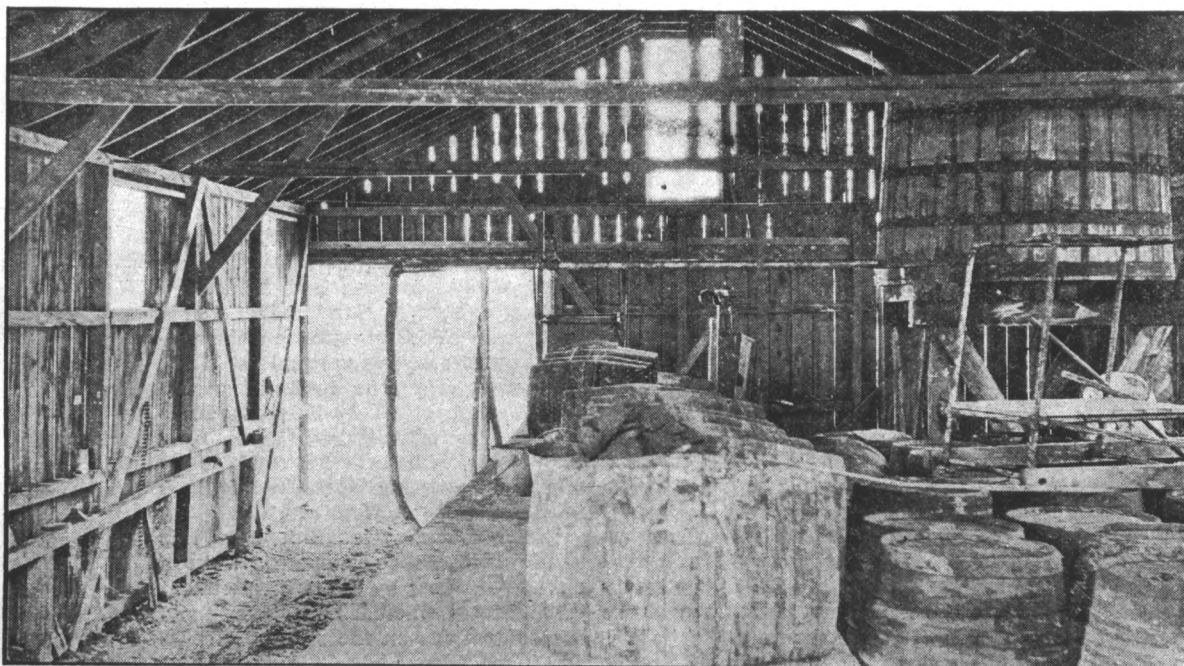
In spraying the orchard the cost of materials is an important consideration. The best materials to use are common knowledge to the fruit grower. The insecticides and fungicides should be ordered early in the season to insure the supply being at hand when the right time arrives for making the application. Purchase the materials of reliable dealers and then test them out whenever there is any doubt as to the quality. When such materials can be ordered in co-operation with the neighbors it is especially desirable if the orchards are small and only a few pounds or a few gallons of the solution will be needed for the work on any one farm. Better prices can be obtained by ordering in large quantities.

The application of spraying materials requires some experience and unskilled labor cannot do the work unless under the supervision of the grower. The main points are to keep the rod constantly moving without missing a single twig or branch. The laborer who holds his rod still until the tree is drenched in one spot will waste a lot of material and leave some portions of

(Continued on p. 234).



To Make Thorough Work Easy Use Long Leads of Hose.



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DETROIT, FEB. 19, 1916

CURRENT COMMENT.

A new idea in the line of educational entertainment was brought to our attention this winter by a northern Michigan farmer who deplored the fact that the only organized effort toward entertainment in his vicinity was purely of a social nature. In his desire to introduce features of educational value through the medium of this organization, he appealed to the Michigan Farmer for information relating to the possibility of securing illustrated lectures from national departments.

Resulting correspondence revealed the fact that the States Relation Service of the Department of Agriculture at Washington, D. C., has a list of a dozen or more lectures of an educational nature for which stereopticon slides are loaned. This opens up a valuable field for educational entertainment in rural communities where a hall or other meeting place is available in which illustrated lectures could be given. Arrangements for a series of interesting lectures of this kind would be most beneficial to any rural community. In addition to acquainting the members of that community with the agricultural resources and possibilities of the country, other government departments could be appealed to for similar service. Those interested in the building of the Panama Canal could, we are informed, secure views of this great construction work through the Isthmian Canal Commission, Washington, D. C., while information regarding lectures on national parks and government reclamation projects can be similarly secured by correspondence with the Department of the Interior of the Federal government, and the Office of Public Roads and Engineering may be appealed to for data regarding projects within the scope of the activities of that office.

This is a field for rural educational entertainment which should not be neglected when so much good material is to be had for the asking, and we trust that the initiative of the reader who directed our attention to this line of inquiry may be followed to a profitable culmination of the idea in many rural communities of Michigan during the present year.

Reference was made

The Sisal Fiber in our last issue to the activities of the

Comision Regula-

dora del Mercado de Henequen, an institution created by the government of the Mexican state of Yucatan and which now exercises a monopoly in sisal fiber from which binder twine is largely manufactured. In this connection the general attorney of the organization

is said to have made the claim to members of Congress and for purposes of publicity that the activities of this commission would really save the farmers of this country several million dollars on the cost of their twine instead of adding millions to their necessary expense for this item.

The basis of this claim is the fact that Manila fiber has advanced in the market to a higher comparative basis than the price for sisal fiber which has been maintained by the Yucatan commission. He has pointed out that on this account the commission could force the price of sisal fiber several cents higher if it cared to pursue this course, but that on the contrary it desires to gain the friendship of American farmers and at the same time prevent a combination of large twine manufacturers from gaining control of the fiber market, which he alleges to have occurred upon former occasions.

In view of the vital interest of American farmers in this proposition and the part which is said to have been played by American capitalists in bringing about the control of the fiber market which is profitable to at least some of the interests involved, there is every reason why an official investigation should reveal the facts in the case as to whether this Mexican state organization is in reality a co-operative marketing enterprise organized for the mutual benefit of the Yucatan planters and American consumers, or a government monopoly created for the purpose of enriching individuals concerned, including American financial backers, as well as providing added revenue for the Mexican state in which the producing industry is located. This information would be interesting, even if it did not indicate a method of relief from the apparent result of the organized effort.

Among other important subjects of legislation with which Congress is wrestling at the present time is that of providing for some form of rural credit by which the farmers of the country may through their own co-operation, or by some other plan under the supervision of the government, pool their resources for the purpose of obtaining long-time loans at a low rate of interest, and perhaps short time loans under more favorable conditions than now obtain in many sections of the country.

Considerable criticism has been directed to members of Congress, members of the American Commission and others who have been strong advocates of some form of rural credit for the delay in the passage of enabling legislation along this line. The idea seems to be general that all that is necessary to establish some efficient form of rural credit is the right kind of legislation. But changes in credit systems as well as other business customs and relations are bound to be slow. The state of New York has a rural credit law and has for some time had local loan associations organized for the purpose of extending rural credit under the plan adopted. While a central bank for the purpose of floating such credits has been in existence for more than a year, the first series of bonds amounting to only \$50,000 has just been issued on the mortgage loans made by the local associations. This fact illustrates the slowness with which a new business of this kind is necessarily gotten under way, even when the machinery for carrying out the plan adopted is already in existence.

While it is important that enabling legislation which will provide for an adequate system of long-time rural credits should be enacted as soon as possible, it is equally important that the plan adopted should be well suited to the needs and conditions of the farmers of this country, and it is better to make haste slowly than to make mistakes which will tend to delay the

growth of a suitable rural credit system adapted to the needs of American farmers. It is likely that the rural credit legislation now pending in Congress will be shaped into a suitable working plan so far as government direction and supervision is concerned, but the interest and co-operation of the farmers of the country at large will be essential to the successful working out of the plan after it is once adopted, hence the importance of continued interest in, and consideration of, this subject by the farmers of the entire country.

The thirty-second annual meeting of the Michigan Dairy Meeting. The Michigan Dairymen's Association held at Kalamazoo, February 8-11 inclusive, was one of the most successful events in the long history of this organization. The attendance was very good, comprising over 500 members of the allied organizations which are identified with this association, over 300 guests invited by the supply houses contributing to the equipment show held in connection with the meeting, in addition to over 700 paid admissions from interested visitors not identified with the organization.

The program was an interesting one from start to finish, as will be noted from features of same which will be summarized in future issues. The officers elected for the ensuing year were as follows: President, R. A. Frary, of Lapeer; vice-president, E. V. Bennett, of Elsie; secretary-treasurer, Geo. H. Brownell, of Detroit. Directors, N. W. Wentworth, of Lakewood Farm, Battle Creek; Glen Overton, of Allegan; W. A. Mudge, of Caro; E. C. Krehl, of Detroit, and John F. Ruff, of Port Huron.

Resolutions passed by the convention, extended the thanks of the organization to the mayor, the chamber of commerce and the people of Kalamazoo; regret for the death of Samuel J. Wilson, for 18 years secretary of the Michigan Dairymen's Association; regret for the attitude of certain Detroit newspapers in accepting deceptive advertisements of oleomargarine dealers; pledging the support of the organization to the State Dairy and Food Department in its efforts to enforce the oleomargarine law, and disapproving the policy of delay and obstruction followed by the Detroit courts of law in the prosecution of oleomargarine cases.

Arrangements for the exhibit were peculiarly unique, due to the foresight and energy of Secretary Brownell in securing artistic booths and decorations for the advantageous exhibit of the equipment contributed by the large list of dairy supply exhibitors. Altogether the meeting was a credit to the dairy industry of the state, and its success is a matter for congratulation to the energetic officers who prepared the instructive and entertaining program.

The experiment tried last year in substituting "Farmer's Week," so-called, for the State Round-up Institute as previously held, was a success from every standpoint. Great interest was taken by those present in the lectures on various agricultural subjects, which were really short courses arranged by different departments of the Agricultural College with lectures, demonstrations and laboratory work which supplied a fund of useful and practical information on the various subjects covered. Farmers' Week will again close the institute season this year, the week of February 28 to March 4 inclusive, being the date for this event, which is intended to be made home-coming week for Michigan farmers at the Agricultural College.

The tentative program for this year's lectures as summarized in a circular sent out by the superintendent of institutes, includes lectures and demonstrations on the subject of soils and farm crops, in which special attention will be paid to improving the

fertility of depleted soils by the use of lime and fertilizers and the growing of leguminous crops, as well as lectures on the production of some of the more important money crops. Lectures and demonstrations will be held by the Department of Dairying, and Animal Industry; exercises in stock judging will also be included. The more common diseases of live stock will be discussed and remedies suggested by the division of veterinary science, with particular emphasis on emergency methods and medicines. The lectures and demonstrations in poultry husbandry will be especially complete, the poultry department being assisted by W. H. Card of Connecticut, a well-known poultry authority. The horticultural lectures and demonstrations will cover the more important orchard operations, and attention will also be paid to leading truck crops.

Special emphasis will be placed on the importance of standardizing potato production through better seed selection, fertilization and the control of various potato diseases. Altogether the program will be an attractive one which should appeal to every farmer who can arrange to attend this closing week of the institute season for the current year.

HAPPENINGS OF THE WEEK.

Foreign.

The European War.—With the exception of Greece, there has been more or less fighting along all the battle lines during the past week. In the west both sides claim victories, the French having captured and retained several hundred yards of German trenches, while the latter announces the taking of a greater length at another point in the Champagne district. The Russians are becoming aggressive from Riga south to the Galician frontier and small successes have attended several of their offensive movements. Before the Albania capital of Durazzo, Austrian and Italian forces are assembling and a battle seems imminent. In the Caucasus district both the Russians and the Turks claim successes. The important fort at Erzerum which lies to the south of the eastern extremity of the Black Sea is being surrounded and bombarded by Russian forces. To the east the Turks claim to have dislodged Russian troops from positions recently taken. Great Britain fears that the Turks have succeeded in cutting communications with the British force at Kut-el-Amara. Relief forces are still 23 miles from the surrounded fort. Although announcement is made that Bulgaria is seeking separate peace with the Allies, in that her purpose in entering the war which was the conquering of Serbia has been obtained, diplomats do not credit the news as authentic. Grecian neutrality was again proclaimed last week in a royal note to the entente allies.

Germany is alleged to be making strenuous efforts to induce the Poles to agree to an autonomy under the suzerainty of Germany in which event an additional army of 900,000 Poles will be organized by the Teutons. Polish leaders in Switzerland believe therefore it is imperative for the entente allies to guarantee Polish autonomy to prevent the Poles from accepting Germany's offer.

Russia is planning to float a loan of \$25,000,000 in Japan.

The great gun works at Skoda, Austria, the second largest factory of this character in the world, has been partially destroyed by dynamite explosions. Two hundred workmen are reported killed.

National.

The attitude of European belligerents regarding armed merchantmen entering American ports is giving our government some concern. Germany and Austria declare they will treat such vessels as war ships, while the Allies insist upon the right to carry guns for defensive purposes. It is probable that Congress may close armed liners to American passengers.

The committee on foreign relations of the United States Senate are in possession of extraordinary revelations pointing to plans of Germany to establish a foothold in several republics of the western hemisphere and in the Danish West Indies in defiance of the Monroe doctrine.

Over one hundred guests at a banquet at the Chicago University Club were made ill through eating of soup containing arsenic supposed to have been maliciously added to the food.

Again diplomats believe the Lusitan controversy within the safety zone, the governments of the United States and Germany having only a few minor details upon which they now differ.

The Farmer Versus the Sportsman

By ALLEN J. TITUS.

DURING the last ten years, while acting as deputy game and fish warden, I have given much thought to this question of the relations of the farmer and the sportsman. I have also experienced many uncomfortable moments as the result of some very unnecessarily careless act on my own part, and have learned that I have caused unnecessary worry, irritation and at times, loss, to some farmer. In making mention of these facts, I desire only that a line may be drawn, whereby an amicable understanding will eventually be reached. Perhaps the farmer may be living in the immediate vicinity of my home town; perhaps he may live in some remote corner of the county, engaged in the pursuit of grazing sheep or cattle; but wherever it may be, I can see, where, in a moment of utter disregard for another's rights, I may have caused unnecessary trouble, thereby bringing to light just cause for damage claims which oftentimes are not made.

and for the second and, or any subsequent offense charged in the complaint, shall upon conviction thereof, be punished by a fine of not less than fifty dollars and not exceeding two hundred dollars and costs of prosecution, or imprisonment not less than sixty days nor more than one year, and in all cases when fine and costs are imposed, the court shall sentence the offender to be confined in the county jail or state house of correction until such fine and costs are paid, for any period not exceeding the maximum jail penalty provided for such offense."

With this law the farmer has little cause for complaint. It really puts the matter up to him and it is up to the sportsman to observe the signs that are posted. Of late about the most prevalent cry is against the use of the bird dog. A great many would like to see the use of the bird dog dispensed with for a given length of time. As to the advisability of the latter proposition, I would not venture to commit

costs of \$32. Now, did Wilson pay for the many hours of anxious worry and watching which he had caused Gleason? I think not.

Was the law stringent enough or did the presiding justice fail to administer the law as was intended in cases of this sort? I am a sportsman, taking my whirl at birds, rabbit and deer each fall, but I can truthfully say that I fail to see where Wilson made good in this instance, unless he really learned that it was best to observe the rights of every farmer. If he learned that, I am satisfied.

Another time Farmer Smithson pastured one hundred sheep upon one hundred acres of land upon the shores of Nicol Lake. A party of Newaygo county sportsmen went to the lake, made camp and fished three days, when they departed, leaving a few coals of fire. The party had not reached the depot four miles away, when a fire had gained great headway. A few days later the state papers contained a story that "flames, started from the fire of careless fishermen, had driven forty head of valuable sheep, belonging to Smithson, into a hedgerow of brush, where, panic-stricken, they were that death ensued. Can you blame Smithson for asking for more stringent laws relating to trespassing?

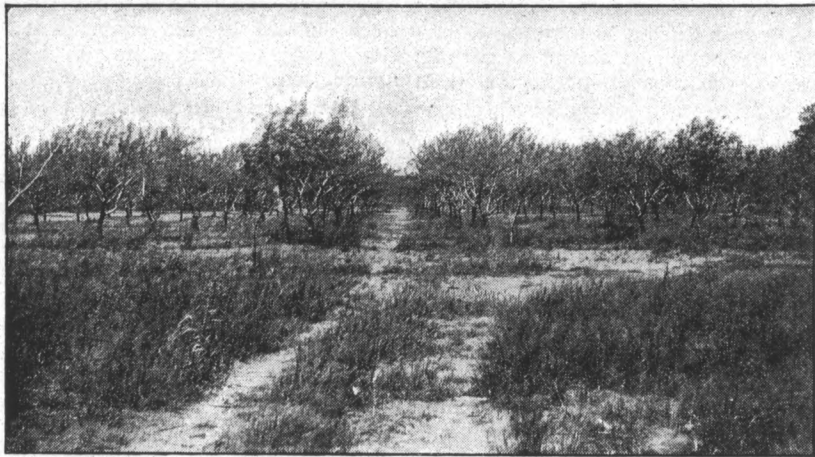
John Branch had endeavored to safeguard the roots of his young peach trees against the frosts, and sowed sand vetch which was to collect the leaves and snow. Three bird hunters started a fire and, the foliage being dry, some entire rows of trees, containing forty trees to the row, were nearly ruined. Yet Branch had posted his lands against this very invasion.

Another party, hunting deer in the slashings and cut-over lands in a remote portion of the country, pitched their camps and stayed in twenty days.

On occasions of this kind it becomes necessary to have firewood and in this instance the finest cedar and birchwood were used. Members of this party selected the best timber for their fires, both for cooking and heating. As the snows afforded better sleighing and the farmer owning the land and timber, desired to remove some of his best timber, he was surprised to discover that a large amount of the best timber was gone. Later this man met one of the hunters and explained the situation to him. The hunter replied that "he supposed he was upon state land." There were several signs upon the trees in that vicinity.

The Gypsy Menace.

Another menace, not of the least, to the wild dry lands is the average gyp-



A Peach Orchard which was Nearly Destroyed by Fire Started by Hunters.

For many years, as the laws existed in Michigan, it was next to impossible for the farmer to bring action and collect damage, in any court in city or village, other than a measly six cents damages.

The Farmer's Protection.

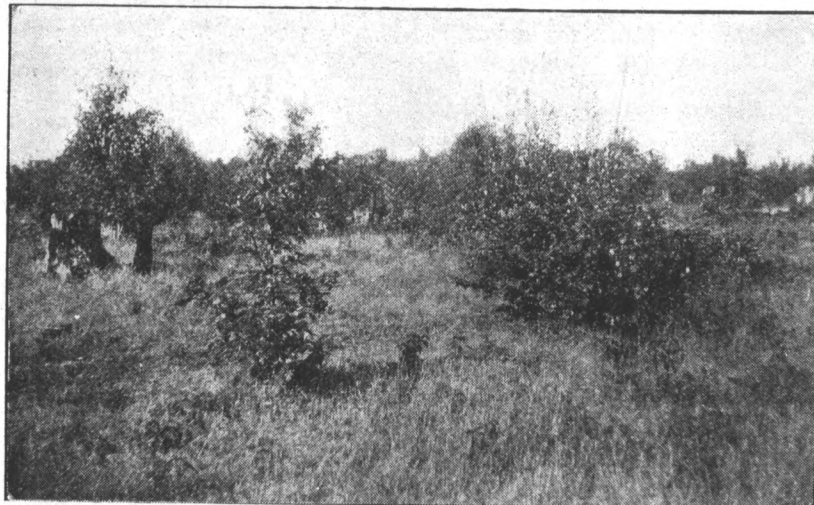
Thousands of readers will ask, "how does the sportsman cause this damage to the average farmer?" and I can find no better explanation and answer than to relate some of the instances which have been so forcibly brought to my attention. During the years I have acted as warden in my county, and later as a state deputy, I was often forced to visit the homes of some of my best friends among the farmers, there to listen to complaint that the "law was all wrong," which to my mind seemed to be the case. In 1911, when the State Legislature enacted a law giving the farmer better protection, it seemed that the trouble was obviated to some extent.

Section 3, Act 275, Public Acts, 1911, reads: "No person shall hunt with firearms or dogs, or in any other manner, in any public park or public game preserves at any time. No person shall hunt with firearms or dogs, or in any other manner, on the enclosed lands of another or upon any farm lands or farm wood-lot connected therewith, without the consent of the owner of such lands when notices have been posted on such lands forbidding hunting thereon, by the owner or lessee of such lands. No person shall deface or destroy any notices posted upon such enclosed lands, farm lands, or farm wood-lots in accordance with the provisions of this act." Penalty. "Any person or persons violating any of the provisions of this act, shall be deemed guilty of a misdemeanor, and upon conviction thereof for the first offense shall be punished by a fine of not less than ten dollars, and not exceeding one hundred dollars, together with costs of prosecution, or by imprisonment in the county jail or state house of correction not exceeding 90 days, or both such fine and imprisonment in the discretion of the court;

myself except in this way: To the average hunter who shoots over his dog, the time is rapidly drawing near when there will be little bird shooting in Michigan, unless the line is rigidly drawn soon. I am sincerely of the opinion that unless the sporting fraternity soon recognizes the claims of the farmer, rather than incur his everlasting contempt, the opportunity for the use of dog and gun will soon be at an end.

Where Hunters Are Justly Accused.

But a short time ago a report was received at this office to the effect that one Wilson, persisted in hunting with gun and dog upon the enclosed and posted lands of Farmer Gleason, al-



Fires are Often Started by Careless Hunters in Dry Grass and Brush Lands.

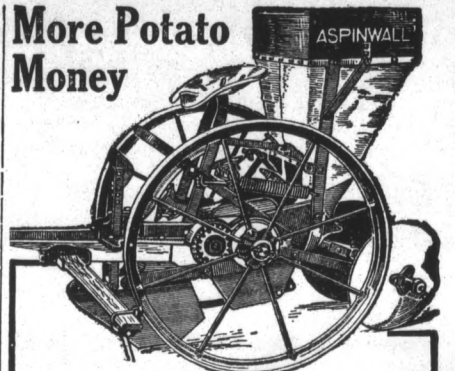
though Gleason had repeatedly warned him to keep off.

Although the farmer had repeatedly ordered Wilson off the premises, he would as often return. Gleason claimed that upon his 200 acres of pasture land were being fed hundreds of sheep and young cattle, and that as he had posted the land, he was taking no other precaution against wild or stray shots, or dropping of a lighted match, which might cause thousands of dollars worth of damage. In this case Wilson was forced to pay a fine and

sy campers, who travel each season over the roads of our state without restrictions. In many places fires have been traced to these people.

It is my firm conviction that the farmer has reached the limit of forbearance in these matters. In many cases the state game wardens and their deputies are doing much to curb the nuisances of which I have written. "Do by thy neighbor as ye would be done by," and we will have better feeling between the two factions of which I have written.

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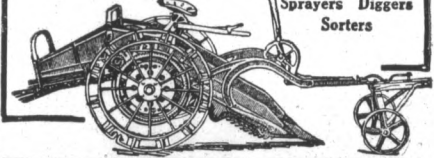
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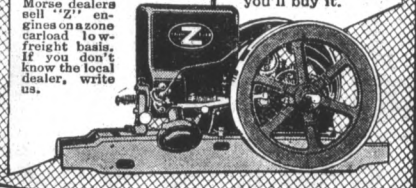
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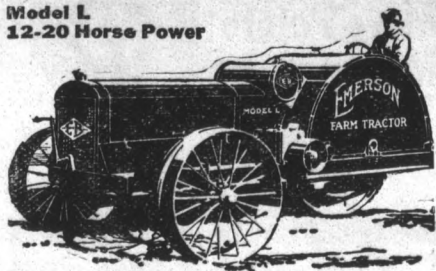


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Durability of Concrete Tile

By PROF. A. J. PATTEN.

THE disintegration of concrete drain-tile has attracted the attention of manufacturers and users alike ever since they were first used for draining soils. There are concrete tile drains known to have been in existence for twenty-five years and are still giving good service, yet there are many others that have failed. The use of concrete drain tile has increased rapidly during the past few years but the many failures has resulted in a more or less widespread belief that they are not durable under all soil conditions. There seems to be quite a general belief that in muck soils, especially, tile made from concrete should not be used.

The cause of the disintegration has not been clearly understood and in response to many requests that came to the experiment station for information on the subject the chemical division undertook an investigation of the subject.

At the outset, a number of drains were examined and cases of disintegrated tile were found in all types of soil. Samples of the soil and disintegrated tile were forwarded to the laboratory for further examination and all the information possible in regard to the manufacture of the tile was obtained. In every case examined, sound tile as well as badly disintegrated ones were found and it was not uncommon to find a perfectly sound tile between two poor ones. This evidence strongly indicated that neither the soil nor the soil water could be the primary cause of the disintegration, otherwise all the tile in the drainage system should be affected in the same way. A further examination of the tile in the laboratory revealed very little beyond the fact that some of the cementing material had been removed which allowed the sand and gravel to crumble and rub off at the slightest touch.

An examination of the soils in which the tile had lain showed no uniformity of condition. Some of the soils were acid and some were not acid. Some contained a large amount of organic matter and others contained very little organic matter. No one condition that might cause disintegration was present in all cases.

The Contributing Causes.

Upon examining the data concerning the manufacture of the tile a great variation was found and every case disintegration might have resulted from one or more of the following causes:

- (1) The use of too lean a mixture.
- (2) The use of too dry a mixture.
- (3) Improper hardening of the product after being formed.
- (4) Placing the tile in the ground before the concrete had sufficiently hardened to afford proper resistance to the solvent action of the soil water on the cement.

In order to throw more light on the action of solutions upon concrete, a number of experimental tile were prepared, through the walls of which, solutions of various kind were caused to pass. In this way it was found that even pure water passing through the walls of a tile will slowly dissolve some of the cementing materials while water containing carbon dioxide and dissolved salts will bring about this result much quicker.

Requirements for Good Tile.

The next step in the investigation, naturally, led to the production of a tile so dense that solutions would not readily pass through its walls. Obviously, air spaces or voids should not be present as they tend to make the tile porous. The gravel should be graded from fine to coarse so that when mixed with the cement no air-spaces will exist. The size of the largest particle should not be more than one-half the thickness of the tile wall or one-quarter inch for all sizes up to ten inches. Bank-run gravel is rarely satisfactory but should first be screen-

ed and remixed in the proper proportions. Sharpness is not essential but it is very important that the gravel be clean. It should not contain more than three per cent of clay or organic matter as this prevents the cement from forming a close union with the particles.

One sack of cement to three cubic feet of gravel is recommended as giving the best results. Just enough water should be added so that the casings may be removed from the tile immediately after forming and an automatic device for measuring the water is desirable. A batch mixer is preferable and the mixing should be continued for one minute after all the materials, including water, have been added. The tile should show web-like markings or water marks on the outer surfaces and trowel marks on the inner surfaces when the casings are removed. They should be uniformly packed from top to bottom so as to insure a dense product with smooth ends and inner surfaces.

Proper Curing is Important.

The hardening or curing process is, perhaps, the most important step in

the manufacture of concrete tile, for, although one may use the utmost care in grading and mixing the materials, if the tile are not properly hardened the maximum strength and durability will not be attained. The best results are obtained when the hardening process is conducted in a specially constructed chamber where the temperature can be controlled and an atmosphere saturated with moisture maintained. The length of time required in the hardening process varies from about eighteen to thirty days, depending upon the method employed.

With the knowledge now at hand there is no reason why concrete tile cannot be made that will be durable under all soil conditions and if properly made and hardened before being placed in the ditch, they should become better rather than poorer. However, unless one has the facilities for employing the best materials and methods, the manufacture of concrete tile should not be attempted. The investment of labor and material required to place a drain is too great to take the risk of using poor tile.

More complete details of the investigation will be given in a bulletin soon to be issued by the experiment station, copies of which may be had on application.

Winter Care of Farm Tools

Much has been written on this subject and I must admit that there is some need of prompting an occasional farmer about the care of his tools. Many people, however, have criticized the farmer about his carelessness in caring for his tools who do not always seem to understand the real conditions. On the train the other day a traveling man noticed a hay loader standing in the back field on a man's farm we passed. He at once began a tirade about the shiftlessness of farmers in general, and some in particular. There was no wonder many of them did not meet their obligations on time, etc. He asserted that they lost enough from leaving their tools out doors to make a good dividend on their farm investment. I got interested, as I sat close to him, and his remarks seemed to be directed to me as much as to anyone, and I rather took the farmer's part. He said, "There is a hay loader that cost that farmer \$40 or \$50, and it is ruined. It will be out there all winter and probably can never be used again. It is really an absolute loss." But I reminded him that the loader may have been useless, worn out, good for nothing, and left there on that account. Farm tools do not last forever. When they are used about so much they, like everything else, are not worth fixing up. It doesn't pay the farmer to putter along with an old loader that is getting out of order every little while. Hay must be got into the barn on time, sometimes in short order, and if machinery is worn, if it bothers, the farmer can not afford to use it. One day with a good tool might save the cost of the tool. I told him that same farmer probably had a good loader in his tool shed or barn, and this one had been discarded as useless.

This was a new idea to this man. He was talking about something he knew nothing about. I argued that not one farmer in one thousand would leave a good hay loader in the field over winter. Farmers have to work too hard, and figure too close to make dividends on their investments to actually throw away their tools. I have had an opportunity to observe what farmers do more than some men and I never saw but few cases of wanton destruction like that.

Every farm has a junk heap. You can say, if you know nothing about farming, that it is waste, but one who knows from actual experience would say that this junk heap represents actual wear. The manufacturer would call it expense, or overhead expense. Many of these same men, however, scold the farmer, (and many times it

is more than scold, it is downright abuse), for laying aside worn-out tools.

I heard a banker once deliver a tirade of abuse to farmers in general because of their buying so many new tools and not taking care of their old ones. Yet that same banker had laid aside an adding machine because it got out of order and bothered him when he wanted to use it, and I venture to say a farmer would have fixed up his machine and made it do a while longer.

It is easy and simple for business men to criticize farmers, because they have had little experience and know but little of the wear and tear of farm machinery. Take as simple a tool as the plow. The manufacturer has perfected almost a perfect tool. He has made it so that the essential parts, when worn or broken, can be replaced by new ones, and yet there comes a time, if this tool is used constantly, when it must be thrown into the junk heap and be replaced by a new one. If this is true of the most simple form of tool, what can be expected of the more complicated implements, like mowers, harvesters, hay loaders, etc. Before the traveling man criticizes the farmer he should acquaint himself with the actual facts. If he does he is not apt to criticize so severely.

It certainly would have looked better had this farmer, at first referred to, taken that old, worthless hay loader out of the field, taken it to pieces, saved the belts and such irons as might come handy for future use, used the wood for repairing other tools, or used it for firewood, and he probably will do this in time—when he gets time. Then the farmer would have saved himself from this abuse by the traveling man, but in dollars and cents he would have been but little ahead.

Most farmers, nowadays, take pretty good care of their tools as long as they are worth caring for. Many take good care of tools that actually are not worth caring for. I saw a farmer oil cultivator teeth once when he put his cultivator away for the season, that were actually worn out. They were good for nothing and he could have purchased new ones for 15 or 20 cents each. He should, in my judgment, have thrown them away instead of wasting his time and good oil to care for them, but he had got into the habit of doing this and did not really consider what he was doing. When the binder is worn so the man has to tinker with it half the time, he had better unhook from it and get a new one. The new one costs money, but the old one will waste much more.

COLON C. LILLIE.

Improving the Farm Woodlot

By PROF. A. K. CHITTENDEN

THE importance and value of a woodlot in connection with a farm is often overlooked. The woodlot is not infrequently considered as so much waste land, idle capital, and it is often neglected and allowed to deteriorate. If put to work and properly managed it is a valuable part of the farm and will yield returns, direct and indirect. It should produce firewood, occasional timbers and lumber, often maple sugar, and it is always a pleasant spot on the farm. The woodlot should be taken care of in the same way as the rest of the farm. It will pay, if only by giving a steady supply of fuel. In cutting or selling timber from the woodlot be sure that it can be spared, that there will be enough left to provide for future crops. Do not cut all the timber unless the land is absolutely necessary for some other purpose, and even then stop to consider first what the farm would be like without the woodlot. Remember that farmers are planting trees for windbreaks and are establishing forest plantations where they have no woodlots. Before beginning cutting go over the ground and decide which trees should be taken out. If somebody else is going to do the cutting, mark or blaze these trees so there will be no mistake.

How to Select the Trees for Cutting.

In the average woodlot, cutting should be done on the selection system, taking out trees here and there without seriously interfering with the density of the stand. The greatest

amount of timber per acre is produced when the trees are close enough together to completely shade the ground. The best lumber is produced by trees which are straight and free from limbs on the lower part of the stem. Such trees are the result of growing close enough together to force each other to grow upwards for light. They should, however, have room to develop a good crown, as diameter growth depends very largely on the amount of foliage on the tree. Too much crowding results in crooked and stunted trees. If heavy cuttings are made in any one place the soil will be exposed to sun and wind and planting may be necessary in order to restore the forest. Only the surplus trees, the fully matured trees and the trees of poor species should be cut. Aim to improve the forest by taking out the poorer and less desirable species, giving more room to the trees of better species. The forest should not be opened up too much. Not more than twenty per cent of the older trees should be taken out at any one time and in case of such a heavy cutting a period of some years should elapse before the next cutting. Trees with large healthy crowns are increasing rapidly in volume. They are, however, shading out the small trees which are underneath. If such big-crowned trees are not of valuable species they should be taken out. If, however, they are of valuable species and are healthy it is better to leave them until they are needed for lumber or timbers. If too many such big-top-

When Plantings Should be Made.

Dead and diseased trees which are sound enough for use and trees which are crooked or which have grown in the shade so long that they will not be able to mature should be taken out first. Next the undesirable trees should be taken out in order to prevent them from reproducing, and enough of the wide-topped, mature trees which are shading out thrifty young trees of good species in order to give these young trees room to develop. Openings should not be made so large that the crowns of the trees will not be able to close within five or six years. If there are any large openings in the woodlot valuable, fast growing species should be planted. The composition of the woodlot can be improved by planting. It is better not to make heavy thinnings, but to thin lightly and often. The edge of the woodlot should be kept dense. Norway spruce may be planted around the edge if necessary. They will make good Christmas trees in a few years if they are not needed for a windbreak. There is often a good market for a limited number of Christmas trees.

The forest should consist of an understory of shade-bearing trees, such as sugar maple and beech, growing under an overstory of light-demanding



The Housewife Appreciates a Good Supply of the Product of the Woodlot.

amount of timber per acre is produced when the trees are close enough together to completely shade the ground. The best lumber is produced by trees which are straight and free from limbs on the lower part of the stem. Such trees are the result of growing close enough together to force each other to grow upwards for light. They should, however, have room to develop a good crown, as diameter growth depends very largely on the amount of foliage on the tree. Too much crowding results in crooked and stunted trees. If heavy cuttings are made in any one place the soil will be exposed to sun and wind and planting may be necessary in order to restore the forest. Only the surplus trees, the fully matured trees and the trees of poor species should be cut. Aim to improve the forest by taking out the poorer and less desirable species, giving more room to the trees of better species. The forest should not be opened up too much. Not more than twenty per cent of the older trees should be taken out at any one time and in case of such a heavy cutting a period of some years should elapse before the next cutting. Trees with large healthy crowns are increasing rapidly in volume. They are, however, shading out the small trees which are underneath. If such big-crowned trees are not of valuable species they should be taken out. If, however, they are of valuable species and are healthy it is better to leave them until they are needed for lumber or timbers. If too many such big-top-

ped trees are taken out at once and the ground exposed to the sun and wind, the soil will dry out and the roots of the small trees left may not be able to obtain water enough for their growth.

Be careful in logging not to injure the valuable young growth. The young growth is the basis of future crops. Waste of timber in stumps and tops should be avoided. Stumps should be cut as low as possible and the tops and limbs used for firewood. By doing this the timber will go farther and it will not be necessary to cut so much of it.

The woods should not be pastured if it is desired to maintain the woodlot. It cannot be used for both forest and pasture at the same time with success.

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MODEL OF CARS	1911	1912	1913	1914	1915
Abbott Detroit	A	Arc	Arc	Arc	Arc
American	A	Arc	Arc	Arc	Arc
Apperson	A	Arc	Arc	Arc	Arc
Auburn (4 cyl)	A	A	A	A	A
" (6 cyl)	A	A	A	A	A
Avery	A	E	A	A	A
" (Model C) 1 Ton	A	A	A	A	A
Buick	A	Arc	Arc	Arc	Arc
Cadillac	Arc	Arc	Arc	Arc	Arc
" (8 cyl)	Arc	Arc	Arc	Arc	Arc
Claire	A	A	A	A	A
Chalmers	A	Arc	Arc	Arc	Arc
Chandler	A	Arc	Arc	Arc	Arc
Chase (air)	B	B	B	B	B
" (water)	B	B	B	B	B
Chevrolet	A	Arc	Arc	Arc	Arc
Cole	A	Arc	Arc	Arc	Arc
Detroit	A	Arc	Arc	Arc	Arc
" (8 cyl)	A	Arc	Arc	Arc	Arc
Dodge	A	Arc	Arc	Arc	Arc
E. M. F. (Model 48)	A	Arc	Arc	Arc	Arc
Empire	A	Arc	Arc	Arc	Arc
Flanders	E	E	E	E	E
" (6 cyl)	E	E	E	E	E
Ford	E	E	E	E	E
Franklin	A	Arc	Arc	Arc	Arc
" Com'l	B	A	A	A	A
Grant	A	Arc	Arc	Arc	Arc
Haynes	A	Arc	Arc	Arc	Arc
Hudson	A	Arc	Arc	Arc	Arc
Hupmobile	B	B	A	A	A
" (Model 20)	Arc	Arc	Arc	Arc	Arc
I. H. C. (air)	B	B	A	A	A
" (water)	B	B	A	A	A
International	A	Arc	Arc	Arc	Arc
Interstate	A	Arc	Arc	Arc	Arc
Jackson	A	Arc	Arc	Arc	Arc
Jeffery	A	Arc	Arc	Arc	Arc
" Com'l	A	Arc	Arc	Arc	Arc
King	A	E	A	E	A
" (8 cyl)	A	E	A	E	A
Kiesel Kar.	A	Arc	Arc	Arc	Arc
" Com'l	Arc	Arc	Arc	Arc	Arc
" (Model 48)	A	A	A	A	A
Krit	A	A	A	A	A
Lozier	Arc	Arc	Arc	Arc	Arc
Marion	A	E	Arc	Arc	Arc
Maxwell	A	Arc	Arc	Arc	Arc
Mets	B	A	A	A	A
Mitchell	A	Arc	Arc	Arc	Arc

MODEL OF CARS	1911	1912	1913	1914	1915
Moline	A	Arc	A	Arc	A
" Knight	A	Arc	A	Arc	A
Moon (4 cyl)	Arc	Arc	Arc	Arc	Arc
" (6 cyl)	Arc	Arc	Arc	Arc	Arc
National	A	A	A	A	A
Oakland	A	Arc	Arc	Arc	Arc
Oldsmobile	A	Arc	Arc	Arc	Arc
Oversland	Arc	Arc	Arc	Arc	Arc
Packard	Arc	Arc	Arc	Arc	Arc
Pontiac	A	A	E	A	A
" (6 cyl)	A	A	E	A	A
Pathfinder	A	Arc	Arc	Arc	Arc
Premier	A	Arc	A	Arc	Arc
Rambler	A	Arc	Arc	Arc	Arc
Regal	A	Arc	Arc	Arc	Arc
Reo	A	Arc	Arc	Arc	Arc
Saxon	A	Arc	Arc	Arc	Arc
Studebaker	A	Arc	Arc	Arc	Arc
Stutz	A	Arc	Arc	Arc	Arc
Volvo (4 cyl)	A	Arc	Arc	Arc	Arc
" (6 cyl)	A	Arc	Arc	Arc	Arc
White	Arc	Arc	Arc	Arc	Arc
Winton	Arc	Arc	Arc	Arc	Arc

TRACTORS

Model of Tractor	Summer	Winter
Aultman-Taylor (4 cyl. horizontal)	A	Arc
Avery	B	A
Best	B	A
Big Four (20)	A	Arc
Bull	A	A
Butler (Model A-1)	A	A
Holt Caterpillar	A	A
C. O. D. (2 cyl. horizontal)	A	Arc
Denning (Models B & C)	A	A
Eagle	A	A
E. B. Farm	A	A
Emerson Brantingham (Model L—Big-20)	A	A
Lozier	A	A
Farquhar	A	A
Flour City	A	A
" (Heavy Duty)	B	A
Gray	A	A
Hackney Auto Flow	A	A
Hart Parr	B	A
Heer (2 cyl. horizontal)	A	Arc
I. H. C.	A	Arc
Imperial (40)	B	A
Lambert (Model X)	A	Arc
Leader (Heavy Duty)	A	Arc
Lion	A	A
M. & M.	A	A
Nichols & Shepard (2 cyl. horizontal)	A	Arc
Ohio	A	Arc
Reeves (40)	A	A
Rumely	A	A
Russell	A	A
Simplex (4 cyl. horizontal)	A	Arc
Strite	A	A
Twin City	A	A
Universal (Models A & B)	Arc	Arc
Wallis (Type D)	A	Arc

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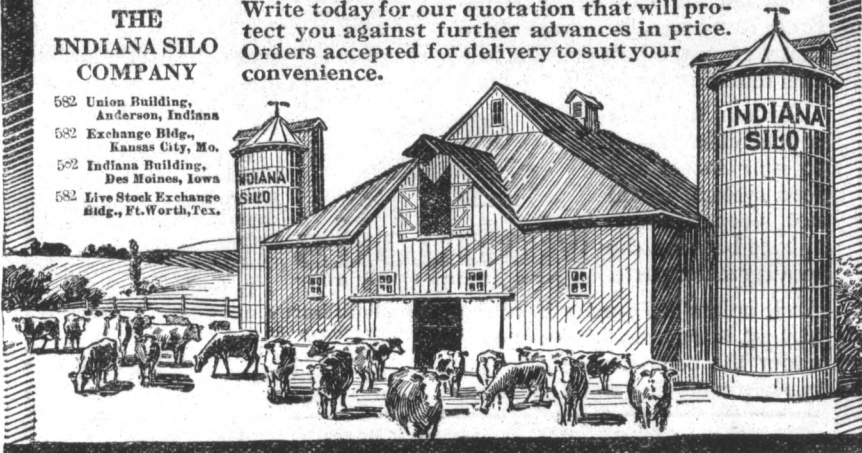
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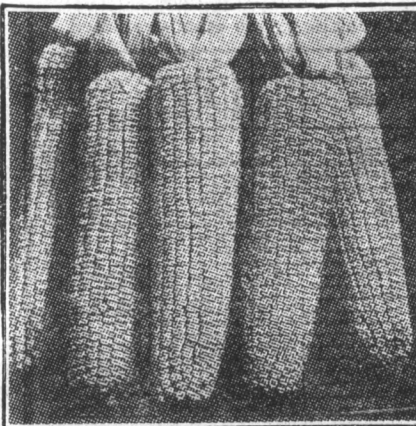
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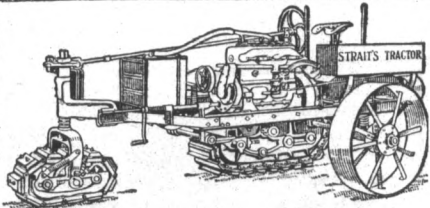


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Sweet Clover

SWEET clover won its early reputation in the south. First it grew successfully on the prairie lands of Mississippi, then farther to the north on soils that had been practically depleted of fertility the plant proved its ability to grow luxuriantly. In Kentucky short-tenured tenants discovered the possibilities of getting a crop of sweet clover on the run-down farms and their frequent moving did much to introduce the plant into new territory. Its first use was to provide nectar for bees, as the little fellows can reach down into the blossoms and secure the honey. To others it was classed as a weed until its feeding value and fertilizing benefits became better known.

