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SUDAN grass is of African origin and was first introduced in the United States in 1909. It has proved to be well adapted to certain sections of the southwest, and during the past two or three years has been rather extensively advertised as a valuable grass for general use over much of the United States. Michigan farmers have therefore become interested in any available data on this grass and its adaptability to Michigan conditions.

Sudan grass is a tall, coarse, annual grass closely related to the cultivated sorghums and the Johnson grass of the southern states. It resembles the latter grass in general appearance but differs in not having the underground root stalks which make the Johnson grass so difficult of eradication. It makes a growth of three to eight feet, according to the thickness of planting, fertility of soil, season, etc. In the northern states one, or sometimes two crops are secured, and in the southern states as many as four crops are sometimes harvested.

Sudan grass does best where the summers are long and hot. It is a fairly good drought-resisting grass. While it may be grown on a variety of soils, it does best on fertile soils that are well supplied with organic matter. The growth on very light or badly run soils is small.

Adaptability to Michigan Conditions.

Sudan grass has been little tried in Michigan. However, the following points are worthy of consideration by those contemplating seeding it. Large yields sometimes reported from fertile soils in the southern states should not

be expected. Sudan grass should occupy much the same place on the farm as millet or sorghum rather than as a substitute for alfalfa, clover or timothy. It is a true grass (not a legume) and the crop is produced at the expense of the store of plant food in the soil. On many of our soils, especially those in which the nitrogen content is relatively low it would seem best to depend upon some of the numerous leguminous crops that are well adapted to Michigan conditions. It is therefore recommended that farmers seed only small acreages for general forage purposes until more data are available in regard to the value of this crop for growing under Michigan conditions.

Sudan grass produces seed abundantly and may be matured as a seed crop in Michigan. The price of the seed has been very high in the past few years but has dropped materially recently. As long as the high prices are maintained Sudan grass should be a profitable seed crop for the Michigan farmers. Pure seed produced in the northern states is in greater demand than seeds produced in the Johnson grass infested areas in the southern states.

Cultural Methods.

On account of the heat-loving nature of the plant and the slow development during the early periods of growth, the seed bed should be thoroughly prepared, well firmed and free from weeds,

Sudan Grass

By PROF. V. M. SHOESMITH

and the planting should be delayed until the season is fairly well advanced and the soil is thoroughly warmed. May 25 to June 10 is a favorable time for seeding. When grown for hay it should be close drilled or broadcasted, using twenty to twenty-five pounds of seed per acre. When grown for seed it should be drilled in rows thirty to thirty-six inches apart, using four or five pounds of seed per acre and cultivated throughout the season the same as corn.

The crop should be cut for hay just after full bloom. While Sudan grass is rather coarse and is harvested late in the season, it can be cured satisfactorily under favorable weather conditions. Mr. C. G. Williams, of the Ohio station, reports a three-year average yield of 4.3 tons per acre as compared with 3.9 tons of German millet. A limited number of Michigan farmers reporting consider it equal or slightly better in yield than millet. Under average or fairly favorable conditions, one and a half to four tons per acre can probably be produced.

Feeding Value.

Sudan grass hay is palatable to the stock and seems to have no objectionable qualities which would make it unsafe for feeding. Judging from available analyses the hay is materially lower in feeding value than millet, sorghum or timothy. However, final judgment in regard to feeding value

should be reserved until more data are available.

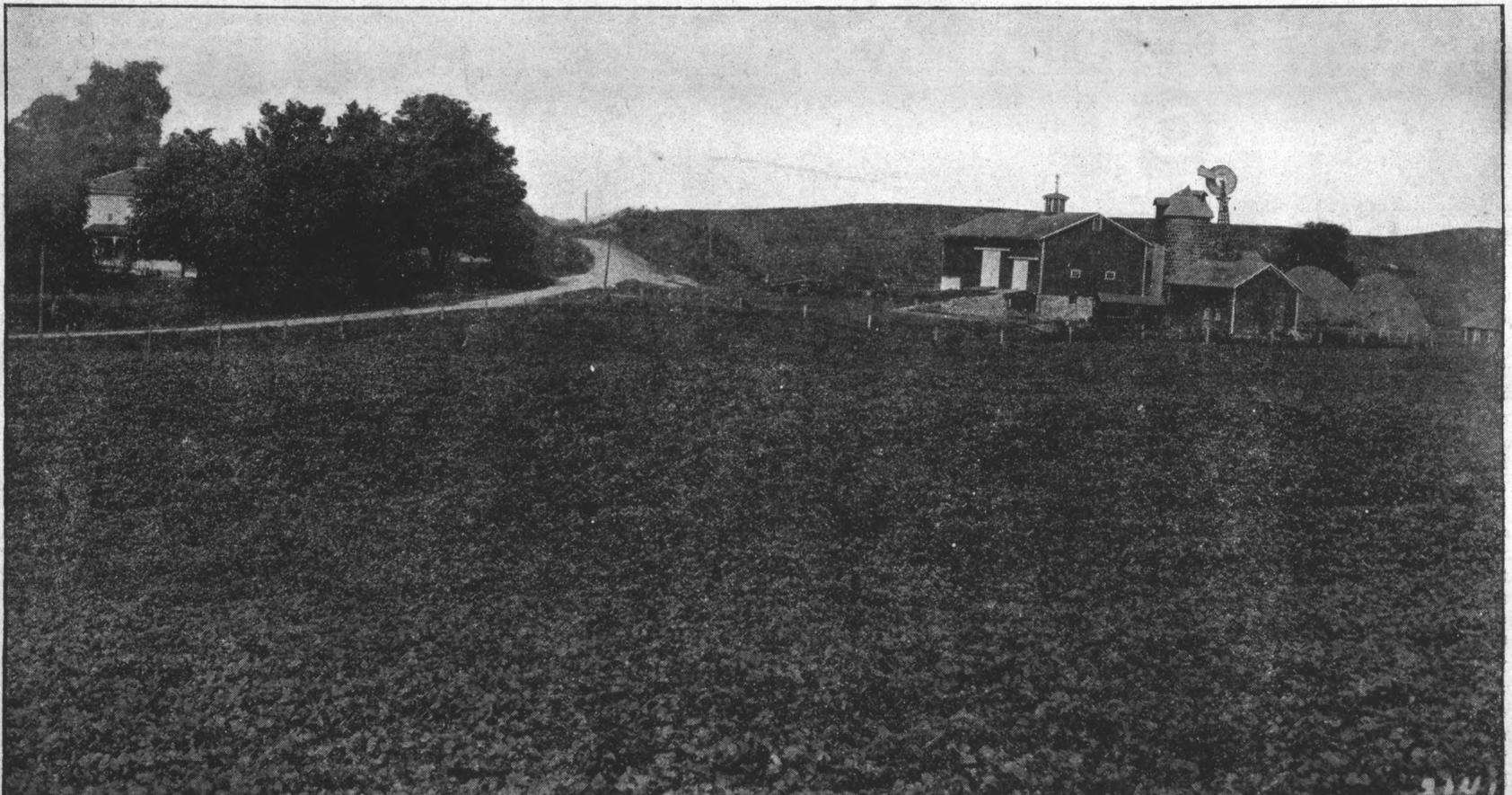
The following statements from Michigan growers and from experiment station investigators will be of some interest:

Some Michigan Experiences.