The Advantages of the Plant.

In recent years the two advantages last named have given great impetus to the growing of this legume. As a pasture it is equal to alfalfa and the hay, while a little less valuable than the average alfalfa crop, is much superior to clover and timothy. The ability to add humus to the soil is perhaps chief among the advantages the plant offers to farmers in the northern states. The immense root growth fills the soil with organic matter and this has peculiar value due to its rapid decomposition. Besides the above, farmers have found the seed of the plant a valuable crop to grow. The widespread use of sweet clover at the present time has increased the demand for seed many times in the last decade. These were the reasons given for the rapid growth in the popularity of sweet clover, by H. S. Coe, of the U. S. Department of Agriculture, at the recent meeting of the Michigan Experiment Association held at the Agricultural College.

Among the several species of sweet clover grown in the United States only three have attained any considerable commercial importance. First, white sweet clover is the species most generally grown and it probably constitutes 75 per cent of the acreage devoted to this plant in the United States. In Colorado and a few other limited districts, what is known as yellow sweet clover is grown quite generally. This variety makes a better quality of hay than the first species named by reason of its finer stems. Still a third variety is used in the far southwest as a catch crop in orchards, but is grown hardly at all for forage purposes.

May be Pastured Closely.

One of the points made by Mr. Coe was that it is not necessary to leave a growth of leaves and stems on the sweet clover field for the protection of the plants over winter. The buds producing the new stems in the spring are located much lower than are the buds of the alfalfa plant. They are naturally protected by the soil itself. This fact increases the grazing advantages in that the plants can be grazed closer and also that stock may be turned in much earlier in the spring than with some of our other pasture crops. The speaker stated that stock can usually be kept upon this pasture from early spring until about the middle of August.

Observation and experience have shown that stands of sweet clover may be secured, either with or without a nurse crop. The condition of the soil and the purpose of the farmer would dictate very largely the method to be employed.

Amount of Seed to Sow.

It is generally recommended that with seed giving a germinating test of about 85 per cent, 20 pounds of the seed will be required to sow an acre. The speaker was of opinion that much less seed would give a very satisfactory stand, in fact he believed that one-half that amount would be sufficient. If germinating tests showed that 50 per cent of the seed would grow, then he thought 20 pounds would be enough to use.

Many of the sweet clover seeds fail to germinate because the seed coats do not admit moisture to the embryo to start germinating processes. Consequently it has been found advantageous to treat seeds in some manner to overcome this difficulty. The use of sulphuric acid has given good results and the scarifying machine showed an advantage in favor of its use. Experiments where seeds were rubbed with sandpaper gave a far higher percentage of germination than did similar tests of untreated seeds.

It was stated that in regard to soil conditions lime requirements for sweet clover are practically the same as for the alfalfa plant. When this element and good seed are provided it is not a difficult matter to secure a satisfactory stand.

Caring for the Crop.

Where the crop is being pastured the stock can usually be turned in about ten weeks after seeding. On good lands farmers have been able to keep as high as twenty shoats per acre on this crop. In some of the dry sections of Kansas ranchmen have doubled the number of cattle that their lands would sustain on natural grasses. Hoven is practically unknown where cattle are pastured on sweet clover, and stockmen believe that the bitter element in the plant is responsible for the splendid condition of the digestive systems of animals kept on sweet clover forage.

In growing the crop for seed it is difficult to know just when to harvest the plant. The seeds do not all ripen at the same time. There will be blossoms, green pods, ripe ones and some that are shelling all at once. The farmer must use his judgment and cut the clover when he thinks the yield will be largest. Different methods of harvesting are in vogue; some use the mowing-machine and buncher and take care of the plant the same as cloverseed. Others use the binder, shock the bundles in long open shocks, then when cured either draw to the threshing or stack and allow to stand for some time before threshing out the seed.

THE SEED CORN SITUATION.

Field men of the Agricultural College have made a survey of the seed corn situation in some of the counties of this state, according to Mr. Bamer in his address before the recent session of the Michigan Experiment Association. Out of over a hundred farms visited, less than one-half have made provisions for next year's seed. Most of these are contemplating the selection of ears from their cribs. About an equal number expect to buy seed from others, while about four per cent have seed from their 1914 crop.

Mr. Bamer emphasized the advantage of the field selection of corn over crib selection. Experiments conducted in Ohio showed that the average increase in yield of corn from seed selected by the two methods showed an advantage of four bushels per acre in favor of that taken directly from the field. Experiments in southern Michigan on the same line showed an increase of seven bushels per acre. Other work corroborates these results.

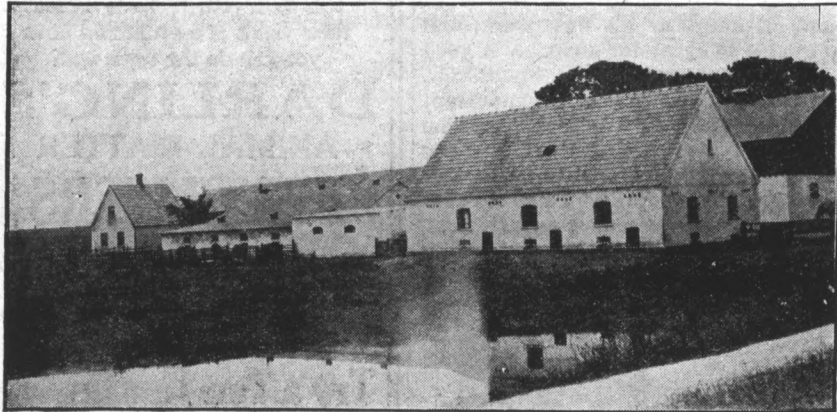
In many years the necessity of making careful germinating tests has not been so important as it will be for this coming season. Much of the corn going into the cribs that may have the general appearance of being in good condition for planting purposes has a very low germinating test. Many of these tests show the corn to have a germinating ratio as low as 20 per cent. The kernels are also very shallow and tapering, which makes the need of securing good seed corn for next spring still more urgent. The speaker was deeply concerned over the question as to where dealers would be able to secure a sufficient amount of good seed to satisfy the requirements of growers in the districts where the crop failed to mature before frost last fall.

Organized Agriculture in Denmark

By WILLIAM B. HATCH, Member of American Commission

WE took a sleeper from Berlin to Copenhagen on the twenty-first of June. I was awakened in the night by a sensation, which for the moment, made me think I was just approaching Detroit, in the days before the tunnel—that sensation that comes when your sleeping car passes from rock ballasted terra firma onto a ferry boat which yields under your weight. We were passing from the Island or Province of Falster to the larger Island or Province of Zeeland, on which is located Copenhagen, the country's capitol and metropolis in which dwell

the seat of "Anna Hobbman." Upon inquiry we learned that seven of the forty-eight councilmen are councilwomen. This beautiful municipal building did not appeal to me alone because of its attractive interior equipment, but I was equally impressed with the beautiful park which it partly enclosed on two sides. The park was designed for use and its design was realized. Fountains were playing, birds were singing in the trees and a generous sand pile provided endless amusement for happy children. I did not learn that the presence of seven



Typical Danish Farm Buildings Are of Brick with Tile Roofs.

over 500,000 people, or fully one-fifth of its entire population.

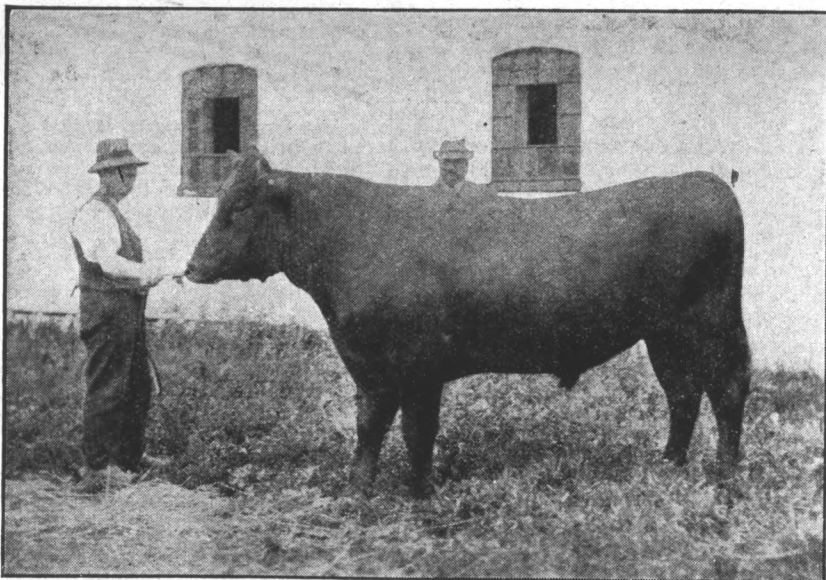
I welcomed the opportunity of visiting Denmark and looked forward to it, believing from what I had read, that it would prove to be, one of the most interesting countries in all the world, in which to study co-operative agriculture in action. We had learned already in studying the question in eight other countries, that Denmark had applied these principles with pronounced success. Other countries, in other words, had gone to School in Denmark.

Our arrival in this thrifty country's capitol gave us Sunday for rest before our regular work began. This afforded us an opportunity to get some individual, general, first impressions of the Danish people in her chief city. My personal impressions, and I think those generally of all the other commissioners there, were decidedly favorable. We had a feeling somehow that we were headed towards home, when we could attend an English Church, where

women in the legislative halls of the city had anything to do with this concrete remembrance of the children, but I naturally suspected that it had.

Denmark is known almost as widely as a dairy country as is Holland, and Holland acknowledges her indebtedness to Denmark for teaching her how to apply co-operative agriculture more successfully. Denmark seems obviously to be much behind Holland in the quality of her dairy cattle. There seems to be a sort of rivalry in Europe in the production of a distinct national type of farm animal. The Dane has left to Holland those pre-eminently profitable black and white dairy cattle, the Dutch Friesians, and she has confined herself to the development of a red cow, without any spots. The picture of a typical Danish bull illustrates the Danish type. It resembles the Red Polled cattle of England.

The dairies in Denmark as in Holland and throughout Europe, impress me as being better built and better



Type of Dairy Bull Usually Found in Denmark.

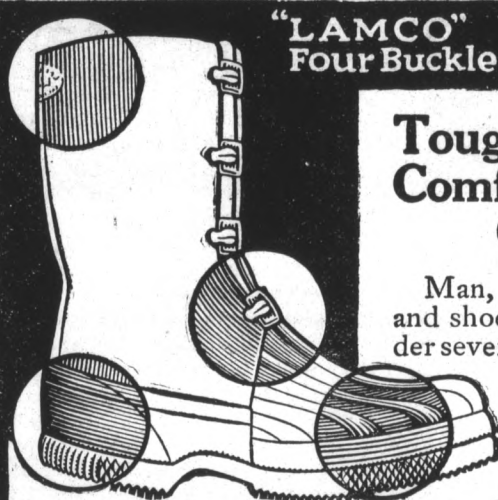
the preaching was in a language that we could understand. On our way home from church we observed a very long parade consisting of men, women and children commingling about equal in proportion as to sex. We were informed that this was a temperance parade. An official assured us that the line exceeded two miles in length and that there were over 25,000 people in line.

While passing through the city council chamber (which compares quite favorably with the senate chamber at Lansing), we chanced to stop opposite

equipped than those in America. This, however, is characteristic of all European building, or most of it. I presume the much cheaper labor cost there has considerable to do with it. And then they have the object lesson before them all the while, of substantial building—lessons learned from construction done when labor cost practically nothing. But at any rate they have the habit and have retained it, of doing things well.

In the Danish dairies the law requires a sterilizing outfit as part of the

(Continued on page 246).



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They will continue to wear long after ordinary goods have gone the way of the scrap heap. It's because

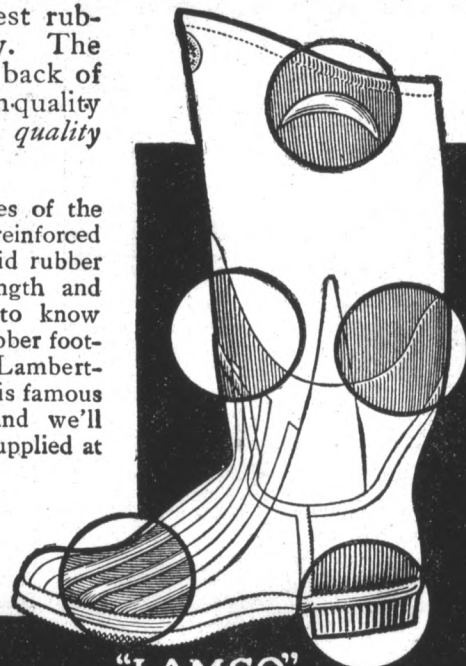
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is made of the very finest rubber that money can buy. The forty years' reputation back of these boots is founded on quality—quality in materials, quality in manufacture.

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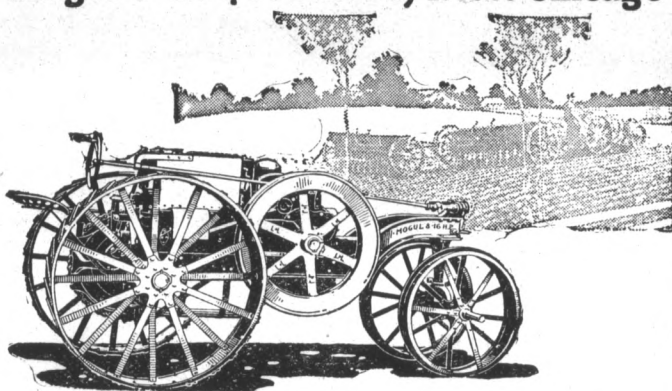
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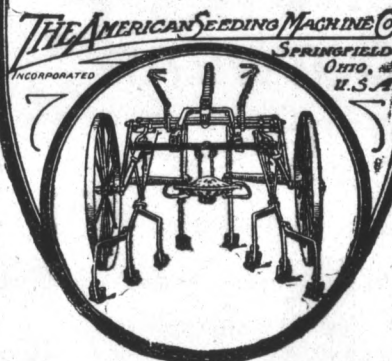
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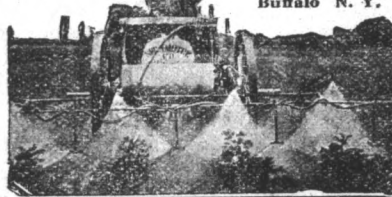
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The Farm Orchard

OFTEN during the past year, people have said to the writer: "Fruit growing is destined to become a profession. The time will soon be here when the average farmer will not try to grow fruit. The time was when the orchard needed but little care, a slight annual pruning, perhaps some fertilization now and then, were all that was required, but now we must spray and prune, fertilize and thin, and it is simply out of the question."

I do not wish the reader to understand that each one of these parties delivered his speech in the above words, but they are a fair interpretation of the minds of an increasing number of people who really feel that it will not pay them longer to pay any special attention to their orchards. They realize, of course, that the San Jose scale will destroy the trees in a very few years at most, and that very soon the fruit will be rendered worthless by these pests and others, but this only strengthens their determination to let them go.

"Yes," says the man who would give up his orchard, "but what does it mat-

ter for that orchard, and have plenty of good fruit right at home just when you want it.

Apple scab is a difficulty that is widespread. I have seen it nearly all over Michigan, and do not believe that any county in the state is exempt. But it is easy to control this trouble. The first necessity is a good spray-pump. A hand-pump for the small orchard is good enough. One man in the community with a good power machine might do a lot of spraying for his neighbors if he could be gotten just when he was needed, but the trouble is that when you want that man the worst, he is working for someone else, or is at home detained by his own work, and so unable to spray for anyone. A good hand-pump, then, is the first necessity.

To my mind, the most important spray in the control of scab is "The Pink Spray," the spray that is made just before the blossoms open. It does not take long to do this work. A small orchard can be gone over at little cost. After the blossoms fall comes the first spray for codling moth. The best mixture is arsenate of lead, about two and



A Well-kept Orchard Adds Greatly to the Attractiveness of the Farm.

ter when the curculio stings the plums, the yellows destroy the peach trees, the worms get into the apples and the scab on the outside of them, then the blight kills the pear trees and the San Jose scale comes along to take whatever happens to be left?"

Now we did not say that we could have the orchard on the farm without intelligent labor, and we do not claim that it can be done without some expenditure of time and money, but our position is that it can and should be done, because it will pay; because the time and labor required are going to be well spent and worth while.

It is true that more time is required in proportion, to care for a small orchard, than for one of commercial proportions, but the owner can afford to expend more time on an orchard whose fruit is to be consumed at home. It is worth more to him, than it would be if he were obliged to sell it to someone else after he had produced it. If the fruit is consumed at home, the grower gets all of "The Consumer's Dollar."

He may not be able to market his surplus to as good advantage as the large orchardist sells his crop, but he will sell for a price which will compensate him well for the labor expended, and will get the fruit consumed at home, in larger quantities and for much less cost than he otherwise could.

Now, reader, if you are a farmer with a small orchard, and are thinking of giving it up, and buying your fruit of someone who has time to grow it, let us see if it would not be cheaper and better after all, for you to care

one-half pounds to fifty gallons, and lime-sulphur, one gallon to 40 of water. The application should be very thorough, because if the poison is not gotten into the calyx cups of the little apples, the worms will not all be killed. This spray should be repeated in ten days, and a final application should be made on the winter fruit only, at the end of July, or during the first week in August.

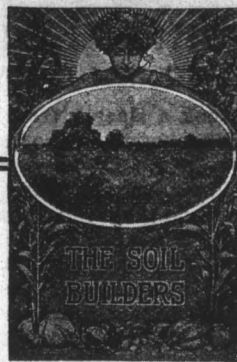
It is not my purpose in this article, to give instructions about spraying. I simply wish to make a plea for the orchard on the general farm, and prove that it can be successfully grown and cared for without materially interfering with the routine of farm work.

Two or three thorough sprayings will keep the curculio from stinging the plums and sweet cherries, and will protect the foliage of the trees from fungous pests.

Intelligent and timely pruning will save many of the pear trees from blight, and the fruit grown will pay over and over for the time and trouble spent in the work.

As practically everyone knows, the remedy for San Jose scale is lime-sulphur applied at winter strength, which is one gallon to eight of water. This application may be made during the month of March, and need not consume much time. If the work is thoroughly done, results are sure to follow.

Five sprayings when scale are present, and four when there are no scale, are the price of maintaining the orchard in health and vigor. It will take (Continued on page 234).



FARMERS

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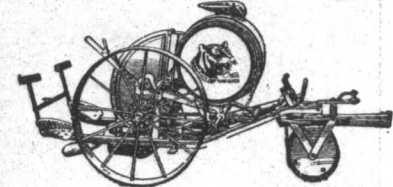
works as fast as horses walk. Plows the furrow, spaces right for cultivation, waters, covers and fertilizes the plant. Next spring "Plant in a ball of mud." Write for Free Circular.

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The M. A. C. Hort. Show

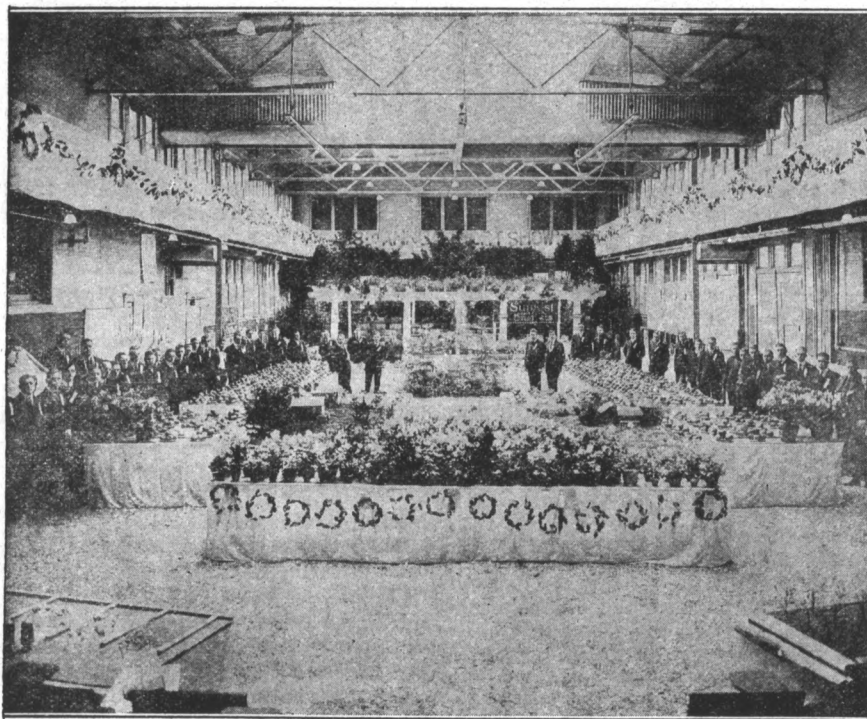
THE standard of excellence which has been reached by the Eighth Annual Hort Show, given by the Horticultural Department of the Michigan Agricultural College on January 28-29, is one of which it can well be proud. The big Agricultural Pavilion, nearly one hundred feet long and half as wide, was arrayed in a scene of beauty that fairly took one's breath when first the whole appeared before the eye.

At 1:30 Friday afternoon the show was thrown open to the public, who kept the committees in charge of the exhibits busy with questions about the interesting features. During the afternoon the Lyric Orchestra entertained the spectators with good music. An excellent program of lectures by students was also given at this time. Mr. L. V. Williams spoke upon a subject entitled, "The Horticultural Advantages of Michigan." Mr. R. W. Peterson gave a very interesting talk on "The Limiting Factors in Horticulture." This was followed by an illustrated talk on "Interesting Topics," by

plants, and by taller shrubbery, the little stream of water seemed to spring like a freak of nature from the little wilderness. Leaving the fountain to the admiration of others, one next found himself confronted with two tables on which were arranged all conceivable orchard tools. Here were the pruning saws and shears, the picking ladders and baskets. Here also was a demonstration of tree surgery and the proper method of planting a young tree.

The Home Economics Exhibit.

Continuing the course another mass of hothouse flowers met the view. Passing around this the romantic-looking pergola, which one has been aching to reach since the first distant glance, unfolds itself. Extending entirely across the room, this broad structure of white frame was covered by a canopy of green boughs and decorated with hanging baskets of flowers and vines. This provided shelter for the home economics exhibit and the store, in which one could purchase almost every fruit which the tongue of



The Eighth Annual Hort. Show.

Mr. C. H. Donnelly. In the evening the Bemis Trio furnished music. Saturday afternoon Mr. Donnelly gave another illustrated talk, followed by Mr. M. E. Bottomley with a lecture on "County Life Worth Living." For an hour in the afternoon the M. A. C. Band attracted a large crowd. An auction sale of prize pies and other things presided over by Prof. Mitchell ended the show.

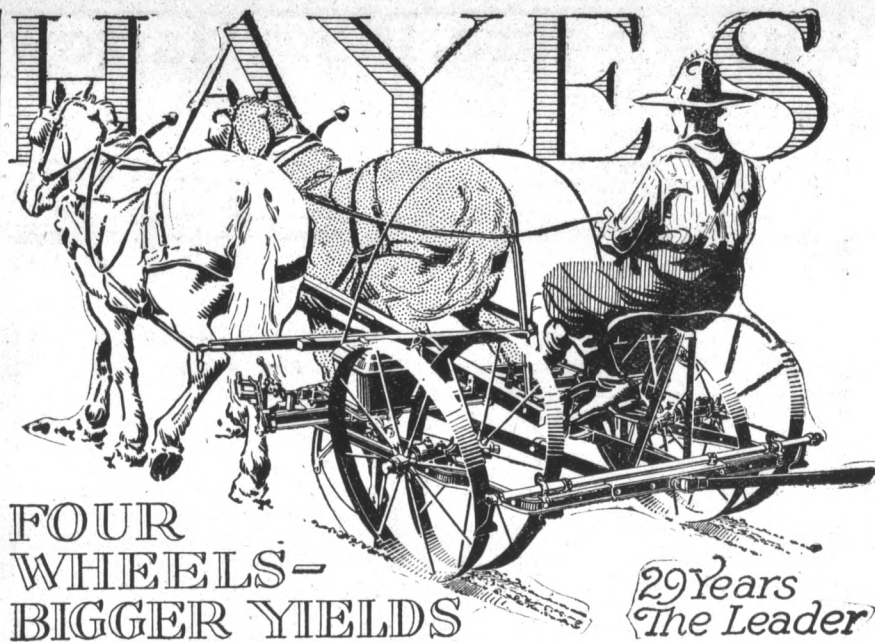
The Beauty of the Exhibit.

As one entered the big Agricultural Pavilion in which the show was held one was immediately struck by the beauty and harmony of the whole. Upon closer inspection one was likewise impressed with the individual merit of each separate exhibit. The first detail which attracted the eye was the display of azaleas and primroses—a mass of flowers that commanded admiration. Beyond this bank of blossoms the landscape gardening students had prepared two miniature plots of ground, one representing a city street upon which the houses and grounds were developed on a co-operative plan. Then came the biggest and best apple exhibit ever collected for a hort show. The arrangement of these large blocks of red, yellow and green fruit was not a small part of their beauty. The usual premiums for state and county exhibits were given. In the state exhibit Washington won first, while Montcalm took the county blue ribbon.

The water fountain in the center of this dream garden was a feature which added much to the entire effect. It gave life to the otherwise inactive picture. Surrounded by a mass of rocks overgrown with moss, vines and

man has tasted and pronounced good. Here also one could find ice cream, grape juice, candy, peanuts, cracker-jack, and everything the children like so well. The home economics half of the pergola was another place to procure goodies. An electric range had been installed from which baked apples were served a la whipped cream. Fruit salad and pie a la mode were also on the menu, the pies being made by the co-eds of the institution.

Now, coming up either side of the enclosure, one found interesting exhibits on fruit insects and diseases, showing their ravages on the wood, fruit and leaves. An ideal bee hive with frames for both the comb and extracted honey, is shown. The different methods of packing and sorting apples were well illustrated and also an ideal cold storage house. The different methods of orchard planting were represented and the practical fertilizers to use among the fruits. The vegetable exhibit included everything in the line of olericulture. The many different kinds of canned fruits, jellies, and juices showed an excellent way of disposing of the surplus fruit production. A long table of variations exhibited the changes which occur in nature and by which man is profiting in producing the many new and valuable varieties of plants and fruits. At the exhibit of nuts appeared this sign, "Eat More Nuts and Less Meat." The home economics department had furnished recipes and specimens of many kinds of nut foods. In the farm mechanics laboratory all kinds of orchard machinery and spraying tools were shown and demonstrated.



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The HAYES Four-Wheel is guaranteed. It must be all we claim and all you expect. 130,000 users verify that HAYES Four-Wheels regulate depth of planting to the fraction of an inch. Corn all comes up at the same time, allows earlier cultivation, an earlier harvest, a better quality and bigger quantity.

HAYES Four-Wheels guarantee surer germination and quicker growth. Wheels pack the dirt around the corn to hold the moisture and leave a ridge of loose soil on top. Ridge over corn prevents washouts in hilly fields and gives greater surface for sun's heat.

Covers where all ordinary open wheels fail—even in wet and sticky ground. Guaranteed not to clog. Short coupled, light draft and

turns in shortest space. Checks with absolute accuracy, regardless of team's speed. Cross rows straighter than the way you drive.

The HAYES Drop never misses a hill. Simple, reliable and most efficient. Fewer parts, less breakage and delays. Has no clutch to miss and give trouble. Never cracks or grinds the seed. Will drop accurately any sized or shaped kernel. No bare spots in HAYES planted fields. No replanting necessary. Increased yields soon pay for it.

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2000 DEALERS. Ask your dealer or let us prove how this planter prevents corn field waste and increases corn yields. Don't make a mistake. Buy the planter that guarantees results.

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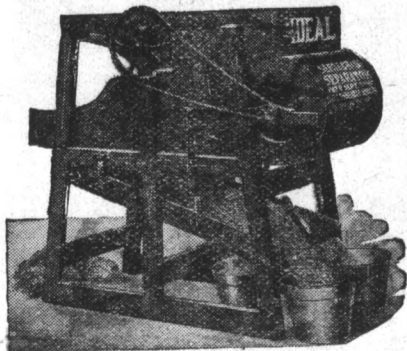


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The Deming Schedule is a spraying calendar 16 x 22 inches in size, listing all kinds of trees, the pests from which they suffer, and the best methods of destroying those pests. It helps you pick better profits from your orchards.

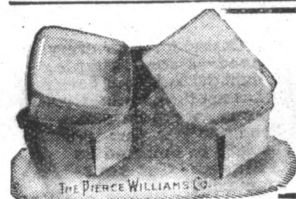
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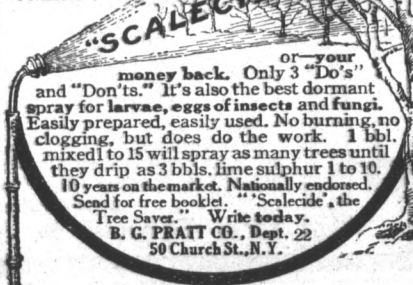
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The success of the Hort Show is due in a great measure to the consistent co-operation of the students and the department. The event was well planned, and the harmonious and artistic placing of each exhibit showed it. It demonstrated the fact that a thing can be just as useful, and even more so, by being beautiful. Each visitor was presented with a twenty-page program containing the list of committees, explanation of exhibits, program of events, and much other useful information. A standard has been attained which will attract people to subsequent Hort Shows from different parts of the state. M. E. BOTTOMLEY.

PRACTICAL SPRAYING METHODS.

(Continued from first page).

the tree untouched. He must learn to get under the tree and spray upward and outward, taking care to keep the rod constantly traveling. By getting under the tree it is possible to touch a great deal of surface that cannot be covered by carelessly sprinkling the outside foliage.

It must be remembered that spraying an orchard is not like setting a trap for the bug. It is more like swatting the bug on the head with the trap. Controlling a fungous disease does not consist in hiding some poison for the spore to hunt up and eat, you must place the fine film of the fungicide so carefully over the fruit and foliage that the spore cannot find one place to enter without coming in contact with its destroyer. After the encounter the spore ceases to exist. Spraying apples with arsenate of lead does not mean that you place arsenate of lead in spots where it can be eaten. The codling moth must find the fine film of poison over every part of the apple, and especially in the calyx, where he may try to enter. The bug cannot avoid the poison and he is then destroyed. For this reason it is easy to understand why a fine misty spray is best, and why a good pressure is necessary to deliver that mist with force against every minute portion of the tree. The man whom you cannot trust with the ordinary duties of the farm is certainly not the man to entrust with the spray pump. There is too little profit in the fruit business as it is, without spending good money for spraying materials which can never do their best work. A few hours spent in showing the laborer how to spray will give the "spray dope" a fair show to do its duty.

There are many brands of spray nozzles on the market and fruit growers are generally of the opinion that simple construction means good work. Elaborate nozzles are apt to clog, they are difficult to clean, and usually are more expensive than the plain nozzles of greater value. The angle nozzle enables the sprayer to direct the spray in any direction with a slight turn of the wrist, and this is an especially valuable point when spraying under the trees. It also simplifies the work of the man who is spraying from the tower. The aluminum nozzle finds favor with many growers as it lasts well and is lighter to swing on the end of the rod. A heavy complicated nozzle adds a great deal to the work of spraying. It is apt to catch in the branches, it tires the worker and cannot be cleaned readily when it clogs.

The spraying of the orchard is not as difficult as in the past. Experiments have proven which are the best materials and when to apply them. The apparatus for spraying has been improved until there is equipment on the market for every size orchard and pocketbook. As a usual thing, the spraying equipment receives the worst treatment of any machine on the farm, and its life is greatly reduced. The purchase of good material plus the care that a spraying machine demands will reduce the cost of fruit raising and improve the quality of the fruit. In spite of the low prices of the past some growers have made money on good fruit and no growers have received

profit or satisfaction from any other kind. We should offer our thanks to the San Jose scale, which has developed our knowledge of fruit disease control and made fruit growing a real business.

THE FARM ORCHARD.

(Continued from page 232).

some time, to be sure. You are very busy, my farmer friend, without doubt, but can you give up your orchard to get out of making these five sprayings? Personally, I can not, and I do not think anyone can, who is making a home in the country.

I am willing to admit that many a farmer should not try to go into fruit growing commercially, even though he is in "The Fruit Belt," but this is not saying that he can afford to do without plenty of fresh fruit, grown right on the farm where the family can have access to it at all times when it is wanted.

While in a commercial orchard it is always to one's advantage to have a large number of trees of each variety, the orchard which best serves the needs of the home, should contain sorts that will yield the best of fruit throughout the entire season of ripening.

Thus, peaches may be had fresh from the middle of July to the fore part of October, pears from the middle of August to the first part of March, if winter sorts are planted, plums from the tenth of August until quite late in the fall, and apples the year around.

True, all of this suggests labor, and we often think that we are overworked now, but as a matter of fact, to care for a sufficient number of trees to keep of fruit of all kinds that can be grown the home well supplied with the best in our locality, will consume but little more time than some men spend fishing, and they manage to live quite comfortably, too, though they do not often eat fish.

That man whose boyhood was spent on the farm, has never forgotten the "The old Apple Orchard." When memory brings to me fondest visions of childhood, the orchard is always in the picture. Even while I write I can see it, though it is not likely that many of those trees are alive today. How the memory of them lingers. I can recall the varieties just as they used to stand in the rows. Early Harvest, Sweet Bough, Golden Sweet, Baldwin, King, Greening, and then, up on the hill, where the sun shone warm and bright, the Autumn, an the Summer Strawberry, plenty of Rambos, too, with a number of sweet winter sorts whose names I never knew.

Why, I can almost taste the pies that mother used to make from the fruit of those Early Harvest. I can see father as he gathered those Golden Sweets, taking to town the few bushels that remained after the family were served. But to see that orchard in May, when the trees were covered with blossoms, and their perfume was everywhere, to rest under those trees and listen to the gentle hum of the bees, was good for any normal boy and the memory of it would be sure to go with him far on into the years.

No, my friends, we can not think of giving up the farm orchard. Let us plant in it, just as many kinds and varieties of fruit as are needed to make the home more complete in its power to hold the hearts, and mould the lives of our boys and girls.

For them let us care for the orchard in the very best manner possible. Thus shall we add to the attractiveness of the home, and increase its holding power in the lives of our children. When the years shall have carried them far out into a busy, hustling world, now and then they will turn back in fancy to those "sunny days of childhood," and then, be sure that the orchard will be in every picture.

Oceana Co. W. F. TAYLOR.

The Dormant Spray

THE San Jose scale which has been the cause of more progress in the fruit business than anything else, has made the dormant spray the most important one of all. A few years ago many growers would spray for worms and scab but they doubted the value of spraying for the scale. But the scale forced them to it or out of the business. And now there are many who spray for scale but are careless about the other applications.

It was through fear of the scale that the annual dormant spray has been brought about. At first the smallness and inconspicuous appearance of the scale enabled it to get foothold in many orchards before the grower was aware of it. But now almost one of the fundamentals of a fruit grower's education is to know the scale when he sees it and know how to treat for it.

When the scale first became serious most everything was tried to control it, but it was not until a sheep dip, common out west, was tried for scale that we got a satisfactory remedy. This remedy, the lime-sulphur, has been standard for many years now, and the old formulas containing a large amount of lime and a quantity of salt are just as effective as the present-day article. The improvement in lime-sulphur has not made it more effective but has made it much more convenient. At first the salt which was put in to make it stick better was found unnecessary. Then the amount of lime was greatly reduced and next the commercial concentrated lime-sulphur became the popular remedy it is now.

The Best Time to Spray.

Late spring is accepted generally as the best for the application of the dormant spray. This is because of the fungicidal value of the lime-sulphur. In many cases if the winter strength of the spray is put on just as the leaf buds open it will suffice as a pre-blossom fungicide spray, but if it is done earlier an application just before the blossoms open, of a 1:40 strength of the lime-sulphur will be necessary for good results. On peach trees if the scale spraying is done before the middle of March the lime-sulphur will be very effective in the control of the leaf curl.

If the infestation of scale is very bad it is advisable to spray in fall and again in the spring. This will usually clean up the scale in pretty good shape. Winter spraying is not advisable as experience shows that the results are not as good when the spraying is done in freezing weather.

We will always have complaints regarding the efficiency of any spray material because so many people will blame the spray mixture for the results of their own lack of thoroughness in application. We often hear of dissatisfaction with lime-sulphur on account of poor results and many have turned to the use of the commercial oil sprays and find them apparently more efficient. The reason for this is that the oil sprays, on account of their oily nature, spread over the bark better than the lime-sulphur does. This spreading quality will to a great extent overcome carelessness in application.

Thoroughness Necessary in Controlling Scale.

One can rest assured that both the oil sprays and the lime-sulphur are effective in the control of the scale if he will do his part in properly applying them. The oil spray has the advantage over the lime-sulphur in that it is much more pleasant to apply but it lacks the fungicidal value. What one wants to use must be decided by the advantages one wishes in the spraying for scale. There are other spray materials in dry or powder form for which several advantages are claimed and the experience those who have used these sprays would indicate that they are worthy of trial by

those who wish to try new spray materials.

Scale spraying even at its best is not a very comfortable job. Therefore, one should have everything arranged so that the work can be done quickly and conveniently. If the lime-sulphur is used those whose skins are tender to the caustic action should protect themselves by greasing their hands and face with vaseline or some other grease. Some people's skins are practically immune to this caustic action of the lime-sulphur while others get quite serious injury if they are careless in handling it. The harness and the shoes or anything made of leather, should be protected as much as possible as lime-sulphur is hard on leather. It is a good plan to oil thoroughly the shoes and the harness and then protect them with covers.

Spray Injury.

The amount of injury that a late spraying of lime-sulphur does depends upon the weather and the method of application. If the spray is put on in a fine mist and not too much put on in one place, and if the weather is so that the trees do not dry too quickly, the injury will not be much. The writer has safely sprayed plums and cherries almost in full blossom without any serious injury to the leaves of the crop. For general practice, however, it is not advisable to do much spraying after the leaf buds begin to burst.

It is advisable to spray for scale every year regardless of how well the scale has been kept in check. The development of the scale depends greatly upon the weather conditions of the growing season. If the summer is warm and long there is danger of just the few scales in the orchard causing a renewed infestation which will be serious enough to affect the marketing value of the fruit by spotting it. An annual spraying will prevent such an occurrence.

OBSERVATIONS OF FRUIT BUD FORMATION.

The Department of Agriculture has received from the New Hampshire Station a series of tests made to determine the question of fruit bud formation as influenced by cultivation, fertilization and cover cropping. The experiment was conducted in an orchard of 302 trees, mostly Baldwins and about 25 years old at the beginning of the test. The soil conditions are quite uniform throughout the orchard and the ground almost perfectly level.

The results thus far indicate that clean cultivation up to July 10, followed by a cover crop of crimson clover, has given the greatest amount of fruit, although the plot on which cultivation and cover cropping was practiced two years in three gave almost as good results. In this orchard the inability of apple trees to produce fruit buds when grown in sod as compared with any of the systems of cultivation employed has been clearly and completely proved. Although the addition of fertilizers failed to stimulate a greater production of fruit buds, they improved the size and quality of the fruit. The largest quantity of No. 1 fruit per tree was produced in the limed plot, which plot included a section of the fertilized plots, and the next largest quantity of No. 1 fruit was produced in the plot receiving an excess of potash. The fewest No. 1 apples but the most highly colored fruit was produced by the sod plant. Excess of phosphoric acid appeared to produce the smallest apples, though the fruit ran uniformly of good quality. The indications are that spraying has only an indirect influence on fruit bud formation. A general review of all results indicates that a plentiful supply of moisture, the result of cultivation, was the most influential factor in stimulating the production of fruit buds.

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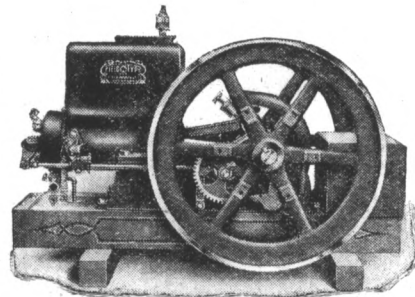
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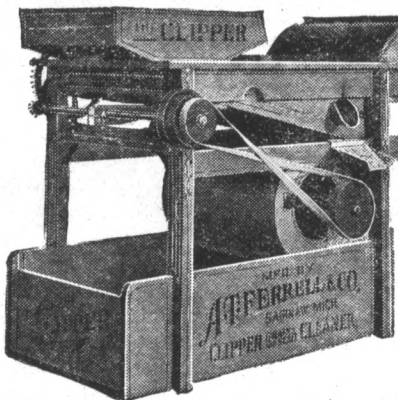
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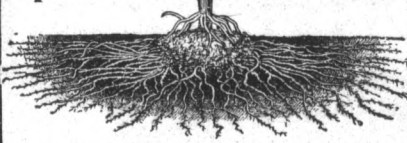
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Farm Horsepower Costs

By H. L. ALLEN

PROBABLY not one farmer in a thousand pays anything like the attention to the cost of horsepower on the farm that is paid to the cost of operating power by nearly every up-to-date manufacturer. And yet the subject is one that is of as much importance, comparatively speaking, to the farmer as it is to the manufacturer. It is true that steam or electricity is generally the source of power used by the manufacturer, but in the profitable conduct of a farm the cost of horsepower, compared with the work performed, is just as important a factor in the profit or loss of the farmer as steam or electric power is in the case of the manufacturer.