Edw. E. Evans, Ogemaw Co., says: "Owing to the wetness of the season do not think the Sudan grass had a fair trial last year. Part of it (one-half acre) was on sand, rather low, one end running down to muck. This piece had 250 pounds of high grade fertilizer. On the muck there was no Sudan grass. Crop was harvested September 14-15 without frost. I saved a little seed from the same. Was afraid to trust the crop longer for fear of frost, though as it turned out, most of the crop would have matured safely. Would mature here at the same time as early varieties of corn. Think the first week in June best time for sowing here. Consider it superior to all millets except Japanese barnyard, and that for forage only. Have fed it since January 1 to six calves. They like it and leave very little. As they have been fed soy bean hay and straw at the same time am unable to judge of its feeding value. All I can say is that calves grow like weeds and are in perfect condition."

L. H. Remus, Lenawee county, reports seeding broadcast about June 1. He finds that the Sudan grass is easily injured by frost, his crop being injured when it reached the height of three feet. He considers the feeding value better than that of millet.

(Continued on page 652).



To Insure a Crop of Beans Like this it will be Necessary to Secure Seed which is not Badly Affected with Anthracnose and Bacterial Blight.

The bean crop promises to be unusually profitable to Michigan growers this year, if the usual acreage is planted with clean seed and cultural methods practiced which will encourage a maximum yield. Well informed men in the bean trade predict high prices for next year's crop, even with a maximum production. With the market practically bare of stock, it is certain that few old beans will be carried over, and with a foreign demand rather than a foreign surplus as a factor in the situation the prediction is likely to be fulfilled. But the net profit to the grower depends not a little upon the planting of good seed, hence the importance of every bean grower securing the cleanest seed available.

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DETROIT, MAY 20, 1916

CURRENT COMMENT.

Some Important Testimony.

At the National Conference of Milk Producers held in Washington the first week of May, many phases of the market milk problem were discussed by men of national reputation. A comprehensive report of this conference or convention is published in another department of this issue. Every dairyman who is at all interested in this market milk proposition should carefully read this report which contains valuable expert testimony bearing on the points which have been under discussion in these columns during recent weeks.

Relating to the matter of inspection as usually practiced by municipal boards of health, Dr. Harding, dairy bacteriologist of the University of Illinois, stated that bacterial examination is at present the best test of cleanliness, and that using the bacteria count as a test investigations show that the condition of the barn or stable, as ordinarily scored, has very little effect upon the bacteria content of milk except in extreme cases. The conclusion reached by this authority is that the two great sources of contamination are the handling of the milk in the process of straining, aerating, transporting in cans, in bottling machinery, and in temperature. Of these, responsibility for contamination at strainer and pail, which tests show to be least common, is with the farmer; while responsibility for contamination from machinery in bottling, which tests show to be most common, lies with the retailers, and temperature so far as it relates to time and methods of handling is a matter for which the transportation company or retailer is responsible after the milk is delivered at the receiving station.

This is practical testimony from a scientist of repute in direct support of the contention that the test upon which milk is admitted to city markets should be the quality of the milk itself, as determined by a bacteriological examination at the receiving station, instead of upon dairy farm inspection alone as is the case at the present time. When considered in connection with the New York experiments, this testimony given by the bacteriologist of the Illinois station is an important added argument for this method of scoring the farmer's product rather than his farm. The weight of this testimony, together with that which has been previously advanced through our Practical Science Department, should be sufficient to induce the health departments of Detroit and other cities to at least try out this plan of inspection, if they are inclined to be progressive in their methods and

fair in the administration of their authority.

The description of the conditions which obtain in the Chicago dairy district and the methods employed by the dairymen in that district to secure a compensatory price for their product as described by the secretary of the Northern Illinois Milk Producers' Association is also an interesting feature of the report above mentioned. The careful reading of this report should impress upon every producer of market milk who is a reader of this paper, the importance to himself of obtaining all possible information upon every phase of this subject through every channel open to him, and of attending the meeting of Michigan milk producers which has been called at the Agricultural College on May 23.

While general discussion of every phase of the market milk problem is beneficial in an educational way, yet the problem is purely a local one in its final analysis, and its best solution can be worked out only through the co-operation of a large percentage of local producers. Of ten thousand dairy farmers, the larger percentage of whom are renters, producing market milk in the Chicago dairy district, more than nine thousand stood together in the recent milk strike and, acting as one man, won recognition of the justice of their cause and secured a more compensatory price for their product. If Michigan dairymen take a like interest in the coming Lansing meeting, an early solution of many of their most serious problems may be safely predicted.

Quite frequently one City vs. Country Health.

which exists in well regulated cities as compared with country districts, health conditions have changed about in recent years and become better in the city than in the country. Some statistics recently compiled by the Bureau of the Census show the error of this assertion when applied to the country at large.

According to these figures, the death rate among white males under one year of age in cities having 8,000 population and over in 1909 and in cities of 10,000 population and over in 1910 and 1911, was 13,380 per 100,000 born alive, whereas in smaller places the corresponding rate is only 10,326 per 100,000, or 23 per cent less than the rate for cities. A similar difference prevails with respect to white females under one year of age, for which the death rate is 24 per cent less among rural than among urban population.

For white males the expectation of life at birth in rural sections is shown to be 7.7 years greater than in cities; at the age of ten years, 5.4 years greater, with a margin of more than five years in favor of the country resident until the age of 39 years is reached. Thereafter the difference becomes gradually less, but is always in favor of the country until the advanced age of 83 is reached, at and after which the urban resident has a greater expectation of life than the old man living in rural localities.

For white females the difference between the urban and rural longevity is somewhat less though still pronounced. At birth the white female's expectation of life is shown to be six years greater in rural than in urban localities; at ten years of age it is 3.3 years greater, and until the age of 46 years is attained the difference continues to be more than three years in favor of the country resident. Thereafter the difference declines until the age of 83 is reached, after which the old ladies of the city have a slightly greater expectation than those living in the country.

This, however, is not an argument against better living conditions in the country, but is an argument for wholesome county life to which the advantages of good sanitation and hygiene

should be added in many cases, thus to a still greater extent making country living conducive to long life as well as to greater present enjoyment.

The Preservation of Records.

In announcing the forty-second annual meeting of the Michigan Pioneer and Historical Society, which will be held in the Senate Chamber at Lansing on Wednesday and Thursday, May 24-25. That organization directs public attention to the importance of the preservation of old records which have a bearing upon the early history of the state. In urging all historical and patriotic organizations to send delegates to this annual meeting for a conference regarding plans for the safeguarding of records relating to the pioneer history of the state, members of these organizations and all others interested are requested to carefully consider what might be the result of a fire which would destroy the town or county buildings and with them records having an important bearing upon the early history of such municipality. Wherever important records of this kind exist, those having charge of them, and other interested citizens, are urged to look into the matter of their condition and safety and to send copies of the most valuable records and statistics to the state society for protection and preservation. The people of every locality who are interested in the early history of the state are urged to call a meeting of all interested, start a county historical society and send a delegate to the state meeting on the above date. Such societies are entitled to a set of thirty-nine volumes of the Michigan pioneer and historical collections with all historical bulletins, pamphlets and books published by the state historical commission.

The pioneers of the state are rapidly passing to the great beyond; men of three-score years are now termed pioneers. Many of them living in every rural community have treasured up reminiscences related to them in their youth relating to the early pioneer days of the state. Many of these reminiscences are well worthy of preservation in the records of such a society. They are full of human interest, and will afford the members of such an organization not a little pleasure if related for the purpose of permanent entry in its records.

In the strenuous rush of modern life we are too apt to forget the work and experiences of those who have gone before us and have made possible the enjoyment of our present homes. The suggested activity is well worth considering by the remaining pioneers and those for whom pioneer reminiscences have a special interest in every community.

HAPPENINGS OF THE WEEK.

Foreign.

The European War.—While artillery activity is being kept up around the fortress of Verdun, the Germans are gradually widening the scope of their attacks. On both sides of the Meuse river violent bombardments by both the French and Germans and infantry attacks have occurred almost constantly for the past several days without any material change in the line of trenches. Last week the Germans succeeded in taking a small line of trenches from the British near Lille and other points along the western front were made the scenes of artillery duels, but no advantages were gained by either side. Nothing of consequence is reported from the Russian front, and while there is some uneasiness in the Balkan district, no engagements of importance are reported. The Russians are persistent in their attacks on the Turkish lines in Asia Minor, and their efforts are meeting with general success. An English report states that another Zeppelin has been brought down off the coast of Norway.

Mexican Affairs.—The efforts of Gen. Scott and Gen. Obregon to reach an agreement regarding the disposition of American troops in the hunt for Villa and his followers, have apparently failed, and the two representatives have been called home by their respective governments. An attempt

will now be made to settle the matter through the state department. Gen. Funston is massing American forces within two hundred miles of the American border for the purpose of protection against any surprise attack by the Mexicans. A delegation of Mexican business men are now enroute for Germany on an unknown mission.

Rebel forces of Santo Domingo have evacuated the Dominican capitol when warned by the United States minister that the city would be taken if the rebels remained therein. After stripping the fort of all guns and war munitions the soldiers retired to county points.

Considerable feeling has been aroused throughout the British Isles and in many of the British colonies, by the manner in which the Irish rebels have been treated. In order to get firsthand information, Premier Asquith is making a personal investigation of the conditions as they exist in Dublin. This personal interest of the premier has apparently gained considerable confidence of the Irish subjects and it is reported that he has ordered a relaxation of martial law in that city.

The government of Sweden is protesting against the fortification of islands commanding the entrance to the Gulf of Bothnia and also the Gulf of Finland, by Russia, claiming that permanent fortifications at this point would be a menace to the security of Sweden.

The German government has appointed a new food minister who is to have absolute control of the distribution and prices of all foods. In establishing this office the government hopes to relieve a situation by which at present the large cities are suffering to the advantage of the rural districts.

In an address delivered at Nancy, France, President Poincaré declared that France does not want Germany to tender peace, but wants her adversary to ask for peace.

The Greek government is in a serious financial situation. The Chamber of Deputies will consider the issuing of unsupported paper and providing for a graduated tax on the net profits of shippers besides taxes on hotels, mills, and other businesses.

National.

For fear that the wrong interpretation will be placed upon the action of this country in warning Great Britain on matters pertaining to stringent orders in connection with the blockade of Germany and neutral ports of northern Europe, the State Department at Washington has delayed sending a note to London. This delay it is stated, is due solely to the attempt of Germany to impose as a condition of the abandonment of illegal methods of submarine warfare to the effect that the United States should require Great Britain to permit the shipment of food-stuffs to reach the population of Germany.

A summary of the growth of foreign commerce of the United States shows that all previous records were broken during the month of February when the balance of trade in favor of the United States amounted to \$209,056,001. The preliminary report for the month of March indicates a balance in excess of that for February. More than half of the total exports for February went to England and British possessions.

Despite the poor returns from the local fruit crop in 1915 and the equally poor resort season, savings deposits in the four banking institutions in Benton Harbor have passed the million dollar mark for the first time in the history of the city. Dry advocates credit the splendid showing to the absence of the saloons.

The Michigan Pioneer and Historical Society has undertaken an active campaign to perpetuate through the memoirs of remaining pioneers, events in the early history of the state. Counties are being urged to organize auxiliary societies to assist in this work.

The Aero Club of America is planning a monster contest to consist in aerial flights across the continent for prizes amounting to probably \$100,000.

Preliminary arrangements are being completed for the Republican National Convention to be opened in Chicago on June 7. Delegates and visitors to the National Democratic Convention at St. Louis are finding it difficult to secure accommodations, and Mississippi river passenger boats are being chartered as sleeping quarters for the visitors.

Congress will consider national defense legislation again this week. A compromise army reorganization bill which provides for a regular army of 206,000 men at peace strength will probably be reported to both houses. After the army bill has been disposed of the navy building program will be taken up.

All departments of Michigan newspaper workers' federation will assemble at Battle Creek for a three-days session on Thursday of this week.

Concrete Anchor and Line Posts

By PROF. H. H. MUSSELMAN

CONCRETE fence posts are under certain conditions, to be recommended. Anchor posts of good size and material compare favorably in cost with wood and serve admirably not only as fence anchors but as permanent markers for the corner of fields or farms. When properly proportioned they also give the impression of strength and stability. A well-designed concrete post on either side of the main entrance or drive also lends dignity and architectural beauty to the landscape.

Anchor posts should be 12 inches square at the top, 16 inches square at the ground line. Five feet is a good height, and a depth of not less than three feet below the ground is recommended.

Forms for the anchor post may best be made of two-inch lumber. They can be built up with the four sides separate and held together with clamps which are also made of boards, as shown in Fig. 1.

For attaching gates or fences to the anchor post, it is well to provide holes

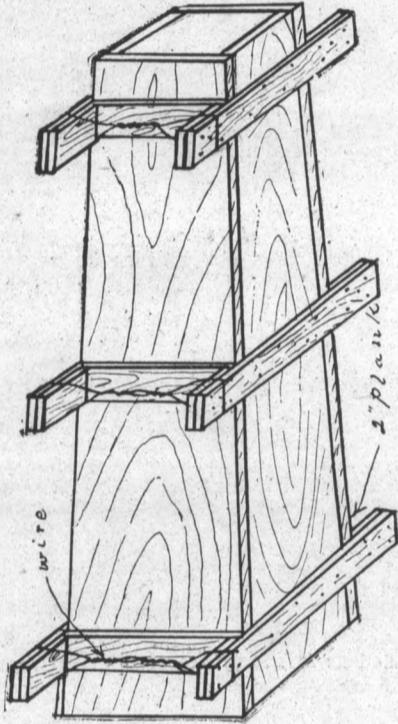


Fig. 1.

for hinges through the post. It should not be forgotten that the anchor post is a permanent thing and is extremely difficult to remodel. Two holes will be sufficient both for gate fastening and fence attachment. Before the molds are filled it is well to place piece of three-quarter-inch pipe in the proper place for the gate hinge bolts. The hinges will have to be made by the local blacksmith as they will need special fastenings to the post. By attaching an eyebolt to the opposite end of these hinges and passing it through a piece of pipe or 2x4, a neat way of fastening the fence ribbon may be secured as shown in Fig. 2. The details of the hinge are shown in Fig. 3.