The first lesson the farmer can learn from the manufacturer is in the selection of equipment. Few owners of a manufacturing plant, when installing a power equipment, will select a partially wornout engine and boiler, or devices for transforming electricity into power, that are in a similar condition. They figure as closely on the cost of power production as they do on any other factor in their business.

The farm team or teams are to the farmer what the boiler and engine, or the electric transformers and motors are to the manufacturer. If his horses are lacking in the essentials of power production, or, if they are cared for in a way to lessen their working power, as compared with what they might produce under the best treatment, the farmer is permitting a leakage in his operating expenses which may mean the difference between profit and loss.

Essentials of Economic Horsepower.

To begin with, then, the farmer should provide himself with horses that, properly treated, will perform the maximum amount of labor as such labor is measured. With horse power of this kind, then comes the matter of cost of maintenance which may be presented under these heads:

First. Economy of rations; use of feeds grown on the farm.

Second. Proper care to prevent sickness or lameness that might lessen the hours of work.

Third. A satisfactory plan of working that will spread the working period over the entire year.

Fourth. Selection of implements and vehicles and their proper care.

Fifth. The employment of competent men as teamsters.

Economy in Maintenance.

The average farmer feeds his horses oats and timothy hay regardless of the fact that sometimes the cost of maintenance can be appreciably lessened with no decrease in the horses' working powers, by making use of other feeds which he grows. For instance, oats may at certain times make a much more expensive grain feed than corn and bran, with alfalfa instead of timothy. And again, with the use of the cutting machine, good, clean corn stover may be used as a portion of the roughage. Corn stover, alfalfa and timothy cut together makes an excellent roughage. When this mixture is used the grain may be ground and sprinkled over it, the whole being slightly moistened. If one has barley it may be made a part of the grain rations, but should be boiled.

In the winter some succulent feed will not only assist in keeping the horses in condition, but it will also cheapen the ration somewhat. Carrots make the ideal succulent feed, but if they are not available, good, clean silage, free from any taint of mold, may be used. If neither carrots nor silage are to be had bran will partially take their place in the regimen.

The farmer who recognizes the importance of keeping down the cost of maintaining his horses should make use of his state agricultural college to as-

sist him in compounding a proper ration from the roughage and grain grown on the farm and available for use. A statement of what he has and giving the information as to whether he desires to feed working or idle horses, will secure from the college a formula for a proper balanced ration.

Avoid Breakdowns.

Sickness and lameness are to the farmer what breakdowns of motive power-producing machinery are to the manufacturer, and mean, when the horses are incapacitated for work, an increase in the cost of upkeep. And many times a seriously sick or lame horse, or the loss of a horse by death is the result of failure to observe the simple rules which should govern the horse's treatment. The failure to feed clean, wholesome food, or the failure to feed regularly often means indigestion, impaction and the more severe forms of sickness following those ailments—colic and inflammation of the bowels. Failure to properly protect horses from the inclement weather, especially in winter, early spring and late fall, results in colds, coughs and pneumonia. Continued feeding of the regular working rations while the horses stand idle several days, and then putting them to work is the frequent cause of azoturia, nearly always fatal. Any one of these ailments a couple of times a year, even if the horse recovers, means a considerable period of idleness, possibly at the season of the year when his services are of the most value, to say nothing of the outlay a veterinary's services will entail.

Failure to take proper care of the legs when muddy weather comes, means cracked heels, scratches, sometimes called mud fever; standing in filth with no care taken to keep the feet cleaned out, brings on thrush and horses may become very lame from either cause. Carelessly leaving trash around the yard has been responsible for more than one case of lockjaw, from a rusty nail in the foot and if a recovery is made the time lost from work and the fees of the veterinary will, in most cases, be pretty nearly equal to the value of the horse.

Parasites.

A weak, out-of-condition horse is about as far from being a good working unit as an engine with a leaky cylinder, either one requiring more fuel to develop energy than is required by one in good condition. The potent factors in putting a horse into condition which requires an increase in the cost of keep and means a depreciation in his value as a worker, are worms and lice. Either form of vermin is not difficult to avoid if proper precautions are taken, but if given a foothold means an outlay for horsepower that adds appreciably to the expense in that department of the farm.

A feature in horsepower economy which many farmers overlook, is the importance of condition in horses. Many of us have watched the preparation a trainer of race horses gives a horse when getting him ready to race. The race horse is never required to put forth his powers until his muscles, tendons, lungs and heart have been brought up to the proper condition by gradual work. Of course, a farm horse does not have to exert himself to the extent that a race horse does, but the steady pull of the spring work is no light task and when it is commenced before the horse's muscles and ligaments have been gradually brought up to what race horse men call "condition," muscle and tendon soreness, and even skin soreness, are likely to develop to such a degree as to greatly lessen the horse's usefulness—even incapacitate him entirely, temporarily, sometimes, and thus add to the cost of the farm horsepower.

A good plan for assisting in keeping

some of the horses in condition is to provide work for the winter months. Wherever conditions will permit, draw and spread the manure instead of letting it lay in the barnyard or the manure pit. If there is a farm woodlot get out the next season's wood. A team used in this manner throughout the winter will develop working condition in the spring much more quickly than one that has been idle during the winter months.

Equipment.

Implements and farm vehicles which are properly cared for assist in lessening the cost of farm horsepower. A reaper, mower or other implement that is put into winter quarters without proper attention or, as is sometimes the case, is not put into winter quarters at all, means an increase in the horsepower required to operate it the following season. Anything that increases the labor of the horses or adds to the discomfort of the horses while at work, means an increase in the cost of the farm horsepower. An ill-fitting harness or one that through lack of care has been allowed to become hard and unyielding, contributes to the increased cost in this direction. Improper shoeing or failure to have the horses' shod at proper intervals often results in a lame horse and the cost of horsepower gets a boost. Time spent in the shoer's shop when the need of horse labor is pressing, and the weather is good, is another way to add to the operating expenses of this branch of the farm. Except in emergencies try and get the horses shod on stormy days, or at least when there is a lull in the work. If a stormy day comes look over the horses' feet and if there are any which indicate that the shoer's services will be needed soon, take them to the shop then instead of waiting until the shoes come off, perhaps on a day when there is the utmost necessity for the horse's services. That will mean a saving in the cost of horsepower.

The Personal Equation.

Another great factor in the cost of farm horsepower is the man who drives and cares for the horses. A lot is heard about the importance of having men care for the cows in the dairy who would, under no circumstances, treat a cow roughly. Most farmers find no trouble in understanding the importance of having such men in their dairy, for to have men of the other sort means a decrease in milk production and that lowers the farm revenue. The farm horses have an earning power almost equal to the cows in the dairy, but the returns are not in the form of cash, hence it does not enter into the farmer's calculations in the same way. There is no doubt, however, but that the actual difference in the cost of the farm horsepower is affected for good or bad as greatly by the sort of men who are placed in charge of the horses as the earning power of the dairy is by the class of men employed.

The man who looks to the comfort of the horses placed in his charge, conserving their powers while at work, feeding and caring for them properly after the day's labors, doing all those little things which the other sort of man would not do, is a most efficient factor in keeping the cost of farm horsepower down to its lowest limits. Such a man is, possibly, the greatest one factor in bringing about this end for he enters, more or less into all the other factors mentioned. As between such a man and the slipshod, non-obedient teamster who simply drives his horses, feeds them what is furnished, and leaves them at the earliest possible moment after their work is done, there is no correct basis for determining the difference in the value of the service rendered by each. The last mentioned man is really an expensive one at any price, while one of the other sort is easily worth far more than the difference in wages which the good man feels justified in asking.

The Control of Hog Cholera

Address delivered by Dr. J. W. Conaway, of Missouri, before the Michigan Improved Live Stock Breeders' and Feeders' Association.

IN regard to diseases, we have such a muddle of methods for their control, that one is at a loss to know which ones are practical and which are not. Many of the methods advanced in the past have been fundamentally wrong because at the outset they ignored the most important factor of all. I refer to the farmer—the raiser of the hogs which are afflicted by cholera. The time has come when we are beginning to realize our mistakes and trying to get away from that idea.

When we come to talk about the eradication of hog cholera, we find that the job cannot be laid upon the state and national authorities and expect them to successfully control the ravages of the disease. The reason why this condition of affairs has existed is partially due to the fact that the breeder of swine has not been shown the facts regarding the nature of the disease which he is contending. Then again, the organizations have not seen the project in the proper light.

We cannot expect the Department of Animal Industry at Washington, to attend to all of the various outbreaks of the disease. The same is true of the State Live Stock Sanitary Commission. These departments are not formed with the idea in mind that they are to carefully police every township in the county and be ready to take steps in the control of each and every individual case. But on the other hand, the departments have been too slow in the teaching of the farmers some of the important factors relative to the keeping down of the diseases.

Alfalfa and Hog Cholera.

Another point which I might well bring in here. I wish to call your attention to the relation between alfalfa growing and the successful control of hog cholera. When your hogs are afflicted with disease, one of the best methods is to spread them out. That is exactly what you do when you intend using your alfalfa fields for hog grazing. It is a well-known fact that in all human disease, one of the most modern of practices of control is the spreading out of the people who may be afflicted. Do the same with your hogs by means of the feeding of alfalfa in your feeding lots and you will reduce the prevalence of hog cholera to a considerable extent.

The stock which the farmer may buy is liable to infection and result in death, which in turn results in a distinct loss to the owner—obviously, then, the good farm manager will consider that the successful control of all animal disease is a good piece of farm management. So you will see at a glance that our Veterinary Departments, our Live Stock Sanitary Commission, as well as the farmers them-

selves have a work to do in the control and eradication of the hog cholera and other prevalent diseases.

I have taken the stand that the farmer must work in co-operation with the authorities in this war against disease. In the plan which I wish to outline before you, the farmer is the essential unit. When it is found that hog cholera prevails on a certain farm, the whole proposition is up to the owner. During the first few days of the disease, he may do more in the control of it than can a whole corps of veterinarians or federal authorities.

In Missouri it is obligatory by law that all cases of infectious disease be reported to the State Live Stock Commission. This law is all right if it is obeyed, but we have found in so many cases that the owner, fearing great loss, has excused himself on the grounds that this cannot be the cholera—the death of the hog in question was due to some other cause. Consequently before the condition is really found out, it has been spread onto other farms and into other herds, making it a serious problem in the community.

The Missouri Plan.

To avoid this condition of affairs, a plan has been tried out in parts of Missouri which has proved very successful. In brief, it consists of dividing the townships up into groups. These groups are arranged and subdivided by someone in close touch with affairs. The idea is to discover the disease upon the first farm and kill the animals infected at once. It has been formerly thought that by proper handling, vaccination would control the disease. Such has not always been the case, however. The most important thing in a case of infection is what you can do yourself—quarantining the diseased animals in good clean sanitary quarters where they can be given good treatment is often advisable. Then application of some germicide about the yards and hog houses is of utmost importance. We are advocating the use of milk of lime for the purpose—it costs no more than does some of the carbolic solutions and is equally good for disinfecting of all places about the buildings. There is still another reason why lime should be used—and again I refer to Prof. Otis' speech on the use of lime for the growing of alfalfa. The beneficial effect of lime upon sour soil in the production of alfalfa often times warrants its use for that purpose alone, and surely when that lime could be used in the successful eradication of germs which cause the cholera and later served the agricultural purpose, it should be advocated.

The plan is best shown by the following chart:

Unit.	Area.	Co-operation.	Officers.
1. Smallest unit.	Individual farm 1/4 of a section.	One farmer and helper.	
2. Unit group.	Nine contiguous farms.	A farmer.	Farm group leader.
3. School district.	Four contiguous unit groups.	36 farmers.	Sc. Director. Sc. Clerk. Sc. Teachers.
4. Township.	Four school district groups— 144 1/4 sect.— 23040 acres.	144 farmers.	Township bureau president and sec. two men from each school.
5. County groups.	20 town groups average 2880— 1/4 acre sect. farms—460,800 acres.	2880 farmers.	County Bureau Counselors. County agent. Sch. Supt. Township Presidents (20) Secretaries (20)
6. State group.	State district groups; 264,000 farms.		State Bd. of Agriculture. College of Agril.
7. Interstate.	U. S. Department of Agriculture Bur. Animal Industry. State Boards Agriculture and Veterinarians. Veterinary Department of College of Agriculture. The Experiment Stations and the work.		

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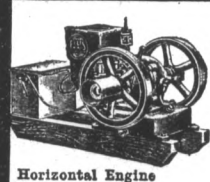
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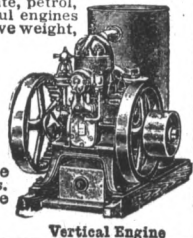
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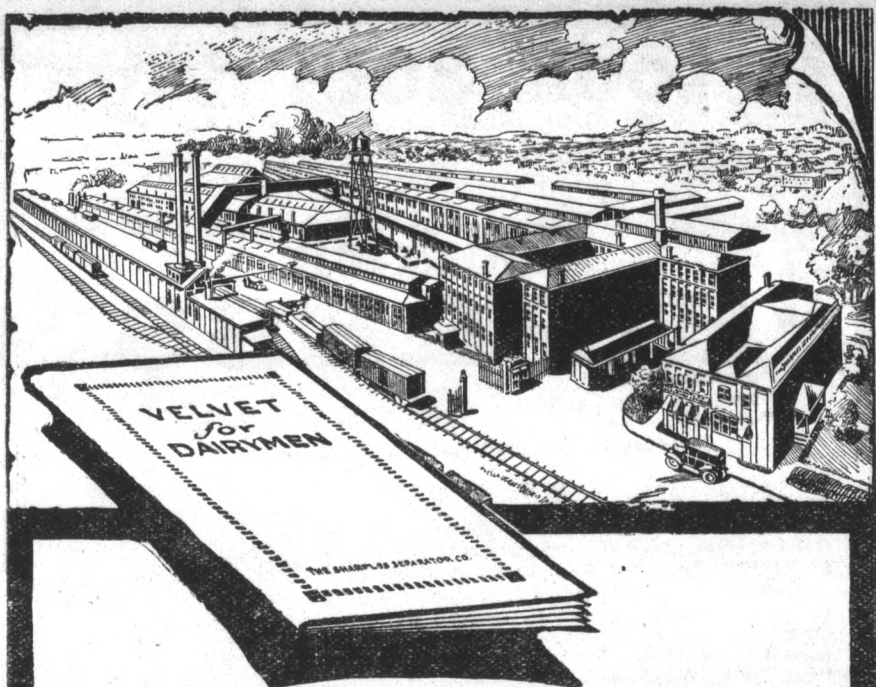
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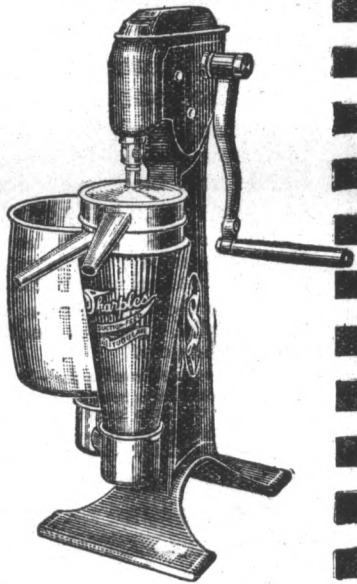
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It will be noted in the table that the unit of the working plan of organization, consists of the farmer who is surrounded by eight others—nine in all, constituting a group which seems the most natural of any imaginable. With such an arrangement there should be no spread beyond the limits of this group. Of course, it is true that there may be a stream running through one of the farms, but this difficulty may be surmounted if the proper precautions are taken.

One of the fine things about such a unit group is the way in which it fits into the ordinary township as it is usually geographically divided. The school houses are ordinarily about three miles apart and serve as a center for another and still larger group consisting of four of the contiguous unit groups. This grouping has a wonderful advantage in that it affords a good opportunity for the advancing of work worthy of consideration by the ease with which it may be put on foot. In the community enclosed by this group there are farmers who are interested in alfalfa growing—those interested in pure-bred live stock, while still others are interested in the education of the children; all of these may be handled very efficiently through this grouping.

Principles of Sanitation Should be Taught.

Another feature which is worthy of our consideration, is the opportunity of teaching in these public schools the principles of sanitation which underlie the control of all diseases. This affords a good way of getting the farmers to bring about the proper conditions upon their farms.

In all of this work it has been advisable to have the county agricultural agent act as executive of the town group. He is a good man to have for a go-between because he understands the situation in other parts of the county and knows the authorities to which reports should be made.

The organizations are apt to die out, however, unless some especial attempt is made to keep them alive. This is certainly true if the cholera is quite thoroughly stamped out for a time. It is quite essential for the entire success of the movement that the organization be kept on the alert, since it is comparatively easy for the disease to drift in from some outside source—and in case the organization was asleep, the disease would become quite widespread before it could be stopped.

The largest group is the state. Often times there is an overlapping of the functions of the duties of the various officers concerned with live stock matters. I am glad to learn that you have no such conditions here in Michigan. But your State Board of Agriculture has a different duty than ours in Missouri. I am told that your State Board has charge of your fine college here, while in our own state their chief duty is to take charge of live stock interests of the state. It is not the function of the state to give to any individual farmer especial service. Going out and saving the hogs of Tom Jones is not the purpose of the Board of Agriculture or of the Live Stock Sanitary Commission. If they do anything with his herd at all it is for the sake of the interests of the community as a whole. It is sometimes advantageous and worth while to take Jones' case as an example and make a demonstration to the public of methods of control, but the principle underlying the whole proceeding is the service to the mass.

Another object of the college is that of investigation. Such men as Dr. Giltner are spending their time in the laboratory in the study of factors relative to animal disease which concerns you. You may consider that the things which he is finding out are impractical and of little account, but the time will surely come when the results of investigation will be of value and will assume some degree of practicality. The college men have a large service in working out things which border along this particular line.

The function of the Live Stock Sanitary Commission is similar to that of a police force. They have the authority to quarantine when they consider such action advisable. Any other methods which they consider worth while may be instigated by this body. Among other things is the action regarding the shipping of stock over state lines. There are two or three actions which may be taken in regard to this matter. As a rule, however, their authority ceases at the state line.

In all of the organizations, the chief aim should be to put into office men who are competent—those who will work for the best interests of the community. It is only in this way that you can hope to have a system which will prove efficient in the control of any disease.

FEEDERS' PROBLEMS.

Silage for Pregnant Ewes.

I would like some information in regard to feeding ensilage to ewes that are about to lamb the first of March. This is my first experience with silage, and some people tell me that it isn't good to feed to ewes that are about to lamb. For roughage I have second-cut clover, bean pods and cornstalks and they have access to a strawstack. I feed some kind of roughage in the morning and silage at night, with some oats sprinkled on top. I was also under the impression that ensilage would be quite warm as it came out of the silo, but mine isn't; it is rather cool. In some of the silos around here the ensilage is quite warm and others are cool. What is the reason for that? Does the corn in the ensilage contain the same strength as dry, hard corn, or in other words, does the heating of the silage injure the feeding value of the grain?

Ogemaw Co.

G. L.

No animal, sheep, cow or steer that is allowed out in the cold for any considerable portion of the day or night ought to be fed too freely of ensilage. It is too succulent, juicy and watery. Animals fed heavily on corn silage cannot stand the cold as well as those that have a large per cent of dry food. That is the only thing to figure on.

Dairy cows that are kept in warm stables nearly all the time can be fed heavily on silage, all they want. Fattening lambs that are sheared and kept in warm barns continuously can be fed all they will eat. But ewes that have only a shelter or open shed should be fed only a small feed of silage once a day. It is not because they are going to have lambs, but because they are out in the cold. I would feed just as you are feeding until the lambs are dropped, then when the weather becomes warmer in April and you want to increase the flow of milk you can feed ensilage twice daily if you wish.

Silage should cool off in a reasonable time after filling, say a month. If it keeps warm for a long time it was not packed properly and there is sufficient air to keep up fermentation. This will bring a loss of food.

Alfalfa Meal for Hogs.

Will it be profitable to feed ground alfalfa at \$1.40 a hundred in winter to pigs, also brood sows? Or would beet pulp be better at \$21 a ton, and how much would you feed?

Montcalm Co.

H. P. N.

Hogs will eat a little alfalfa to good advantage, but no great amount of it can be fed. Hogs are not adapted to a too bulky ration. Beet pulp can also be fed in small quantities to furnish a food of vegetable matter, but this is not a food to balance a ration of corn. It contains nearly the same analysis.

Where a farmer grows alfalfa and has plenty of it, it is advisable to feed the hogs all they will eat, but I would not go to the expense then of grinding it. They will eat a good bit without grinding.

When one must buy alfalfa, that is a different question. I might buy it for cows or horses but not for hogs. If I had to buy I would put my money into some food more adapted to hogs, like oil meal, or better, feeding tankage. Wheat bran is better for hogs than ground alfalfa.

COLON C. LILLIE.

LIVE STOCK NEWS.

Few stockmen owning thrifty cattle in preparation for the market have sufficient faith in the future market to feel warranted in producing a high grade of beefs, and the inevitable result is that the cattle now moving marketward run mainly to a fair to middling class, with too many of the \$7 to \$8 kind of steers and too few of the class valued at \$9 to \$9.75. Steers worth from \$8.25 to \$8.75 are having a good sale, and there is at all times a scramble among buyers for the \$9 and upward class. Advances in prices for the choicer class of cattle have brought about a demand from stockmen in Illinois and Indiana for stock cattle that can be matured as good beef cattle in from two to three months, and the prevailing opinion is that prices are going to advance enough to warrant careful ventures of this kind, the principal danger being that stock feeders will pay too high prices at the start. The consumption of beef in the United States has been growing, as fresh pork has advanced in price, while lamb and mutton are very dear eating everywhere. The few experienced stockmen who are producing a high-grade class of beef cattle are certainly reaping generous profits, and only a short time ago a sale was made on the Chicago market of a consignment of fancy Kansas steers that averaged 1,486 lbs. at \$9.85 per 100 lbs. after having been fed since the fourth of last October. So long as the Chicago market is so much higher than other western markets, owners of prime beef cattle in Kansas and Nebraska will be inclined to favor that market, for they realize the importance of sending cattle to a market where active eastern buying competition is a certainty.

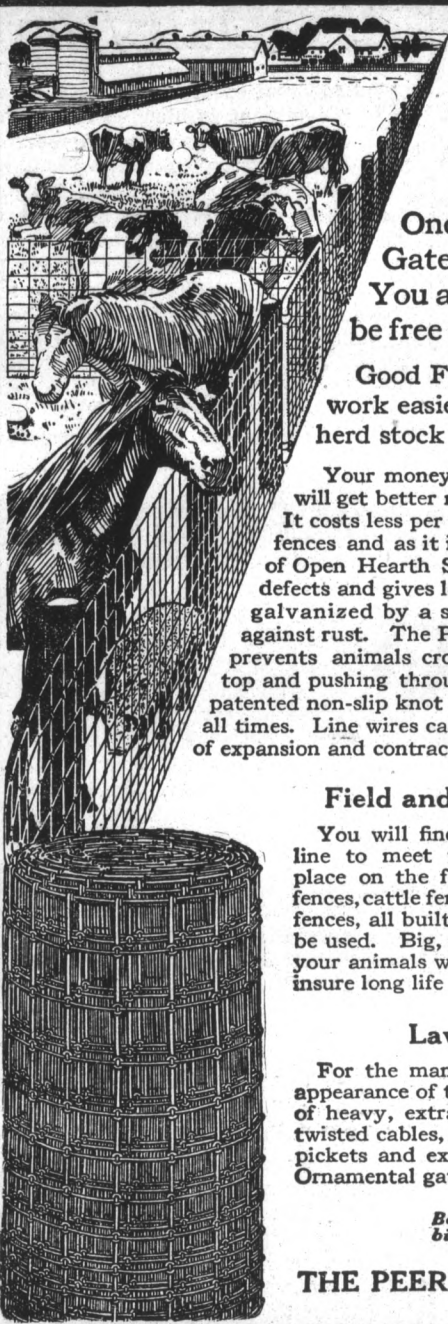
A prominent Chicago live stock commission firm that handles nothing except sheep and lambs advises its country patrons as follows: "The demand for feeding lambs is extra good, and nowhere near enough can be had to fill orders. We are getting lambs for slaughter that should not come here. If any of our friends have flocks that are not finished they wish to dispose of, we believe we can find buyers for them in the country where they will net the owners more money than they will get out of them by shipping for slaughter. On the other hand, it will help out the fellow who wants feeders, as well as the market conditions, as unfinished stuff should not come here. The quality from the local territory has not been any too good. There never was a time when choice handy-weight lambs were so scarce. There was not a load of prime, handy-weight lambs here today." It may be added that feeding lambs are much sought for in the Omaha market and have brought recently as high as \$10 to \$10.25 per 100 lbs. for light-fleshed 70-pound lambs adapted for finishing and shearing. Colorado lambs are now moving freely to the Chicago market, and they will be offered freely from the middle of February to the middle of March. The number of lambs fed in Colorado is reported as about the same as a year earlier. Other parts of the country have very few lambs or sheep for marketing this season. With winter prices the highest by far ever known at that season of the year, owners cannot avoid making splendid profits.

Five million pounds of dressed chickens, valued at \$950,000, were sold during ten days in the Chicago market recently for export to Liverpool and London. Business in poultry has been on a much larger scale than ever before. An aggregate of 55,000,000 pounds of poultry reaches the Chicago market in the course of a year, and this, based on recent prices, is valued at \$10,450,000. Farms and incubators throughout the country are kept busy producing poultry, and the great bulk of the poultry comes to the Chicago market, because it lies between the producing west and the consuming east.

John R. Wilson and Oliver Ebert, of the Wilson Sheep Company, of Burlington, Wis., were in the Chicago stock yards recently looking over the sheep and lamb trade. They have handled between 60,000 and 70,000 head since the close of last August and are extremely optimistic about future prices.

Owners of prime heavy cattle are now making good profits, there being an extreme scarcity of such beefs everywhere, but there are plenty of the common to medium kinds, and they have frequent declines in prices, as owners are quick to make large shipments after any good advance.

Horses were in ample supply last week, and there was a normal trade at recent prices, with interest centering chiefly in horses for the French army, mounts selling for \$125@135 and cavalry horses at \$150@160.



Stretch a PEERLESS FENCE Around Your Farm And Quit Worrying

Once your fields are all enclosed with Peerless Fencing and Gates, your fence troubles are over for a long time to come. You are sure to find your animals where you want them and will be free from injuries caused by trying to get through a poor fence.

Good Fences and handy Gates increase the value of your farm, make the work easier and your assistants more contented. The hired man hates to herd stock that has broken out and mend old inefficient fences.

Your money will go farther and you will get better results with Peerless fence. It costs less per rod than other high grade fences and as it is made of the best grade of Open Hearth Steel Wire it is free from defects and gives long service. It is heavily galvanized by a special process insuring against rust. The Peerless one-piece crossbar prevents animals crowding it down from the top and pushing through at the bottom. The patented non-slip knot holds the wire in place at all times. Line wires carefully coiled to take care of expansion and contraction.

Field and Poultry Fences

You will find a style in the Peerless line to meet the requirements of any place on the farm. Hog fences, sheep fences, cattle fences, paddock and poultry fences, all built for the place they are to be used. Big, closely spaced wires keep your animals where you want them and insure long life for the fence.

Lawn Fences

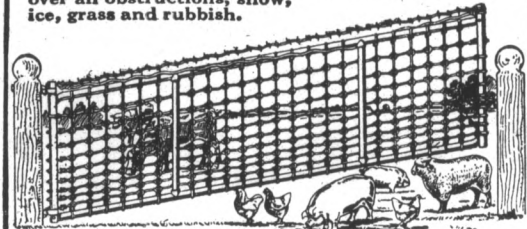
For the man who takes pride in the appearance of the front yard. All made of heavy, extra galvanized wire, extra twisted cables, extra deep crimps in the pickets and extra care in construction. Ornamental gates to match the fence.

Peerless Gates

Very few farmers can afford board gates in this age of high price of timber. Peerless steel gates are not only cheaper but they look better and are easier to handle. Heavy tubing frames, filled with special galvanized wire, insure long life. Every part of every Peerless gate is heavily galvanized to prevent rust.

The Peerless Self-Raising Gate

It is one of the best selling styles in our entire line. It is no longer necessary to lug around the old-fashioned sagging, dragging, heavy gates. The Peerless lifts automatically and swings over all obstructions, snow, ice, grass and rubbish.



In addition to being self-raising, it is extra heavy in both frame and filling. Big massive frames of 1 1/2" tubing and close woven all No. 9 wire, close mesh filling, insures long life.

Every part heavily electro-galvanized—no paint to wash or wear off in a year or two.

Before you buy a rod of fence or a single gate you should send for our big free catalogue and get full details about Peerless fencing and gates

THE PEERLESS WIRE FENCE CO., 210 Michigan Street, Adrian, Mich.

MY NEW FREE BOOK WILL SETTLE THE SPREADER QUESTION FOR YOU NOW!

If you are undecided about buying a spreader—if you do not know what machine to buy—if you doubt whether a spreader will pay—then read this great new book! It tells you in dollars and cents just what a spreader will do for you on your farm. It tells why I began building spreaders and how we have steadily improved them; it tells about my many patents which fully protect the special Galloway Spreader features. I want you to have this book—that's why I'll send it to you for a post card request.

SPECIAL 90 DAY PROPOSITION

I have a special proposition for you from now until seeding time which should sell 25,000 machines in the next few weeks. I want you to take a Galloway spreader right onto your farm and test it out. I want you to see how it will lighten the work of getting the manure on the fields. You know that nothing will pay you bigger profits than getting the winter's accumulation of manure out onto the land. A hundred loads or so will pay for the Galloway spreader because of the extra profit you would not otherwise get. Let me send you this new proposition and new 250 page book that tells the whole story.



New all steel Beater and V-Rake.

Steel Tongue.

LOW 1916 PRICES AND LIBERAL SELLING PLANS.

Galloway was first to lower high spreader prices. I have kept spreader prices down and led in spreader improvements. Buying material in great quantities, manufacturing in my own chain of factories by the thousands, and selling direct at one profit to the customer, has been the reason for the great growth of this business! That's why they say "Galloway divides the melon with his customers." Spreader prices now lower than ever, and you can buy on one of six selling plans, including no money down, a year to pay and five other buying plans.

1916 SPREADER FEATURES

Light draft, two horses handle it; low down, double chain drive, cut under front wheels, channel steel frame, trussed like a steel bridge, steel tongue, endless apron, force feed, top of box only 12 inches high, with our improved Model V-rake and all steel beater which makes a finer and wider spreading machine than ever. Shipped from Waterloo, Kansas City, St. Paul, Council Bluffs and Chicago. My new 1916 easy selling plan, cash or time, are fully described in my book, which is mailed for the asking. Write today.

WM. GALLOWAY CO. BOX 189 WATERLOO, IOWA

Special Prices to Churches and Cemetery Associations.

REPUBLIC ENTRANCE ARCH AND FENCE

Make an Attractive Permanent Improvement



Every community is interested in the proper care of the last resting place of loved ones, and those who have charge of that sacred spot are sure of public approval if they protect and adorn it with the Republic Ornamental Entrance Arch and Fence. These arches and fences are economical, because substantial and permanent. Uprights of heavy tubular iron, connected with artistic scroll work of wrought iron securely riveted. All galvanized or painted, as desired.

We build arches also for parks, private grounds, country homes, etc. Lettering in upper panel made to order without charge. Our Free Service Department will work out your Cemetery Fence Problems. See your committee now and have your new fence and arch up by Memorial Day. Illustrated Catalog giving various designs free on request.

REPUBLIC FENCE & GATE CO.

44 Republic St., North Chicago, Ill.

400,000 Farmers Have Bought 25,000,000 Rods!

BROWN FENCE
DIRECT FROM FACTORY FREIGHT PREPAID
Every inch Basic Open Hearth wire, Double Galvanized.
13c PER ROD UP.
Money Saving Fence Book and sample free. Just write postal now to THE BROWN FENCE & WIRE CO. Department 49 Cleveland, O.

New Edition (264 Pages) of "Modern Silage Methods"

Only 10c
ENTIRELY a new book—new chapters—tells facts about every type of silo—home made, stave, brick, cement, tile, metal, pit, etc. Tells best for your needs—impartial suggestions for making most profits. 264 pages—10 page index—Copyrighted Nov. 1914, covers 41 silage crops. Send for new book; it beats all previous editions. Write today. Mailed for 10c. Mention this paper. Silver Mfg. Co., Salem, O.

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WANTED NOW FARMER OR FARMER'S SON

With rig or auto to call on regular trade with the big Shores Line of Family Medicines, Spices, Extracts, Toilet Articles, Veterinary Remedies, Oils, Etc. Our new, successful plan for increasing business assures you of over \$150.00 per month profits. Ask about it. No experience necessary. Don't worry about capital, but write quick. Shores-Mueller Co., Dept. 44, Cedar Rapids, Ia.

Penny Postal Brings Book of Facts

Before you buy any fence, get this valuable book. **Empire Fence** Big No. 9 wires, open hearth steel heavily galvanized. Bond Steel Post Co. Direct from factory—freight prepaid. Save dealer profits. Thousands write that it outlasts everything else. 16c Maumee St., Adrian, Mich.

Ear Tags FOR STOCK

Tag your stock—best and cheapest means of identification for Hogs, Sheep and Cattle. Name, address and number stamped on tags. Catalog and samples free on request. F. S. Burch & Co., 189 W. Huron St. Chicago

Only \$2 DOWN and One Year To Pay

For any Size—Direct from Factory

You can now get one of these splendid money-making, labor-saving machines on a plan whereby it will earn its own cost and more before you pay. You won't feel the cost at all.

\$24 BUYS THE NEW BUTTERFLY

No. 2 Junior—a light running, easy cleaning, close skimming, durable, lifetime guaranteed separator. Skims 95 quarts per hour. We also make four other sizes up to our big 600 lb. capacity machine shown here—all sold at similar low prices and on our liberal terms of only \$2 down and a year to pay.

30 DAYS' FREE TRIAL **GUARANTEED A LIFETIME**

You can have 30 days FREE trial and see for yourself how easily one of these splendid machines will earn its own cost and more before you pay. Try it alongside of any separator you wish. Keep it if pleased. If not you can return it at our expense and we will refund your \$2 deposit and pay the freight charges both ways. You won't be out one penny. You take no risk. Postal brings Free Catalog Folder and direct from factory offer. Buy from the manufacturers and save money. Write TODAY.

Patented One-Piece Aluminum Skimming Device, Rust Proof and Easily Cleaned—Low Down Tank—Oil Bathed Ball Bearings—Easy Turning—Sanitary Frame—Open Milk and Cream Spouts.

Albaugh-Dover Co., 2165 Marshall Blvd., Chicago, Ill.

No. 5% Over 75,000 now in use

Churn A New Way

30 Days FREE

Pay Us No Money

You need not pay us one cent in advance to try this new way of butter making. Prove for yourself before you decide to buy, that it will make better butter, more butter, in a shorter time than any other churn. That's the test that tells.

THE NEW IMPROVED CHALLENGE

Churns Butter in 3 Minutes

A marvelous new churn that brings the finest grained, sweet, yellow butter in 3 to 10 minutes time. Operates easily—made on new scientific principle—the right way to make GOOD BUTTER. Gets ALL (not part) of the butter fat. \$500 REWARD FOR A BETTER CHURN. Write today for FREE BOOK on Scientific Butter Making and liberal FREE trial offer. Send letter or post card.

THE MASON MFG. CO. DEPT. M CANTON, OHIO

GUARANTEED Glazed tile or four kinds wood stave. Haul and easily erect Kalamazoo Silos when farm labor is most plentiful and cheap. Freight paid to your home town—Red wood doors, continuous opening door frame. Tile silos anchored by weight. Fire and frost proof. Superior to cement. Save money, too, by early-in-year shipments direct from nearest kiln, on factory to farm co-operation sales plan. Ask for booklet and details. Silo users make best local agents.

Write today—Dept. 621.

KALAMAZOO TANK & SILO CO. KALAMAZOO, MICH.

ROSS In-de-str-uct-o MetalsILO

Keeps all your ensilage sweet, fresh and clean. Unavoidable loss reduced to about 1% due to no leakage or evaporation.

THE PERMANENT SILO can't blow down, buckle, twist or collapse. Stands right even when empty. Fireproof, storm-proof. Capacity increased any time by adding to height. Guaranteed against silage acids. We also make the Ross Wood Silo. Write for free catalog.

AGENTS WANTED.

THE E. W. ROSS CO. Box 314 Springfield, Ohio.

THE HINGE DOOR SILO

THE most convenient and best equipped silo made. Doors always in place. Strong steel frame. Perfect anchorage. Best material throughout. We also make the Lansing Silo, the Chicken Silo, and Tanks of all kinds.

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Main Office: Dept. 15 Lincoln, Neb.
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Tile Silos

We are the originators of hollow block tile silos; and our first silos are still standing, in perfect condition and without repairs, after 12 years steady use.

Send for Catalog on "Success Ideal Silos."

The Louisville Brick & Tile Co., Dept. A. Louisville, Ohio.

BOWSER SWEEP MILLS

Different from all others. 4 or 2 horses. Grind Corn with shucks and all small grains. (Also make 10 sizes of belt mills)

FREE—Folder on "Feeds and Manures"

D. N. P. Bowser Co., South Bend, Ind.

Cheap Feed Dried Salvage Grain from injured. Price low—Ask for sample.

BARTLETT CO., Mill H. Jackson, Michigan

LOUDEN Stanchion for Your Cow

It's Cheap It's Strong It's Durable It's Sanitary It's Comfortable Hangs Any Place

The best way to tie the cow ever devised. Hundreds of thousands sold every year. Government adopted. Will last a lifetime. Cow rests in perfect comfort. Can turn her head to lick her flanks. Does not bruise her shoulders when she rises. Louden stanchions can be used in any stall. Ask your dealer or write us.

"Everything for the Barn"

The Louden Machinery Co. 1901 Court St. (Established 1867) Fairfield, Iowa

Tubular Steel or Wood Lined

Comfort in this Slack

A Wonderful FEED

THAT'S GUARANTEED

—to produce more milk than any other ration either home mixed or purchased and do it without giving your cows constipation or udder trouble. Ready to use right out of the sack without any mixing.

Larro-feed

Absolutely free from adulterants and fillers, just like the feed you would mix for yourself, is a special combination of choice cottonseed meal, dried beet pulp, gluten feed, corn distillers' grains, wheat bran, wheat middlings and a little salt, that's all; each ingredient weighed by automatic scales and all thoroughly mixed in huge power driven mixers, so that it is always absolutely uniform, and always good. An extra quart or two of milk daily from each cow may turn a loss into a profit. Try LARRO-FEED for more profits. Sold on "money back or not satisfied" plan, the decision being entirely up to you. LARRO dealers almost everywhere; write if none near you.

THE LARROE MILLING CO. 1055 Huron Bldg., Detroit, Mich.

IT PAYS TO DEHORN

Dehorned cows give more milk; take less room; are gentler and easier handled. Dehorned steers fatten quicker and are not dangerous. Horns cost money; remove them with the new

Improved Keystone Dehomer quickest, cleanest, strongest and most satisfactory. Clean, shear and sliding cut; no crushing; no bruising. Money back guarantee. Send for booklet.

M. T. Phillips, Box 126 Pomeroy, Pa.

Dairying for Profit

FARM real estate is not as good an investment as blooded stock. The dairy cows pay for themselves and the farm, too. But the farm, on a general farming basis, will not pay for itself. This is what breeders of good dairy cows throughout the dairying states have come to know to be true. For proof, these men submit fertile farms, profitable herds and bank accounts to serve as "preponderance of the evidence," as lawyers will say. On the other hand, few of the general farms have the mortgage "lifted," money is hard for the general farmer to borrow, while the dairy farmer, with a good herd of stock not only rides in a good auto, but finds it easy to go to his banker with his herd dividends and make a loan at any time.

A success at farming is a success only when it is on a business basis. Profits steadily increasing, with times always good, is assured to the man who has a good dairy herd. Never before in the history of the country was dairying more profitable; never was the future more bright.

The Cow the Mortgage Lifter.

The Brown Brothers, as they are known in western New York, began farming more than twenty years ago, keeping cattle only for milk and family purposes. They were so busy doing nine kinds of farming at once that they didn't have time to "monkey with stock." After ten years' effort they still had the big mortgage on the 320 acre farm. They raised a few colts and calves, fussed about the markets and paid their grocery bills, but the luxuries of life remained with the rich and not with the Brown boys.

Their wagons wore out hauling grain and hay to market and they went to a fall auction and bought two second-hand wagons at a great bargain. For these they gave their notes, reading, "This note to bear six per cent interest from date." When the notes became due Brown Brothers couldn't find the holder of the notes to pay them. It ran along for a while and they received a notice from a bank to call and pay the note "and eight per cent interest from the date of making."

It Pays to Have Good Stock.

The Brown Brothers made a small investment which has netted them a good-sized fortune since 1903. That year they bought three pure-bred Shorthorn heifers and one full-blooded bull. When they paid \$500 for the bull, their neighborhood threatened having them examined as to their sanity then, but today they are praising their foresight.

The Brown Brothers continued to produce general farm crops and take good care of the little herd of pure-bred Shorthorn cattle. They kept the heifer calves and sold the bulls. Since 1903 they have sold more than \$15,000 worth of pure-bred Shorthorns from the herd and have eighty head left, which \$30,000 wouldn't buy. They have purchased only one cow since 1903. In that time they have made their farm more fertile than the year the sod was broken. And they have added more than \$20,000 of improvements to the farm.

"We paid as we went along," said one of the brothers. "We didn't do anything unless we had the money to pay for it. It took a lot of scrimping to get money to buy the seven head of pure-bred cattle with in 1903. But this was the wisest thing we ever did. If we hadn't made it our farm would be worn out by this time, and we would have been bankrupt."

Success Due to Management.

"It would be hard for me to understand why farmers do not get into the business of producing live stock if we hadn't been a little slow in getting into it ourselves. When I talk to some of my neighbors about it they say, 'Well, we know a lot of fellows who have made a failure in the pure-bred stock business.' They are right. It

is in the man and the management, not in the business. Any man who uses judgment, isn't afraid of work and will take good care of his stock will make a success in the dairying business, with any good stock.

"One farmer will fancy one kind, another another kind. It all depends, though, on the way a man's fancy runs. But the thing for every farmer now doing general farming to do is to get into the live stock business. Some fellows will say, 'Oh, you have stock to sell is the reason you are advising us to get into the live stock business.' Yes, and you will have some to sell, too, if you will get into the business, where you haven't anything to sell now.

"Start with a few head. Buy a herd bull and don't be afraid to pay the price if he is the kind you want. More depends on the selection of the bull than anything else. When a man starts out to buy a herd bull he usually fixes the price he will pay and he won't vary from that. He will look all over the country for a herd bull for \$100 to \$150. There is cheap registered live stock the same as there is cheap grade stock, and the money spent in the foundation of the herd is of little consideration, but quality is of prime importance. A good registered bull will pay for himself twenty times over, and during that time you will have built a reputation for your herd."

High-bred Cows Profit Makers.

The Brown Brothers maintain that if each farmer would buy just one pure-bred cow it would put him on the profit side of the ledger in a year. From one heifer they sold \$3,000 worth of cattle in 12 years, and they still have thirty heifers of her family in their home herd. But farmers make the error of trying to do it all in one year. Most fellows don't enter the business unless they can start with a full herd from the start, and because big profits don't roll in the first day they drive the cows into the barn, become discouraged, and belittle the possibilities of good stock. But no farmer who was practical, who used common sense, devoted his time and attention to the business, ever made a failure. If he keeps the investment on the farm and in the herd he will make money if he displays patience and energy.

Not only is the herd a good investment, viewing it from the side of the ledger of cattle sold, but aside from this income, which, with good stock is even larger than with scrub varieties, there is the possibility of selling offsprings for a handsome price. This is the kind of dairying that is really profitable; the kind every farmer should have a slice of, for the demand will exceed the supply for several years to come.

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

DAIRY PROBLEMS.

Feeding One Pound of Grain to Three or Four Pounds of Milk.

You say feed one pound of grain to every three pounds of milk. Now suppose the cow gave 28 pounds when fresh and six months from that time only gave half of that, would you continue to give the same amount of feed as at first, or suppose she is only giving 14 pounds and you want to make her increase the flow and you know that she gave 28 pounds when fresh, would you give a feed that would correspond with the 28-pound milking?

Jackson Co. **J. W. K.**

There is only one better rule for feeding a grain ration than that of feeding one pound of grain for every three pounds of milk if the milk tests above five per cent, or one pound of grain for every four pounds of milk if the milk tests four per cent or below.

The best rule, that is the most accurate, is to feed one pound of grain per day for every pound of butter-fat produced in a week. This accurately takes into consideration the quality as well as the quantity of milk. Rich milk requires more feed for 100 pounds

than poor milk. But, of course, the grain fed must make with the roughage a balanced ration, that is, furnish the food nutrients in about the right proportion for economical digestion and assimilation.

Your idea is correct. If a cow gives 30 pounds of milk give her ten pounds of grain; if only 15 pounds of milk then only five pounds of grain. Let her get the balance of her ration from the roughage.

Butter and Over-run.

Will you tell me the correct way for finding the amount of butter from the fat and over-run? Is there any law regarding it? How do creameries usually figure it?

Lapeer Co.

L. S. L.

Butter is fat plus over-run, it is fat and over-run combined. Take 100 lbs. of cream testing 30 per cent fat, that would be 30 lbs. fat. To get the amount of butter this butter-fat with

you have a sufficient amount to churn, then warm the cream to 70 degrees and let stand for 24 hours, stirring occasionally. Just before churning cool the cream to 60 degrees.

Ensilage Too Dry to Keep.

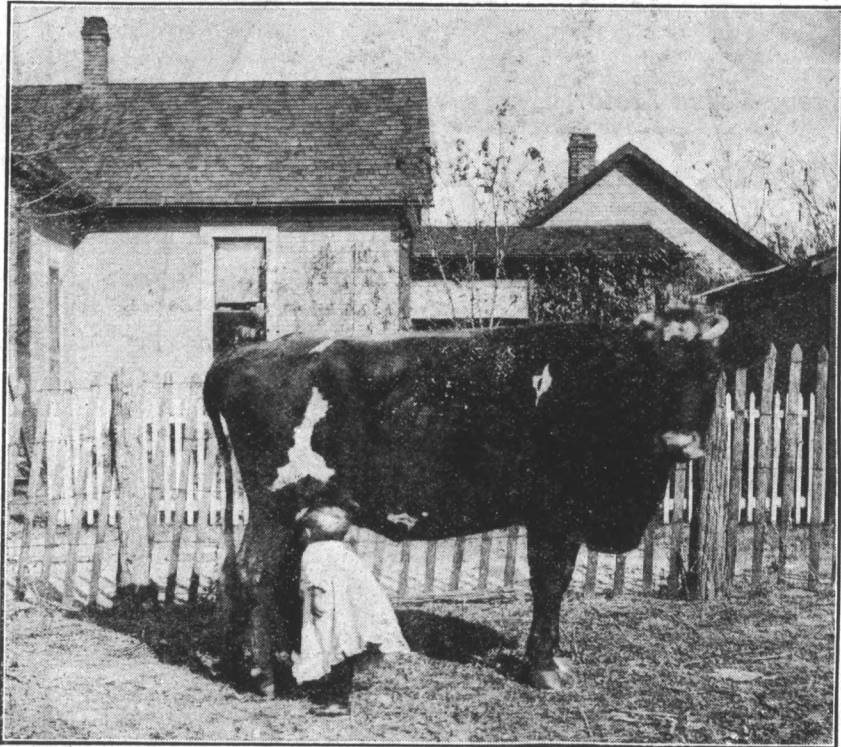
Will someone kindly tell me how to keep my ensilage? I have a big silo and only 22 head of cattle to feed it to. It was put up in the year of 1914 and I don't think there was any water put in it. It is molding now, a blue and white mold.

Roscommon Co.

W. O.

If this ensilage was so dry when put up that mold formed all through it, I don't believe it can be saved. Water would help it but there is no possible way of getting water distributed through the compact mass of silage. If you pour water on top of it it will run off and not penetrate the mass.

Just as soon as you discovered the silage was in this condition you should have gotten a lot of cattle and fed it



Looking After the Source of Supply.

an 18 per cent over-run would make, multiply the 30 by 1.8, which would equal 54. This, added to 30 would make 84, or the number of pounds of butter 100 lbs. of cream testing 30 per cent fat would make.

Pea Bran as Sole Concentrate.

Kindly give me a balanced ration for Jersey cows. I have clover hay and I would like to know what grain to feed them, and what difference I would have to make if I fed cornstalks with the clover hay. I have been feeding clover hay and pea bran, cornstalks and pea bran, and clover hay, cornstalks and pea bran, but I do not get good results. What is wrong with the butter? It had a strong smell and taste. I have three cows that freshened in October, November and December, and separate the milk and churn once a week.

St. Clair Co.

L. R. A.

I don't think you are feeding sufficient protein. Pea bran contains only 7.7 per cent of digestible protein, which is not sufficient when you feed all clover hay for roughage, and if you feed cornstalks it is not nearly enough protein. If you had ground peas it would be different, as this product contains 20 per cent protein. I suggest that you mix gluten feed equal parts with the pea bran when you feed clover hay once a day, and cornstalks once a day, and when you feed clover alone mix wheat bran and pea bran equal parts. Now feed all the roughage the cows will eat fairly clean and then feed one pound of grain per day for every pound of butter-fat produced in a week, or feed one pound of grain for every three pounds of milk produced.

Perhaps the trouble with the butter is caused by the way you handle the cream before churning. You ought to churn twice a week to make good butter, and oftener if possible. Stir the cream until cool. Don't set it away warm. Cool every mess of cream before adding to the old cream, then stir together. Keep in a cool place until

all out the first winter. In fact, the quicker it had been fed out the better.

Where silage is put up under proper conditions it will keep perfectly for years, no one knows how long. Cases are on record where it has kept in good condition for several years and apparently would have kept much longer.

COLON C. LILLIE.

HOLSTEIN BREEDERS MEET.

The West Michigan Holstein Breeders' Association held its annual meeting February 2 in Grand Rapids and carried out an interesting program of talks, followed by discussion. For the first time Michigan will entertain the Holstein-Friesian Association of America this year, the annual meeting of this body coming to Detroit June 7-8, and many breeders from this section of the state will attend. Officers of the West Michigan Association were elected as follows: President, M. W. Willard, Grand Rapids; vice-president, Peter Buth, Grand Rapids; secretary, and treasurer, W. R. Harper, Middleville; executive committee, F. H. Williams, Allegan; F. D. Cutler, Wayland; H. A. Washburn, Moline; H. F. Curtis, Lake Odessa; John J. Nyenhuis, Hudsonville.

The Saginaw County Holstein-Friesian Association met at Saginaw and re-elected Wm. J. Morgan as president. C. P. Reed, of East Lansing, spoke on the advantages of farm account books and business records of what every animal and every field is doing. The matter of holding a consignment sale of Holstein cattle under auspices of the association, was discussed and a committee was appointed, with Thomas Phoenix as chairman, to report on this plan at the next meeting.

Kent Co.

ALMOND GRIFFEN.



Extra Strong

where extra strength is needed

ROUGE REX SHOES

"for the man who works"

SHOES that are worn by men who work have to stand up to hard wear. The man who works can't be particular where he steps; his shoes come down wherever he has to put them.

Toe-caps on such shoes get more wear than the toe-caps on any other kind of shoes. We know that and so we make our shoes to be worn by men who work, with two thicknesses of leather on the toe.

It's good leather, too. We buy the green hides and tan them ourselves. No one can make shoes of Rouge Rex tanned leather but ourselves. Rouge Rex leather has never been on the market for other shoe makers.

This No. 4131 is a Rouge Rex shoe designed for spring wear, strong and roomy—an ideal shoe for outdoor wear in wet weather.

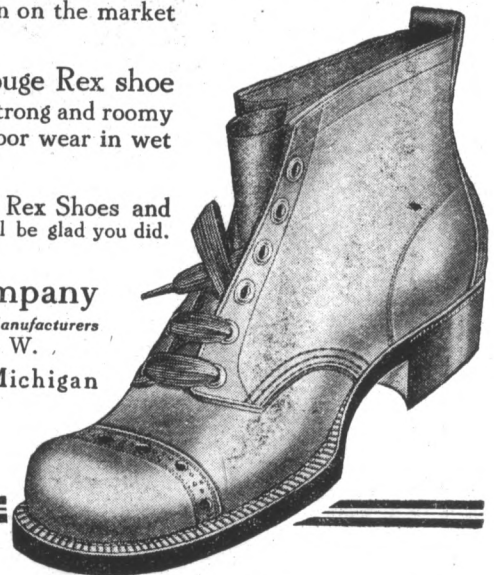
Send for booklet of Rouge Rex Shoes and name of nearest dealer. You'll be glad you did.

Hirth-Krause Company

Hide to Shoe Tanners and Shoe Manufacturers
18-2 Ionia Avenue, S. W.

Grand Rapids

Michigan



Would You Hire Two Men To Do One Man's Work?

OF course not! Then why buy or put up with a cream separator that uses any more discs than are used in the **Sanitary Milwaukee**? With practically half the number of discs used in other separators, the **Sanitary Milwaukee** actually skims closer, quicker and easier. The discs are tapered, allowing greater separating capacity where separation takes place. This together with the fact that the feed slides allow an equal amount of milk to flow between each set of discs—something accomplished in no other separator—explains why the skimming bowl of the

SANITARY Milwaukee CREAM SEPARATOR

Does its work more thoroughly, with *less trouble, less work for you*. You have only about half as many discs to clean every time you use the separator. Moreover, the discs of the **Sanitary Milwaukee** have no holes, pockets or perforations to catch and hold impurities. They are as smooth as glass. Still another reason why they are easy to keep clean, is that they are stamped out of pure aluminum. Every woman knows that aluminum utensils are easier to wash because grease does not stick to aluminum. It can never rust or corrode and thus taint the cream.

Sanitary Milwaukee will give you *all* the cream with less work, yet cost you no more. Write now for complete illustrated catalog and name of dealer nearest you who can show you the **Sanitary Milwaukee**.

MILWAUKEE SEPARATOR MFG. CO.

243 Madison Street
Milwaukee, Wis.



70 lbs. Milk Cost 36 cts.

Elsie, Mich., H. F. Lewis, has a herd of 16 pure bred Holsteins that are doing fine on Unicorn. He has a 2 year old that is giving 56 lbs. per day with no other grain ration but Unicorn. Also a 5 year old that averaged 70 lbs. per day through January on 14 lbs. of Unicorn feed as a grain ration. These are facts I obtained of him this morning. A. R. LEVEY.

Hundreds of UNICORN feeders are doing as well.

UNICORN DAIRY RATION

is equally profitable for tests or every day dairying. TRY IT.
FOR FACTS AND FIGURES WRITE,

CHAPIN & CO., Dept. M, Hammond, Ind.

Willys

KNIGHT

Sleeve-Valve Motor

For Better, More Constant, Longer Service

Let the city man have his poppet-valve motor if he wants one.

His garage around the corner will take care of it for him—"tune it up" frequently and remove the carbon and re-seat the valves every few thousand miles!

But you probably have no such nearby facilities.

You have to be without your car for days—maybe weeks—when engine repairs are necessary.

The great Daimler—England's best known motor car builder,—says: "if there is no repair shop within miles, own a Knight Motored Car."

It will give you far the most constant service—far the greatest total mileage.

For instead of getting noisy and losing power and flexibility, as all other types of motor must,

from the very nature of their construction,—

The sleeve-valve motor will steadily improve with use without any attention beyond oiling.

Carbon in the sleeve-valve motor only makes it run the smoother and quieter—only gives it greater power and flexibility.

And it will serve you more and more efficiently for literally thousands of miles beyond the life of any other type of motor.

We believe the Willys-Knight is the most economical car, in the long run, which a farmer can buy.

It will give him better, more constant, longer service than any other car at anywhere near the price.

See the Overland dealer now and talk it over with him.

Catalog on request. Please address Dept. 443

The Willys-Overland Company, Toledo, Ohio

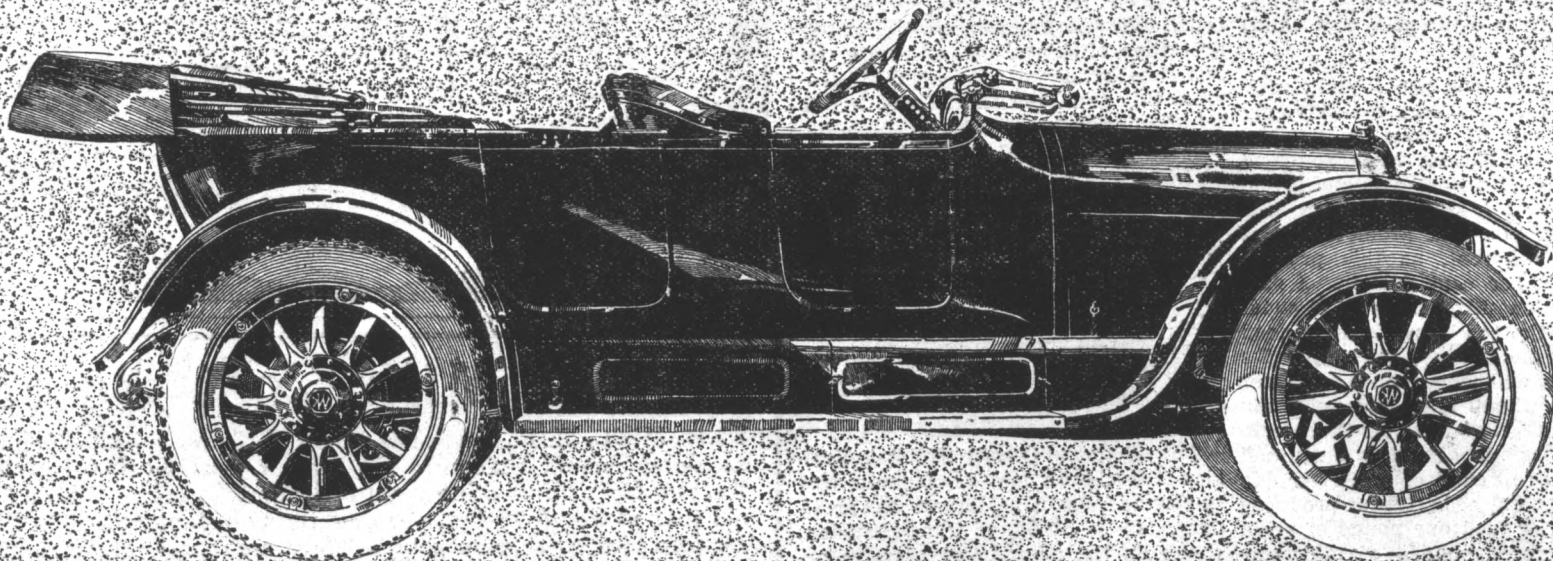
Model 84 B

\$1125

Roadster . . \$1095

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"Made in U.S.A."



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

WHEN the Serb armies crossed the border of Bosnia, to meet the Austrians, they put an end to what has, for thirty years, been the model government of Europe.

Bosnia, now an integral part of the Austro-Hungarian Empire, was the province which, until only a few years ago, was unique for its curious status: It was nominally still part and parcel of the Ottoman Empire, but, at the close of the wars of the seventies, the Austro-Hungarians came into the province and set up there a model govern-

Bosnia's Model Government

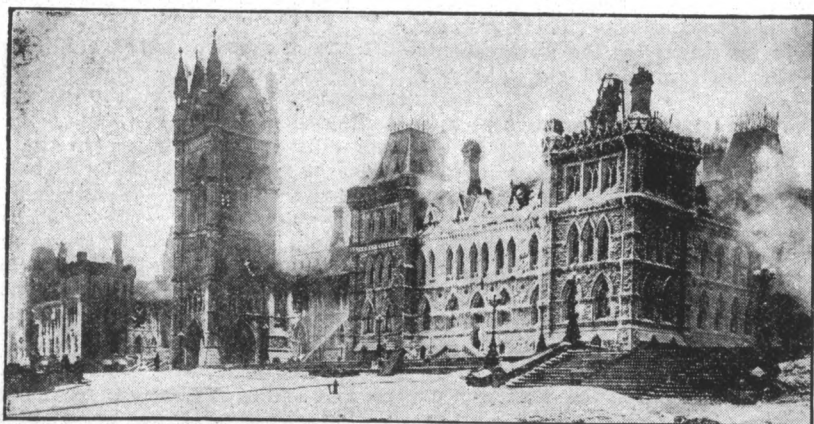
By FELIX J. KOCH

ment, much as the English did in Egypt. They have done this, however, and at the same time, have held the sympathies of all parties concerned. The government is the good friend of the people. Everything is done by it. When a peasant is in need of seed, he goes to the government physician and is prescribed for. If he be very

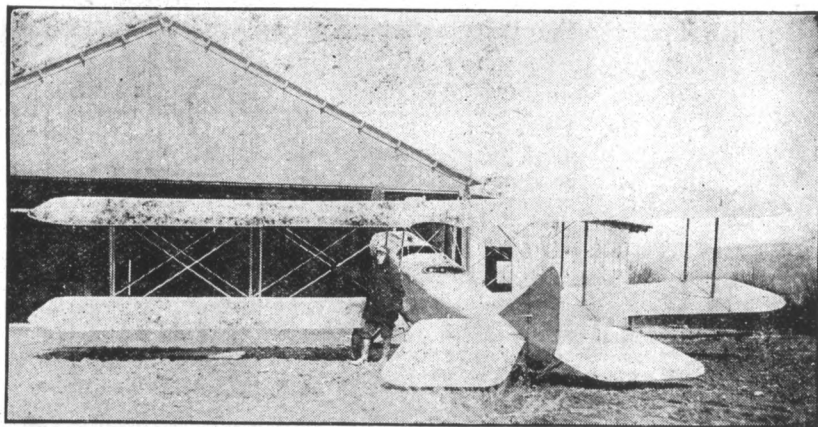
poor, the government gives him the medicine also. In the cities, the government has erected schools of craft, and the proportion of educated folk in Bosnia is remarkable, considering the short time that they have had opportunity in which to study. Better still, the practical side of the laborer's existence is looked after. On the out-

skirts of Mostar, the county seat of the Herzegovnia, (now a province of Bosnia), there is, for example, a school of vine and fruit-culture. To anyone who wishes to attend this institution the government gives free transportation on the railways, for the railroads are government monopolies. While the student is there, the government pays him wages and gives him his food and lodging. For this it receives, in return, only the output of the farms of the institution and, later, the advantages of having in the country farmers

WORLD EVENTS IN PICTURES



Canadian Parliament Building at Ottawa as it Appeared After the Fire of February 3-4.



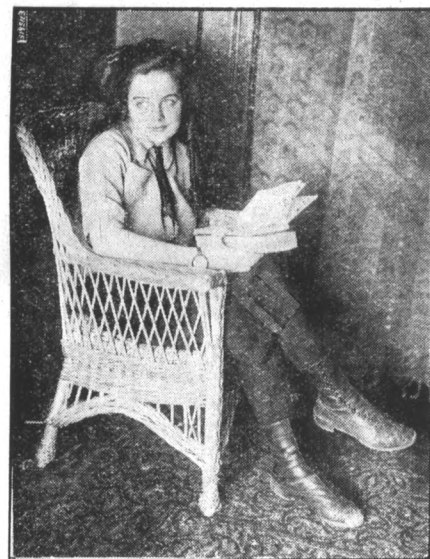
Latest U. S. Aeroplane Makes 90 Miles an Hour, Breaking all American Speed Records.



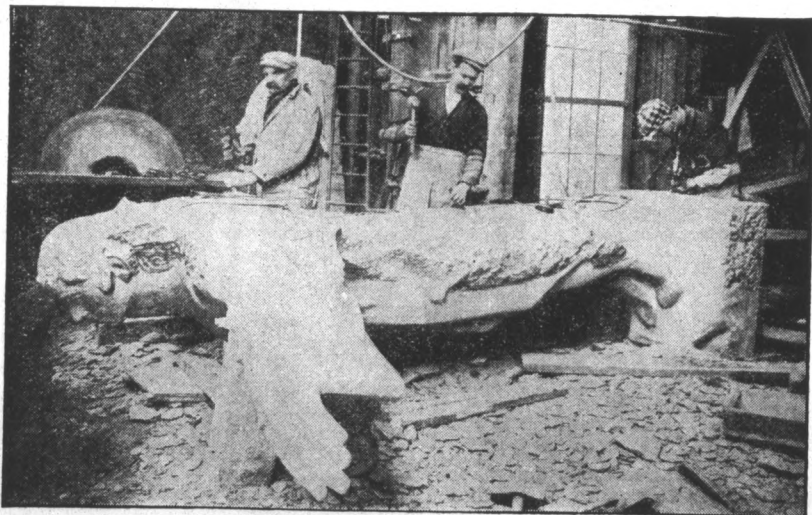
"Pon Pon" Veil, Latest Millinery Novelty.



"Bouncing" the Queen at the Northwest Winter Sports Carnival at St. Paul.



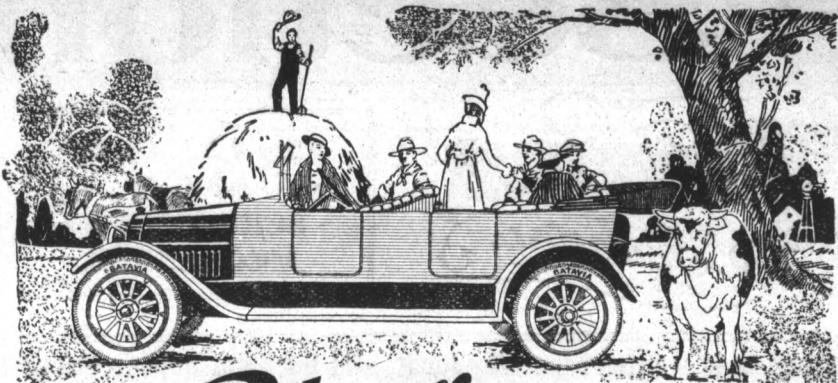
Marjorie Sterrett Starts Patriotic U. S. Warship Fund.



Sculptors Working on Huge Memorial to Titanic Victims—to be Mounted at Washington, D. C.



Germany's Largest Prison Camp is at Koenigsbruck where Thousands of Prisoners Are Housed.



Pullman
\$740

The Great Big Car For The Farm

COMFORT is the keynote upon which the body was designed—plenty of knee room in the driver's compartment, ample leg space in the tonneau and wide seats. Real leather upholstery over real curled hair creates an easy chair of the road. Perfect balance and smooth, easy-running qualities are insured by the famous cantilever springs of the English Lanchester type. The rakish lines, the simplicity in construction, the continuous satisfactory performance, all give to a Pullman owner a marvelous value for the money. There is no other car on the market today that wears as well.

Write Dept. 12

Pullman Motor Car Co. York, Pa.

SPECIFICATIONS: 114-inch wheel base; 32-H. P. four-cylinder motor; Batavia non-skid tires on all four wheels; cantilever rear springs; Independent electric starting and lighting systems; separate high-tension magneto; honeycomb radiator; full floating rear axle.

trained in modern methods. In Bosnia, then, side by side, with the skillful educated farmers, the workmen of an earlier generation labor, and through this association they are gradually learning better methods.

In a corner of the field of the untrained farmer is the threshing-floor, where the pony is driven 'round and 'round—and the quaintly-garbed peasant woman takes her broom and raises the chaff. Here and there, from broad baras, comes the merry rattle of the flail and, in the grain fields, the swish of the grain beneath the sickle is still heard.

Nor is the laborer of this interesting country without his primitive instincts. The music of bells, especially, attracts him and so every horse must have his bell, which jingles merrily on the lonely roads. Much of the other music is of the Magyar gypsy sort, produced by a stringed instrument, around which the peasants gather in the green, of a summer's evening, and dance the kola. Of other amusements there are few.

The women take to embroidering for a pastime, and, by the evening candle and in the cruel winters, when the towns are all but snowed in, the dames sit by the faggot-fire and spin. The government, however, has introduced modern methods to change this also—and so, from all Bosnia, the government is bringing the expert spinners and sewers to Sarajovo, that they may learn modern methods. Their product is sold for them by the government, that the sum may aid the laborer's wage.

The city laborer of Sarajovo recalls the lands of the Arabian Nights. In and about the bazaars he putters; for in these shops there is not much for him to do. He is a porter, or else he attends the officials. His fare is simple—his costume still more so—a blouse of blue, a pair of loose black bloomers, a girdle of red, and gaiters. If he be a Christian, he wears on his head a bandana, twisted into the shape of a turban. Such is the workman as one sees him in one section. In another section he is garbed all in white; save for a red, much-bestitched vest, worn outside the jacket, and a fez of the same color.

For food, in Bosnia, there is the polenta and the melon, the potato and cucumber and tomato. Wine is much cheaper than water. Coffee is the national beverage for Moslem and Christian alike and the coffee houses are never empty.

If the laborer be employed as muleteer, on the long trails through the Balkans, he will count distances by kavanas, or coffee houses, where he will halt his train of animals and, while they drink from the brook, he will slake his own thirst with the coffee and two glasses of cold water, which always accompany the order.

The time he guesses at—caring little. Four times a day the muezzins call the long wail, which echoes over the mountains—and this is enough to assure him of the passing of the day. Time goes unappreciated.

He is light-hearted and happy. Overtaken by night in the mountain passes which, prior to the seventies, were haunted by death, he sings old folk-songs of the day of the Turks and Bosnia's glorious past. Politics he cares nothing for, for the government was so long a military despotism, in which he had no hand, that, as yet, he cares little for franchise. He is far from ready for autonomy. He knows that the government is good and that he will get what he asks for. So, what need has he of care?

Up in the mountains there is still another type of the contented laborer—the herder—who watches his own flocks and those of his neighbors, staying out with them in the summer, tending them and making cheese from their milk for the winter. In the uplands, the government has built shelter huts for the traveler—who wishes to explore them—and there, in the heart of the Balkans one is surprised to find a life simpler and more peaceful than any known in many parts of our own republic.

Now, though, the spirit of war has entered the land; the armies of Austria and Serbia are battling on the line—cities are falling, towns being burned and plundered, and stern martial law is bound to destroy, for long decades, what the arts of peace had brought to so splendid a state.

WANTED

Ten or more persons in each town or township to try our pure tested seeds. To every one who answers this ad and orders from our new, different and original seed book, we will include some free seed, some of our new novelties. We want 100,000 more new customers this year. These ten or more new customers will multiply next year. That's the way our pure tested seed business grows, and you too will become an enthusiastic booster for the "Live Seed House."

We also have a full line of fruit trees, vines, shrubs, etc. Drop us a postal card today.

Galloway Bros. & Co., Dept. 181, Waterloo, Iowa

JAPANESE ROSE BUSHES

Five for 10c.

The Wonder of the World
Rose Bushes with roses on them in 8 weeks from the time the seed was planted. It may not seem possible but we guarantee it to be so. They will **BLOOM EVERY TEN WEEKS** Winter or Summer, and when 3 years old will have 5 or 6 hundred roses on each bush. Will grow in the house in the winter as well as in the ground in summer. **Roses All The Year Around.** Package of seed with our guarantee by mail, only Ten Cents.

Japan Seed Co., Box 49, South Norwalk, Conn.

100 Pound Assortment BOLTS & NUTS

An assortment especially prepared for Farm, Repair or Machine Shop use. Contains Standard U.S. A. L. A. M. or S. A. E. NUTS, BOLTS, CAP-SCREWS, Studs, Carriage Bolts, Rivets, etc. Price \$6.00.

The M. & M. Co., Cleveland, O.

The "Berlin Quart"

The White Basket

That secures highest prices for your fruit. Write for 1916 catalog showing our complete line and secure your baskets and crates at **WINTER DISCOUNTS.**

The Berlin Fruit Box Co. Berlin Heights, Ohio.

ALFALFA \$9.60 PER BU.

Best Hardy Non-irrigated Seed 99.6% Pure 98% germination, \$12.90. Government tested. Absolutely guaranteed Northern grown, extremely hardy. No seed better. Have Turkestan Alfalfa; Sweet Clover; Timothy; grass seed of all kinds. Ask for our latest 60-page book on growing Alfalfa, 100-page catalog and samples. All sent Free. We can save you money write today.

A. A. BERRY SEED CO., Box 451, CLARINDA, IOWA.



WILLIAM E. ROBB, Secretary and Treasurer

The Man Who fired the shot that brought down the price of automobile insurance so that the farmers and business men of the State could afford to insure their automobiles against fire, theft, and liability, and who spent his time in obtaining and organizing a safe automobile insurance company.

This Company was organized August 30th, 1915, thus enabling his first members to join at a time of the year when the best risks could be selected and after the more numerous losses of the summer months had passed. This Company obtained about nineteen hundred members which enabled them to pass through the winter and the experimental stage with safety, and the large membership and surplus will now enable the Company to commence the spring work with everything in its favor. The revenue from new members will be large for sometime to come. One Company and one overhead expense will keep the cost down to the lowest point, as the Company is run on the mutual plan, the cost to join is only \$1.00 for policy and 25c per H. P. State rating.

Anyone desiring an application or an agency should write to the Citizen's Mutual Automobile Insurance Company, Howell, Michigan.



COATS

We custom tan and dress and make up a coat from a large best hide or horse hide for \$10 complete job. Send for our illustrated catalog today that will give you full information on making up all kinds of fur coats.

W. W. WEAVER, Custom Tanner, Reading, Michigan.

WANTED—In farm home by childless couple about 60 years of age, a young man with wife, sister or mother. Will pay salary or share. Refer.—Exch.

W. H. LANE. HUDSON, MICH.



WASHINGTON is the mightiest name on earth, long since mightiest in the cause of civil liberty, still mightiest in moral reformation. On that name a eulogy is expected. It cannot be. To add brightness to the sun or glory to the name of Washington is alike impossible. Let none attempt it.

In solemn awe pronounce the name, and in its naked, deathless splendor, leave it shining on.—Abraham Lincoln.

THESE AFFIDAVITS TELL THE STORY

Eighty Maxwells Make Good

ONE day last Autumn, eighty stock Maxwell automobiles left Buffalo, N. Y., for as many points along the Atlantic Coast, from Portland, Me., to Baltimore, Md.

Every item of expense of these eighty Maxwells—for gasoline, oil, tires, and repairs—was carefully checked and recorded.

Under Sworn Records

And the sworn affidavits of these eighty Maxwell drivers created a new record for automobile economy by showing a gasoline consumption as low as 36.85 miles per gallon—an oil consumption as low as 1134 miles per gallon—and *no expense* for tires or repairs.

Maxwell—"The Car Complete"

The "first cost" of a Maxwell is your *only* cost. Nothing you can buy *extra* will make it a better automobile. It is *absolutely complete*.

The "after cost" is, without exception, the lowest of any automobile of equal weight. The bona-fide affidavits of these eighty drivers prove it. 70,000 satisfied Maxwell owners back up this proof.

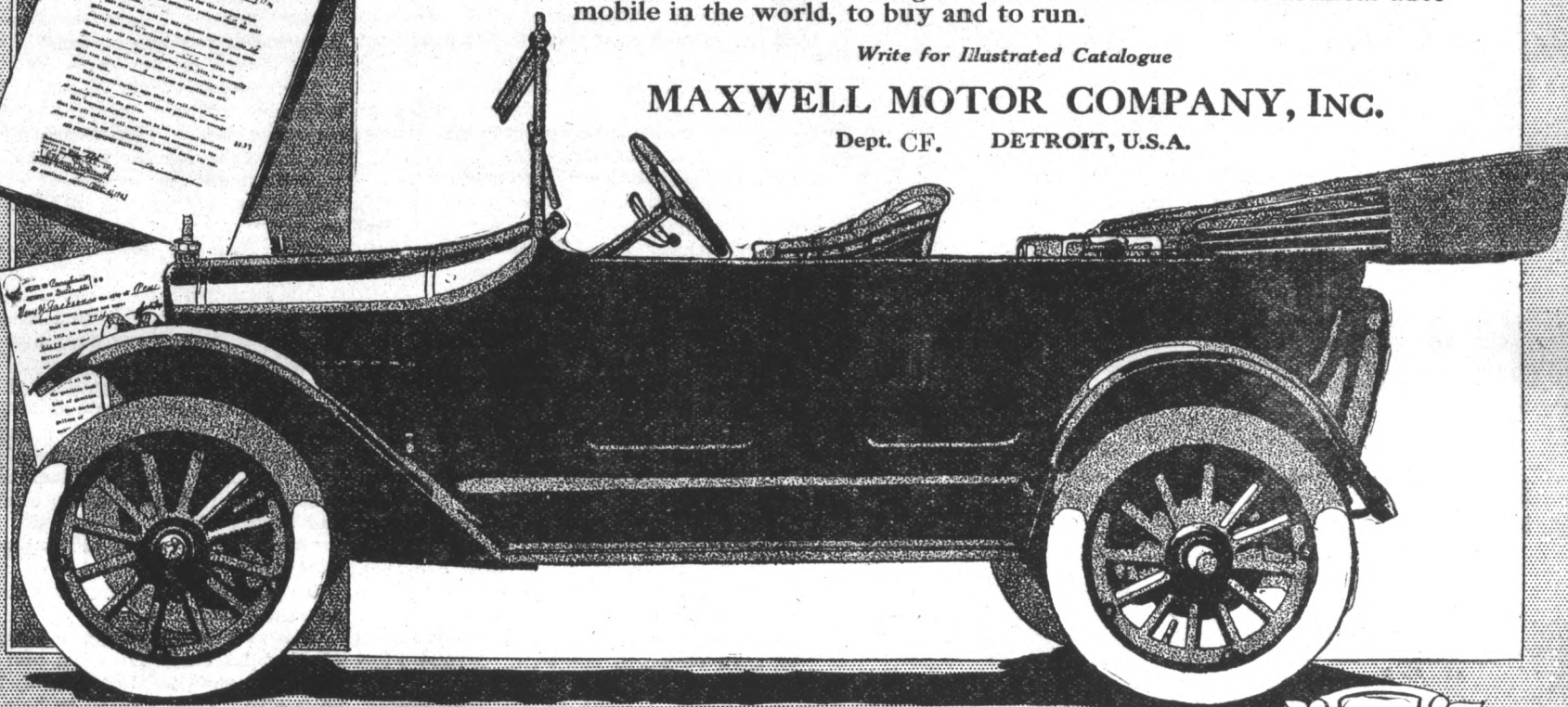
Every Road a Maxwell Road

The Maxwell has abundance of power and speed. It conquers hills and pulls through the worst of roads in any weather. It has strength and durability to withstand the hardest usage. Yet it is the most economical automobile in the world, to buy and to run.

Write for Illustrated Catalogue

MAXWELL MOTOR COMPANY, INC.

Dept. CF. DETROIT, U.S.A.



This gives you the right idea of Maxwell completeness at \$655

ELECTRIC—Starter and Electric Lights.
MOTOR—Four-cylinder, L-head type, cast en bloc. Bore 3½ in.; stroke 4½ in.
MAGNETO—Simms high tension.
CLUTCH—Cone, faced with multibestos lining, runs in oil.
TRANSMISSION—Selective sliding gear. Three speeds forward and one reverse.
CONTROL—Center left side drive; foot accelerator. 16 in. steering wheel.

WHEEL BASE—103 inches; tread 56 in.; 60 in. optional for the South.
WHEELS—Artillery, of best grade hickory; with demountable rims.
TIRES—30x3½ in., front and rear. Famous make of anti-skid tires in rear.
SPRINGS—Front, semi-elliptic. 32 in. long. Rear ¾-elliptic, lower half 40 in. long.
AXLES—Front, drop-forged, I-beam section, complete with spring seats. Rear, floating type.

BRAKES—Internal and external, actuated on 12½ in. drums on rear wheels.
EQUIPMENT—Two electric head lights with dimmer, electric tail light, generator, storage battery, electric horn, speedometer, "one-man" mohair top with envelope and quick adjustable storm curtains, double ventilating rain-vision windshield, improved instrument board with all instruments set flush, spare tire carrier with extra demountable rim, jack and tools.

All Maxwell Dealers Can Show You Copies of Original Affidavits as Reproduced in this Advertisement

Maxwell
\$655
F. O. B.
Detroit

Heating Pipes Are Needless

(Copyright 1915 by The Monitor Stove & Range Co.)

When you fit your house with the Caloric pipeless furnace. It fits immediately under the floor and the warmed air from its single register circulates through the entire house.

You can install this furnace almost as easily as a stove and you do not have your cellar littered with a labyrinth of pipes. There being no pipes in the cellar this is the one furnace that will not spoil produce. The

(Patented) TRADE MARK PIPELESS CALORIC FURNACE TRADE MARK (Patented)

is designed on new principles and has desirable features that cannot be found elsewhere. It is guaranteed to save 35 per cent of your fuel. This great saving is effected by means of our ribbed firepot, and the fact that there are no pipes running through the house and cellar to waste heat. The ribs ad-

mit free air circulation which causes the coal to burn thoroughly. No clinkers to lose you money. These ribs prevent ashes from forming on the firepot and retarding heat radiation. The Caloric firepot has 600 square inches greater radiation than the average firepot.

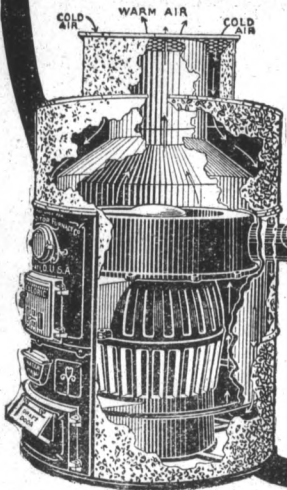
Install It Easily in Any House--Old or New

Nothing to do but cut one hole for a register. By digging a small pit you can even put the Caloric Pipeless Furnace in a house that has no cellar. It will burn coal, coke or wood. Bring city comforts to farm homes. Saves the labor of carrying fuel upstairs and ashes downstairs. The Caloric Pipeless Furnace lessens fire danger to house and children. It provides a healthful uniform heat for every room in the house.

Our Strong Guarantee

To prove our confidence. If the Caloric Pipeless Furnace is not entirely satisfactory we'll make it so any time within one year. If there is no dealer in your town to demonstrate this furnace write us for illustrated catalog.

The Monitor Stove & Range Co.,
206 Gest St., Cincinnati, O.



Light of Western Stars

By ZANE GREY

The horseback rides Madeline had taken to the little Arizona hamlet had tried her endurance to the utmost, but the journey by automobile, except for some rocky bits of road and sandy stretches, was comfortable, and a matter of only a few hours. The big touring-wonder to the Mexicans and cowboys; not that automobiles were very new and strange, but because this one was such an enormous machine and capable of greater speed than an express train.

The chauffeur who had arrived with the car found his situation among the jealous cowboys far removed from a bed of roses. He had been induced to remain long enough to teach the management of the machine; the choice fell upon Link Stevens as his successor, for the simple reason that of all the cowboys he was the only one with any knack for mechanics. Now, Link had been a hard-riding, hard-driving cowboy, and that winter he had sustained an injury to his leg, caused by a bad fall, and was unable to sit his horse. This had been gall and wormwood to him; but when the big white automobile came, and he was elected to drive it, life was once more worth living.

All the other cowboys regarded Link and his machine as some correlated species of demon. They were deathly afraid of both. For this reason Nels, when Madeline asked him to accompany her to Chiricahua, replied reluctantly that he would rather follow on his horse. However, she prevailed over his hesitancy, and with Florence also in the car, they set out.

For miles and miles the valley road was smooth, hard-packed, and slightly down hill; and when speeding was perfectly safe Madeline was not averse to it. The grassy plain sailed backward in gray sheets, and the little dot in the valley grew larger and larger. From time to time Link glanced round at Nels, whose eyes were wild and whose hands clutched his seat.

While the car was crossing the sandy and rocky places, going slowly, Nels appeared to breathe easier; and when it stopped in the wide, dusty street of Chiricahua, he gladly tumbled out.

"Nels, we shall wait here in the car while you find Stewart,"

"Miss Hammond, I reckon Gene'll run when he sees us—if he's able to run," replied Nels. "Wal, I'll go find him an' make up my mind what we'd better do."