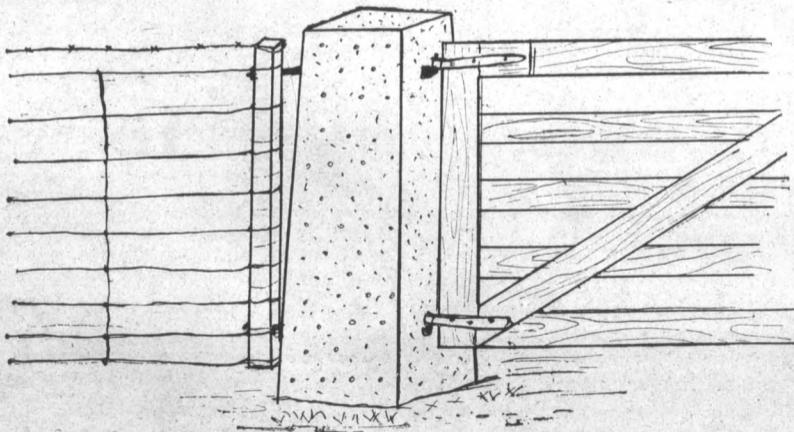


Fig. 2.

For line posts of concrete it is advised that they be well made or not at all. It takes more and better material

and workmanship to make successful ones than is generally supposed.

Line posts are not recommended to be placed about yards or paddocks where they are likely to be broken by animals running against them or where they may be struck by wagon tongues or hubs. They are not as

to get the rods of the proper length and for that purpose a length gauge may be contrived by nailing a stop block at the proper distance from the bending device.

Instructions for Making.

The proportions to use of cement, sand and gravel should be 1:2:3, mean-

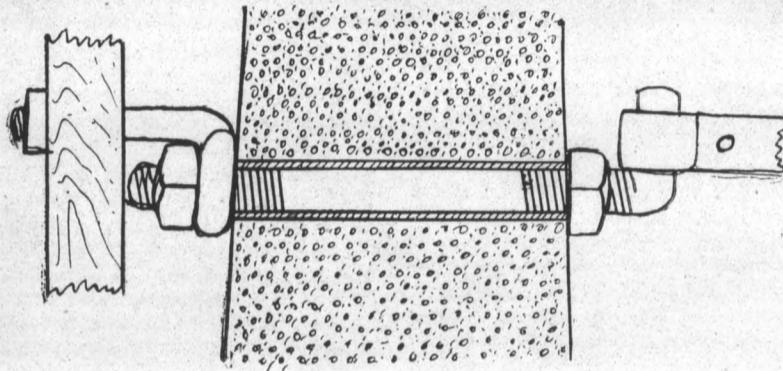


Fig. 3.

strong and resilient as wooden posts and will not withstand shock or jar. In an open field the loss of an occasional post from the above causes will not be objectionable. Following is given directions for making molds and posts:

Molds.

Molds made of 26-gauge galvanized iron hung in a wooden frame give good satisfaction and may be handled rapidly. It will be necessary to have as many molds as it is desired to make posts at one operation. Since these molds may be refilled about every three days it will not be necessary to have a great number.

Reinforcing.

Round iron rods quarter-inch in diameter should be used for reinforcing. To satisfactorily place this reinforcing it is necessary to have some means of holding it in place while the concrete is being placed in the forms. This may be done by means of half-inch saddles in the shape of the letter "U" which are placed through holes in the end of molds. Pins are placed through the holes in the ends of the "U" and the reinforcing which is hooked at the end is placed over these pins and drawn tight with wooden wedges placed under the bend of the "U." The

ing one part cement, two parts sand, and three parts gravel. Sand is understood to be the material which will pass a screen of quarter-inch mesh, and gravel that which will remain on it. For posts, however, gravel larger than half-inch cannot well be used for this reason, and should be screened through a half-inch screen. A mix made of these proportions with sand and gravel measured separately, will make a better concrete than that made from gravel as it commonly runs at the pit. Pit gravel as a rule contains too much fine material. If pit gravel is used it should be mixed 1:3, cement and gravel. For proportioning, a bottomless box should be used for measuring the gravel. A bag of cement may be counted as a cubic foot and the box should be made large enough to hold gravel for a one-bag mix. Where the sand and gravel are separate, the box should be made large enough to hold the gravel for a one or two bag mix and the sand can then be measured in the same box.

Reinforcing.

Reinforcing should consist of quarter-inch round smooth black iron rods. Purchase these straight and cut to the required length—eight feet for an eight-foot post. Hooks are then made

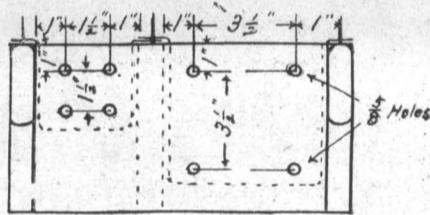


Fig. 5.

mold assembled with the reinforcing is shown in Fig. 4 while the details of the mold are shown in Figs. 5 and 6. Fig. 7 shows the bending device which

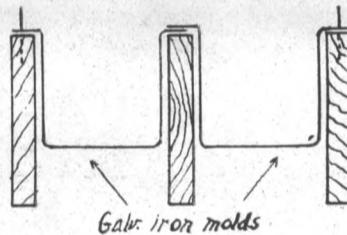


Fig. 4.

nails through sheets to support them. Remove mold and enlarge nail holes to make the nails easily removable.

9. Make saddles, pins, and bending device as shown on drawing.

Making the Posts.

Make enough molds to contain at least a one-bag mix at one time. Follow this order in making up the post:

1. Set up the bending device and make hooks on each end of rods, turning back about one inch of the rods. Make hooks on the same side of rod. Make hooks on all the rods first at one end; then use length gauge so that when the second hook is put on, all the rods will be the same length.

2. Set up frame and hang galvanized iron molds in place. Insert saddles and set pins through the holes in the saddles.

3. Place reinforcing rods in each mold, hooking each end over a pin inserted into the holes in the saddles. There should then be a rod in each corner of the mold with the hooks turned in.

4. Insert one wedge under each sad-

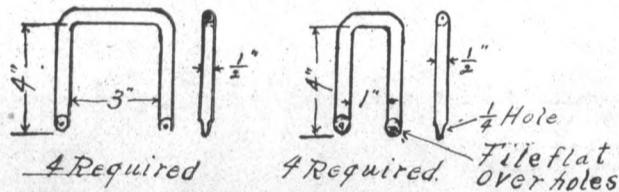


Fig. 6.

attention will be required in spacing the reinforcing rods in the post. The molds are made from galvanized

and drive in until reinforcing rods are drawn tight and in place. 5. Mix aggregate as directed under

place in molds, jarring molds by lifting slightly and dropping while filling to compact aggregate, this will make concrete to a slush consistency and the surface in contact with the metal smooth, and bring excess water to the surface.

6. Screen off surface of concrete with board or trowel.

7. Remove wedges, pins, and saddles, and tuck down concrete at end of post.

8. Allow posts to set for three days at least, turn molds over carefully on

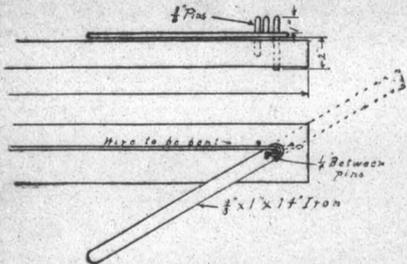


Fig. 7.

a bed of sand, remove frame, and strip molds from posts. Cover posts with wet sand and leave for a period of 30 days.

Fastening Line Wires.

Fence fastenings consist of No. 12 wires passed around post with each

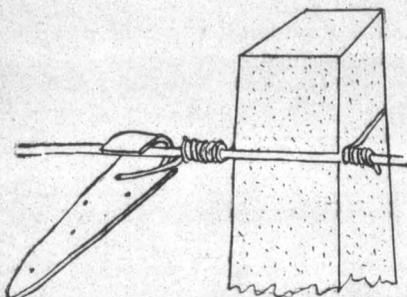


Fig. 8.

end wrapped about the line wire of the fence. This method is exactly the same as the method of wiring insulations in telephone construction.

SUDAN GRASS.

(Continued from first page).

"L. H. Remus, Lenawee county, planted in rows June 15 and secured a growth of seven to eight feet. Also secured a second cutting. He reports bigger yield than from millet but not as good a feed, millet being softer and cows giving more milk when fed millet than Sudan grass."

"Martin Karel reports seeding on fairly rich sandy soil in rows the first of June. Stand and early growth were not satisfactory but the grass later made a growth of five feet. Cows relish it if cut when young, but when the stalks get woody cattle will not eat it."

"Benj. Folger, Benzie county, planted in rows about the first of June. It made a growth of three feet when it was injured by frost the last of August and cut. Additional growth of two feet was secured in the following 35 days before another frost. He reports being satisfied with the way the grass grew and says that horses relish it very much."

"C. G. Williams, Ohio Experiment Station: 'In the opinion of its introducers the grass promises to be of greatest worth in Oklahoma, Western Kansas, Western Nebraska and South Central Dakota, where an entirely satisfactory hay plant has not been available heretofore. Where timothy, red clover and alfalfa do well there is less need for the annual grasses. In Ohio the Sudan grass will compete with the sorghums and millets rather than with the clovers.'"

Prof. R. A. Moore, Wisconsin Experiment Station: "We had some grow six or seven feet tall and the stock relished it very much. If cut when about four or five feet tall, in the southern part of our state one will usually get two cuttings. I think in feeding value it is not very high, but it grows quite readily, and do not know but that it might find a place in some

of your sandy regions. We think there may be a place for this grass and some money in it for farmers growing it for seed. The south, I understand, uses enormous quantities of seeds and, as you know, it is very high-priced. My advice to all farmers, however, inquiring about this grass is not to go into raising it until we have tested it out at the station farms and in various parts of the state."

"Mr. J. C. Hackleman, Missouri Experiment Station: 'In Missouri Sudan grass should be considered a hay grass of much the same use on the general farm as millet. It will generally give two cuttings and will yield from two to four tons of good hay. In feeding value it is similar to timothy hay, millet and Johnson grass.'"

"Mr. H. N. Vinall, Forage Crop Investigations, U. S. Department of Agriculture: 'I have never been enthusiastic about the value of Sudan grass in Michigan. It is perhaps possible that it can be used as a catch crop in overcoming a shortage of hay on the farm, under such conditions as brought about by the failure of a regular rotation crop. You will notice in my Farmers' Bulletin No. 605 that I do not recommend Sudan grass in any of the northern states. Later information received since publication of this bulletin has quite generally confirmed our opinion. The situation is complicated, however, by numerous cases of the successful production of Sudan grass in these northern states. Where the soil is comparatively rich and the grass starts off promptly in the spring and comes to maturity during warm weather in summer, a profitable yield is often obtained. As a general thing, however, farmers can afford to plant Sudan grass in Michigan and other northern states only as an emergency crop.'"

CROP AND FERTILIZER QUESTIONS.

Fertilizing the Bean Crop.

I wish to use some commercial fertilizer on ground intended for beans and would like to know how much to sow to the acre, also the best way and time to apply it.

Livingston Co. B. W. S.

The best way, beyond question, to fertilize the bean crop and most crops, for that matter, is to apply the fertilizer broadcast (use fertilizer drill, letting fertilizer run in all the openings), and work it well into the soil while preparing the land for the crop. After the land is plowed and harrowed down, apply the fertilizer. If the land is clover sod or if stable manure has been applied, use only phosphorous (acid phosphate), 250 lbs. per acre, but if the land is run-down it will pay to use some nitrogen, say a 2:10:0 fertilizer.

Most people are in a hurry and will not take the time to apply the fertilizer before planting the crop, and it can be done nicely if the beans are planted with a fertilizer grain drill, at the time of planting. Set the drill to sow 200 lbs. of fertilizer and distribute from all the openings. This method will put a little fertilizer right in the row with the beans, but 200 lbs. per acre distributed through all the openings will make so small an amount in the one with the beans that there is little danger of injuring the germination.

Millet After Rye.

I have some good quality sandy land seeded to rye. Can I sow an early variety of millet, like the Siberian, on this soil after the rye is cut about the middle of July and get growth enough in hay to pay for the labor involved? Would Sudan grass make a good cutting if sown after the rye is cut?

Osceola Co. W. W. P.

The middle of July is certainly late enough to sow millet. It is risky to depend on a crop under such circumstances. If the season is very favorable you can succeed, but if the season is against you you will fail. It is probably worth trying if you are going to be short of hay. One year I sowed a field to millet after the Fourth of July and had a splendid crop. We left it

growing until danger of frost. In fact there was light frost in the lower portions of the field, but we cut it at once and it made good hay.

Practically everything depends on sufficient moisture at time of sowing. I would not plow the ground but disc it thoroughly, thus conserving the moisture to the greatest possible extent. Cut the rye just as soon as it will do and disc the ground immediately before it dries out. If you can get the millet to start at once and have timely rains to keep it growing you can get a crop. Millet requires rich land to make good growth.

Planting Beans with Horse Corn Planter.

I would like your advice as to planting beans with a horse corn planter, using the fertilizer attachment, and what kind and how much fertilizer to the acre.

Kent Co. F. S.

Many farmers use the two-horse corn planter for planting beans. There are special bean droppers to use so the desired amount of seed can be planted. The planter is narrowed up to 28-inch rows and the beans are planted in continuous rows or drills instead of being dropped in hills. Fertilizer at about the rate of 100 lbs. per acre is used usually and with very gratifying results on the average; 100 lbs. per acre with the planter means just what it says. This amount of fertilizer is applied per acre and all is applied in the bean row. Where beans are planted with a fertilizer grain drill the drill should be set to apply 200 lbs. per acre at least. This will not be as much fertilizer in the row of beans as 100 lbs. with the corn planter because 200 lbs. with the grain drill means that much per acre applied through all the eleven openings. My judgment is that acid phosphate is the best bean fertilizer. This plant does not need nitrogen unless the land is pretty well run down.