Nels crossed the railroad tracks and disappeared behind the low, bat houses. After a little time he reappeared and hurried up to the car. Madeline felt his gray gaze searching her face.

"Miss Hammond, I found him," said Nels. "He was sleepin'. He's sober an' not bad hurt; but I don't believe you ought to see him. Mebbe Florence—"

"Nels, I want to see him myself. Why not? What did he say when you told him I was here?"

"Shore, I didn't tell him thet. I jest says, 'Hullo, Gene!' an' he says, 'Wal, Nels, mebbe I ain't glad to see a human bein'.' He asked me who was with me, an' I told him Link an' some friends. I said I'd fetch them in. Now, if you really will see him, Miss Hammond, it's a good chance; but shore it's a touchy matter, an' you'll be some sick at sight of him. He's lyin' in a greaser hole over here."

Madeline did not hesitate a moment. "Thank you, Nels. Take me at once. Come, Florence!"

They left the car, now surrounded by gaping-eyed Mexican children, and crossed the dusty space to a narrow lane between red adobe walls. Passing by several houses, Nels stopped at the door of what appeared to be an

alleyway, leading back. It was filthy.

"He's in there, around the first corner in the patio. Miss Hammond, if you don't mind, I'll wait here for you. I reckon Gene wouldn't like any fellers around when he sees you girls."

Madeline hesitated, and went forward slowly. She had given no thought at all to what Stewart might feel when suddenly surprised by her presence.

"Florence, you wait also," said Madeline at the doorway, and turned in alone.

She stepped into a broken-down patio, littered with alfalfa straw and debris, all clear in the sunlight. Upon a bench, his back toward her, sat a man looking out through the rents in the broken wall. He had not heard her.

She saw that the place had been used as a corral. A rat ran boldly across the dirt floor. The air swarmed with flies, at which the man brushed with weary hand. Madeline did not recognize Stewart. The side of his face exposed to her gaze was black, bruised, bearded. His clothes were ragged and soiled. There were bits of alfalfa in his hair. His shoulders sagged. He made a wretched and hopeless figure, sitting there. Madeline divined something of why Nels shrank from being present.

"Mr. Stewart! It is I—Miss Hammond—come to see you," she said.

He grew perfectly motionless, as if he had been changed to stone.

She repeated her greeting. His body jerked. He turned violently, as if instinctively to turn and face this intruder, but a more violent movement checked him.

Madeline waited. How singular that this ruined cowboy had pride that kept him from showing his face! Or, was it not shame more than pride?

"Mr. Stewart, I have come to—talk with you, if you will let me."

"Go away," he muttered.

"Mr. Stewart!" she began with involuntary hauteur; but instantly she corrected herself, and became deliberate and cool, for she saw that otherwise he might not even hear her. "I have come to help you. Will you not let me?"

"For Heaven's sake! You—you!" He choked over the words. "Go away!"

"Stewart, perhaps it was for Heaven's sake that I came," said Madeline. "Surely it was for yours, and your sister's—"

Madeline bit her tongue, for she had not meant to betray her knowledge of Letty. He groaned, and, staggering up to the broken wall, leaned there with his face hidden. Madeline reflected that perhaps the slip of speech had been well.

"Stewart, please let me say what I have to say."

He was silent. She gathered courage and inspiration.

"Stillwell is deeply hurt, deeply grieved that he could not turn you back from this—this fatal course. My brother is also. They wanted to help you; and so do I. I have come, thinking somehow I might succeed where they failed. Nels brought your sister's letter. I—I read it. I was only the more determined to try to help you, and indirectly to help your mother and Letty. Stewart, we want you to come to the ranch. Stillwell needs you for his foreman. The position is open to you, and you can name your salary. Both Al and Stillwell are anxious about Don Carlos, the vaqueros, and the raids down along the border. My cowboys are without a capable leader. Will you come?"

"No!" he answered.

"But Stillwell wants you so badly."

"No!"

"Stewart—I want you to come."

"No!"

The replies had been hoarse, loud, furious. They disconcerted Madeline,

NEW KEROSENE LIGHT

Beats Electric or Gasoline

10 DAYS FREE
Send No Money

We don't ask you to pay a cent until you have used this wonderful modern light in your own home ten days—we even pay transportation charges. You may return it at our expense if not perfectly satisfied after putting it to every possible test 10 nights. You can't lose a cent. We want to prove to you that it makes an ordinary oil lamp look like a candle, beats electric, gasoline or acetylene. Lights and is put out like old oil lamp. Tests by Government and 33 leading Universities show it

BURNS 50 Hours on ONE GALLON common kerosene (coal oil), and gives more than twice as much light as the best round wick open flame lamps. No odor, smoke or noise; simple, clean, no pressure, won't explode. Several million people already enjoying this powerful, white steady light nearest to sunlight. It's GUARANTEED.

Get One FREE We want one user in each locality to whom we can refer customers. Be the first and get our special introductory offer under which you get your own lamp FREE for showing it to a few neighbors and sending in their orders. Write quick for beautifully illustrated FREE Book and get full particulars. Address nearest office

MANTLE LAMP COMPANY, 1228 Aladdin Building, CHICAGO
Largest Kerosene (Coal Oil) Mantle Lamp House in the World
Also Offices and Warehouses at: New York City, Portland, Ore., Montreal and Winnipeg, Can.



MEN WITH RIGS OR AUTOS
MAKE \$300 A MONTH

No Money Needed
We Furnish Capital

Without any sales experience, yes even without capital, you can make a big success by placing the Aladdin on trial. If you haven't capital we will help you with our liberal credit plan.

Every home wants and needs this wonderful light, that from half the usual amount of oil produces the brightest, mellowest light obtainable. To sell the Aladdin is a simple matter of getting the light into people's hands. After a trial nobody wants to go back to old feeble lighting methods. Hundreds of men are making \$100 to \$200 a month. Here are some letters just like thousands we receive:

"Out of eight calls I sold six. Then ordered in four dozen lots and sold five lamps a day. My patrons all say they are fine after using them a year."—H. B. Stewart, S. Dak.
"Between Jan. 2 and Feb. 20, I sold about 275 lamps. I never saw anything that would sell equal to it."—Charles Conrad, Ohio.

Sample Sent Prepaid—10 Days FREE to responsible men. Tell us what territory you prefer, whether you have a rig or auto so you can work in country, how long you have lived in the community, etc., so we can give you full information, agency terms, credit plan and sample lamp for free trial.

APOLLO ROOFING

Made from APOLLO-KEYSTONE COPPER STEEL Galvanized Sheets—the most durable, rust-resistant galvanized sheets manufactured for all forms of exposed sheet metal work.

Actual weather tests have proved conclusively the superiority of this material for Roofing, Siding, Culverts, Tanks, Silos, Cisterns, and similar uses. Look for the Keystone added below regular Apollo brand—it indicates that Keystone Copper Steel is used. Demand the genuine—accept no substitute. Our free booklet "Better Buildings" contains farm plans, information and instructions for the application of metal roofing and siding. It is of special interest to every farmer and owner of buildings. Write for free copy.

AMERICAN SHEET AND TIN PLATE COMPANY, Frick Building, Pittsburgh, Pa.



Beacon Burner FREE

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

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

WANTED—AN IDEA: Who can think of simple things to patent? Protect your ideas, they may bring you wealth. Write for "Needed Inventions" and "How to get your Patent and Your Money." **RANDOLPH & CO., PATENT ATTORNEYS, DEPT. 67, WASHINGTON, D. C.**

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and she paused, trying to think of a way to proceed. Stewart staggered away from the wall, and falling upon the bench, he hid his face in his hands. All his motions, like his speech, had been violent.

"Will you please go away?" he asked.

"Stewart, certainly I cannot remain here longer if you insist upon my going. But why not listen to me when I want so much to help you? Why?"

"I'm an infernal blackguard," he burst out. "But I'm not so low—that I can stand for a lady like you—seeing me here."

"When I made up my mind to help you, I made it up to see you wherever you were. Stewart, come away; come back with us to the ranch. You are in a bad condition now. Everything looks black to you; but that will pass. When you are among friends again you will get well. You will be your old self. Why, Stewart, think how young you are! It is a shame to waste your life. Come back with me."

"Miss Hammond, this was my last plunge. I'm done for now," he replied despondently. "It's too late."

"Oh, no; it's not so bad as all that." "It's too late."

"At least make an effort, Stewart, Try!"

"No. There's no use. I'm done for. Please leave—me—thank—you—for—"

He had been savage, then sullen, and now he was grim. Madeline all but lost power to resist his deadly finality. No doubt he knew he was doomed. Yet something halted her—held her even as she took a backward step.

She became conscious of a subtle change of her own feeling. She had come into that squalid hole Madeline Hammond, earnest enough, kind enough in her intentions, but she had been almost imperious—a woman habitually, proudly used to being obeyed. She divined that all the pride, blue blood, wealth, culture, distinction, all the condescending persuasion, the fatuous philanthropy on earth would not avail to turn this man a single hair's breadth from his downward career to destruction. Her coming had terribly augmented his bitter hate of himself. She was going to fail to help him! She experienced a sensation of impotence that amounted almost to distress; and all at once she became merely a woman, brave and sweet and indomitable.

"Stewart, look at me," she said.

He shuddered. She advanced and laid a hand on his bent shoulder. Under the light touch he appeared to sink.

"Look at me," she repeated.

But he could not lift his head. He was abject, crushed. He dared not show his swollen, blackened face. His sullen, cramped posture revealed more than his features might have shown; it betrayed the torturing shame of a man of violent pride and passion, a man who had been confronted in his degradation by the woman he had dared to enshrine in his heart. It betrayed his love.

"Listen, then," went on Madeline, and her voice was unsteady. "Listen to me, Stewart. The greatest men are those who have fallen deepest into the mire, sinned most, suffered most, and then have fought their evil natures and conquered. I think you can shake off this desperate mood and be a man."

"I'm only a dog!" he cried.

"Listen to me again. Somehow I know you're worthy of Stillwell's love. Will you come back with us—for his sake?"

"No; it's too late, I tell you."

"Stewart, the best thing in life is faith in human nature. I have faith in you. I believe you are worth it."

"You're only kind and good, saying that. You can't mean it."

"I mean it with all my heart," she replied, a sudden rich warmth suffusing her body as she saw the first sign of his softening. "Will you come back?"



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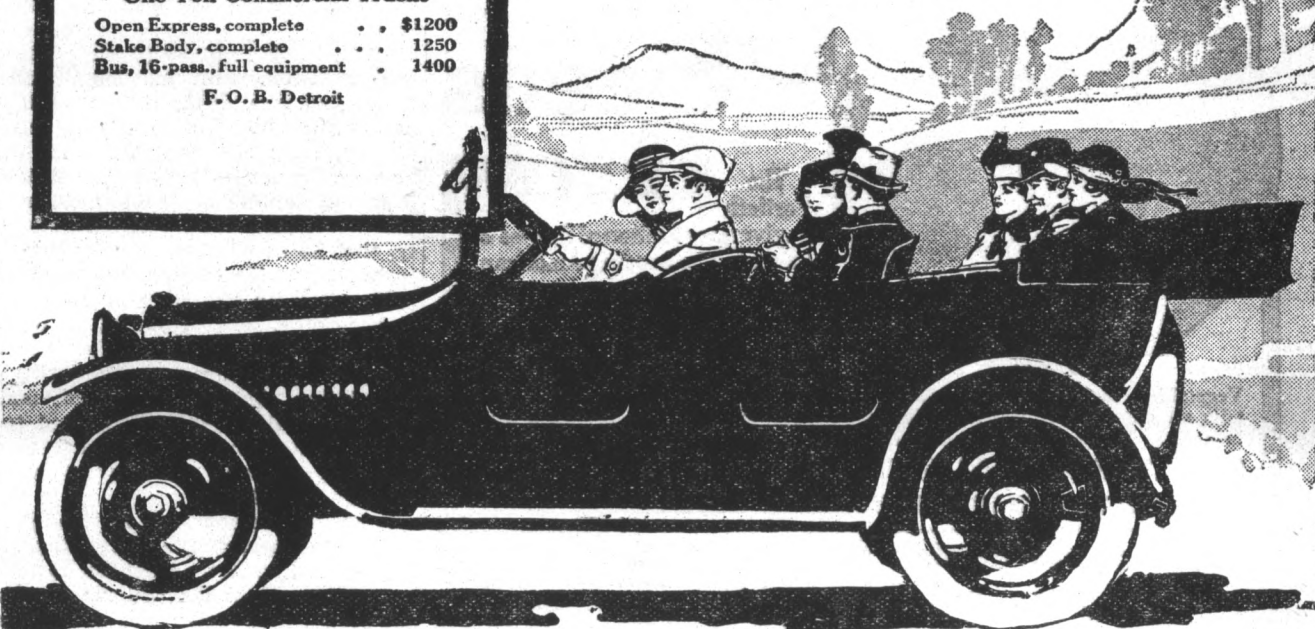
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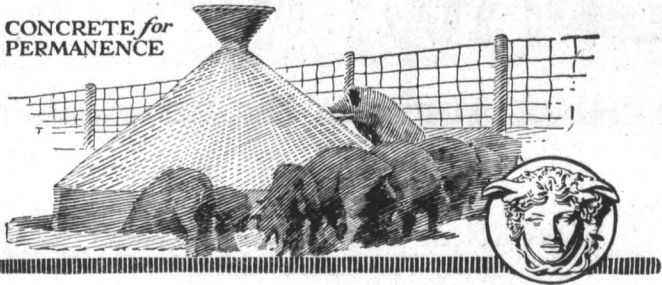
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If not for your sake or Stillwell's—then for mine?"

"What am I to such a woman as you?"

"A man in trouble. I have come to help you—to show my faith in you."

"If I believed that I might try," he said.

"Listen," she began softly, hurriedly. "My word is not lightly given. Let it be my pledge of faith in you. Look at me now—and say you will come."

He heaved up his big frame; as if trying to cast off a giant's burden, and then slowly he turned toward her. His face was a blotched and terrible thing. It was hideous. At that instant all that appeared human to Madeline was the dawning in dead, furnace-like eyes of a beautiful light.

"I'll come," he whispered huskily. "Give me a few days to straighten up—then I'll come!"

CHAPTER XV.

Toward the end of the week Stillwell informed Madeline that Stewart had arrived at the ranch and had taken up quarters with Nels.

"Gene's sick. He looks mighty bad," said the old cattleman. "He's so weak an' shaky he can't lift a cup. I was goin' to tell him what he did to me up at Rodeo; but I know, if he'd believe it, he'd be sicker than he is. Either Gene is losin' his mind, or he's got somethin' powerful strange on it."

From that time Stillwell, who evidently found Madeline his most sympathetic listener, unburdened himself daily of his hopes and fears and conjectures.

Stewart began slowly to mend, and presently he was able to get up and about. It was a good augury of his progress that the cowboys once more took up the teasing relation which had been characteristic of them before his illness. A cowboy must indeed be out of sorts when he cannot vent his peculiar humor on somebody or something.

"Wal, the boys are sure after Gene," said Stillwell, with his huge smile. "They josh him all the time about how he hangs around jest to get a glimpse of you, Miss Majesty. Sure all the boys hev a pretty bad case over their boss, but none of them is a marker to Gene. He's got it so bad, Miss Majesty, that he actooly don't know they're joshin' him. He takes every word an' smiles dreamy like, an' jest looks an' looks. Why, he's beginning to make me tired. He'll never run that bunch of cowboys if he doesn't wake up."

Madeline smiled her amusement, and told Stillwell that he wanted too much in such short time from a man who had suffered grievous injury in body and mind.

It had been impossible for Madeline to fail to observe Stewart's singular behavior. She never went out to take her customary walks and rides without seeing him somewhere in the distance. When she sat on the porch during the afternoon, or at sunset, he could always be descried at some point near. He idled listlessly in the sun, lounged on the porch of his bunk-house, sat whittling the top bar of the corral fence; and always it seemed to Madeline he was watching her, though he avoided meeting her.

Once, while going the round with her gardener, she encountered Stewart and greeted him kindly. He said little, but he was not embarrassed. She did not recognize in his face any feature that she remembered. He was pale, haggard, drawn. His eyes held a shadow through which shone a soft, subdued light. Madeline fancied that it was like the light in Majesty's eyes, and in the dumb, worshiping eyes of her favorite staghound. She told Stewart that she hoped he would soon be in the saddle again, and passed on her way.

Stewart recovered his strength, but not in time to ride at the spring roundup; and Stillwell discussed with Madeline the advisability of making the cowboy his foreman.

"Gene seems to be gettin' along,"

said the ranchman, "but he ain't like his old self. I think more of him, at thet; but where's his spirit? The boys'd ride roughshod all over him. Mebbe I'd best to wait longer now, as the slack season is on. All the same, if those vaqueros of Don Carlos's don't lay low, I'll send Gene over there. Thet'll wake him up!"

A few days afterward Stillwell came to Madeline rubbing his big hands in satisfaction and wearing a grin that was enormous.

"Miss Majesty, listen to me. I've somethin' strange to tell you. Them greasers down on our slope hev been gettin' prosperous. They're growin' like bad weeds; an' they got a new padre—the little old feller from El Cajon, Padre Marcos. Wal, this was all right, all the boys thought, except Gene; but he got blacker'n thunder an' roared round like a dehorned bull. I was sure glad to see he could get mad again. Then Gene heads down the slope fer the church. Nels an' me follered him, thinkin' he might hev been took sudden with a crazy spell or somethin'. He hasn't never been jest right yet since he left off drinkin'. Wal, we run into him comin' out of the church. We never was so dumfounded in our lives. Gene was crazy, all right—he sure hed a spell; but it was the kind of a spell he hed that paralyzed us. He ran past us like a streak, an' we follered. We couldn't ketch him. We herd him laugh the strangest laugh I ever heerd! You'd thought the feller was suddenly made a king. He was like thet feller who was tied in a buryin'-sack an' throwed into the sea, an' cut his way out, an' swam to the island where the treasures was, an' stood up yellin': 'The world is mine!' Wal, when we got up to his bunk-house he was gone. He didn't come back all day an' all night. Frankie Slade, who has a sharp tongue said Gene had gone crazy fer liquor, an' thet was his finish. Nels was some worried, an' I was sick."

"Wal, this mawnin' I went over to Nels's bunk. Some of the fellers was there, all speculatin' about Gene. Then big as life Gene struts round the corner. He wasn't the same Gene. His face was pale an' his eyes burned like fire. He hed thet old cool, mockin' smile, an' somethin' besides, thet I couldn't understand. Frankie Slade up an' made a remark—no wuss than he'd been makin' fer days—an' Gene tumbled him out of his chair, punched him good, walked all over him. Frankie wasn't hurt so much as he was bewildered."

"'Gene,' he says, 'what on earth struck you?'"

"An' Gene says, kind of sweet like:

"'Frankie, you may be a nice feller when you're alone, but your talk's offensive to a gentleman.'"

"After thet what was said to Gene was said with a nice smile. Now, Miss Majesty, it's beyond me what to allow fer Gene's sudden change. First off I thought Padre Marcos had converted him. I actooly thought thet; but I reckon it's only Gene Stewart come back—the old Gene Stewart an' some. Thet's all I care about. I'm rememberin' how I once told you thet Gene was the last of the cowboys. Perhaps I shold hev said he's the last of my kind of cowboys. Wal, Miss Majesty, you'll be appreciatin' of what I meant from now on."

It was also beyond Madeline to account for Gene Stewart's antics. Making allowance for the old cattleman's fancy, she did not weigh his story very heavily. She guessed why Stewart might have been angry at the presence of Padre Marcos. Madeline supposed that it was rather an unusual circumstance for a cowboy to be converted to religious belief; but it was possible. She knew that religious fervor often manifested itself in extremes of feeling and action. Most likely, in Stewart's case, his real man-nor had been both misunderstood and exaggerated. However, she had a curious desire, which she did not wholly admit to herself, to see the cowboy

and make her personal deductions.

The opportunity did not present itself for nearly two weeks. Stewart had taken up his duties as foreman, and his activities were ceaseless. He was absent most of the time ranging down toward the Mexican line. When he returned, Stillwell sent for him.

This was late in the afternoon of a day in the middle of April. Alfred and Florence were with Madeline on the porch. They saw the cowboy turn his horse over to one of the Mexican boys at the corral, and then come with weary step up to the house, beating the dust out of his gauntlets. Little streams of gray sand trickled from his sombrero as he removed it and bowed to the women.

"Wal, Gene, I'm sure glad to see you," Stillwell was saying. "Where do you hail from?"

"Guadaloups Canon," replied Stewart.

Stillwell whistled.

"Way down there! You don't mean you follered them hoss tracks thet far?"

"All the way from Don Carlos's ranch across the Mexican line. I took Nick Steele with me. Nick is the best tracker in the outfit. This trail we were on led along the foot-hill valleys. First we thought whoever made it was hunting for water; but they passed two ranches without watering. At Seaton's Wash they dug for water. Here they met a pack-train of burros that came down the mountain trail. The burros were heavily loaded. Horse and burro tracks struck south from Seaton's to the old California emigrant road. We followed the trail through Guadalupe Canon and across the border. On the way back we stopped at Slaughter's Ranch, where the United States cavalry are camping. There we met foresters from Peloncillo forest reserve. If these fellows knew anything, they kept it to themselves; so we hit the trail home."

"Wal, I reckon you know enough?" inquired Stillwell, slowly.

"I reckon," replied Stewart.

"Wal, out with it then," said Stillwell gruffly. "I reckon Miss Hammond can't be kept in the dark much longer. Make your report to her."

The cowboy lifted his dark gaze to Madeline. He was cool and slow.

"We're losing a few cattle on the open range. Night drives by vaqueros. Some of these cattle are driven across the valley, others up into the foot-hills. So far as I can find out, no cattle are being driven south; so this raiding is a blind to fool the cowboys. Don Carlos is a Mexican rebel. He located his ranch here a few years ago and pretended to raise cattle. All that time he has been smuggling arms and ammunition across the border. He was for Madero against Diaz. Now he is against Madero because he and all the rebels think Madero failed to keep his promises. There will be another revolution. And all the arms go from the states across the border. Those burros I told about were packed with contraband goods."

"That's a matter for the United States cavalry. They are patrolling the border," said Alfred.

"They can't stop the smuggling of arms—not down in that wild corner," replied Stewart.

"What is my—my duty? What has it to do with me?" inquired Madeline, somewhat perturbed.

"Wal, Miss Majesty, I reckon it hasn't much to do with you," put in Stillwell. "Thet's my bizness an' Stewart's; but I jest wanted you to know. There might be some trouble follerin' my orders."

"Your orders?"

"I want to send Stewart over to fire Don Carlos and his vaqueros off the range. They've got to go. Don Carlos is breakin' the law of the United States, an' doin' it on our property an' with our hosses. Hev I your permission, Miss Hammond?"

"Why, assuredly you have! Alfred, what do you think best?"

"It'll make trouble, Majesty, but it's got to be done," replied Alfred. "Here

you have a crowd of eastern friends due next month, and we want the range to ourselves then. But, Stillwell, if you drive those vaqueros off, won't they hang around in the foot-hills? I declare they are a bad lot."

Stillwell's mind was not at ease. He paced the porch with a frown clouding his brow.

"Gene, I reckon you got this greaser deal figgered better'n me," said Stillwell. "Now, what do you say?"

"He'll have to be forced off," replied Stewart quietly. "The Don's pretty slick, but his vaqueros are bad actors. It's just this way. Nels said to me, the other day: 'Gene, I haven't packed a gun for years until lately, and it feels good whenever I meet any of those strange greasers.' You see, Stillwell, Don Carlos has vaqueros coming and going all the time. They're guerilla bands, that's all, and they're getting uglier. There have been several shooting scrapes lately. A rancher named White, who lives up the valley, was badly hurt. It's only a matter of time till something stirs up the boys here. Stillwell, you know Nels and Monty and Nick."

(Continued next week).

Winter Sports

THE present winter has witnessed a general revival of winter sports throughout this country. The idea has developed in the east as well as in the west. In our large cities where outdoor space is lacking, indoor ice rinks have been built in unusually large numbers. Some of the higher class hotels have even provided ice skating accommodations for their guests.

It is probable that some impetus has been given to the revival of winter sports through the inability of society



people to spend the winter in European winter resorts. However, it is not so much this class as it is the general public that is causing observers everywhere to note the wide interest of both the rich and poor in these health-giving exercises.

Particularly enthusiastic are the people in the northwestern states. About thirty years ago winter carnivals were held in the larger cities of that section and this winter St. Paul will, for the first time in three decades, hold a ten-day carnival to which people from other cities in that region have been invited. Among the sports to be employed are snow-shoeing, skiing, skating, curling, hockey, and tobogganing. The illustration above is that of an attractive northwestern maiden dressed to challenge the bitter cold of the north wind and equipped with snow-shoes for a cross-country jaunt. She is assisting in reviving among her many friends the old winter carnival spirit.

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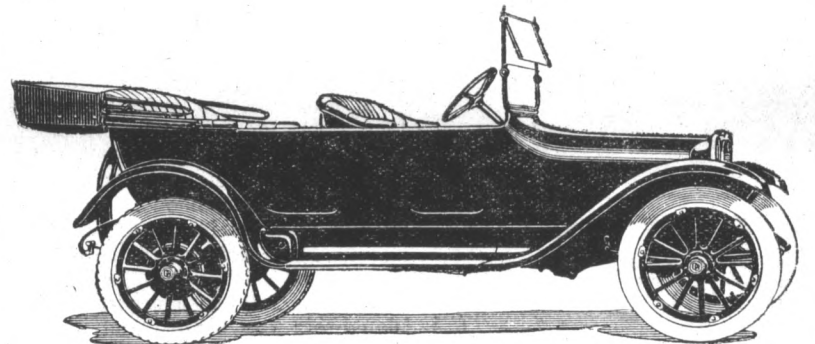
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Woman and Her Needs

At Home, and Elsewhere

The American Woman's Chance

Household Editor:—I am a reader of the Michigan Farmer and I always enjoy the writings of Deborah. They are full of life and right to the point. I am going to ask Deborah to write something on this subject, "The American Woman's Chance."—Mrs. N. L.

At first glance it would seem my correspondent has assigned a tremendous subject, for we are accustomed to thinking that the American woman has a chance to do whatsoever her fancy dictates. But when we stop to consider that the subject reads "Chance," not "Chances," the thing grows easy. For the American woman's one big chance today is exactly the one Eve had when she rocked her babies in those early days, the home. Here is every woman's one exclusive chance, the one thing which she can do better than any man, in fact the one thing which no man can do. She can make the home, and from it control the nation. And the American woman's chance there is greater than that of the women of any other nation. For in no other country are the women left so free to do entirely as they will with both money and children.

Our women have gone far in many ways. The doors of colleges and universities have been opened to them, the trades and professions are their legitimate field if they so desire. Machinery and modern methods have freed them from the drudgery of the kitchen. They can dabble in politics, take a hand in law making, head peace expeditions and take a whirl at anything man does. And because they have been given this freedom many women have left their place in the home and rushed out into the world. For what? For economic independence, for a widened sphere of usefulness, for a desire for soul culture, for a greater opportunity for happiness, they will tell you. These may be the reasons which lured them forth, but if they will tell the truth they will confess that all they ever got was a Dead sea apple.

It was a sorry day for woman when the doors of trades and professions were opened to them. For no matter how much we may object to it, wifehood and motherhood is woman's vocation, and nine-tenths of our so-called social problems would be solved if woman would return to her God-given vocation. Let mothers teach their daughters the beauty and dignity of honest manual labor, let them bring their daughters up to assume responsibilities instead of to think the world is a pleasure garden in which the woman who can get the most and give the least is the cleverest, and the divorce evil and most of the other evils would solve themselves. It is the home that is wrong, and only by the mothers in the homes can reforms be affected.

We have made a good deal of woman's so-called wonderful advance, but a large part of the advance has been retrogression. Where we have gained a little in freedom we have lost immeasurably in other ways. We have become selfish and unsympathetic, and filled with a restlessness which we call ambition, but which is really discontent. We want to do some wonderful thing, which will make our name live through all the ages, when really the best thing by which we can be remembered is our children.

Women complain of the monotony and drudgery of housework, but there is monotony and drudgery connected with every sort of work. The teacher teaches the same subjects, year in and year out, her only changes being a

new class of children, and the different angle she can put upon the lesson herself. And any bright housewife can put as much change into cooking as can the teacher into arithmetic. There is nothing particularly inspiring about measuring yards of ribbon, or typing dozens of the same sort of business letters day in and day out. Men find their labor monotonous, and housework is no worse than anything else that must be done. In fact, it may be made pleasanter, for the housekeeper in her own home can plan her work to suit herself, whereas the woman who goes out into the world in search of a wonderful chance quickly finds that she does what someone else plans regardless of her own views in the matter.

The home always has been woman's own best chance, and it will be to the end of the chapter. It sounds much more thrilling to speak of a career outside the home, but careers are most unsatisfactory things, even the brightest of them. Home-making is more prosaic, but it is more sure and more satisfactory, if you do a good job. And if you look carefully into the matter you will always find that the ones who are not satisfied with home-making are the women who have turned out some mighty poor work. I am not much of a believer in the idea of looking back to "the good old days." In most ways these days suit me. But in the way of woman's chances it would be well to go back to the days of our grandmothers.

DEBORAH.

SIMPLE CROCHET EDGING.

BY MRS. WALTER JACKSON.

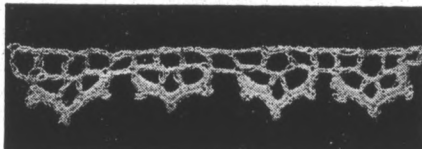
This is suitable for muslin underwear when made of No. 50 Irish lace thread, or for curtains, made of No. 15 or No. 20 cordonnet.

First Row.—Chain 8 stitches, treble in 1st stitch, turn.

Second Row.—Chain 5, treble in 3rd stitch from needle, turn.

Third Row.—Same as second.

Fourth Row.—Chain 5, treble in 3rd



An Effective Design for Edging.

stitch from needle, chain 3, treble in 2nd space from needle, chain 3, treble in same space, chain 3 and fasten at bottom of treble in 2nd space. Chain 1, * 3 doubles, chain 4 (for picot) 3 doubles * repeat from * in each of next two loops of scallop.

This brings you back to foundation spaces. Chain 5, treble in 3rd stitch from needle and repeat from second row.

CARE OF HOUSEPLANTS.

BY L. H. COBB.

"Why do houseplants grow like weeds for my neighbor and look like weeds for me? My begonias are pale and scraggly, my roses have lost their leaves, my geraniums are dwarfed and yellow, my ferns are a mass of dried-up fronds and bare stems with a few weakly shoots in a year. I go over them and water them every morning and feed them plant food just as directed. Mrs. Jones says she seldom feeds hers plant food and she does not water them regularly at all, yet her

plants all grow and look so strong and healthy."

How many times during my years in the florist business I have heard complaints something like this. They would be surprised when I informed them that the very irregularity of their neighbor's watering and feeding was the probable cause of her success. She watered when water was needed and fed when the plants asked for food. Some kill their plants by neglect, it is true, but this class know it, and do not wonder as to the cause.

Probably there is no part of the care of plants that is so difficult to learn as watering. It is very easy to kill some plants by overwatering, but the greatest danger in a regular method is that you do not water thoroughly enough but just soak up the top soil a little while the most of the soil becomes as dry and hard as a rock. You could hardly help noticing if you watered too much for the soil would turn green and the pots, even, would be moss grown, but the plants alone will warn you of the other extreme.

The best way to water is to set the pots in a vessel of water and let them soak up from the bottom, taking them out as soon as the moisture shows through on top. If left in too long the soil becomes water-logged and washes when drained. Do not water again until they begin to look dry on the surface. If you can take a pinch of dirt from under the loose surface mulch and it is wet enough to make a ball that will not crumble easily it is wet enough to need no water. If it will not form a ball or crumbles easily when formed you can set in the water again.

Some plants will stand considerable water without injury but most of them will not. Begonias will be killed usually if kept saturated for a day or two. I have seen them killed by leaving in the pan of water over night. I believe that the custom of standing pots in saucers has been the death of more begonias than any other cause, for water is very apt to accumulate and they will not stand it. Fuchsias are water lovers but they will not stand water at the roots continually. Callas and umbrella plants want the soil soaked all the time. Ferns root on the surface and seldom have any roots down far in the soil, so the pots they are put in should be shallow and the drainage good.

Asparagus sprengeri is a heavy feeder, and takes a great deal of water. The soil must be rich, and plant food supplied freely if you want the best results. This same treatment would kill a plumosus asparagus, for it is not so hardy, does not require a specially rich soil, and the soil is apt to get sour if overwatered, causing the spray-like leaves to turn yellow and shatter. If you want your plumosus to make a bushy plant give it a rather poor or ordinary soil, but have it loose and porous. Water carefully so as to keep it healthy. Even then they will insist on climbing sometimes, but not so often as if the soil was made rich.

Never feed a weak plant. Plant food should be used only on healthy, growing plants, and very sparingly on begonias at any time. Callas, cannas, and asparagus sprengeri will stand heavy feeding, but fuchsias, ferns, hydrangeas and lantanas should be fed moderately. Geraniums are better for a little feeding if they are in poor soil but not otherwise, for they have a tendency to run to soft growth and surplus foliage if the soil is too rich.

Tea roses in the house should have a stiff clay soil and some thoroughly

rotted cow manure, and can be mulched with cow manure in the winter if growing well. A healthy rose plant always sends up red shoots. If the new growths are yellow your plant is weak or diseased. Be very careful in watering roses. Cut all buds as soon as they are fairly well opened and take about two-thirds of the stem with the flower. Ammonia is a good fertilizer for roses, one teaspoonful to the gallon of water applied once a week. Insect enemies are especially bad on roses, but are not hard to be kept at bay if taken in time. Wash the plants thoroughly in the soapsuds every wash-day and you will seldom be troubled. Water is the best cure for the red spider, soapsuds or tobacco tea will kill the aphids, and careful handwork with the suds or fir-tree oil in solution of a teaspoonful to the pint of water will get rid of the scale or mealy bug.

Coleus should have a very light soil if you would have the richest colors and they will not do well in a cool room. Give them plenty of sunlight and a warm place and the colors will be clear and rich.

MICHIGAN'S HAPPY BABIES.

Whooping Cough.

Perhaps the most trying disease of childhood is whooping-cough. Trying for the length of time it holds out, the harrowing effects on both mother and child of the fits of coughing, and the uncertainty attending its outcome. While in later childhood whooping-cough is usually unattended by any grave troubles, in infancy it is one of the most fatal diseases. Nearly 25 per cent of the deaths in infants under one year of age are due to whooping-cough, and two-thirds of these are caused by broncho-pneumonia, which often attacks the infant after it has been weakened by whooping-cough. Whooping-cough is often the predisposing cause of tuberculosis.

Whooping-cough is characterized by catarrhal symptoms accompanied by a peculiar spasmodic cough from which the disease gets its name. There will be a series of short explosive coughs during which the child can not get its breath, followed by a long inspiration which gives the crowing sound called the "whoop." A mass of mucus is usually expelled, when the paroxysm of coughing will cease. Sometimes vomiting accompanies the coughing spells and often nose bleed. In severe cases the child is utterly exhausted after each paroxysm and at times the mind seems confused. The number of coughing spells in a day varies with the severity of the disease, running from a half dozen in mild cases to 50 in those of a more severe nature.

In some cases the distinguishing "whoop" is never heard and the disease must be diagnosed by other characteristics. A severe cough which continually grows worse instead of better and will not yield to treatments, especially if accompanied by vomiting or nosebleed or both, usually proves to be whooping-cough. The average duration of the severe cough stage of the disease is about one month, though it often continues for three months. In case the child contracts the disease in the fall it often coughs until spring.

The cough may disappear for a few days, only to break out anew with every fresh cold. Bronchitis and broncho-pneumonia frequently accompany the disease, especially in infants, and convulsions are not unusual. The run-down condition of the child makes pneumonia much to be dreaded.

Drugs have little effect on whooping cough, sanitary measures doing more good than anything else. The coughing spells are less frequent if the child is in the fresh air than if in a closed room, so that in warm weather the best cure is the open air cure. In winter, however, it is safer to keep infants and delicate children, inside, though older children may go out then except on raw and windy days.

The disease is communicable and the patient should be quarantined during its entire course. It would be better, if possible, to send other children away from home and let the patient have the freedom of going from room to room, since a change only of rooms is often of great benefit. The rooms used by the patient should be thoroughly aired frequently, and occasionally fumigated.

With infants bowel disturbances accompany whooping-cough in summer and are as much to be dreaded as pulmonary complications in winter. The feeding problem, too, is complicated, as the sight of food often induces vomiting and the child becomes weakened by lack of nourishment.

DEBORAH.

THE LIVING-ROOM.

BY CHARLOTTE BIRD.

The present higher prices of building materials, coupled with a more or less unconscious reversion from extravagance to a greater simplicity and practicality, has put the old-time closed company parlor out of use. No longer is any room in the house kept carefully closed against the health-giving sunlight and life's daily uses, a room whose sacred precincts are not to be profaned on any occasion less important than a wedding or funeral or the annual visit of the preacher's family. Where callers are not quite intimate enough to be ushered into the domestic familiarity of the living-room, the vestibule, suitably furnished, may serve for the reception of the most transient and formal calls. But today the living-room answers most purposes in the average home for a meeting place for all who enter.

Being thus the great meeting center of the home, the living-room should be made the most cosy and satisfying room in the house. Whether we are conscious of it or not, the furnishings of our rooms either rest or tire us, they either jar us or put us into a state of harmony. A room cluttered up with a lot of useless bric-a-brac wearies us, both in mind and body, while simplicity of furnishing along with charming color scheme cannot but rest, even a wearied mind.

One of the first essentials of any living-room is plenty of light and a good exposure to the unhindered sunlight. Hence, there should be plenty of windows, especially on the sunny sides of the house. And the artificial lights should be so placed that anyone may read or work with the least possible eye-strain.

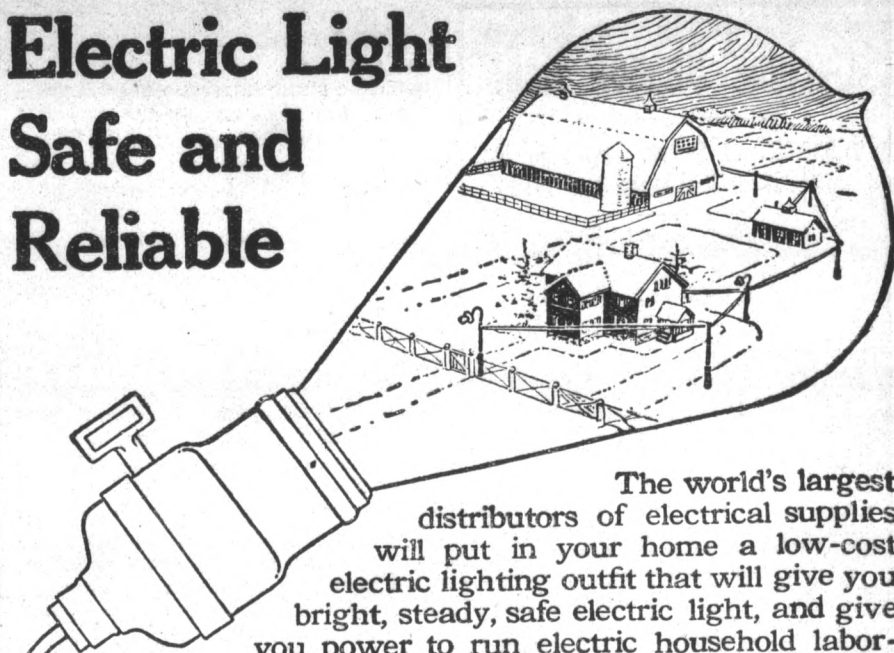
For the walls one of the kalsomine finishings would seem to be better than paper. They are applied with a strong disinfectant and there is nothing behind them in which any germs or insect life could lodge. These furnishings are inexpensive and more easily put on than paper. Anybody with a little physical exertion and common sense can apply them and renew them as often as desired. And the effect is artistically beautiful.

For the living-room the wall finish should not be too dainty in color; delicate pinks and other perishable colors should be reserved for the bed-rooms where the wear is not so severe. A plain color should be selected and not a figured paper, not even a paper with a quiet figured border.

The ceiling should be finished with a pale tint because this will reflect light into the room. Straw color or a light tan is very good. With this for the wall one may combine green, terra cotta or a light chocolate. These colors are all restful so that one can live with them daily. Then they have the advantage of harmonizing beautifully with the picture frames. But the green in all shades has the fault of fading in even an ordinary indoor light and so is unsatisfactory.

All the colors of the restful living-room should harmonize. If the ceiling and walls are tan and light chocolate, then the rugs and draperies also will

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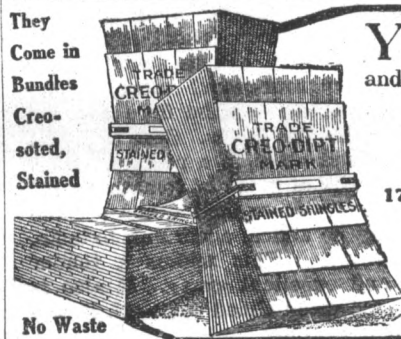
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have these as predominating colors. The window curtains may be a light tan with chocolate borders. They should be sheer in weave and so made as not to obscure the light.

Certain furnishings go with every well appointed living-room. Easy chairs well appointed living-room. Easy chairs in plenty are indispensable. There must be a comfortable sofa with a real pillow somewhere within easy reach. On this at any hour any member of the family may drop down for a ten minutes' rest. Window seats look cosy and all that, but what tired person ever feels moved to drop down on one for a genuine relaxation of over-worked muscles? If he tried, he could not get the relaxation. This sofa may be as fine or as inexpensive as the owner may choose. It may be of costly leather or only a cot, daintily draped, and ten to one the cot will be the more restful. Whatever is selected, must imperatively fit every square inch of a tired back.

There must also be a table about which the family may cluster. Near it should be a magazine stand; inexpensive ones are now made of wicker. This will save the housekeeper the daily necessity of gathering up all the papers and magazines and arranging them neatly on the table. The living-room should have also a well supplied writing desk with every convenience at hand for quick letter writing. It should be a kind to shut up and keep its contents out of sight.

In a furnace-heated house a grate fireplace may not be an urgent necessity. But on stormy days and dismal evenings it certainly would contribute mightily to the comforting sense of cosy hominess. Then between seasons it would serve the practical purpose of taking the chill off the unheated air indoors.