Clover is Better than Alfalfa.

Our land is a heavy gray clay and will grow clover or alfalfa. And we plan a four or five-year rotation seed with oat pasture or hay, corn, beans, then beets. Would you advise clover or alfalfa? What amount of potash does alfalfa take from the soil compared to wheat? Clover is generally understood to be a benefit to the soil. Is alfalfa also?

Tuscola Co. C. V. A.

For a four or five-year rotation alfalfa is not practical. I would not advise sowing alfalfa unless one is to leave it down for several years. My idea is to seed the field you do not want to plow very often, to alfalfa. I am seeding my rough land to alfalfa. It takes this plant longer to get established than clover. It is a better yielder but certainly not so good for a short rotation. Like clover it adds nitrogen to the soil and a great amount of organic matter of high quality, and is a soil improver.

A ton of alfalfa contains 24.7 lbs. of nitrogen, 6.1 lbs. of phosphoric acid and 17.9 lbs. of potash. A ton of wheat (grain) contains 26.1 lbs. of nitrogen, 20.4 lbs. of phosphoric acid and 5.4 lbs. of potash, and a ton of wheat straw contains 5.0 lbs. of nitrogen, 2.2 lbs. of phosphoric acid, and 6.3 lbs. of potash, but this amount in the straw can not be all added to the grain for a ton of grain will not require a ton of straw. It will be seen that alfalfa takes considerable more potash from the soil than wheat.

How Long will Drain Tile Last?

How long can drain tile be expected to last if laid 12 or 15 inches deep? Must they be below the frost line to last any length of time?

Livingston Co. SUBSCRIBER.

Soft drain tile will crumble to pieces by the action of frost in one winter when left on the top of the ground. If buried 12 or 15 inches deep they would last much longer because the soil would hold them together, but it would only be a few years before a tile drain laid of soft tile would be worthless if laid so shallow they would freeze.

Hard or glazed tile are practically indestructible. They can absorb no moisture and consequently are not af-

ected by frost. But tile drains should be laid more than 12 to 15 inches deep to be practical. They should be on the average, two feet or two and one-half feet deep. Where only laid one foot deep the drains must be so close together that it would make tile draining very expensive. But more than this, they would not lower the water table sufficiently to furnish proper feeding ground for the plant roots.

Sowing Alfalfa in Standing Corn.

I have a piece of clover sod I pastured last summer that I am going to cover with manure and plant to silage corn. I keep it well cultivated. How would it be to sow it to alfalfa some time in August? I have plenty of marl. How would be the best way to apply it?

Wexford Co. O. S. E.

It would not be giving alfalfa a square deal to sow it in standing corn at the last cultivation. Even weed seed will not germinate and grow under such conditions. The corn shades the ground entirely too much. The corn needs and will use all the moisture at that time of year. Many years it is so dry then that the corn crop can't get anywhere near enough moisture. Don't sow alfalfa then, but plow this land this fall after harvesting the corn and then next spring early sow the alfalfa, using a bushel of oats or barley as a nurse crop. Inoculate the seed and be sure and use the marl.

The best time to apply the marl is this fall and winter after the land is plowed. The only way to apply the marl is with a manure spreader or with a shovel. Don't be afraid to put on a good lot of marl.

In this way you will make a success of alfalfa. The other way will be a failure.

COLON C. LILLIE.

A FARMER'S SCRAP BOOK.

Some time ago I noticed, in these columns, an article recommending the collection of a farmers' technical library. While I agree with this idea, and find my own limited collection of inestimable value, I wish to offer an additional suggestion.

When Mr. Evans said: "There is probably no other occupation so diversified as farming," he pretty nearly hit the nail on the head. And for this very reason it is impossible to write a text book that will cover all cases.

When a man sets about the preparation of a text book, he must be guided by general conditions; therefore, the example in the text book must be adapted to local conditions, and more or less experimenting is necessary to obtain the best results.

In every issue of this paper readers from different parts of the state give their experience in the various lines, and under various conditions of soil, climate, etc. In nearly every issue we find something that fits our case especially well; perhaps the writer has offered some new idea that is not to be found in any text book; or the writer of the article has peculiar conditions to cope with, which are the same as those with which we have to contend.

We read these things, and are impressed; but when the time comes for using them, they are forgotten.

Let us prepare a scrap book and preserve those articles which are especially valuable. I have applied this plan, and have a store of information which is of more value than any text book, because it is composed of articles which meet my special requirements.

Most farmers receive reports from the state and national governments, which are in the form of bound books. Take one of these and remove two-thirds of the leaves; a tube of glue can be purchased for ten cents; and here, at a trifling expense, we have a means of recording these valuable hints.

Try this; and a year from now you will be surprised at the value of your collection.

Otsego Co. G. F. DE LA MATER.

The White Grub in 1916

THE white grub was very destructive in many parts of the state last year, causing much damage to lawns as well as field crops. Wherever they were bad last year or wherever they are found in abundance this spring means a war of extermination. Every white grub killed now will do much to lessen the damage to the crops, by these pests, in 1918.

This insect takes three years to complete its life-cycle. The grubs that were so injurious during the past year spent the winter in the soil, and by May they come nearer the surface, and feed for a short time on the roots. In a little over a month they change into pupae, which is the transformation stage before they become beetles. In September the large robust, brown beetles emerge from their pupal skins, spending the winter of 1916-17 in little earthen cells in the ground. They will emerge during May, 1917, and lay their eggs in grass lands, sod or weedy ground. The egg is oval in shape, white, and about one-tenth of an inch long. These are laid in a small ball of soil, nearly half an inch in diameter, from one to five inches below the surface. In a couple of weeks a new crop of destructive grubs are hatched and begin feeding on the surrounding roots. For the rest of the season they

let hogs have free range for a while and they will prove very efficient in freeing the land of these undesirables.

Planting the next crop as late as possible will also aid as the grubs soon become dormant pupae and as such do very little damage.

The grubs are not the only ones that do the damage although they are responsible for the major part of it. The adult, commonly known as the June-bug, feed on the leaves of fruit and shade trees where they can be controlled by spraying with an arsenical or by the use of trap-lights. The beetles fly at night and are attracted to lights, so by suspending a light over a tub of water, into which some kerosene has been poured, many may be caught. This method is very little used however.

The beetles emerging in the spring of 1917 can be controlled to a considerable extent by watching to see when they appear, which will be during the latter part of April or May, and then spraying the trees.

As the white grub is bad on such crops as corn, timothy, early potatoes and strawberries, to get the best results these should not follow one another. Small grains or clover have been recommended for use in a rotation following one of the above crops.



The Ditches by the Side of the Road on this Hill were Allowed to Fill, Causing the Roadway to be Destroyed by Erosion.

continue to eat and grow very slowly, becoming half-grown and more destructive during the year of 1918.

Preventive Measures.

Immediate measures will do much to keep down the chances for destruction, by this pest, during 1918. Inasmuch as the grubs will come near the surface of the ground during the latter part of April it is best to delay the plowing of last year's infested ground as late as possible. This will crush a number of them. The more the ground is worked and the finer the dirt is broken up, the greater the destruction of animal life contained therein. A farmer in Branch county, last year found, while digging a ditch for a tile drain, that his land contained a large number of white grubs. He had planned to grow corn here but as corn is a favorite food of the grub it looked as if he would have to change his rotation. Not wishing to do this he plowed the field, sixteen acres in all, and dragged it four times. Then he spread two tons of commercial fertilizer, planting the corn about the first of June. On the twenty-fifth of September the corn was heavy both in stalk and leaves and also in the amount of grain.

Chickens following the plow will pick up many of these pests before they get a chance to crawl back into the soil. If a piece of pasture is found to be badly infested with these grubs

There have been many reports of the white grub doing damage already in some sections. There will be many sections in the state that were little troubled with the grub last year but will find it in great numbers this year. This will also mean that, as the grub takes three years to pass through its life-cycle, it will be bad again in the year 1919.

Mich. Ag. Col. DON B. WHELAN,

Cross Pollination of Corn.

Will seed corn mix the first planting? I purchased some sweet corn seed from a reliable seed company and planted it in my garden last spring near the road. My neighbor, whose garden is across the road to the south, planted some pop corn in his garden near the road fence. My sweet corn, when mature enough for cooking, was found to resemble the pop corn. It had the pointed kernel and small, with rows far apart and the corn was tasteless. The corn that I planted was perfect in appearance. Was it possible that the mixing was done the first year or was my seed mixed before planting?

SUBSCRIBER.

Corn cross pollinates very readily under conditions such as are stated in this inquiry. Any mixing of varieties will be at once noted in the mixed character of the corn produced. It is probable that the sweet corn seed was pure, but cross pollinated with the pop corn planted across the road, which is easily possible.

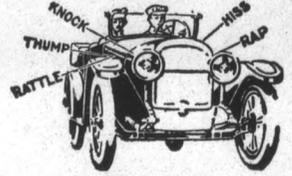
Protect Your New Car

About 900,000 cars will be bought this year. Thousands of those new cars will age through lack of proper attention. Between the new car and the prematurely old car there are three main differences:



New Car

1. Silen motor.
2. Full power.
3. Infrequent repairs.



Old Car

1. Noisy motor
2. Weakened power.
3. Frequent repairs.

Let us look at the symptoms of premature old age:

(1) In a new motor, only one thing brings on noise. That is abuse. Too often noise is the motor's complaint against improper lubrication.

(2) The most serious causes of permanently weakened power are scored cylinders, worn bearings and piston rings. These troubles are brought on by incorrect lubrication.

(3) During the first year, engine repairs usually are infrequent — even with incorrect oil. But with incorrect lubrication the second year brings the reckoning. The results of wear now show up plainly. The worn motor never "comes back."

The one main factor in keeping your new car new is correct lubrication.

You selected a car that suits you. Now select the oil that suits your car. You will find the correct grade of Gargoyle Mobiloils for your car specified in the Chart of Recommendations, below.

For several years this Chart has been a standard guide to correct automobile lubrication. If your car is not listed in this partial Chart, a copy of our complete Lubrication Chart will be sent you on request.

In buying Gargoyle Mobiloils from your dealer, it is safest to purchase in original packages. Look for the red Gargoyle on the container. For information, kindly address any inquiry to our nearest office.



Mobiloils
A grade for each type of motor

CORRECT AUTOMOBILE LUBRICATION

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

Gargoyle Mobiloil "A"
Gargoyle Mobiloil "B"

Gargoyle Mobiloil "E"
Gargoyle Mobiloil "Arctic"

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

MODEL OF CARS	1916		1915		1914		1913		1912	
	Summer	Winter								
Abbott Detroit (8 cyl).....	Arc									
Apperson (8 cyl).....	Arc									
Auburn (4 cyl).....	A	A	A	A	A	A	A	A	A	A
Buick (6 cyl).....	Arc									
Buick (8 cyl).....	Arc									
Buick (12 cyl).....	Arc									
Cadillac (8 cyl).....	Arc									
Case (Model 6-40).....	Arc									
Chalmers (Model 6-30).....	Arc									
Chandler Six.....	Arc									
Chevrolet (8 cyl).....	Arc									
Cole (8 cyl).....	Arc									
Cummins (water, 4 cycle).....	A	A	A	A	A	A	A	A	A	A
Detroit (8 cyl).....	Arc									
Dodge.....	Arc									
Empire.....	Arc									
Federal.....	Arc									
Ford.....	A	A	A	A	A	A	A	A	A	A
Franklin.....	A	A	A	A	A	A	A	A	A	A
Grant.....	Arc									
Haynes (12 cyl).....	Arc									
Hudson.....	Arc									
Imperial.....	Arc									
L.H.C. (air).....	A	A	A	A	A	A	A	A	A	A
L.H.C. (water, 2 cycle).....	A	A	A	A	A	A	A	A	A	A
L.H.C. (water, 4 cycle).....	A	A	A	A	A	A	A	A	A	A
Jackson (8 cyl).....	Arc									
Jeffery.....	Arc									
King (8 cyl).....	Arc									
King (12 cyl).....	Arc									
Kelly Springfield.....	Arc									
King (8 cyl).....	Arc									
King (12 cyl).....	Arc									

MODEL OF CARS	1916		1915		1914		1913		1912	
	Summer	Winter								
Kissel Kar.....	Arc									
Knock (Model 48).....	A	A	A	A	A	A	A	A	A	A
Knock (Model 35).....	A	A	A	A	A	A	A	A	A	A
Lozier.....	Arc									
Marmon.....	Arc									
Maxwell.....	Arc									
Mercer (22-70).....	Arc									
Mitchell (8 cyl).....	Arc									
Moline.....	Arc									
National.....	Arc									
Oakland (12 cyl).....	Arc									
Oakland (8 cyl).....	Arc									
Oldsmobile (8 cyl).....	Arc									
Overland.....	Arc									
Packard (12 cyl).....	Arc									
Packard (8 cyl).....	Arc									
Paige (6-46).....	Arc									
Paige (6-36 & 38).....	Arc									
Pathfinder.....	Arc									
Peerless (12 cyl).....	Arc									
Peerless (8 cyl).....	Arc									
Pierce Arrow.....	Arc									
Regal.....	Arc									
Regal (8 cyl).....	Arc									
Reo.....	Arc									
Saxon.....	Arc									
Selden.....	Arc									
Stearns Knight.....	Arc									
Studebaker (8 cyl).....	Arc									
Stutz.....	Arc									
Veje (4 cyl).....	Arc									
White.....	Arc									
Willys Knight.....	Arc									
Winton.....	Arc									

YOUR TRACTOR

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

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Of course, you'll want at least one serviceable suit for "all occasion" use this spring.

You have more room for choice this year, for we secured a beautiful new Clothcraft gray serge suit, "6130," from the same house that makes the well-known "5130" Blue.

You'll wonder how it's possible to get so much good style and careful workmanship for \$15.00.

It's because the makers have specialized on medium-priced clothes for 70 years. The Clothcraft factory ranks among the foremost in the country in scientific methods of manufacture.

It's a case where good wages, fair treatment and high ideals have produced better quality at lower cost.

Blue or Gray—\$15.00—which shall it be?