The furnishings of the living-room need not be expensive but they should be tasteful and therefore restful, because the living-room is the home's heart in the family life.

A GOOD ROAST FROM A TOUGH CUT.

An excellent roast may be made from a very tough cut of beef by the following method:

Select a thick cut of the lower round or any other portion that is without bone (this should be three or four inches thick). Pound flour into the meat on both sides (about one and a half cups of flour can be pounded into a three or four-pound piece). The pounding breaks up the fibre and the flour retains the juices. Sear the meat all over and place in a roaster. Pour the contents of a can of tomatoes over the meat. Onions and other seasonings may be added, according to taste. Cook slowly. This makes a tender roast and excellent gravy. It also is very good when sliced cold.—N. D. Experiment Station.

A PLEA FOR THE BIRDS.

BY MAE Y. MAHAFFY.

In this day of nature study there are very few of us, I take it, who have not learned to love the birds, not only for their beauty of song or color, but for their humanizing influence upon life. And, too, we appreciate their economic value, and realize a need for protection. This is evidenced clearly in the various Farmers' Bulletins issued by the government, and in the various laws which have more or less recently been evoked in their behalf. There is, however, one feature of the spring work upon the farm which always fills me with terror when I think of the danger to so many of our birds which it causes. This is the burning off of the land of old stubble or weeds late in the spring. All too often weather conditions have not allowed much farm work up to the time when our birds are the busiest little home-makers imaginable, and with no thought of the numerous happy families he will break up the farmer sets fire to the field. If

the grown birds themselves are not injured their work is destroyed, their eggs ruined, and the nest-building must begin all over, cutting out at least one brood for the season in most instances.

A great deal of this work is done in the fall, and then no such danger exists for the birds, and when this is impossible can we not try to accomplish such tasks before our birds are engaged in their nest-building? Some of them commence work very early, even the latter part of March, but a majority are not busy until in April or May. Let us, then, get busy with our fields as soon as the snow disappears, and not wait until these little builders have pre-empted much of the territory in their trusting, fearless way.

"A bird's nest. Mark it well, within, without,

No tool had he that wrought, no knife to cut,

No nail to fix, no bodkin to insert, No glue to join: his little beak was all.

And yet how neatly finish'd What nice hand,

With every implement and means of art,

And twenty years' apprenticeship to boot,

Could make me such another?"

—Hurdis.

SHORT CUTS TO HOUSEKEEPING.

Mrs. C. E. P. Baldwin, Mich.—Write to the Department of Agriculture, Washington, D. C., and ask them if they have bulletins giving information along the line you desire.

Here is a brown bread recipe I think the "best ever." One cup wheat flour, two cups corn meal, two cups graham flour, one cup dark brown sugar, one cup raisins, one cup currants, three cups buttermilk, two teaspoons soda, just rounded, one and a half teaspoons salt. Steam two hours and bake one hour. This is fine hot or cold.—Mrs. F. L. S.

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Feeding for Eggs

IN the summer the farm hen usually has a good range where the bugs and worms are collected which constitute the necessary animal food. In the winter this supply is lacking and if the flock produces winter eggs and keeps in good condition for the spring breeding it will be necessary to feed a certain amount of animal food along with the grain ration and the mash.

On the average farm skim-milk is looked upon as too good for the hen. It is the best possible substitute for beef scrap and if the flock is properly housed there is no animal on the farm which will pay better for the skim-milk than the hen. If the milk is allowed to sour the lactic acid germs have the power of destroying certain disease germs in the digestive tract. Any food that acts as an agent to prevent disease is worth more than a cure. It is preventing poultry diseases and not curing them which builds up strong vigorous flocks.

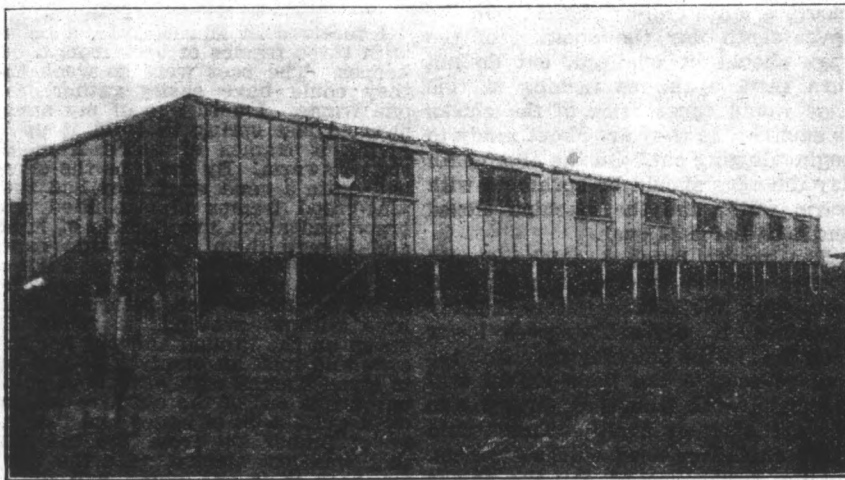
It Pays to Feed Animal Food.

From the Missouri Experiment Station, Prof. H. L. Kempster reports that a pen of fowls which received no animal food produced 945 eggs in a year. The pen fed on beef scrap laid 1,802 eggs, while the sour milk pen produced 1,783, which almost equalled the beef scrap pen. On our farm beef

and reminds you of tainted or spoiled meat it is no good and should be discarded. The color should be light, if dark colored it denotes poor quality. Dried blood is sometimes substituted for beef scrap but it is more concentrated and not so good for the flock. In purchasing beef scrap it pays to buy it in fairly large quantities if there is a good place to store it. Poor storage facilities mean that it must be purchased in small quantities as used, in order to have it clean and fresh. Beef scrap in itself is a very narrow ration and should always be fed in combination with other materials. The firms selling beef scrap usually furnish the formula for a good ration, but often these recommend a higher percentage of beef scrap than is necessary, and it is recommended that the breeder study the bulletins of the experiment stations concerning poultry rations. Several very excellent bulletins on balanced rations for poultry have been published and practically every state experiment station can furnish the poultry breeder with a collection of very food literature on poultry feeding.

Feeding Cut Bone.

Green cut bone contains a large amount of protein and mineral matter and is thus an excellent egg food. It should not be fed in large quantities and not more than one-half ounce per



The Poultry House on Posts is Becoming Popular Because it Makes Certain Dry Conditions in the House.

scrap is an expense and has to be hauled from the city, while sour milk is a home product. By feeding sour milk to the hens they receive animal food at a small expense and doubtless there will be little difference in the egg production of the average flock whether on the beef scrap or the sour milk. Prof. Kempster recommends the following ration, included with the sour milk: "Corn, four parts; wheat, two parts; bran middlings, one part; corn meal, one part." The sour milk is fed separately at the rate of two and one-half gallons per 100 hens. They are also given from 19 to 25 pounds of the grain ration per day.

Undoubtedly two and one-half gallons of sour milk per day will be about right for 100 hens, although some feeders give the flock all they will eat and it seems to cause no trouble. The grain ration must be modified somewhat by local conditions. For instance, the farmer with a small flock has some table scraps which may be combined in a mash and the flock which is allowed to range at times during the winter will pick up considerable food, especially if they are allowed access to the barn and have a large barn floor for a scratching place. This floor is usually somewhat cluttered with clover heads and the birds pick up a lot of nourishing food in their scratching.

Buying Animal Food.

Where the supply of milk is limited some beef scrap will be necessary in the ration. Buy this product of reliable dealers and test it. Pour boiling water over a handful of it and note the odor. If it has a sweetish odor it is all right, if the odor is sickening

bird each day is usually recommended. When green cut bone is scarce it is usually better to obtain the protein and mineral matter from oyster shells and beef scrap. Some breeders cut their supply of green cut bone with a power cutter and in cases where it is possible to obtain a large amount of bone for a small price this is a cheap way of obtaining a lot of fine poultry food. The fowls thrive on green cut bone but it must be fed sparingly. Hand bone cutters are sometimes used successfully on the farm but where the bone is plentiful at times and scarce at all other seasons, there is a tendency to feed too much and then omit it altogether. This leads to serious digestive disorders.

In feeding for eggs there are many rules and rations that have proven successful at the different experiment stations and every breeder works out a ration eventually which he likes better than any other. Poultry food is seemingly growing higher every year and poultry products are also bringing more money. It follows that it is possible for the breeder to make more or lose more than he could have made or lost ten years ago. The breed, range, number of fowls, local prices for feed and the home supply all enter into the making of the hen's ration. The farmer who can raise his own grain and feed plenty of sour milk has a fine grip on the business. By studying rations and purchasing a few necessary ingredients he can turn moderate priced grain and milk into high priced eggs, and do it consistently during every season of the year.

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STARTING THE INCUBATOR.

If brooders or setting hens are ready to take the chicks at hatching time the incubator may be started with profit as early as the first of February. Chicks hatched during the months of February and March bring the best prices, besides the pullets from such hatches make the best winter layers. However, the incubator should never be started until the proper facilities are secured for brooding the chicks after they are hatched. The same care should be used in selecting the brooder as in buying the incubator. The writer's experience is, that two brooders should be used for each machine that is in operation. The incubator should be started the day before the eggs are put in. For the first week it should be kept going at 102 degrees, increasing the heat one degree each week until the hatch is over.

Before putting the eggs in the machine they should be dipped in warm water to give moisture to begin with. By adding forty drops of carbolic acid to one gallon of water before dipping, all possible germs may be killed which might have adhered to the shells of the eggs. Every egg should be marked on one side before putting them in the incubator so there will be no mistake made when turning them. Morning and evening, after the first week, the eggs should always be turned, aired and cooled, and every time they are turned these places should be changed to keep them evenly heated to insure a more uniform hatch. On the seventeenth day the position of the eggs should be changed, but do not turn them again, as turning at this time would cause some of the chicks to smother, as they are about ready to begin "digging out." On the eighteenth day the eggs should be sprinkled with warm water and the machine closed until the hatch is over.

The newly hatched chicks should not be allowed to drop into the nursery below as the temperature in many machines is several degrees lower than that in the hatching tray, and too cool to receive the little chicks still damp and weak from their struggles to get out of their shells. This would mean chilled or dead chicks later on. On the twenty-second day the chicks should be removed to their brooders, but should not be fed until the next day.

Eggs for filling the incubator should receive the best of attention, and should be gathered daily when the weather is cool. They should not be more than ten days old to insure a good hatch. Eggs for hatching should be kept in a room where the temperature is as even as possible, and be turned every day. If allowed to lie in the same position the yolk will settle to the lowest point, making them useless for hatching purposes. One person should have the entire care of the incubator and should closely follow the directions coming with the machine. Experience counts much in operating the incubator successfully, and if the first effort is not crowned with success, do not give up, but try again.

Illinois. Mrs. S. E. McCoy.

NESTS FOR THE HENS.

Now when the egg crop is increasing, the number and kind of nests, and where located, are important questions. It is common enough to find only a half-dozen nests for 75 to 100 hens. The hens seek nests about the straw stacks and under buildings to get away from the confusion caused by so many hens crowding the same nest. An insufficient number of nests means broken eggs that may start the vice of egg eating in a flock. When many hens lay in a few nests and fight for first place the eggs get soiled. It is more difficult to keep nests clean, and the eggs are kept warm enough by the constant presence of the hens to start incubation. One nest to every six hens is a good proportion.

The time is near when it is a great

advantage to have separate nest boxes that can be easily moved. When a broody hen bobs up the hens and nest may be taken up after dark and carried to the place where sitters are kept, without disturbing her. And the broody hen being used to her own nest will be more likely to return to it than to a new nest. It is easy to keep the single boxes clean and sanitary, as it is no trouble to take them out and fumigate at frequent intervals. We do not like favorite nests and we avoid them by having all the nests very much alike. And nest boxes should be of a size to fit the hens. The smaller breeds need smaller laying boxes than the larger kinds. The Leghorn hens like darkened nests. With any breed the birds are more liable to form the habit of egg eating when nests are fully open to the light. Leghorns like high nests, but larger breeds would rather lay on the ground than try to reach a high nest.

Inside nests are warmer and more inviting at this season but we like to have a few outside nests. It is a splendid plan at this time to clean out the empty brood coops and put boxes filled with clean nesting material in them. The hens are quick to discover and make use of them. When a hen gets broody it is so easy to shut her away from all disturbing influences.

Indiana.

FRANCES WOOD.

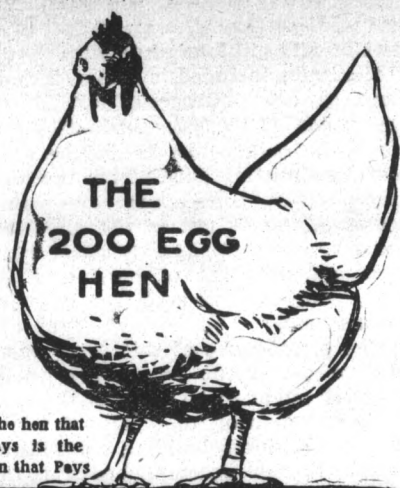
FEEDING BEES AND RE-QUEENING.

I received in March, 1915, a colony with three frames of bees from a beekeeper. The bees were so weak that they could have easily gathered on one frame. I used one of my strong swarms last spring to build it up by giving it frames of brood from the strong swarm. By the time the clover had quite a good start they had their nine-brood frames almost filled with brood and about five pounds of honey and I gave them a ten-frame super. About this time they swarmed but as the queen was clipped she could not go along and the bees returned to the hive without settling. I found the queen on the ground and put her in a cage and took an empty hive and put in some frames with drawn-out comb, one frame out of the old hive without eggs, quite a bit of honey and the super of foundation from the old hive that was just started, with the working bees in it and about half of the bees out of the bottom. Then I removed the old hive about six feet away and put the new hive on the old stand to catch the working force and put the queen in with them. They started to work in good earnest again, and the old hive built up in good shape for winter and made a little comb honey. The new hive with the old queen soon filled the super with nice white honey and a second with amber honey, most golden rod, and just started a third. The queen used her nine frames throughout from top to bottom all summer, and even had a lot of brood yet when I took the super off, so I had to feed them for winter after the brood was hatched. They were just crowded in the bottom when I took the supers off. I fed them about 15 lbs. of honey in what is commonly called the pepper-box feeder. I took molasses cans instead and punched small nail holes in the cover and then inverted this on the frames. I tried to feed them sugar syrup but I couldn't get it thick enough to work in these feeders, but I shall have to feed them a sugar preparation of some kind out of doors next spring as my honey is most gone. What do you advise to feed? This is the second winter for my queen; do you think it would be safe to keep her another winter if she does so well next summer again, or else what time should I give them a new queen next summer?

Newaygo Co.

W. C. R.

Regarding the feeding of bees and the life of a queen, the following would be my advice under the circumstances. If the colony of bees has enough food to last them until February or March then I would mix up equal quantities by weight, of sugar and water, being certain that all the sugar was dissolved. If you heat the water and then add the sugar and keep stirring to prevent burning, all the sugar will soon be dissolved. Now, fill your pails or molasses cans full and then put on the perforated lid. Next take a piece of burlap about the size of the top of the hive and cut one or two circular



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pieces out about the size of the top of the feeders, then uncover the colony, put on your piece of burlap and an empty super in which to stand the feeders. Now, tip the feeders upside down and place directly over the holes in the burlap, packing all around with straw, rags or other filling. If the colony is very light they should have 15 to 20 pounds of this sugar syrup and if you will feed it to them warm you will have no difficulty in getting the bees to take every bit of it down. The syrup will run for a minute but will stop after a little has run out and then will only run as fast as the bees suck it from the feeder. You need not be afraid of it all running out. This should put your bees in good shape for spring.

If they are very light now I would not risk waiting, but would feed them right away, making it about one and one-half part of sugar to one of water, by weight. This could be fed any evening, being sure, however, that the bees are covered securely in case of a cold snap. Once you have fed them you need not disturb them again until warmer weather comes. If the tops of the cans are quite flat it is a good plan to place a small stick under each side so that the lids of the cans, when inverted over the bees, stand up over the frames about a bee space. This gives the bees a chance to cluster and suck out the syrup more easily and quickly than when the tops of the feeders are right on the frames.

Now, with regard to the queen you do not say whether she was a young queen when you received her, but the majority of good bee-keepers usually feel that two winters is plenty for one queen, and that they get better results by requeening the next season, giving the colony a young queen. I would advise you to do this any time during the clover flow in June, at this time the bees will accept a queen more readily than at any other time and your colony will remain in good shape through the season. If, however, your queen shows good results in the spring of the year, this can be told by the amount of brood and bees in the colony, then I would wait until August before re-queening. We can not set any hard and fast rule as to the worth of a queen at a certain age, we must judge entirely by the work of the colony. Some queens are worn out after one year, while others are good when three years old. F. E. MILLEN.

MATING THE BREEDING PENS.

If one would build up a flock of vigorous laying hens, he should give careful attention to the parent stock. Too often the farm flock is increased by haphazard methods. Such a flock is sure to decrease in vigor and productivity from year to year. One cannot select eggs for hatching by the appearance of the eggs, but he can select the eggs laid by known producers and feel assured that his chicks will be strong and liable to make good layers.

Breeding pens should be made up from old hens, that is, of birds that will be two years old the coming spring. Pullets do not make vigorous breeders as they have not yet reached full maturity, and it is not possible to know just which of the birds are the best layers. Hens that lay during the fall are almost sure to make desirable breeders. Select those that finish the moult early and have a new coat of feathers grown before the coldest weather comes on. These points being fresh in mind, it is possible to make an intelligent selection in the fall, better than late in the winter. Some breeders advocate selecting those that moult late. It may be true that such a bird will lay a larger number of eggs during the twelve months, but she is almost sure not to produce many eggs when they are highest. Our ideal type of bird is the one that begins the moult early and lays occasionally all through September and October, and by the end of that month

has a new coat fully grown and is all ready for November and December eggs.

In selecting breeders choose those that are of standard weight. In the utility flock the coloring of all feathers need not be exact, although it adds considerably to the satisfaction of the owner if his birds are fairly uniform. In shape the breeders should be compactly built rather than long and lanky.

It should be remembered that the male bird is half the pen and the only safe way for the average farm flock is to bring in a new cockerel every year that is not even remotely related to the hens. Cockerels hatched early in the spring are all right to head the breeding pens for next winter. To insure fertile eggs it is a good plan to have two male birds for each pen, using them on alternate days, keeping one at a time shut away from the hens. New Hamp. C. H. CHESLEY.

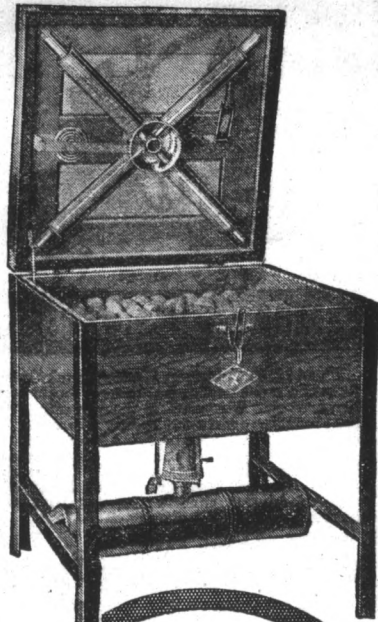
THE PROFITS FROM HENS.

I do not believe there is any other farm live stock that pays as large a net return back to the owner, considering the feed consumed, as do the hens. The refuse and slops from our kitchen is given daily to the chickens. A variety is what chickens need most in order to be thrifty and healthy. The table scraps help to give a variety in feed and are an excellent diet for the fowls. We are very careful, however, in feeding table scraps to the poultry, for if foods, where large quantities of salt are present, are fed, it will prove fatal. The hens like salty food and if they eat a large amount of it they will die. Once we threw an old fish pail out thoughtlessly, and it contained a large quantity of salt, and it was only a day until we noticed several chickens lying dead. They had eaten a large quantity of salt and it killed them.

In feeding the laying hens during the winter we use bran in large quantities, together with wheat, cracked corn, and sprouted oats. This, along with the table scraps, makes an excellent ration and gives a large variety of feed. If we want eggs we must feed a good ration and the feeding must be done regularly. Considering prices of eggs and poultry during the past year, we can well afford to use only the best feeds for them. Of course, feedstuff is high. Bran is worth about \$35 a ton and other feeds are just as high in proportion, but with eggs selling for 30 to 40 cents a dozen I believe it will pay to give the hens a good ration and especially now when eggs are in the greatest demand and command the highest prices. In the larger cities such as Boston, New York and Chicago, customers will pay 60 cents a dozen and more, for guaranteed strictly fresh eggs. We have several city customers who buy from us direct by parcel post and they are quite willing to pay a little more for eggs that are guaranteed fresh. While we have not used the parcel post very long for this purpose, so far we have found same satisfactory. Our customers are in a nearby city and known to us, so we are never alarmed about getting our money. This is probably the greatest obstacle to be overcome in shipping country products to the city and to customers whose financial standing is not known. We have lost less than five per cent in breakage by using the parcel post and think some day it will solve to a large extent some of the market problems now confronting farmers everywhere.

Last year our profits from our flock paid for an additional four acres to our farm, and also made possible some long-wished for things in the home. Aside from this we used plenty of eggs for home consumption.

This year we are going to enlarge our poultry plant and install some new brooding pens and perhaps we will need one or two more incubators if we decide to work our plans. E. O. S.



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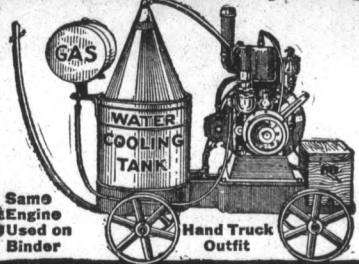
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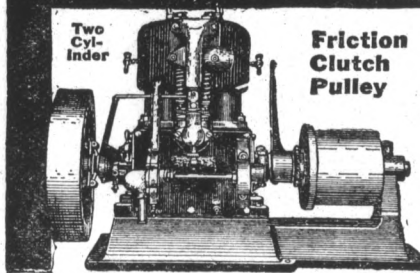
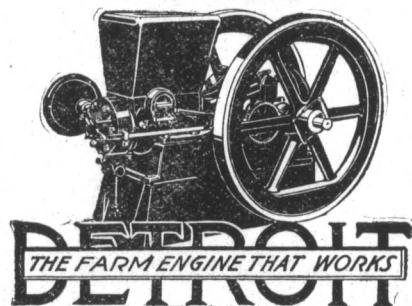
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ORGANIZED AGRICULTURE IN DENMARK.

(Continued from page 231).

regular equipment. This is to insure against disease being transmitted through the skim-milk to the cattle and hogs and other animals using it at home. It saves the individual farmer largely, the necessity of owning his own separator and it adds, no doubt, to the advertising value of the high quality of Danish dairy products. The state requires frequent examination and report on every cow as to health and yield. We need to remember, of course, in studying Denmark comparatively with Michigan, for example, that while her population is about the same as ours, her area is only a little over one-quarter of that of Michigan.

Her state's attention to the yield of her cows has operated naturally in weeding out the "boarders" and demonstrating the value of others. This work has resulted in increasing the number of cows from 900,000 in 1880 when co-operative dairying practically began in Denmark, to 1,282,000 in 1909, the latest statistics I succeeded in examining. During the same period the annual yield of milk per cow increased even more, or over 1,360 pounds per

con factories and slaughter houses and twenty large private ones. The co-operative factories had 95,000 members at this time. One-half of all farms raising pigs and two-thirds the total number of pigs were connected with the co-operative bacon factories. During the last year of available statistics the members of these co-operative bacon factories received a total of twenty-three millions of dollars for their product.

Co-operative breeding and live stock improvement associations as might be expected, are also found in active operation in Denmark. And to these, of course, should be added that of the Danish Co-operative Egg Export Society. Here the same high and even standardization in marking, assembling and shipping obtains. This export had already grown from six affiliated associations in 1895 to five hundred and fifty in 1909; from two thousand members to forty-three thousand; and from twenty thousand dollars' annual business to one million, one hundred and fifty-five thousand dollars. Every egg exported is marked with a rubber stamp, containing a trade mark design of the Danish Egg Export Society, so that you can buy and know that you are buying Danish eggs in most of

thrifty little country, one-fourth the size of Michigan, with an annual turnover of fifty millions of dollars. Some of the items included in this aggregate business are: Groceries \$2,725,000; dry goods \$1,100,000; seeds \$665,000, while the balance is divided between bicycles, knitting goods from the knitting factory, coffee from the coffee roastery, the output of the chocolate factory, confectionery, tobacco, rope, oleomargarine, tea of their own import, ready-to-wear suits for men and women, etc.

The significance of this great co-operative movement is perhaps to be seen, or ought to be seen, in the equitable distribution of wealth involved and the business building possibilities which it has accomplished for this thrifty little nation. For it must be observed that a very considerable part of this business is export business. A nation, as an individual, measures its prosperity largely by what it can create and sell in excess of supplying its own requirements. In 1910 these co-operative stores of Denmark had increased to 1,364 with turn-over of \$19,500,000. These same societies owned "a saved capital as reserve fund in inventory and plants of more than a million dollars additional, and eighty-six per cent of them owned their own buildings."

We doubt if Danish success can be fully appreciated without remembering an element of thoroughness which seems to obtain in the mental makeup of these people, and this is nowhere better illustrated than it is in their schools, and the pride they take in them, and the way they make them valuable to themselves. Americans as well as other peoples have been interested to make pilgrimages to Denmark to investigate the People's High Schools. The president of one of these schools at Lyngby near Copenhagen, gave the commission, during its visit there, this information:

"These schools are for grown-up young men and women. The first school was erected in 1844. The object of these schools is to make the young people fond of their country, their language and their history. More than anything else, they learn the history of Norway and Denmark. The young men come from November until April and the young women from May to August. The young men pay something like \$11.00, your money, per month, they board and live right here. The young women pay less. The government pays something for pupils who cannot afford it. Government appropriation is 350,000 crowns per year. We have eighty of these schools in Denmark with an attendance of about 8,000 pupils per year, about equally divided between boys and girls."

Some time ago H. Rider Haggard visited Denmark for his country and made a report in popular book form entitled, "Rural Denmark and its Lessons." In speaking of his visit to the Ascov High School he throws light on the Danish character: "We drove to the Ascov High School through a pretty, prosperous looking country, dotted everywhere with clean and comfortable farm houses, situated amidst well-tilled fields of rather light land. As we drew near to Ascov we overtook or were overtaken by numbers of people traveling thither on foot or upon bicycles. All of these were well dressed, and with the usual Danish politeness saluted us as we passed. At first I thought they must be bound for some festivity until it was explained to me that this festivity was nothing more gay, than an afternoon lecture upon a subject of historical interest. The object of these schools is education in the highest sense, and the strangest thing about them, to an Englishman, is that about ten per cent of the population of Denmark passes through these high schools at its own expense. Especially is this so if he chances to be a magistrate whose frequent duty it is to inflict fines upon parents who stubbornly refuse to avail themselves of the gratis teachings



Co-operative Wholesale Houses in Copenhagen. Ground is Being Broken for New Buildings to Double Capacity.

cow. Eighty-six per cent of all farms carrying cows, and eighty-three per cent of all cows are connected with co-operative dairies. The members are compelled to deliver all their milk produced for a period of years to the co-operative creamery and are liable to it for all damages sustained if they do not, and expulsion from membership. Federated "Control" establishes and maintains the high standard which commands a higher price than the dairy products of any country except Holland, and Holland practices the same method. The total receipts for the Danish Co-operative dairies in 1909 was approximately sixty-two and one-half millions of dollars. Not all, by any means, of the milk produced in Denmark is manufactured into butter and cheese.

Next to butter, bacon has become the largest item of Danish export, and this because of the economic relationship in the production of bacon with that of the production of butter, leaving the skim-milk to be fed to pigs. This milk under thorough inspection and compulsory sterilization is a valuable feed for the production of high quality bacon. The Danes, too, have taught and practiced a uniform bacon type of pig; evidently from appearance the Yorkshire strain predominates.

Co-operative bacon factories and slaughter houses have been organized on a co-operative basis, of course, to further promote the profit of the farmer by manufacturing his own raw materials and selling them in the form of the manufactured product in the most profitable market. The testimony taken on this phase of co-operative activity in Denmark discloses this situation: "In spite of implacable competition of private factories co-operative factories have multiplied. In 1909 there were thirty-four co-operative ba-

con factories and slaughter houses and twenty large private ones. The co-operative factories had 95,000 members at this time. One-half of all farms raising pigs and two-thirds the total number of pigs were connected with the co-operative bacon factories. During the last year of available statistics the members of these co-operative bacon factories received a total of twenty-three millions of dollars for their product.

And the Danish people seeing the large feeding value of beet pulp in the dairy business, have organized several sugar beet factories and are building more. Beet pulp being practically a by-product in the sugar business and finding such a ready sale at good prices, as a dairy feed, it reduces the cost of manufacturing beet sugar very materially. The result is claimed to be that the Danish consumer of sugar gets his granulated at six cents a pound when he is not a member of the co-operative sugar beet factory and the members complain if their annual profits fall below twenty-five per cent.

The picture of a typical Danish farm shows the substantial, brick construction with slate or tile roof. The soil is good, beech is the chief native tree and it is re-forested because of its value in the manufacture of butter tubs and other utensils for handling and shipping butter and cheese. Good roads are conspicuous throughout the country. Municipal gas and electric light further testify to the enterprise of the people, and these conveniences, together with power lines, are being extended out through the country so as to make them available for farm use.

Denmark has probably gone farther in the matter of co-operative distribution among its own people than any other country. The picture of the three co-operative wholesale houses in Copenhagen shows in the foreground, men and teams at work preparing for the construction of further buildings to double the capacity of those already built. At the time of the American Commission's visit, of every co-operative retail store, there were 1,280 of these co-operative retail stores in this

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\$1295 F. O. B. CLEVELAND

THE new Chandler bodies, the most beautiful of the season's offerings, are attractive indeed. The New York and Chicago Show crowds admired, and purchased in great numbers, the new Chandler touring car and the new four-passenger roadster. At all the shows the country over, the New and Greater Chandler has been the center of greatest attention.

But the vital reason why so many thousands of motor car buyers are choosing the Chandler is the established and known excellence of the Chandler chassis—the Chandler mechanism.

In every essential way it is the same chassis on which, for three years, all Chandler bodies have been mounted. **THERE IS NOT A SINGLE HINT OF EXPERIMENTATION.**

"The Marvelous Motor," built in the Chandler factory ever since this Leader of Light Sixes was first put on the market, has won its laurels and **still holds them.**

It has always been powerful—powerful enough to do with ease anything that you could ask any automobile to do.

It has always been speedy—speedy enough to go faster than 999 out of every thousand car owners would ever want or dare to drive.

It has always been flexible—slowing down to snail's pace on high, and jumping away instantly at the touch of the throttle.

Interesting Features

In the face of higher cost of materials, nothing has been cut out of the Chandler. Highest quality equipment continues to be a feature.

Bosch High Tension Magneto, the most expensive and satisfactory ignition.

Gray & Davis Separate Unit Electric Starting and Lighting System.

Chandler aluminum crank case.

Chandler full-floating silent spiral bevel-gear rear axle.

Three silent enclosed chains driving motor shafts.

Annular ball bearings.

Stewart-Warner magnetic speedometer.

Stewart vacuum gasoline feed.

Non-skid tires in rear.

Deep cushioned upholstery covered with long-grain semi-glazed leather.

Seven-passenger touring car and four-passenger roadster, each \$1295

It has always been economical in operation—owners **averaging** 16 miles per gallon of gasoline, 700 miles per gallon of oil and 7000 miles per set of tires.

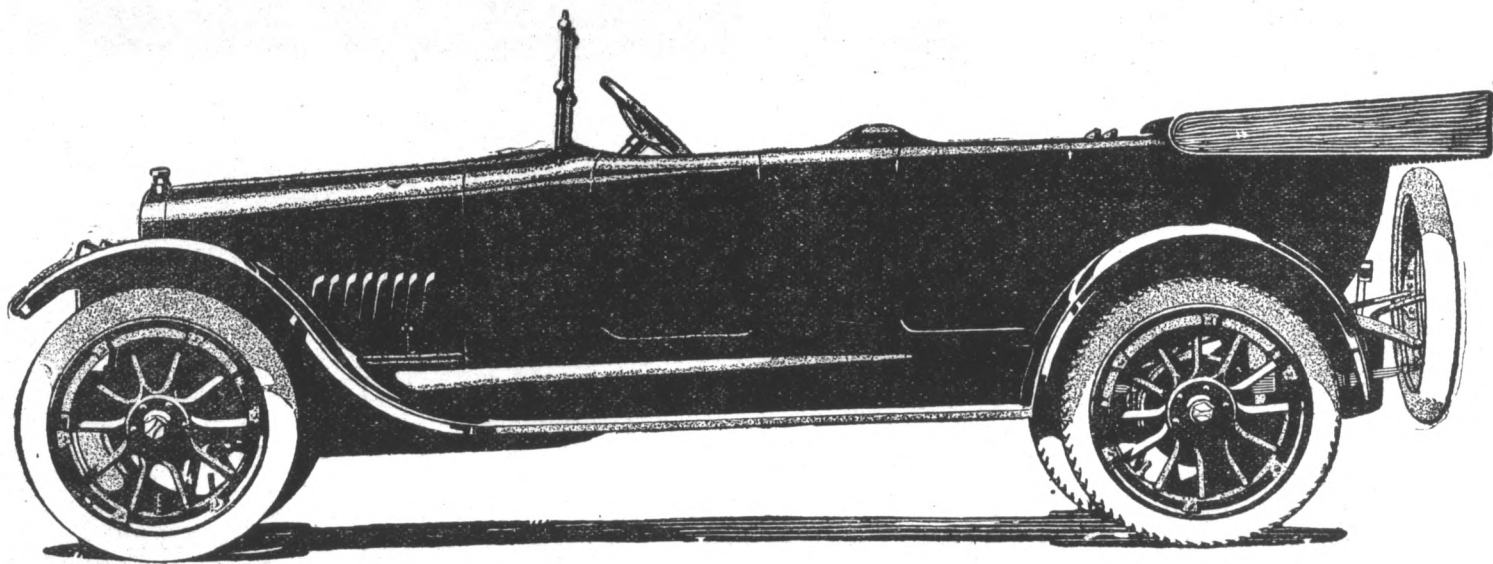
For three years it has had, and today has in even greater degree than ever before, **all** of these qualities you rightly demand in a high grade motor car.

It is a known quality.

And more than ever in the past, automobile buyers this year recognize the security of dealing in known quantities.

Chandler production has been increased to 20,000 cars for 1916, but Chandler dealers say that even this great output will not take care of the demand for the New and Greater Six.

Good judgment will indicate the advisability of finding out for yourself all these things which thousands of Chandler owners now **know** to be true of the Chandler, and then placing your order at once.



The New Chandler Catalog illustrates the New Big] Touring Car, the Four-Passenger Roadster, other body types and all mechanical features fully. If you do not know your Chandler dealer, write us today.

CHANDLER MOTOR CAR CO.

2702-2732 E-131st St., Cleveland, Ohio

Markets.

GRAINS AND SEEDS.

February 15, 1916.

Wheat.—Values suffered a decline during the past week. Primary receipts have been large, aggregating nearly two million bushels more than for the corresponding week a year ago. Foreign demand, however, would take care of this surplus nicely, providing ships could be secured for delivering the grain in Liverpool. Quotations there are higher, supplies are decreasing and ocean freight rates are advancing. Reports of crop damage are common, especially in the southern wheat states. Visible supply and wheat in bond decreased over two million bushels. A year ago No. 2 red wheat was quoted at \$1.58 per bushel. Last week's prices were as follows:

	No. 2	No. 1	May
Wednesday	1.31	1.26	1.35½
Thursday	1.31	1.26	1.35½
Friday	1.31	1.26	1.35½
Saturday	1.31	1.26½	1.35½
Monday	1.30½	1.26	1.35
Tuesday	1.31	1.26	1.35½

Chicago.—May wheat \$1.28¼; July \$1.21½c.

Corn.—Liberal receipts and the influence of wheat caused a decline in corn values. Seaboard demand, however, offset to some extent the downward course. Domestic consumption is about normal. Visible supply increased one and a quarter million bushels. One year ago No. 3 corn was quoted at 77½c per bushel. Quotations last week were:

	No. 3	No. 3
	Mixed.	Yellow.
Wednesday	73½	75
Thursday	73½	75
Friday	74	75½
Saturday	74	75½
Monday	73½	75
Tuesday	73	75

Chicago.—May corn 78¾c; July 77¾c.

Oats.—Oat values suffered less than the other grains, a moderate demand and limited primary receipts having kept values well up during the week. Visible supply is practically the same as one week ago. The local quotation at this date in 1915 was 60½c for standard oats. Detroit quotations for last week were:

	Standard.	No. 3
		White.
Wednesday	51	50
Thursday	50½	49½
Friday	51	50
Saturday	51	50
Monday	50½	49½
Tuesday	50½	49½

Chicago.—May oats 48¾c per bu; July 46¾c.

Rye.—Cash No. 2 has declined 2c to \$1.01 per bushel.

Barley.—Milwaukee's price is lower at 73@77c for malting and Chicago's price is down to 73@77c.

Beans.—No dealing here. The local board quotes March at \$3.65 and immediate, prompt and February at \$3.60. At Chicago pea beans, hand-picked, are quoted at \$3.80@3.85 per bushel; prime choice \$3.65@3.70; red kidneys \$5.20@5.25. Feeling is firm.

Timothy Seed.—Prime spot \$3.80.

Clover Seed.—At Detroit prime spot is \$13; March \$12.50; alsike \$10.25. Toledo quotes prime cash at \$13.05; March \$12.50; prime alsike at \$10.20.

FLOUR AND FEEDS.

Flour.—Jobbing lots in one-eighth paper sacks are selling on the Detroit market per 196 lbs., as follows: Best patent \$7; seconds \$6.70; straight \$6.50; spring patent \$7; rye flour \$6.

Feed.—In 100-lb. sacks, jobbing lots are: Bran \$26; standard middlings \$25; fine middlings \$30; cracked corn \$33; corn and oat chop \$29 per ton.

Hay.—No. 1 timothy \$18@18.50; Standard timothy \$17@17.50; light mixed \$17@17.50; No. 2 timothy \$14.50@15.50; No. 1 mixed \$14@15; No. 1 clover \$10@13.

Straw.—Wheat and oat \$6.50@7 per ton; rye \$7.50@8.

DAIRY AND POULTRY PRODUCTS.

Butter.—Trade rules firm with prices for best grades a fraction higher. Extra creamery 30½c; firsts 28c; dairy 21c; packing stock 18c.

Eggs.—Another advance of one cent is reported with trade firm. Prices, based on sales, are 31½c.

Chicago.—An active general demand and moderate receipts forced prices up for all but packing stock. Extra creamery 31½c; extra firsts 30½c@31c; firsts 26½@27½c; extra dairies 30c; packing stock 19@19½c.

Eggs.—Cautious purchasing by buyers and increased receipts have forced

prices down lower really than conditions seem to warrant. Receipts are about one-half what they were a year ago. Current receipts are quoted at 22c; candled firsts 23½c.

Chicago.—Values on lower basis but dealers refuse to take hold except for immediate supplies. Firsts 23½@24c; ordinary firsts 22@23c; miscellaneous lots, cases included 20@23½c; refrigerator stock 12½@17c, depending on quality.

Poultry.—Improved demand and limited supply brought higher prices for all lines. Turkeys 16@17c; spring turkeys 21@22c; fowls 14@18½c, according to quality; spring chickens 17@18½c; ducks 18@19c; geese 17@18c.

Chicago.—Firm feeling pervades the trade, with supplies small and the demand active. Turkeys, young and old 12@19c; fowls 11½@15½c; springs 17c; ducks 15@17c; geese 10@15c.

FRUITS AND VEGETABLES.

Apples.—There is no change, the market being quiet. Greenings at \$2.50 \$3.50; Spys \$3.50@4; Baldwins \$3@3.50; Steel Red \$4.50@5. At Chicago market continues about steady. No. 1 Greenings \$2.75@3 per bbl; Jonathans, No. 1, \$3.50@4; Baldwins \$3@3.25; Wageners \$2.25@2.75; Spys \$3@3.75.

Potatoes.—Steady and not specially active. Carlots on track, white \$1.05 @1.10; red \$1@1.05 per bushel. At Chicago the market ruled quiet. Values range from 92c@1.05, according to quality. At Greenville the price is 80c per bushel. The arrivals are light on account of cold weather.

WOOL AND HIDES.

Wool.—At Boston the trade continues firm with price tendencies upward. Some manufacturers have already contracted for 1916 deliveries from producers in west. Strong confidence in continuation of present prices for several months. Fleece in better demand and Michigan's are 1@2c higher with fine unwashed clothing at 26 @27c; do ½-blood 28@30c; do ¾-blood 29@31c, and ¼-blood 29@31c.

Hides.—No. 1 cured 16½c; No. 1 green 14c; No. 1 cured bulls 13c; No. 1 green bulls 10c; No. 1 cured veal kip 19c; No. 1 green veal kip 18c; No. 1 cured calf 21c; No. 1 green calf 20c; No. 1 horsehides \$4.50.

GRAND RAPIDS.

The potato market has been around 80c for the past few days and farmers are not selling freely at this figure. While the potato market is always a gamble to most growers it looks as though tubers would easily bring \$1 before spring is, far advanced. The bean market, showing sympathy with potatoes, is off perhaps 5@10c, with white pea beans now quoted at \$3.30. Dressed hogs sold at \$9@9.50 during the past week, owing to liberal offerings, but are expected to bring 10c this week.

DETROIT EASTERN MARKET.

Amount of trading is small with apples quoted at 75c@1.50, the best price being for good Spies. Cabbage 60@65c; potatoes scarce at \$1.25; carrots \$1.25; parsnips 85c; eggs 38@40c; loose hay is coming slowly and sales are made around \$20 a ton.

LIVE STOCK MARKETS.

Buffalo.

February 14, 1916.

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

With 165 cars of cattle here today the market was very slow and the nice tidy shipping cattle sold mostly 10@15c lower, and heavy plainer grades 15@25c lower, while the bulk of the light butcher cattle and cows and heifers sold weak to 10c lower. Prospects are for a fair run of cattle next week and if the weather stays cold, a steady market.

Our market was extremely dull and lower on all classes of hogs, excepting the pig stuff, with a fairly liberal supply. The total receipts were about 105 double decks, but quite a number of them arrived too late to be sold. Our trade was very slow at the opening and dragged along all day. Best classes sold at \$8.70, a few selected lots of closely sorted a little bit more; pigs generally \$8.25; stags \$5@6; roughs around \$7.50. It looks as if we will have a fairly liberal supply here for Tuesday, and do not look for much, if any, better prices for the next few days.

With about 45 double decks of sheep and lambs on sale here today the market was active and prices 20c higher than the close of last week. All sold and we look for steady prices balance of the week.

We quote: Lambs \$11.90@12; cull

to fair \$8@11.75; yearlings \$8.50@10.75; bucks \$4.50@7; handy ewes \$8.25@8.50; heavy ewes \$7.75@8; wethers \$8.75@9; cull sheep \$4.50@7; with 1,200 head of calves on the market, the good to choice sold \$12.25@12.50; common to fair \$8@11; heavy \$6@9.

Chicago.

February 14, 1916.

Cattle. Hogs. Sheep. Receipts today..14,000 75,000 20,000 Same day 1915..21,880 53,748 10,328 Last week.....56,492 256,433 69,440 Same wk 1915...39,885 201,956 62,292

Shipments from here last week amounted to 12,949 cattle; 67,978 hogs and 14,315 sheep, comparing with 7,016 cattle, 25,313 hogs and 10,487 sheep for the same time last year. Hogs received averaged 203 lbs.

This week opens with such a meager cattle supply that prices are 15c or more higher, and commission firms have sent out dispatches to country patrons quoting a rise of about 25c. Buying is animated, and bulls, cows and heifers share in the advance. Hogs are a good time lower, with a big run, sales ranging at \$7.75@8.35. There was a late Saturday top at \$8.45 for weighty hogs, with a sale of some 192-lb. hogs at \$8.40. Sheep and lambs open firm, and feeder lambs sold at \$10.25.

Cattle were marketed last week in much larger numbers and sales showed average reductions of 25@40c. So few choice beefs were offered that they remained firm, the better class of heavy steers going at \$9@9.75, poorer light steers at \$6@7, with small scattering sales down to \$5.50@5.75. Good steers \$8.25@8.75, medium grade \$7.50@8.20, warmed-up steers \$6.75@7.45. Choice to fancy yearlings were saleable at \$9@9.65; common little yearlings were very bad sellers. Butcher-cows and heifers were usually in active demand, and fat lots had a good outlet, with the receipts largely common. Cows sold at \$4.85 and upward, to \$7.50; heifers \$4.75@8, choice little yearling heifers went up to \$9. Cutters \$4.20@4.80, canners \$3@4.15, and bulls \$4.85@7.25. Calves were in the usual good demand on local and shipping account, with sales at an extreme range of \$5@11.50 per 100 lbs. for rough heavy to prime light vealers. On the opening day 16 head of receipts ran largely to plain half-fat to fancy Hereford steers that averaged 1,745 lbs. sold at \$9.75. All week the good short-fed steers, and these were the quickest to decline in value.

Hogs were in the usual active local packing demand last week, while the eastern shipping demand was extraordinarily large. The receipts continued on a liberal scale, but had no effect in stopping the continued upward course of prices, the best hogs landing at \$8.40. The best light shipping hogs had a better outlet than heretofore. Receipts have continued to run much ahead of corresponding weeks one and two years ago, but prices were far higher than a year ago, while much lower than two years ago. Pigs had good advances, and the Canadian demand for thin hogs averaging from 175 to 200 lbs. sent these up sharply. The week closed with hogs selling at \$7.90@8.20 for light bacon hogs, \$8.22½@8.30 for the best light shipping hogs, \$8.30@8.40 for the best heavy shipping hogs and \$6@7.75 for pigs. A week earlier hogs sold at \$7.55@8.15.

The sheep and lamb market was active last week on both local and shipping account, and prices showed fresh high winter records all along the line, with continued meager supplies. Reactions in prices took place but even on the breaks fat lambs, yearlings, wethers and ewes sold far higher than ever before in the month of February. High dressing offerings attracted the best demand and were the last to weaken in value, although at top prices the requirements were smaller than heretofore. Most live muttons advanced 25@35c during the week, prices closing as follows: Lambs \$8@11.50; yearlings \$8.50@10; wethers \$7.25@8.40; ewes \$4.50@8.25.

Horses were plentiful last week, and there was a fair local and shipping trade at about former prices, while the trade in army horses was lively at full values. Inferior horses sold at around \$50@75, drivers at \$100@200 and drafters at \$200@285, few choice horses coming to market. Not a great many horses went above \$200.

MICHIGAN CROP REPORT.

Wheat.—In reply to the question, "Has wheat during January suffered injury from any cause," 148 correspondents in the southern counties answer "Yes" and 96 "No"; in the central counties 62 answer "Yes" and 31 "No"; in the northern counties 68 answer "Yes" and 26 "No" and in the upper peninsula one answers "Yes" and 13 "No."

Snow protected wheat in the state 10 days, in the southern counties nine,

in the central counties seven, in the northern counties 14 and in the upper peninsula 27 days.

The average depth of snow on January 15 in the state was 2.33 inches, in the southern counties 1.53, in the central counties 1.49, in the northern counties 3.48 and in the upper peninsula 11.65 inches.

The total number of bushels of wheat marketed by farmers in January at 70 flouring mills was 123,033 and at 91 elevators and to grain dealers 145,946 or a total of 268,979 bushels. Of this amount 189,309 bushels were marketed in the southern four tiers of counties, 69,736 in the central counties and 9,934 in the northern counties and upper peninsula.

The estimated total number of bushels of wheat marketed in six months, August-January is 5,250,000. Forty mills, elevators and grain dealers report no wheat marketed in January.

The average condition of live stock in the state is reported as follows, comparison being with stock in good, healthy and thrifty condition: horses and sheep 96; cattle and swine 95.

Crop and Market Notes.

Michigan.

Eaton Co., Feb. 14.—The condition of winter grains seems to have improved in the past month, the ground now being covered with about six inches of snow. Farmers will have enough feed for own use. Not much marketing is being done. There is some complaint of corn not keeping well, and good seed corn will be in great demand this spring. Hens are laying better than formerly. Wheat \$1.18@1.20; rye 85c; oats 41@44c; corn 75c; beans \$3.40; clover seed \$8@10; potatoes 90c per bushel; butter 24@26c; eggs 24@26c; hay \$10@12.

Emmet Co., Feb. 9.—Settled winter weather appears to have come with the beginning of February. There is some snow, but it does not stay on the open fields. Little if any injury done to winter grain or seeding so far. The sleighing is good. Eggs 32c.

St. Clair Co., Feb. 9.—January was mild, with only a few days of zero weather, but mostly mild and spring-like. February has been wintry with about three inches of snow. Winter grains suffered some from changeable weather. Farmers have plenty of hay but not much corn. Stock is mostly sold. Hens are beginning to lay. Butter fat 34c; wheat \$1.24; oats 50c; beans \$3.50; potatoes \$1.10; hay \$8@12; eggs 27c.

Washtenaw Co., Feb. 14.—Weather cold, down to ten below this morning. Ground is well covered with snow. The farmers are well supplied with feed, but little stock other than hogs kept here, as this is a dairy section. Hogs have been marketed freely. Hens did not lay well this winter, but egg production is now increasing. Eggs 28c; butter 30c; milk \$1.60 for 3½ per cent test; wheat \$1.25; beans \$3.50; potatoes \$1; hay \$14; hogs \$7.50.

Indiana.

Noble Co., Feb. 11.—Having fine winter weather and enough snow to protect wheat and clover. Farmers are marketing sheep and cattle and have plenty of feed for the season. Marketing wheat freely. Roads are good. Wheat \$1.25; oats 42c; corn 70c; potatoes \$1.10; hay \$9@10; cattle \$6@7; hogs \$7.50. Hens are laying well with eggs down to 23c; butter 25c.

Illinois.

Marion Co., Feb. 10.—Ground has been bare most of the winter, and fall grains are in poor condition. While there is plenty of hay, grain is scarce. But few cattle and hogs on feed. Hens are beginning to lay. Wheat \$1.10; corn 80c; potatoes \$1.10; hay \$10@11; cattle \$4@5; hogs \$6.50; roads are in bad condition.

Wisconsin.

Jackson Co., Feb. 10.—January closed with a week of rain and sleet, followed by cold weather, spreading a thick coating of ice over everything, causing some damage to fruit and other trees, and considerable uneasiness in regard to meadows and winter grain. We have about eight inches of snow now, with temperature around zero. Many farmers complaining of a shortage of hay, and buying grain; also of stock getting thin; hens are not laying. Hay \$10; butter-fat 32c; potatoes 60@80c.

Kansas.

Cowley Co., Feb. 12.—There has been little snow so far but plenty of rain and some sleet. The roads are in bad condition. Fall sown grains are in somewhat better condition since the rains, but do not look very well. There will be a surplus of feed, especially hay, this spring. Not so many cattle as usual are being fall fed, and there are not very many cattle in the country. Hens are not laying well. We have no sugar trees. Cream 25@28c; eggs 26c; milk \$1.90 per cwt; wheat \$1.15; corn 65c; hay \$3@5; hogs \$7.50.

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.

February 17, 1916.
Cattle.

Receipts 2338. There was a good liberal supply of live stock at the local stock yards this week and good service was given by the railroads. War horses that are again coming freely caused some delay in the yards, but as a rule, the service was satisfactory.

In the cattle division the trade was slow and on Thursday in some instances the market was 10@15c lower, the decline being mostly on the better grades of steers. Canners and bulls seemed to be in more active demand. The much cow trade was active for anything with quality but this kind was scarce. The close was dull as follows: Best heavy steers \$7.50@7.65; best handy weight butcher steers \$6.75@7.25; mixed steers and heifers \$6.25@6.50; handy light butchers \$5.50@6; light butchers \$5@5.50; best cows \$5.50@6; butcher cows \$5@5.25; common cows \$4.25@4.75; canners \$3@4; best heavy bulls \$5.75@6; bologna bulls \$5.25@5.50; stock bulls \$5@5.25; feeders \$6@7; stockers \$5.50@6.50; milkers and springers \$4@8.00.

Sandel, S. B. & G. sold Mason B. Co. 1 bull wgh 1080 at \$5.50, 2 steers av 950 at \$7.10, 16 do av 900 at \$6.75, 1 bull wgh 970 at \$5.50; to Bresnahan 4 cows av 1050 at \$5.25, 7 butchers av 707 at \$6, 2 cows av 1020 at \$5.10; to J. Bresnahan 13 heifers av 733 at \$5.75; to Mich. B. Co. 1 cow wgh 1270 at \$5.50; to Hammond, S. & Co. 24 steers av 1102 at \$7.25, 6 do av 695 at \$6, 2 do av 1210 at \$7.50, 6 do av 975 at \$7, 9 do av 1014 at \$6.50, 1 bull wgh 1060 at \$5.75; to Thompson Bros. 3 cows av 1030 at \$5.40, 1 do wgh 1300 at \$5.75; to Kull 2 bulls av 845 at \$5.40; to Mason B. Co. cow wgh 1060 at \$5; to Hammond, S. & Co. 20 butchers av 906 at \$6.75, 20 do av 730 at \$6.50, 5 do av 1096 at \$7, 1 bull wgh 1850 at \$6, 1 do wgh 780 at \$5.25; to Nagle P. Co. 1 steer wgh 1350 at \$7.75, 1 cow wgh 1140 at \$5.90, 10 butchers av 859 at \$6.60; to Golden 4 do av 680 at \$6, 4 cows av 807 at \$4.50; to Breitenbeck 26 steers av 880 at \$6.75, 1 bull wgh 850 at \$5.50; to Bresnahan 2 steers av 800 at \$6, 3 butchers av 747 at \$5.75, 7 do av 714 at \$5.85; to L. Bresnahan 10 cows av 1052 at \$5.25, 2 do av 1185 at \$5.75; to Kull 16 steers av 874 at \$7.35, 17 do av 835 at \$7.25; to Newton B. Co. 10 do av 1136 at \$7.10, 11 do av 1008 at \$6.90, 8 do av 920 at \$6.50.

Roe Com. Co. sold Mason B. Co. 6 steers av 870 at \$7, 1 do wgh 600 at \$5.75, 1 bull wgh 2080 at \$6.25; to Parker, W. & Co. 6 canners av 891 at \$4; to Bray 3 cows av 1027 at \$5; to Bresnahan 9 cows av 1104 at \$5.50, 3 do av 963 at \$4.25; to Newton B. Co. 1 steer wgh 1000 at \$6.85, 4 do av 672 at \$6, 1 bull wgh 1070 at \$5.50, 2 do av 1040 at \$5.50, 3 cows av 973 at \$4.75; to Hammond, S. & Co. 4 do av 982 at \$4.

Veal Calves.

Receipts 826. The veal calf trade was strong, and good grades averaged 50c higher than they were a week ago. Common about steady. Best \$11@12; common and heavy \$7@10.

Haley & M. sold Sullivan P. Co. 13 av 175 at \$12, 11 av 150 at \$11.75; to Mich. B. Co. 4 av 150 at \$11, 3 av 125 at \$11, 5 av 145 at \$11.50, 12 av 150 at \$11.50, 3 av 140 at \$11.50.

Sheep and Lambs.

Receipts 3764. The sheep and lamb trade was full steady with last week and there was a good active demand. The Nagle Packing Co. took the bulk of the offerings. The close was steady as follows: Best lambs \$11@11.20; fair lambs \$10@10.50; light to common lambs \$8.50@9.75; yearlings \$9.75@10; fair to good sheep \$6@7.50; culls and common \$4@5.50.

Bishop, B. & H. sold Nagle P. Co. 352 lambs av 82 at \$11.25, 11 do av 85 at \$11.25, 206 do av 77 at \$11, 153 do av 75 at \$10.65, 192 do av 70 at \$10.50, 11 sheep av 100 at \$6.75; to Newton B. Co. 9 do av 120 at \$7.10, 6 do av 110 at \$6.50, 6 lambs av 60 at \$9.25, 35 do av 70 at \$10.75, 8 do av 75 at \$10.50; to Sullivan P. Co. 12 sheep av 95 at \$6.75; to Thompson Bros. 20 lambs av 60 at \$9.50; to Hammond, S. & Co. 31 sheep av 100 at \$7; to Nagle P. Co. 128 lambs av 85 at \$11.10, 141 do av 80 at \$11.20, 97 do av 70 at \$10.85, 49 do av 75 at \$11.10, 90 do av 75 at \$11, 14 sheep av 80 at \$5.50, 9 do av 120 at \$7.50, 12 do av 95 at \$6.50.

Hogs.

Receipts 8833. In the hog department the market was 5@10c higher than on Wednesday. Pigs were selling at \$7.75 and yorkers and heavy grades at \$8.25@8.30.

Friday's Market.

February 11, 1916.
Cattle.

Receipts this week 2368; last week 1730. Market dull at Thursday's decline. Best heavy steers \$7.50@7.75; best handy weight butcher steers \$6.75@7; mixed steers and heifers \$6.50@6.75; handy light butchers \$5.50@5.75; light butchers \$5@5.50; best cows \$5.50@6; butcher cows \$5@5.25; common cows \$4.25@4.75; canners \$3@4; best heavy bulls \$5.75@6; bologna bulls \$5.25@5.50; stock bulls \$5@5.25; feeders \$6@7; stockers \$5.50@6.50; milkers and springers \$35@80.

Veal Calves.

Receipts this week 988; last week 758. Market steady. Best \$8@11.50; others \$6@9.50.

Sheep and Lambs.

Receipts this week 6,327; last week 5,012; market steady. Best lambs at \$10.75@11; fair lambs \$10@10.50; light to common lambs \$8.50@9.50; yearlings \$9.50@10; fair to good sheep \$6@7.50; culls and common \$5@5.50.

Hogs.

Receipts this week 12,224; last week 10,915; market steady. Pigs \$7.75@7.90; others \$8.30@8.35.

LIVE STOCK NEWS.

The Chicago hog market has acted in a manner calculated to inspire the greatest confidence among stockmen, the best hogs selling recently above \$8 per 100 lbs. for the first time in a long period. This advance is in the face of enormous receipts, the local and eastern shipping demands having been extraordinarily large, while speculators have taken hold liberally, aiding in the upward movement. Hogs are showing increased weight, although still much lighter than in other years at corresponding periods, recent arrivals on the Chicago market having averaged 200 lbs., comparing with 194 lbs. a week earlier, 190 lbs. a month earlier, 223 lbs. one year ago and 220 lbs. two years ago. Prime heavy barrows are still sought for by eastern shippers at highest prices, and prime light shipping hogs are doing much better, with the best selling within a dime of the best heavy weights. Prices of hogs are very much higher than in former winters, 1914 and 1910 excepted, and further advances are looked for. It takes great numbers of hogs for the fresh pork industry, and the packers need all the hogs they can get hold of for manufacturing cured meats; pork and short ribs selling much higher than a year ago, but lard is lower, because of reduced exports. Exports of cured hog meats are far greater than ever before, and stocks are small for the season. On the opening day of this month the Chicago warehouses contained 111,043,031 lbs. of cured hog meats, comparing with 87,125,772 lbs. a month earlier and 162,142,173 lbs. a year ago.

Cattle coming to market are not averaging any too well in quality, with a great shortage of prime heavy steers, and a large share of the Chicago sales of steers take place at \$7.50@8.50 per 100 lbs., few going above \$9. Conditions are the reverse of those prevailing a year ago, when there was a surfeit of choice beefs, the change being due mainly to unwillingness of most stockmen to feed high-priced corn for considerable periods, while soft corn has poor feeding properties. Steers that would be classed as feeders are selling on the Chicago market for \$6@7 per 100 lbs., while good feeders sell in the Kansas City market at \$7@7.75 and on the Omaha market for \$6.75@7.50. An important auction sale was made in Denver recently of 142 carloads of stock cattle at \$7.35 per 100 lbs. as an average price. Killers everywhere are showing a marked preference for fat cattle of light and medium weights, and heavy short-fed steers are bad sellers.

Stockmen of central Missouri state that because of the advance in corn prices, the margin of profit in cattle is so small as to lower feeding operations materially.

FIRE! FIRE! FIRE!

We shudder at even the thoughts of fire. Sometimes we think what would we do if our house caught fire, or our barn, or any of our other buildings, or our automobile, by try to put them out, of course, but how?

We had an opportunity of buying, at much less cost than any of our readers could, a lot of fire extinguishers, and of the best sort—the "Fire Chief" Dry Chemical Powder kind—supposed to be the best for quick work. As a rule, the time to put a fire out is as near the start as possible. Farmers have little fire protection; we figured on that when we bought a lot of the "Fire Chief" Extinguishers at a low wholesale price. We bought these with our subscribers in mind and will give them to our readers at cost. Full directions go with each one. They are instantaneous, sure. The \$2 size we will offer to our subscribers at \$1, or six for \$5, while they last.

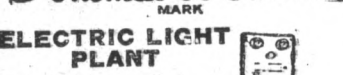
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Save hired-help wages, and make money saving wood for your neighbors, by investing in this easy running durable

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No vibration, sturdy construction, correct proportions—yet price surprisingly low. Size over all—3' 11" x 7' frame—selected hardwood, rigidly bolted, well painted. Many exclusive advantages and improvements. Don't buy any wood sawing machine until you get our descriptive circulars and prices.

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It isn't rating but actual delivered power at small cost that you want.

Chapman Engines saw 22 cords wood or Grind 50 bushels corn with one gallon gasoline. Cut and elevate a ton of ensilage for 2c. State what you want and get our prices on guaranteed power also on Sprayers, Pumps, Ensilage Cutters, Feed Mills, Emery grinders, wood saws and Forges. Address: Engine Works, Box F 95, Marcellus, Michigan

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HAY OUR NEW LOCATION—

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THE HARPSTER COMMISSION CO., Union Stock Yards, Toledo, O. Sell live stock on commission, get highest prices and best fills. Try them. Daily market, force of six looks after your interest. Financially backed by over \$1,000,000.

FARMERS—We are paying from two to five cents above the highest official Detroit Market quotation for your eggs shipped direct to us by express. Write us for information. It will pay you. American Butter & Cheese Co., Detroit, Mich.

MEDICATED SALT TOO HIGH

No stock owner should pay 4c to 5c per pound for Medicated Salt when he can make it for 1 1/2c to 2c per pound by buying the medicine and salt separately. It is very easily mixed by hand with a shovel. The best formula known is that used in Blackman's Medicated Salt Brick, on which there is an enormous trade.

The Brick and formula was originated a few years ago by Dr. G. B. Blackman, a veterinarian of twenty years' experience, and graduate of the American Veterinary College of New York City. Other veterinarians use and recommend it, on account of the splendid formula and its great convenience.

A package of this medicine sufficient for 100 lbs. of salt, costs only \$1.50, delivered. It is cheaper in larger lots. It will clean the worms out of your stock, purify the blood, straighten out their kidneys, and make them look and feel like new creatures. Satisfaction is guaranteed or money refunded. Some stock owners not only mix their own medicated salt, but sell to their neighbors and double or treble their money. Try it once and you will always use it. Blackman Remedy Co., Chattanooga, Tennessee.

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20 Head of Percheron 20

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As good as can be found. Royally bred, some of them by the great \$10,000. Champion Carmot (66066). All recorded in P. S. A. Studbook. If you want good ones come and see me. They will be priced right.

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Registered Percherons

2 rising two year old Percheron Stallions weight 1550 and 1600 lbs. Priced to sell. Inspection invited. L. C. HUNT, Latona Rapids, Michigan.

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

Pair of black Registered Percheron Mares in foal weight 1500 lbs. Price \$600.00. Also some colts. Joseph Parker, Cassopolis, Mich.

FOR SALE—Pair of Grey Reg. Percheron mares 4 and 5 yrs. old. Safe in foal, full sisters, sound good workers, weight 3400. Price \$925. J. M. Hicks & Sons, R. No. 2, Bell Phone 1114, St. Johns, Michigan.

For Sale—Black Percheron Stallion, 3 yrs. old, wt. 1500, right every way. Extra good one, a bargain if taken soon. Wm. Bird, St. Johns, Mich.

LOESER BROS.

We have 100 head of Belgian and Percheron Stallions and mares. Imported and home bred. We have sold pure bred horses in Michigan for the last 25 years, and have the right kind, and at the right price. We can supply any number of work horses, both geldings and mares. Get in touch with us.

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Raise mules and get rich. 200 head fine large jacks, Jennys and mules, 14 to 17 hands high. Large registered jacks and draft stallions cheap now. Will trade for sheep, cattle or horses. Write for prices today. Stock guaranteed. Address KREKLER'S JACK FARM West Elkton, Ohio

FOR SALE—2 Belgian Stallions one imported 15 yrs. Old Bay, weight 2100 lbs. Colts to show. One registered Home bred 3 years old Bay, weight 220 both outstanding good ones, would consider an exchange of one of them for another equally as good, if interested write. OSCAR WOLF, St. Louis, Michigan.

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Poultry, Live or Dressed, Dressed Hogs, Calves, Sheep and Eggs. Reference, Peninsular Savings Bank, Sullivan Packing Co. Shipments Solicited. Satisfaction Guaranteed.

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The work is so easy and simple that even beginners make big profits from the start. Our free book tells how.

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produce big crops of big, fancy berries from June until November. Light freezing does not affect their fruiting.

The berries are in great demand. Price ranges from 30 to 45 cents per quart. Three months after plants are set, your profits begin. Our free book tells the rest.

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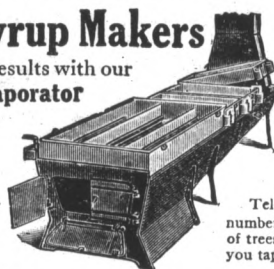
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Quick work, fuel saving, durability and **BEST QUALITY OF SYRUP.** Write us for CATALOGUE.



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A pair of mated EVERBEARING STRAWBERRY PLANTS FREE if you will report as to your success with them. Will bear loads of big, red, berries from June to November. We have counted 450 berries, blossoms and buds on a single plant. A postal will bring the plants, also enough seed of the new CRIMSON BEAUTY to plant a rod square of ground. Also a pkt. of perennial ORIENTAL POPPY seed. Send 10 cts for mailing expense or not, as you please. Write today and get acquainted with THE GARDNER NURSERY COMPANY Box 745, Osgo, Iowa.

Plant Strawberries

We ship plants safely to any part of the United States. Have the VERY BEST for farm or garden CULTURE. Also a complete line of Raspberry, Blackberry, Gooseberry, Currant, Grapes. Acres of Everbearing Strawberry and Raspberry plants, just what you want. Greatest money maker before the American public. Descriptive catalog free. Write now.

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\$1.50 per 1000, etc. Best Michigan Stock. 100 varieties including Everbearers, also Grapes, Raspberries and other early fruits. Send today for FREE Catalog. ALLEGAN NURSERY, BOX 20 ALLEGAN, MICH.

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\$25. For strawberry name. Other big prizes given. File orders now for best plants, none better. R. N. Thomas, Shenandoah, Ia.

AUGUSTA BASKET COMPANY

Manufacturers of Best Quality Fruit Packages, Baskets, Crates, etc.

Write for 1916 catalog and price list, **Augusta, Mich.** Box 52.

"BASSWOOD QUARTS"

Practical Science.

GASOLINE.

(Continued from last week.)

Proportions of different grades of gasoline vapor that air will carry at a temperature of 17.5 degrees C.

Grade of Gasoline.	Proportion of Gasoline Vapor Per Cent.
Cleaner's naphtha	5.0
64 degs. B. gasoline	11.0
69 degs. B. gasoline	15.0
73 degs. B. gasoline	28.0

It will be noticed that air will hold almost six times as much vapor from the lighter gasoline as from the heavier cleaners' naphtha. If the lighter and better grades of gasoline are heated, their vapors, when a light is applied, also flash and burn at lower temperatures than do the heavier grades. This difference does not mean that some gasoline is a dangerous inflammable liquid and some is not. All grades are classed as highly inflammable and dangerous liquids.

Comparison of Inflammability of Gasoline and of Gasoline Vapor.

If one takes the cover off a pail of tightly inclosed gasoline and applies a match to the surface, the gasoline will flare up and burn as long as the gasoline lasts. On the other hand, if one puts a few drops of gasoline in a small tightly inclosed pail, waits a few minutes, and then introduces a flame or an electrical spark a violent explosion will most likely result. In the first case the vapor burns as fast as it comes from the gasoline, and mixes with the oxygen of the air. In the second case the oil vaporizes in the pail and mixes uniformly with the air therein to form an explosive mixture and upon ignition explodes. Consequently, when one hears of a disastrous gasoline explosion one may be sure that the explosion resulted from the mixing of the vapor from the gasoline with air in the proportions necessary to form an explosive mixture.

One gallon of gasoline when entirely vaporized produces about 32 cubic feet of vapor. If a lighted match could be applied to pure gasoline vapor in the absence of air no fire or explosion would result. Gasoline liquid or vapor, like any other combustible material, needs the oxygen of the air in order to burn.

Explosive Range of Mixtures of Gasoline Vapor and Air.

It is fortunate that gasoline vapor, like other gases and vapors, needs a certain proportion of air before an explosion can take place. The author found that in 100 parts by volume of air and gasoline, an explosion will not take place if there is less than 1.4 parts of gasoline vapor or more than six parts. In other words, the explosive range is between 1.4 and about six per cent of vapor. Flashes of flame will appear in mixtures containing considerably smaller and larger proportions of vapor and considerable pressure will be developed, but propagation through the mixture will not take place.

Although the range of explosibility mentioned is narrow as compared to that of many other mixtures of combustible gases and air, yet the proportion of gasoline vapor representing the lower limit is small, and indicates the great importance of not allowing even a little gasoline to be exposed in a room, because of the small quantity of vapor needed to make an explosive mixture with all the air in the room. If one gallon of gasoline is allowed to change completely into vapor simply by exposing it to the room air, and if the room is gas-tight, the one gallon can render explosive 2,100 cubic feet of air, the amount contained in a room measuring 21x10x10 feet.

In the actual use of gasoline such conditions seldom exist. However, an assumed case may be that of a person filling an open pail from a larger tank

or using gasoline for cleaning. When the pail is first filled with the gasoline, a small volume of pure gasoline vapor forms over the surface of the gasoline. Just above this layer of pure gasoline vapor is a mixture of vapor and air; at some point there will be an explosive proportion, and farther away from the pail there will be a small proportion of vapor, and still farther away no vapor at all, but pure air. However, all the time the user of the gasoline is at work, the vapor keeps forming, from both the gasoline in the pail and that applied to the object being cleaned, rendering more and more air inflammable or explosive until finally there will exist a dangerous atmosphere that may completely surround him, so that a chance ignition will envelope him in flames and perhaps cause great damage to property. Ignition of the gasoline vapor may take place even some distance from the gasoline in a room adjoining the room in which the person works. As the gasoline evaporates, and more and more vapor is given off, it mixes with air farther and farther from the gasoline and, if the evaporation lasts long enough, may travel to an adjoining room where it may be ignited. On ignition a sharp flash will travel back through the adjoining room to the room where the gasoline is.

Resume.

At ordinary temperatures air will hold about five to 28 per cent of gasoline vapor. As gasoline vapor is about three times as heavy as air, in a room containing a mixture of the vapor with air the vapor is found in largest proportion near the floor.

The limits of explosibility of mixtures of gasoline vapor and air are between about 1.4 and six per cent gasoline vapor, although dangerous flashes may be produced with mixtures containing less and more than these proportions. In other words, there is needed only a small proportion of gasoline vapor to render air explosive—1.4 cubic feet of the vapor to 97.5 cubic feet of air. One gallon of gasoline can, under ideal conditions, render 2,000 cubic feet of air explosive.

A dangerous feature of gasoline vapor is that it may travel a considerable distance from the gasoline and there be ignited, the flash traveling back to the container of the liquid and causing a roaring fire in a very few seconds.

CATALOG NOTICES.

"The Plain Truth About Seeds that Grow," is the caption of Burpee's Seed Annual for 1916, sent upon request by W. Atlee Burpee & Co., Burpee Buildings, Philadelphia, Pa. This is a 182-page illustrated catalog listing a complete line of farm, garden and flower seeds.

The "Bull Tractor Bulletin" is a publication gotten out by the Bull Tractor Co., Minneapolis, Minn., containing much valuable information with regard to the economy of tractors in practical operation, and useful hints on traction engineering. Write for a copy, mentioning Michigan Farmer.

Rumely threshing machinery, including traction engines, separators and accessories, gas tractors, tractor equipment, etc., are fully illustrated and described in the handsome 40-page catalog sent upon request by the Advance-Rumely Thresher Co., of Laporte, Ind. Readers interested in threshing or tractor outfits should send for a copy, mentioning the Michigan Farmer.

German Nurseries & Seed House, Beatrice, Nebr., send upon request a complete 128-page catalog listing a full line of fruit and ornamental trees and plants and vegetable and flower seeds as well as general farm seeds. The catalog is well illustrated with half-tones reproduced from photographs of trees, fruits, etc.

"Strawberry Plants that Grow," is the title of the 1916 catalog of C. E. Whitten's Nurseries, Bridgman, Mich. This catalog contains illustrations of many of the standard varieties and specialties offered by this company.

Don't Sow CLOVER

until you have received your copy of the latest book on Alfalfa and Clover prepared by four of the foremost Agricultural Authorities in America.

Here are a few chapters showing you the wealth of valuable information necessary to grow this money crop:

1. Clover, the foundation of permanent agriculture.
2. The proper time to sow it.
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4. The value of sowing in rows 4 inches apart.

Results from hundreds of Michigan Farmer users over a period of five years have conclusively proven that seeds drilled at a regulated depth 4 inches apart with Excelsior Clover Drills produced excellent yields.

Seed this year is very costly. You can save many dollars by sowing your seed with an Excelsior Drill and save enough seed in 30 acres to have the drill free.

JOE WING said the Excelsior 4-inch will revolutionize agriculture in America.

A. B. LYMAN, introducer of Grimm Alfalfa, says: "The Excelsior will more than pay for itself in one season in seed saved."

CHAS. METCALF, of San Angelo, Tex., got a better stand with 10 lbs. of seed with his 3 Excelsior Drills than when he broadcasted 20 lbs. the old way.

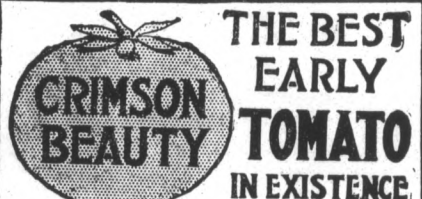
Don't scatter your costly seed on top of the ground to birds, wind and rain. Profit by experience of other reliable farmers and use an Excelsior 4-inch Drill on your farm and get better results.

Reduce your seed bill one-half. Be sure of a stand of clover.

You will get these results by learning all about Clovers and Alfalfa, and what the results are when these seeds are drilled with an Excelsior.

Write for this book, which regularly sells for 50c. It will be mailed to you absolutely free by mentioning The Michigan Farmer.

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Send us the names and addresses of ten growers interested in **GOOD SEEDS** and we will mail you one of our 1916 Catalogs and a 25c. packet of this sensational early Tomato Seed absolutely **FREE**. Sold only in packets—25c. each, 3 for 50c. Our Illustrated Catalog contains full description of this Wonderful Tomato and hundreds of other High-Grade Garden and Farm Seeds. Also **THE MOST GENEROUS COMBINATION OFFERS** ever made by any seed house. Send the List Now. You will be well repaid. **The C. E. DePuy Co., Pontiac, Mich.**



Isbell's famous garden complete for \$1.00—a regular old fashioned garden that will assure you of plenty of fine vegetables. Standard varieties put up in full size packets. Beans, Beets, Early Cabbage, Sweet Corn, Cucumbers, Lettuce, Parsley, Radish, Extra Early Tomato, Choice Late Tomato and 1 qt. Onion Sets. Plant this garden—you can't go wrong—Isbell seeds are sure to grow. Sent complete postpaid for \$1.00. Complete cultural directions with all seeds. We grow our own seed and ship direct.

Send for Isbell's 1916 Seed Book. Isbell's 1916 seed annual now ready. Send for copy. Shows all the new and standard varieties. Saves you money on seeds. Write for book today. **S. M. ISBELL & CO., 804 Pearl St., Jackson, Mich.** (1)

GOOD SEEDS

GOOD AS CAN BE GROWN Prices Below All Others

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

Big Catalog FREE

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

20 Packets Seeds—10c.

We want every reader to test "HARRIS SEEDS THAT HUSTLE." Send 10c. now—before you forget for this mammoth collection. We send you 20 separate packets, finest varieties—one each of Beets, Carrot, Cabbage, Celery, Cucumber, Lettuce, Cress, Muskmelon, Watermelon, Onion, Parsley, Parsnip, Radish, Salsify, Spinach, Tomato, Mixed Poppies, Giant Cosmos, Double Jap Calendula and Children's Botanical Garden, a curiosity collection of flower seeds. With this collection we send rebate check for 10c. and big catalog of world's finest seeds. **HARRIS BROS. SEED CO., 450 Main St., Mt. Pleasant, Mich.**

Seed Corn 5000 Bushels sound Seed Corn, also Oats, Barley, Alfalfa, etc. 1200 Acres. 40 Page Catalog FREE. **W. N. SCARFF, Box 4, New Carlisle, Ohio**

Grange.

POMONA MEETING.

The Genesee Pomona Grange, which met with the Davison Grange, Thursday, January 20, had a successful, interesting and well attended meeting. The meeting was opened at 11 o'clock in the fifth degree, L. Wilmot, master of Pomona Grange, presiding. After a business session a survey of the Grange field was conducted by Miss Jennie Buell. There are 18 Granges in the county and a large majority of those were reported to be holding their own or on the up-grade.

The dinner was served in the dining-room adjoining the hall by the ladies of the Grange, and although small in number they proved themselves large on hospitality. They had planned on dinner only, but after serving a chicken-pie dinner to about 70 people they found there was an abundance left for a chicken-pie supper also.

The afternoon was open to the public and was in charge of Mr. Fields, lecturer of Pomona Grange. Mr. Smith, who was to have given a talk on constitutional prohibition, was not able to be here, so the subject was given over to the members for discussion. Several very good talks were given and a number of good points brought out in favor of prohibition. One was that if there was as much liquor being consumed today as in the past, why had the revenue from liquor imports fallen off \$23,000,000 during the last year?

Rev. Benson also gave a short talk on the subject. He said he believed that the enforcement of the local option law was doing more to create a sentiment in favor of state-wide prohibition than anything else. He gave a very interesting talk on "The Village Parson," as related to the rural community betterment, referring to incidents in his own life which had convinced him of the attitude a minister should take toward the farmer as well as those in other walks of life.

Rev. Schwarzkopf said that he had heard of the Grange for a good many years but that was the first Grange meeting he had ever attended. He told the farmers he wished to become better acquainted with them and to work with them if they continued to carry on their work in the same good spirit and to stand for so many good things in which he believed.

Miss Buell gave a talk on prohibition, also co-operation.

After school Miss Stockman and her little band of second and third graders came in and sang a song which was much appreciated by all.

Miss Buell gave an outline of the work to be done by the Grange this year according to the plans of the state master. A subject to be taken up by the Granges throughout the state is "The Budget System."

The evening session was opened in the fourth degree and was presided over by the lecturer.

W. Billings gave a good talk on the selection and care of the dairy cow.

A reading was also given by the lecturer.

As Pomona Grange had decided to assume responsibility for the weaker Granges of the county in co-operation decided to hold the next meeting at Gaines in February as the Grange of that place was reported not in a very good standing.

AMONG THE LIVE GRANGES.

Notwithstanding the arduous duties of January 28, at which time Charlotte Grange dined 525 farmers at the Commercial Club dinner, not to mention 50 or more who served and looked after the kitchen work, there were nearly 200 present for dinner at Saturday's meeting and they enjoyed a splendid dinner prepared from the food remaining after the big dinner of the day before, which goes to show that liberal provision had been made to entertain their guests. There was much routine business transacted at the business session. The program was fine and, as is not uncommon in Grange circles some high-class talent which had been hitherto lost to the Grange, was discovered. Mrs. Frank Ford and Miss Hazel Laverty both surprised their audience with the very clever manner in which they acquitted themselves. Five candidates were initiated in the third and fourth degrees, the work being done by the degree teams which are rapidly being brought into form by Mrs. Clarence Kiplinger and F. C. Curtis. The work of preparing the dinner on Friday for upwards of 600 people was a gigantic task and those who had the matter in charge are to be congratulated upon the thoroughness of the manner in which the work was performed.

Farmers' Clubs

OFFICERS OF THE STATE ASSOCIATION OF FARMERS' CLUBS.

President—R. J. Robb, Mason.
Vice-president—C. B. Scully, Ahmont.
Secretary and Treasurer—Mrs. J. S. Brown, Howell.

Directors—Alfred Allen, Mason; C. T. Hamline, Alma; W. K. Crafts, Grass Lake; Edward Burke, St. Johns; Mrs. C. J. Reed, Spring Arbor; Roy E. Moore, Bellevue.

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

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

Associational Sentiment:
"The Farmer: He garners from the soil the primal wealth of nations."

CLUB DISCUSSIONS.

Four Townships Represented.—Regardless of the sharp and cold day and the rough condition of the roads, a goodly number gathered at the home of Mr. and Mrs. J. B. Taziman for the February meeting of the Oak Grove Farmers' Club, of Livingston county.

Four townships were represented, Co-hoctah, Deerfield, Osceola and Howell. After the dinner the meeting was called to order by the president and the exercises were opened by the Club singing "America," with Mrs. J. B. Taziman presiding at the piano. Following a good literary and musical program, Douglas Glaspie gave a short address upon "State Affairs." The speaker greatly deplored the rise in taxes; said they had doubled in the last ten years and asked if this thing continues what are we going to do? He thought something must be wrong, was in sympathy with the state institutions but thought they should live according to their means, did not want them to have more than the farmers; said there was a commission appointed to ascertain the cause for the rise in gasoline, thought it might be well to appoint a similar one to investigate the causes for increased taxation. The views held by those discussing this subject, however, were not as gloomy.

In fact, one gentleman remarked that there was nothing to be deplored in higher taxes, providing we had something to show for them, and as to the officers they were placed there by the people and if they were not doing their duty, it was our business as citizens to replace them by electing better ones that is, if we could find them. Another speaker suggested that we commence to live better personal lives, thought if we should do so many evils would vanish; he also advised that we work for state-wide prohibition. Another was of the opinion that increased taxes at home, and the piling up of war debts abroad were omens of a grander civilization. W. O. Richards then gave his address on the subject of "Organization." He claimed that the crying needs of the day were economy and organization and cited as examples the Ford motor factory and the German army. He favored state-wide prohibition. This subject was not much discussed as all appeared to approve of the sentiment expressed. Among the questions submitted through the question box was one relating to "Preparedness." This question provoked quite a lengthy discussion. The majority were opposed to making of this country an armed military camp or allowing the munition manufacturers to pile up profits at the expense of the people, and yet they wish adequate defense in case of attack; however, there was a minority that favored preparedness on a more extensive scale and gave as their reason for such action that it was uncertain as to who our northern neighbors might be after the conclusion of the war and also the possibility of foreign nations pooling their interests and initiating a war of conquest. At the close of the program the Club adjourned to meet Thursday, March 2, at which time will occur the annual banquet.

Have Chicken-Pie Dinner.—Mr. and Mrs. Samuel Schaffer pleasantly entertained the Gun Plains Clover Leaf Club, about 70 in number, at their home Saturday, January 29. It was an all-day meeting. At noon a chicken-pie dinner, beside other good edibles, was served. All did ample justice to the spread. After the sumptuous repast a pleasing program was given, including several good discussions.—Mrs. Fred Myers, Cor. Sec.

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Professor I. W. Dickerson, of the Farm Mechanics Department, University of Illinois, says—"By all means purchase engines for general purpose work in future, of such design as to work properly on grain and corn binders, manure spreaders, potato diggers, etc., in season."



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FOR SALE: 200 A. Clay Loan Farm, E20 A. pasture easily cleared; barn 40x64 ft., full basement, tool shed 18x40; good 10 room house, basement; woodshed; ice house; chicken coop; hog house; garage; 70 ton silo; good well; windmill; water in house and barn, and lighting plant for house and barn also gas range, 1/2 miles from county seat and 9 miles from railroad. Unlimited free pasture available. Terms \$50 per acre, part cash. Owner R. Shepard, Mio, Mich., R. 1.

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The State for Thrifty Farmers. Delightful, healthy climate. Good Land, Reasonable prices. Close to big markets of large cities of the East. Send for free descriptive booklet & map.
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Southern Farms, Mississippi, Tennessee. Cheap land for corn, stock or general farming. Martin & Cole, 115 Madison Av., Memphis, Tenn.

Central Michigan Farms—Best general farming country in the world. Sold on easy terms. Write for list A. C. B. Benham, Hastings, Mich.

For Sale: 640 acres of good land in whole or in part; a rare bargain if taken soon. Inquire of C. C. Whitney, 229 Shearer Bldg., Bay City, Mich.

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640 Acres IMPROVED NEBRASKA FARM
Fair buildings; close to county seat; stocked with 10 head horses, cattle, hogs and all kinds of small fowl. Possession can be given at once. Price \$18,000. Will consider any good Ohio or Michigan property.

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FARMS FOR SALE—One of 80 acres, one 160 acres, one 40 acres and one 320 acres all well fenced and good soil, good buildings and fruit trees bearing. Box A-219 care Michigan Farmer, Detroit.

80+ improved clay and sandy loam, good buildings, water in house and barn, close to good market \$5000.00. For particulars write W. E. Pomeroy, Owner, Valley Ctr., Mich.

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Successors to A. J. Stevens & Co. Established 1883. Farm, Fruit and Stock Lands. We own 18,000 acres of choice unimproved land in Gladwin and Clare counties. Sold on easy payments. Interest 6 per cent. Write for information.

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Central Michigan Farms All Kinds.
Lists are free. Phillip Lippert, Stanton, Mich.

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An illustrated booklet FREE. Michigan has hundreds of thousands of acres of virgin land. \$5.00 an acre up. Healthful climate. Growing season for all crops. Ample rainfall. Write W. P. Hartman, A. & I. Agent, Room 285 Grand Rapids & Indiana Railway, Grand Rapids, Mich.

WANTED—To hear from owner of good farm or unimproved land for sale.
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Michigan Farmer's Club List.

For the benefit and convenience of our subscribers we have arranged the following list of papers. Besides the money saved they save the trouble and expense of sending each order separately.

EXPLANATION.—The first column gives the paper's regular subscription price. The second column price is for the Michigan Farmer and the other paper, both for one year. Add 50 cents when the Michigan Farmer is wanted three years, or \$1.00 if the Michigan Farmer is wanted five years. All combination orders may be handed to our agents or sent to us, as is most convenient.

Write for prices on publications not listed.

Subscribers to the Michigan Farmer whose time is not up for one year or more, may have as many other papers as wanted by deducting 50 cents from the second column price. This takes care of those who subscribed for three or five years a year or two ago.

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HERD ESTABLISHED IN 1900.
TROJAN-ERICAS and BLACKBIRDS only.
Also breeders of Percheron, Hackney and Saddle Horses.
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Aberdeen Angus Four young bulls also young cows and heifers. Extra good. Priced reasonable. Inquire F. J. Wilber, Clio, Mich.

For Sale Pure bred Angus cattle. Some extra good bulls. Prices reasonable. ANDREW EITEL, Vermontville, Mich.

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

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GUERNSEY CATTLE.

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GUERNSEYS

No Tuberculosis Or Abortion

We are offering a number of fine Registered cows for sale. Some of these cows have finished their A. R. test and others soon will with records from 400 to 620 lbs. of fat in one year. We also have Reg. Bull calves from A. R. cows for sale, also one Bull old enough for service whose dam's record is over 620 lbs. of fat as a 4½ year old.

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Coldwater, Michigan.

GUERNSEYS—REGISTERED BULL CALVES
Containing blood of world champions.
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Guernseys reg. for sale, Watervliet, Mich. May Rose Seven A. R. cows in herd.
Address J. K. Blatchford, Auditorium Tower, Chicago, Ill.

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Guernsey Bulls of service age and calves from choice. Adv. reg. breeding.
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AT Farmers' Prices Registered Guernsey Bull calves from A. R. dams and dams being tested. If intersted write for photo, breeding and price. Byers & Barnes, Coldwater, Mich.

Choice Guernseys For Sale Cows—Heifers—Bulls.
J. M. WILLIAMS, NORTH ADAMS, MICHIGAN.

Herefords—3 Bull Calves
ALLEN BROS. PAW PAW, MICH

HEREFORDS, Well developed, beefy bulls, best of blood lines. Serviceable age. Registered. E. J. TAYLOR, Fremont, Mich.

Do You Want A Bull?
Ready For Service.

From a grand daughter of The King of the Pontiacs. Sired by a bull that is more than a half brother to the Champion Holstein Cow of the World, and whose dam is a 30 lb. 64% fat daughter of Pontiac Aggie Korndyke who has more 30 lb. daughters than any other living bull. If you do write for pedigree.

EDWIN S. LEWIS, Marshall, Mich.

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

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

BIGELOW'S HOLSTEIN FARMS,
BREEDSVILLE, MICH.

HATCH HERD
YPSILANTI, MICHIGAN

Registered Holstein-Friesian sires, grandson's of World's greatest dairy sire, out of choice A. R. O. dams and King Pontiac Jewel Korndyke; Brother of K. P. Pontiac Lass 44.5; average record of 50 dams in his pedigree 31.25 in 7 days; average per cent. of fat three nearest dams 4.37; of his own dam 4.93. Sires in first three generations already have over 600 A. R. O. daughters. A few females bred to "King". Prices reasonable.

HOLSTEIN Bull Calf: Born Oct. 5. A splendid individual, well grown, and of choice breeding. Dam has A. R. record, butter 7 lbs. 18.04 lbs. milk 419.8 as a 2-yr. old. Sire Albina Bonte Butter Boy No. 93124. W. B. Reader, Howell, Mich.

\$190 Buys Reg. Holstein heifer 8 mos. old and bred. Bull 3 mos. old. Not akin. Good breeding. F. J. LANGE, Sebawing, Michigan.

HOLSTEIN BULLS

For Sale By

Callam Stock Farm

No. 1. Prince Fayne Callam, ready for service, born December 24th, 1914. Sire—King Keka Fayne. Dam—Lady Nig Volga, official record 24.67 lbs. of butter and 515 lbs. of milk in 7 days. Granddaughter of Hengerveld De Kol.

No. 2. Lucky Burke Callam, born October 22nd, 1915. Sire—Burke De Kol Callam. Dam—Lucky Girl Callam, now in official test, and making big record. Her dam an A. R. O. cow.

No. 3. Pet De Kol Callam, born October 23rd, 1915. Sire—King Keka Fayne. Dam—Pet Fairmount De Kol, A. R. O. record 19.16 lbs. of butter and 406 lbs. of milk in 7 days.

No. 4. De Kol Callam, born November 24th, 1915. Sire—Burke De Kol Callam. Dam—Segis De Kol Callam, now in official test, and making big A. R. O. record. Daughter of Pet Fairmount De Kol, an A. R. O. cow of nearly 20 lbs. of butter and over 400 lbs. of milk in 7 days.

No. 5. Sir Clyde Burke Callam, born December 11th, 1915. Sire—Burke De Kol Callam. Dam—Miss Korndyke Callam, now in official test, making large A. R. O. record. Daughter of Clyde Burke Callam, an A. R. O. cow.

No. 6. King Keka Fayne Junior, born January 12th, 1916. Sire—King Keka Fayne. Dam—Bessie Withroon Pauline 3d. A. R. O. record 17 lbs. of butter and 366 lbs. milk in 7 days. Now in official test and will make a record of over 25 lbs. butter and 450 lbs. milk in 7 days.

King Keka Fayne, the Sire of Nos. 1, 3 and 6, above, is a son of King Fayne Segis, a grandson of King Segis, Grace Fayne 2nd's Homestead, and a great grandson of Pontiac Korndyke. The A. R. O. of his sire's dam, Grace Fayne 2nd's Homestead is 35.55 lbs. butter in 7 days. No better bull in the United States.

Burke De Kol Callam, the sire of Nos. 2, 4 and 5, above, is my junior sire. His dam is the great A. R. O. cow, Rockledge Callam, whose dam is a granddaughter of De Kol Burke and Lord Netherland De Kol, two of the greatest sires of the breed. Burke De Kol Callam is by the noted A. R. O. sire, King Keka Fayne.

These bulls are all registered, choicely bred, handsomely marked and of perfect dairy conformation. They are guaranteed free from disease.

Write me today for price and description.

JOHN F. O'KEEFE, SAGINAW, MICHIGAN.

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As Good as the Best at Your Very Door

BROOKWATER FARM

Sells 46 bred Sows and Gilts and two ready for Service Boars March 4.

A cordial invitation to attend this sale is extended to all breeders and farmers. The offering will be **Closely Related to our State Fair Winners.** The only place where sows and gilts bred to the great boars **The Principal IV and Brookwater Cherry King** can be purchased. The only place in the East where the famous Golden Model strain of Durocs of the west can be purchased. Send for illustrated Catalog and plan to spend March 4 profitably at

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March 4 | You are invited to be our guests at Hotel Whitney the evening before the Sale. Free conveyance to the Farm Sale Day. | March 4



Purebred Registered
HOLSTEIN
CATTLE

The Holstein-Friesian bull possesses a strong constitution, superior we believe to that of any other dairy breed. Hence his value for grading up ordinary herds. A Cornell bulletin describes results secured in grading up its herd of twenty cows. The cow, Freddie, three-quarters Holstein, in forty-five weeks produced 11,693½ pounds of milk, containing 413 pounds of butterfat, or 3.53 pounds. Ruby, three-quarters Holstein, produced in forty-eight weeks, 13,574 pounds of milk, containing 430 pounds of butterfat, or 3.17 per cent. This shows what a purebred Holstein bull will do. Investigate the big "Black-and-Whites."

Send for FREE Illustrated Descriptive Booklets
The Holstein-Friesian Association of America
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Choice Holstein Bulls. All from A. R. O. Dams. Semi-off. yearly records 720 lbs. butter in Jr. 4yr. old class to over 1000 lbs. in mature class. Breeding: Cross "King of the Pontiacs" and the "Dennick blood." Cherry Creek Stock Farm, Hilliards, Mich. M. E. Farnelle, Proprietor.

ALFALFADALE HERD of Holsteins. Contains aged cows producing 32.94 lbs. of butter in 7 days; 4yr. olds producing 31.76; 3 yr. olds producing 26.37 and 2 yr. olds 25.69 all officially tested. Sons and brothers of these high testing cows for sale. Geo. H. Gillespie & Son, Mason, Mich.

\$50 gets another 2 mo. old Hazel-let grandson of Maplecrest De Kol Parthena and Pontiac Maid 30.2 lb. butter 7 days. Dam traces to Pontiac Korndyke twice Pieterje 2nd twice. DeKol 2nd five times. M. L. McLaulin, Redford, Mich.

Upsilonland Farms Registered Holstein young bulls of choicest breeding at \$50 and up. Ypsilanti, Michigan.

Holstein Bulls Ready
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Grandsons of Friend Hengerveld DeKol Butter Boy and Pontiac Aggie Korndyke. From high record A. R. O. dams at farmers' prices.

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I Have Holstein Bulls, Bull Calves and Cows that I can show breeding, records, individuality and attractive prices. L. E. CONNELL, Fayette, Ohio.

Choice Holstein Bull Calves

Ready for service, World's Champion Parentage
HILLCREST FARM - Kalamazoo, Mich.

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Our present farm being more valuable for real estate than dairy farming, we are going to move our herd further out from the city. We have twelve bull calves which will be sold at prices from \$35 to \$150 according to breeding—A rare chance to buy a bull calf at a low price.

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By careful retention, for many years, of largest producing females, and use of superior sires, a breeding herd of wonderful quality has been established. We are selling young bulls of this "TOP NOTCH" quality of serviceable age, at moderate prices. Information, pedigrees, etc., on application. McPHERSON FARMS CO., Howell, Michigan.

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

Registered HOLSTEIN BULLS. Sire is son of former state champion cow, 32.94 lbs. of butter in 7 days. 4 months old, mostly white, beautiful individual. 2 nearest dams average 26 lbs. of butter and 647 lbs. of milk in 7 days. \$100 delivered, safe arrival guaranteed. Write for pedigree and photo. **HOBERT W. FAY, MASON, MICH.**

8 Reg. Holstein heifers, 4 are 8 months old and 4 are 5 months, at \$100 each. Also, 4 young bull calves at \$30 each. Ernest A. Black, R. 3, Howard City, Mich.

Rinkland Herd Composed of Pontiac Korndyke and Hengerveld De Kol Breeding. **John A. Rinke, Warren, Michigan.**

FOR Sale—Registered Holsteins, 3 Bull calves sired by a 30 lb. bull, 1 from a 28.58 lb. dam. Also 2 heifers 8 and 15 months old. Wm. Griffin, R. No. 5, Howell, Mich.

\$150 Buys two high grade, richly bred, light colored Holstein heifers, fresh soon from 26 lb. Bull. **B. B. REAVEY, Akron, Michigan.**

A BARGAIN—A beautiful pure bred cow, nearly white, good size and large persistent milk, bred to freshen this fall. **GEO. D. CLARKE, VASSAR, MICH.**

Registered Holsteins at half Price. Cow five years old, calf by side. Heifer one year old bred bull world's record breeding. 28 lb. dam, one year old. Sold separately or the six head for \$500.00. Also 8 high grade cows for \$50.00. **J. C. BUTLER, Portland, Mich., Bell Phone.**

Reg. Holstein Bull, 5 mos. old. Dam made 546 lbs. milk 18.46 lbs. butter 7 days. Nicely marked and well grown. E. R. Cornell, Howell, Mich.

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

Jerseys. Bulls ready for service, extra quality sired by Jacoba's Fairy Emanon. No. 107111, from high producing dams. **SMITH & PARKER, Howell, Mich.**

Public Sale

February, 24, 1916.

Of Registered Jerseys
From Maple Hill Stock Farm. Commencing at 1 o'clock sharp. 5 males from 4 to 20 months old. 16 cows and heifers. Ask for catalogue.
C. W. Poe, Jones, (Cass Co.,) Mich.
1 1/4 mile north Newberg Sta. Air line division of M. C. R. R. from Jackson to Niles.

Public Sale Feb. 23, 1916

30 recorded pure St. Lambert and Golden Lad cows and heifers, 45 recorded Berkshires, bred sows and gilts three boars, all Masterpiece and Rivals Champion blood. For information, address

BEMILLER BROS.

Route No. 4 Elkhart, Ind.

THE WILDWOOD Jersey Herd. Registered Jersey Cattle of Quality. Forty head. Tuberculin tested Majesty's Wonder 30717 heads the herd. His daughters are producing from 400 to 500 lbs. butter in one year as two year old heifers, and are bred to Majesty's Oxford Fox 134214 a classy Grandson of Oxford Majesty which combines type and production. Alvin Balden, Cass, Mich.

MAPLE Lane R. of M. Jersey Herd. Tuberculin tested by the U. S. Government. For sale bulls, cows, bull calves and heifer calves. The lowest record of any mature cow of this strain is 559 lbs. of 85% butter.
IRVIN FOX, Allegan, Michigan.

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

HILLSIDE Farm Jerseys, yearling bulls, solid color, half brothers to ex-world's-record senior 2yr old and from R. of M. dams, with records from 400 lbs. to 800 lbs. C. and O. DEAKE, Ypsilanti, Michigan.

23 Registered Tuberculin tested Jersey Cows for sale. Also young females
HERMAN HARMS, Reese, Michigan.

For Sale—Registered and line bred Jersey Cows and heifers. Tuberculin tested. Chas. B. Cook Farm, Owosso, Michigan.

BIDWELL SHORTHORNS

For "Beef and Milk".
Registered bulls, Scotch-topped, roans, reds and whites for sale. Farm at N.Y.C. Depot; also D. T. & I. R'y.
BIDWELL STOCK FARM
Box B, Tecumseh, Mich.
Albion Stamp 352670

Shorthorn Bulls For Sale

E. B. & W. J. HOSLEY, Howell, Mich.

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

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

Auction Sale Mar. 1st, 1916. 25 head shorthorns, 7 males, at "Locust" on U. R. between Almont & Imley City. **WARNER BROS. Almont, Mich.**

Two Shorthorn Bulls old enough for service. Golden Wyandotte Cockerels. Cullie puppies. **S. G. BELCHER, R. No. 5, Hudson, Michigan.**

Shorthorns For Sale—One red scotch bull 16 mos. Sire Uppermill Omega. One white scotch topped, Sire Bright Sultan. W. B. McQuillan, Howell, Mich.

FOR Sale—18 Reg. Short Horn Bulls by Maxwalton F. Monarch 2nd, a son of Avondale, from 2 to 18 mos. old. **John Schmidt, Reed City, R. No. 5, Michigan.**

MILKING SHORTHORNS. Young bulls for sale after July 1st. **DAVIDSON & HALL, Tecumseh, Michigan.**

3 Choice Shorthorn Bulls For Sale
H. B. PETERS, Carland, Mich.

4 Shorthorn Bulls including Herd Bull of Young Mary Family. Price \$75 and \$200. **W. F. BARR, ALOHA, MICHIGAN.**

POLLED Durhams for sale, pure Short Horns, bred Phormless. Rose of Sharon and Young Mary. 2 bulls 12 mo. 10 young cows and heifers. L. C. Kelly, Plymouth Mich.

Polled Durhams Bull Calves and Heifers. Mule Foot Boars. W. Wyandotte Cockerels. Seed Oats, Barley. **FRANK BARTLETT, Dryden, Mich.**

HOGS.

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

Royalton Bred Berkshires—Fine October pigs both sexes, sired by Royalton Emperor, registered with papers at fair prices. Write to D. F. Valentine, Supt., Temperance, Michigan.

Berkshires of best breeding. Special price on two Spring Boars. **D. W. SMITH, Wixom, Michigan.**

SWIGARTDALE FARM

BREEDERS OF

HOLSTEINS AND BERKSHIRES

Stock for sale at all times. Berkshires of unsurpassed quality and breeding, at reasonable prices. A choice bull calf, nicely marked, five months old, sire's dam with record of over 27 pounds. Dam of calf a grand daughter of Hengerveld De Kol. Price \$50.00.

Swigartdale Farm, Petersburg, Mich.

Berkshires of best breeding, of various ages, either sex, all registered stock, no akin, special reduced price. Write your wants quick. Mitchell's Lakeside Farms, R. 2, Bloomingdale, Mich.

Berkshires Have a choice lot of gilts. I am breeding for spring farrowing. Write me your wants. A. A. Patullo, Deckerville, Mich.

Berkshires. Of various ages, either sex, open or bred, prolific strains, Registered, at moderate price. **Elmhurst Stock Farm, Almont, Michigan.**

Berkshires—Three nice spring gilts bred for May farrow, one Fear ready for service, Fall Pigs either sex. Priced for quick sale. **RIVERVIEW FARM, R. 2, Vassar, Michigan.**

Registered Chester White males and females. Reg. Holstein male calves, herd bull and cows. **Parham's Pedigree Stock Farm, Bronson, Mich.**

Chester Whites Bred sows and Fall pigs for sale also 9 months Holstein Bull. **F. W. Alexander, Vassar, Michigan.**

Capitol Herd D. J. Swine. Young sows bred, young boars, pigs both sex. Express prepaid. **J. H. BANGHART, Lansing, Mich.**

Breeders' Directory—Continued on page 263.

Veterinary.

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

Unthrifty Calf.—I have a calf two months old that is not thriving and I wish you would tell me what to do for him. F. L., Dundee, Mich.—Give calf 4 grs. of quinine and two-thirds of a teaspoonful of cooking soda at a dose three times a day.

Scarred Hind Leg.—The white hind leg of my three-year-old filly became irritated while running in alsike clover and made the leg quite sore. I succeeded in healing this sore, but the hair refuses to grow, and the leg remains thickened. H. D., Tawas City, Mich.—If the hair bulbs are completely destroyed, hair will never again grow on fetlock. Apply either vaseline or wool fat lightly daily, with gentle hand-rubbing.

Mare Took Cold.—I have a four-year-old mare that seems to have taken cold, runs at nose and coughs very frequently, but she is in good flesh, has a fine appetite, and the remedies I have given her have failed to relieve her symptoms. F. H. S., Homer, Mich.—Mix together one part powdered sulphate of iron, two parts ginger, three parts ground gentian and give her a tablespoonful at a dose in ground feed three times a day. Apply one part turpentine, and two parts camphorated oil to throat three times a week.

Sore Necks.—I have been a reader of your paper for a year and have failed to see treatment for sore neck; therefore, I would like to have you tell me how to cure a case. I have washed them with suds made by dissolving carbolic soap in warm water and kept the hair cut off short, but this treatment fails to cure him. There is a black scab on top of neck covering sore. C. P., Rodney, Mich.—First of all, an effort should be made by the owner of every work horse to prevent sore neck, shoulders and back; however, it has often seemed to me that far too little attention was given to the matter of securing a nice-fitting collar, then keeping it clean and disinfected while it is in use. Dissolve 1/4 lb. acetate of lead, 3 ozs. sulphate of zinc and 3 ozs. of tannic acid in a gallon of water and apply this lotion two or three times a day. The black core that you speak of should be cut out and the raw surface painted with tincture iodine occasionally.

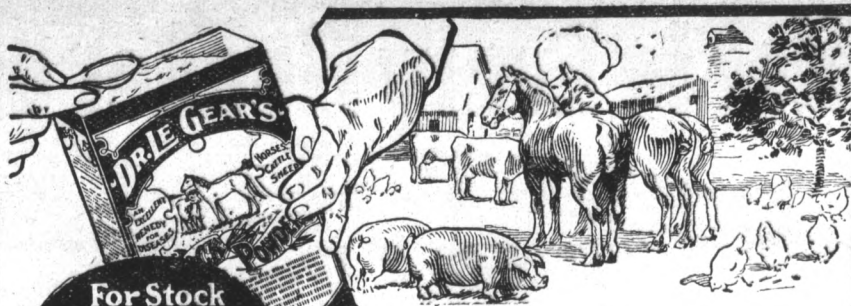
Thick-winded.—I have a horse that had distemper a year ago; ever since then he coughs once in a while and blows when pulling up a long grade. I have fed him pine tar, also kerosene, but neither helped him. H. J. S., Goodrich, Mich.—Apply one part turpentine and two parts camphorated oil to his throat two or three times a week. Feed no clover, or musty, dusty badly cured fodder, and don't feed too much bulky food, when you expect to exert him much. Give a teaspoonful of ground ginger, a teaspoonful of ground gentian and a tablespoonful of powdered licorice at a dose in moist feed two or three times a day. His stable should be kept clean and well supplied with fresh air.

B. M. C., Sherman, Mich.—See treatment for thick wind, result of distemper, this paper.

Chronic Sweeney.—My four-year-old horse has been sweeneyed in both his shoulders since last spring. Our local Vet. treated him some during the summer and helped him, but he is not well. F. E. S., Cassopolis, Mich.—If the entire inflammation of the shoulders has subsided, ask your Vet. to inject with a hypodermic syringe five drops of rectified oil of turpentine in several places over the shoulder where the atrophy has taken place, and in doing so septic measures should be employed. If the animal is nervous and high strung he will paw and fret some for eight or ten hours, and I might say that this treatment will be found superior to most of others in case of muscular atrophy.

Mare Does Not Come in Heat.—I have two mares each seven years old, one of them breeds every year, the other every other year. The shy breeder is either not in heat or is vicious when she comes near stallion. T. Z., Peacock, Mich.—Dilating neck of the womb gently by hand or with a sound, or securing her and a forced service might bring her in heat.

Stomach Worms.—I have a mare coming five years old that will foal about the first of June, which is troubled with stomach worms. A. F., Port Huron, Mich.—Mix together one part powdered sulphate iron, one part salt, one part ginger and three parts ground gentian and give her a tablespoonful at a dose in soft feed night and morning, but avoid giving her cathartic medicine.



For Stock and Poultry
Dr. LeGear's Remedies
One for every curable ailment

Saves feed!

Your profit in stock is measured not by how much feed you give them but by how much nourishment they get out of the feed. Animals with poor digestion cut your profits by wasting feed and developing slowly.

Dr. LeGear's Stock Powders

expel worms and put digestions in A-1 condition, causing your stock to get every ounce of value from the feed given.

Cows give more milk, horses get hardier, hogs develop faster, sheep yield more wool when Dr. LeGear's Stock Powders are used regularly. This is not mere "say-so" but actual results proved both by Dr. LeGear's 23 years Veterinary Practice and by thousands of farmers. Test these powders yourself—get a trial box today at your dealer.

50c stock book free

If your dealer cannot supply you with any of Dr. LeGear's Remedies, tell us his name and we'll send you Dr. LeGear's own stock book free—116 pages and 64 pictures. Write today.

Dr. L. D. LeGear Medicine Co., 712 Howard St., St. Louis, Mo.

Each of Dr. LeGear's 21 different Remedies is his own prescription tested in 23 years Veterinary practice. Ask your dealer for them.

Pulverized Sheep Manure 30% Increased Yield



10 to 20 bushels increased corn yield by applying 100 lbs. sheep manure to the acre. Dropped with fertilizer attachment. Sheep manure is rich in nitrogen, phosphoric acid and potash. Also adds humus. Great for wheat, meadows and other field crops. Wonderful results on gardens, truck patches, lawns, small fruits, etc. **SHEEP'S HEAD BRAND** is sterilized by heat to kill all germs and weed seeds. Pulverized and put into sacks for easy handling. Write for prices delivered. **NATURAL GUANO CO., 834 River St., Aurora, Illinois.**

Saves Money DAILY

You have use for this Feed Cooker nearly every day in the year. **"FARMER'S FAVORITE" FEED COOKER AND BOILER** Bigger profits from cattle, hogs and poultry by cooked feed. Heating water—washing, butchering, etc. Sterilizing milk cans, boiling spraying mixtures. Pays for itself one season boiling sap. Little fuel—coke to chunks, 6 sizes. Many advantages. Guaranteed satisfactory or money back. Write for special price-list and circulars. **LEWIS MFG. CO., 64-78 Oswego St., Cortland, N. Y.**



Dairymen!—The Truth
You may be prejudiced against the Jersey because you don't know her. Look her up. She's the Money Cow. **Get This Book**—a history of the breed and full of very interesting tests and facts. It proves conclusively that for pure dairy type, economy of production, richness of milk, long life and adaptability to feeds and climates—all these combined—the stands way above them all. This book "About Jersey Cattle" is free. Get your copy now. You'll find it mighty good reading. **The American Jersey Cattle Club, 346 West 23rd Street, New York City**

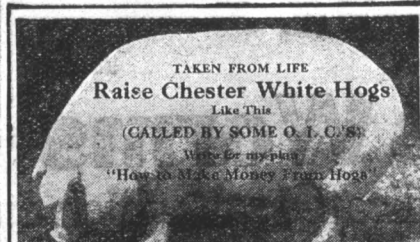
AUCTION

Wed., March 1st., 1916
At 1 O'clock P. M.

Big Heavy Boned Duroc Jerseys. 25 Bred Sows due to farrow in Mar., Apr. and May also a few Fall pigs both sexes. 6 young Horses of the dual purpose type. Also 2 Shorthorn Bulls, 8 mos. old. Sale will be held at my farm 6 miles east of Lansing. Write for Sale Bill.

M. A. BRAY,
OKEMOS, (Ingham Co.) MICH.

HOGS



I have started thousands of breeders on the road to success. I have a very large and fine herd. Every one an early developer, ready for market at six months old. I want to place one hog in each community to advertise my herd. **G. S. BENJAMIN R. No. 10, Portland, Michigan**

Chester Whites: Long type prolific kind. Orders booked for spring pigs. Write your wants. Meadow View Stock Farm, K.S. Holland, Mich.

DUROC JERSEYS Choice Spring boars and fine lot of gilts we are breeding for Spring farrowing from Michigan Masterpiece and other noted boars. Prices reasonable. **The Jennings Farm, R. 1, Bailey, Mich.**

DUROC JERSEY BOARS a choice lot of spring boars. Fall pigs, pairs and trios not akin. **W. C. TAYLOR, Milan, Michigan.**

Duroc Jerseys—Fall and spring pigs either sex, from choice strains. **S. C. STAHLMAN, CHERRY LAWN FARM, Shepherd, Michigan.**

J. W. KEENEY, Erie, Mich. Gilts for April Farrow. Breeder of Duroc Swine D. M. & T. local from Monroe or Toledo, Keeney Stop.

DUROC JERSEY tried sows and spring gilts bred to E. D's. Defender Col. No. 22975. Inspection invited. E. D. Heydenberg, Wayland, Mich.

DUROCS of the best of breeding. April farrow. Either sex. The gilts will be bred for Apr. farrow. Price \$20.00 to \$25.00 while they last. **H. G. Keester, R. No. 5, Cassopolis, Mich.**

DUROC Jerseys, Yearling Sows & gilts bred for Apr. farrow to a son of Orion Cherry King the greatest Boar of his breed. Also fall pigs either sex. **F. J. Drott, R. 1, Monroe, Mich.**

Duroc Jerseys for sale—a few choice fall pigs of either sex. Fancy Buff Rock cockerels. **JOHN MENICOLL, Station A, Route 4, Bay City, Mich.**

DUROC Jersey Mar. gilts bred for April Sept. pigs either sex and Holstein bull calves & 4 Registered Holstein cows. **E. H. MORRIS, Monroe, Mich.**

DUROC JERSEYS Boars and sows all sold. Some good fall pigs either sex for sale. **Wm. W. Kennedy, R. B, Grass Lake, Mich.**

Durocs yearling sows and gilts bred for Apr. farrow. Aug. Boars. Booking orders for Spring pigs at weaning time. **E. J. ALDRICH, R. 1, Tekonsha, Calhoun Co., Mich.**

DUROC JERSEYS A few bred gilts for sale. **Carey U. Edmonds, Hastings, Michigan.**

For Sale—A few of those big bone Duroc Gilts, bigger and better than ever. Safe in pig to an Orion Boar. Prices from \$25 to \$40. Also tried sows and a few boars cheap. **F. A. LAMB & SON, CASSOPOLIS, MICHIGAN.**



O. I. C. Bred Gilts
Choice 100 lb. Pigs \$16.
J. CARL JEWETT, Mason, Mich.

O. I. C's Fine gilt farrow in February, yearling, bred, sows, price right. **A. R. GRAHAM, Flint, Michigan.**

O. I. C. SPRING BOARS of good type and Red Polled bull calves. **John Berner and Son, Grand Lodge, Mich.**

O. I. C. choice serviceable boars; bred gilts for April and May farrow. Fall pigs not akin. Write for low prices and photo. **A. V. Hatt, Grass Lake, Mich.**

O. I. C's. All sold except one July boar and a few Oct. pigs. **C. J. THOMPSON, Rockford, Michigan.**

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

O. I. C. serviceable boars, tried sows, gilts bred for March and April farrow, summer and fall pigs. I pay express. **G. P. ANDREWS, Dansville, Mich.**

O. I. C. Gilts bred for March, April and May farrow. Recorded in buyer's name. **H. W. MANN, Dansville, Michigan.**

O. I. C's. Strictly Big Type. Four boars fit for service. Four July boars, 25 Spring gilts, four fall yearlings, four tried sows, all bred for Spring farrow. Also fall pigs not akin. Extra good ones. As I am crowded for room, this good stock will be sold at Farmers' prices. They are good enough that I will send them C.O.D. & record them free. **Newman's Stock Farm, Mariette, Mich. R. 1.**

O. I. C. and CHESTER WHITE SWINE Big type with quality. We have the undefeated breeders young herd at seven State fairs this year. They were sired by Abo 2nd, one of our many good herd boars. Special prices on all boars for the next 30 days. Get a Gilt bred to the Great Schoolmaster, the highest priced boar of the breed, Champion over champions. Write for our big catalogues with history of the best herd in the whole country. Come and see them. **Rolling View Stock Farms, Cass City, Mich.**

O. I. C. Choice Spring boars and bred Gilts. We pay Express and Register free. **Glenwood Stock Farm, Zeeland, Michigan.**

Registered O. I. C's. Attractive prices on fall pigs and last spring gilts. All from large litters. **Elmer E. Smith, Redford, Mich.**

O. I. C's. 20 bred sows for sale. 8 last April gilts averaged 270 lbs. Jan. 10, 1916. They are a very growthy lot. Have some May gilts and last fall yearlings also for service boars and plenty of last fall pigs. **Otto B. Schulze, Nashville, Mich.**

O. I. C. Choice gilts bred for April and May farrow. Also last fall pigs of excellent quality. **A. J. BARKER, ADA, MICH. R. No. 3**

O. I. C. Sows bred for March and April farrow. Priced to sell, from best of stock. Write for photo and pedigree. **E. B. MILETT, Fowlerville, Michigan.**

O. I. C. SWINE I am offering strictly O. I. C. type bred to farrow the forepart of May, also fall pigs price right. Stock registered in purchaser's name free of charge. **A. J. Gordon, R. 2, Dor, Mich.**

O. I. C. Choice Boars ready for service. I pay express and register fees. **JULIAN P. CLAXTON, R. 8, Flint, Mich.**

POLAND CHINAS

From our thousand pound Grand Champion Boar and Big Stretchy Sows of best breeding. Spring Boars at a bargain. Bred Gilts and Brood Sows. **Hillcrest Farm, Kalamazoo, Mich.**

POLAND CHINA gilts bred for March and April farrow. Fall pigs, satisfaction guaranteed. **G. W. HOLTON, Kalamazoo, Michigan.**

POLAND CHINAS of the big type. Spring boars, Gilts bred for April farrow. **A. A. WOOD & SON, Salline, Michigan.**

Large Strain P. C. a few choice boars of spring and early summer farrow. A choice lot of spring Gilts bred for spring farrow sired by Big Defender the boar that every boar goes wild over. **H. O. SWARTZ, Schoolcraft, Michigan.**

Large Type P. C. Gilts and sows bred for Mar. and April farrow. Sired by Big Des Moines, Big Knox Jr., and Giant Defender. Bred to Big Knox Jr. Smooth Wonder 3 and Big Jumbo, four great-est boars in state. Come or write. **W. E. Livingston, Parma, Mich.**

Big Type Boars all sold. Have several good Gilts Bred to Smooth Jumbo, Jr. Top Boar of J. D. Collin Sale. Priced right to go quick. **A. D. Gregory, Ionia, Mich.**

Big Type Poland China Gilts bred to a good son of B. Wonderful Wonder. He sold in Iowa for \$625. This will lease you. **Robert Martin, R. 7, Hastings, Mich.**

For Sale Poland Chinas either sex, all ages. Something good at a low price. **P. D. Long, R. F. D. No. 8, Grand Rapids, Mich.**

Heavy Boned Poland Chinas. Both sex and all ages at bargain prices. Also, B. P. Rock Cockerels. **ROBERT NEVE, Pierson, Michigan.**

POLAND CHINAS—Big and medium type. Gilts bred to big type boars for April farrow. Fall pigs, either sex. **L. W. Barnes & Son, Byron, Michigan.**

Big Type P. C. Bred sow sale, Feb. 18th. Write for Catalog. **W. J. HAGELSHAW, Augusta, Michigan.**

Big type Poland Chinas—Western bred, long bodied extra large bone, pairs or trios not akin. We have Peter Mow, H. Fesenmeyer and Geo. Marshall breeding. Call or write. **W. Breyer & Sons, Elsie, Michigan.**

Large Yorkshires Gilts bred for spring farrow. Service boars. Pigs all ages. Prices Reasonable. **W. C. COOK, Route No. 1, ADA, MICHIGAN.**

"Jones Pays the Freight" Yorkshires Pay the Mortgage. Bred Gilts for March and April farrowing. Meadowland Farm, Waterman & Waterman. **Ann Arbor, Mich.**

MULEFOOT HOGS. Just a few left yet for sale. **C. F. BACON, R. 3, Britton, Michigan.**

Hampshire Hogs—Nothing for sale but Apr. Boars. Taking orders for spring pigs. Write your wants. **John W. Snyder, St. Johns, R. No. 4, Mich.**

Hampshire Swine. Pigs of both sex. Bred Sows. Service boars. Write for prices. Price to sell. **FLOYD MYERS, R. No. 9, Decatur, Ind.**

HAMPSHIRE Swine. The great pasture hog. Select herd headed by a mammoth son of the Great "Look Out." Have a few bred sows and fall pigs for sale. Booking orders for spring pigs in pairs and trios, not akin, at reasonable prices. **Geo. E. Starr, Grass Lake, Mich.**

SHEEP.

Kope Kon Farms

SHROPSHIRE and DUROCS. KINDERHOOK, MICH.

Oxford Down Sheep. no stock for sale at present. **M. F. GANSLEY, Lennon, Michigan.**

Shropshire Registered bred ewes, also ewe lambs. These are first class sheep at reason-able prices. **G. P. ANDREWS, Dansville, Michigan**

Mr. Feil's Offer to Every Reader of this Paper



I'll Rid Your Stock of WORMS

I'LL PROVE IT BEFORE YOU PAY

I have been advertising in this paper for years. Thousands of your brother subscribers are feeding SAL-VET regularly and are enthusiastic over the benefits they received. Read what one of the thousands has to say:

"We had forty head of hogs last fall; they were in bad shape, getting poorer every day. We began feeding SAL-VET to them, and they immediately began to improve, and kept on improving, until now we have just as nice a bunch of hogs as any one wants to see."—Jaeger Bros., Lincoln, Minn.

I want every reader of this paper who has not yet accepted my liberal offer to do so now. I am going to make it so easy for you, yourself, to find out what SAL-VET will do for your farm animals that whether you have a few head of stock or a thousand, you cannot afford to pass by the offer below.

Sidney R. Feil.
Pres. of The Feil Mfg. Co.



Destroys Worms — Aids Digestion!

SAL-VET is a medicated salt which contains no antimony. It is a safe, simple inexpensive remedy which gives farm animals the medicines they need along with the salt they crave. It requires no dosing, no drenching, no starving. It is the most widely known and used live stock remedy on the market. Almost every farmer and stockman has heard about it and hundreds of thousands of users testify to the remarkable benefits obtained from its use.

Thousands of SAL-VET Users Write Like This:

Remarkable Change in 3 Weeks
"SAL-VET has done wonders for my hogs, which were run down and in as bad a condition as any hogs I ever saw. Three weeks after having access to SAL-VET they began to gain in flesh and now look fine and in good condition."
—Ed. Van Moer, Amiret, Minn.

SAL-VET Benefits all His Stock
"I have given your 'SAL-VET' the best test possible, feeding it to our sheep, hogs, horses and cattle. Since keeping 'SAL-VET' before my sheep, I have had no losses and the animals are in much better condition than when I began. It has greatly improved the appearance of my hogs, given them ravenous appetites and not one of my sows has had any trouble in farrowing. 'SAL-VET' is a good preventive of disease."—S. Jett Williams, Rt. No. 20, Wadesville, Ind.

Rid His Horse of Worms
"I have a five year old horse that had been in bad condition for over 12 months. His hair looked dead, he was very thin, and I could not get him to eat anything, altho' I tried a lot of different remedies, nothing seemed to help him. I then fed him 'SAL-VET' and ever since he has had a hearty appetite, has become as sleek as a mole, and is in fine shape generally, and is being worked every day."—O. T. Peden, Mt. Hermon, Ky.

Stopped His Hog Losses
"We were losing our pigs at a rapid rate when we got your SAL-VET. As soon as we had fed it for a few days, they stopped dying. SAL-VET is just fine."—Edd Schauf, Wellman, Iowa.
"Hogs have died all around the neighborhood lately. I have been feeding SAL-VET and only one of mine has been sick. SAL-VET surely brings the hogs along."—T. J. Wright, Phelps City, Mo.



Look for This Label
on all SAL-VET packages. Don't be deceived by imitations. Don't buy 'Sal' this or 'Sal' that. Get the original Genuine SAL-VET.

Prices	Each 40 lb. package	Each 100 lb. package	Each 200 lb. package	Each 300 lb. package	500 lbs.
	— \$2.25	— 6.00	— 9.00	— 13.00	— 21.12

Extra discount in larger quantities.
No orders filled for less than 40 lbs. on this 60-day trial offer. Shipments for 60 days' trial are based on 1 lb. of SAL-VET for each sheep or hog and 4 lbs. for each horse or head of cattle. Thousands of dealers sell SAL-VET at above prices but in the far West and South the prices are a little higher on account of the extra freight charges.

(245) **THE FEIL MFG. CO.**
Dept. 80-2-19-16 Cleveland, Ohio

Supply me enough SAL-VET to last my stock sixty days. I agree to pay the freight, feed it as directed, and will then pay for it if it does what you claim. If it fails and I so report specifically in 60 days, you are to cancel the charge and I will owe you nothing.

I'll Feed Your Stock 60 Days Before You Pay

If you will fill out the coupon below and mail it to me today, I will ship you enough SAL-VET—my great worm destroyer and live stock conditioner—to last all your stock 60 days. I don't ask you to send me a cent of pay in advance. I want to prove BEFORE YOU PAY—right on your own farm, that SAL-VET will do just what I claim—If it fails I won't charge you a single cent for the 60 days' trial. If it does what I claim—if it does what thousands of other farmers and stockmen say it has done for them, then I know you will gladly pay the small cost of this 60 days' feeding trial. SAL-VET is not only the best stock remedy on the market but the cheapest. Costs only one-twelfth of a cent a day for each hog or sheep, and one-half a cent a day for each horse or head of cattle.

Send No Money—Just the Coupon

Just fill out the coupon—tell me how many head of stock you have and I will supply you enough SAL-VET to last all your stock 60 days; you pay the freight charges when it arrives and feed it according to directions. If SAL-VET does not do what I claim and you make a specific report in 60 days I'll cancel the charge; you won't owe me a penny. Address

SIDNEY R. FEIL, President

THE FEIL MFG. CO., Chemists, Dept. 80 , CLEVELAND, OHIO

I have.....hogs.....sheep.....horses.....catle

Name.....

P. O.

Ship to.....State.....

"Sal-Vet' straightened twelve sick shoats I had and put them in nice shape, and also drove a lot of pinworms from a gelding."—Vern Aldrich, R. F. D. 1, Quimby, Mich.

"Sal-Vet' is good stuff. I did not lose a hog since I have been

feeding it, although, when I got it, I had one that had what we thought was cholera, but it recovered, all right. I do not think that 'Sal-Vet' has an equal as a stock remedy."—A. J. Gilbert, Buchanan, Mich.

"I am sending remittance for

the 'Sal-Vet' you sent me on trial. Am perfectly willing to pay for it, and want to say that I prefer to use 'Sal-Vet' for my stock in preference to any other preparation for the same purpose."—Cal E. Hardy, Rt. 3, Mayville, Mich.