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Fig. 1531 "Pyramid"

Soil Management in the Orchard

By W. MILTON KELLY

HOW to maintain an adequate supply of vegetable matter (humus) in our soils, and at the same time derive maximum benefits from clean cultivation is the practical problem to be considered in any system of soil management as applied to the orchard. After contrasting the advantages and disadvantages of all systems advanced, it is fair to believe, that clean cultivation with cover crops is the system that meets these requirements.

The clean cultivation and cover crop system is practiced by some of the most successful orchardists in the country. It consists of breaking the soil early in the spring, from the fifteenth of April to the fifteenth of May, giving it clean cultivation until some time between the fifteenth of July and the first week in August, and then sowing a cover crop. The cover crop sown at this time helps to check the growth of the trees that season and hastens the maturity of their wood. Soil and climatic conditions, as will be explained later, must influence the time of sowing the cover crops. It is the time of sowing the cover crops that enables the grower to contend against the unfavorable weather conditions, for by early or later sowing he can overcome the effects of too much rainfall or of protracted drouth.

In the Young Orchard.

In a young orchard, before the trees occupy the whole of the ground, a system of inter-cropping may be practiced. The best crops to grow in the young orchard are those that require clean cultivation and that may be harvested in time to admit a winter cover crop being sown in the late summer or autumn, to be plowed under the next spring. Inter-cropping produces an income, provides humus-forming material to be turned under and prevents soil washing. Potatoes, tomatoes, late cabbage and other vegetables may be grown with profit between fruit trees. Strawberries and small fruits are also desirable tenants in a young orchard. As soon as the trees begin bearing crops of fruit the practice of inter-cropping should be discontinued.

Some of the functions of a cover crop are to add vegetable matter to the soil, to form a vegetable blanket to protect the roots during the winter, to prevent soil washing and increase the quantity of available plant food in the soil. Productive soil must contain large quantities of vegetable matter. Trees do not return much vegetable matter to the soil, and its addition by a cover crop, in connection with clean cultivation, is the most economical and efficient method. Cover crops when plowed under improve the physical

condition of the soil by making it porous and refining the particles.

When to Stop Cultivation.

The time to discontinue cultivation and sow cover crops is one of the questions that require discriminating judgment. It depends upon present conditions, and not infrequently upon a forecast of the future weather. The main thing to be considered is the moisture that is available during July and August. Late cultivation during average seasons tends to promote a late growth of sappy wood which fails to harden before cold weather comes, and is consequently killed-back. A cover-crop by absorbing moisture from the soil, checks the growth of the tree and hastens the ripening of the wood, thus enabling the tree to go through the winter without being seriously injured. The growth of the new wood during the late season has much to do with the growth that will be made by the tree the next season. A severe drouth may so devitalize, or too much moisture may cause an abnormal growth as to seriously affect the growth and vigor of the trees for a number of years following. In ordinary seasons from July fifteenth to August first is the best time to sow the cover crop. However, if drouth is prevalent in the summer and continues it may be best to continue the work of cultivation in order to conserve as much moisture as is possible to enable the trees to mature their new growth. Trees that are carrying a heavy crop of fruit during a dry, late summer and fall may require cultivation until the crop is nearly ripened. In such cases there is little danger of encouraging a growth of wood late in the season, because the tree's vitality is largely utilized to mature the crop of fruit. As a rule, I believe it is better to delay the sowing of the cover crop when the weather is dry or when the trees are maturing a heavy crop of fruit. It has been my experience that the trees are not likely to make a heavy growth of wood during years when they bear full crops of fruit. Some years when trees suffer the lack of moisture early in the summer and enter into their dormant state prematurely a few weeks of warm, rainy weather in the fall will start up a spring-like growth at the time when they should be dormant for winter.

The Cover Crops.

Which crops make the best cover for winter? Opinions differ in regard to the best cover crops and it is safe to say that no one crop is best under all conditions. Conditions of soil and climate, the amount of fruit and growth produced and other factors should guide us in the choice of cover crops.

The clovers, vetches, peas and beans, which have the ability of getting nitrogen from the atmosphere, are the best cover crops. It requires considerable labor and expense to get some orchard soils in condition to grow these crops, but when we once bring them up to such a condition, we shall have solved the most important factors of soil management as applied to the orchard, that of tillage, renewing the supply of humus and regulating the supply of nitrogen and moisture in the soil. Now I wish to call your attention to the value of humus in making plant food available. Cover crops do not add mineral fertility, they simply find it, and by the development of humic acid (a powerful solvent) make it available, showing that there is still plenty of plant food, which cannot be made available without humus, to promote the development of humic acid, to liberate the phosphoric acid and nitrogen and make them more available.

The habits and characteristics of some of the better known cover crops are hairy vetch, very hardy, makes a slow growth during the fall and does not hold snow as well as some of the other crops. Field peas make a heavy growth and are especially valuable to mix with some other crops. Crimson clover is rather uncertain and subject to being winter-killed in this latitude. Soy beans and cowpeas are of about



Cut-worms Damage Buds of the Young Trees. Cotton Bands will Protect them. Above Photo Taken at Night.

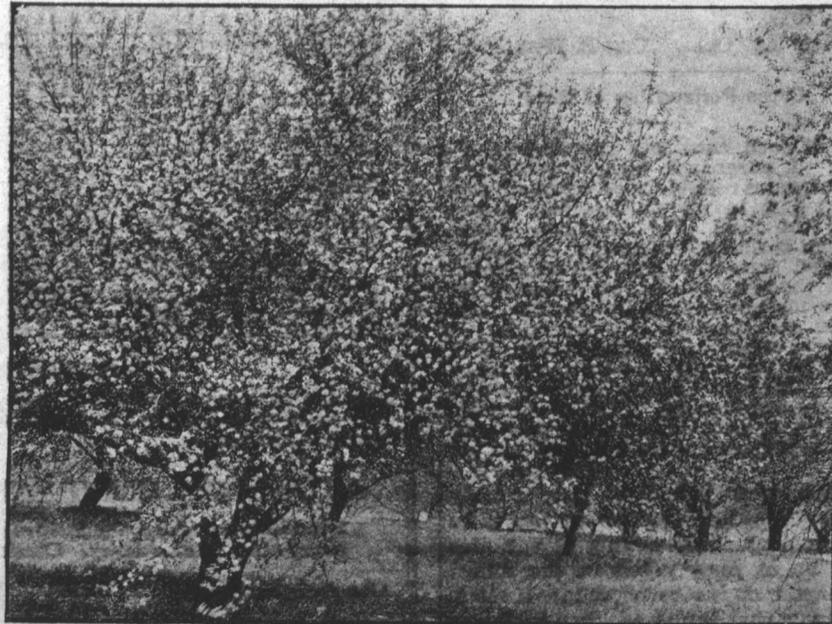
the same value and character of growth and are very desirable crops in sections where they will thrive. Rye is the very best cover crop for winter and stands up well. Oats come up quickly and afford a good blanket for winter. Millet is less valuable than oats. Turnips and rutabagas add humus and make phosphoric acid available, but lack the essential qualities for holding snow.

Use Plenty of Seed.

The quantity of seed to sow and the methods of seeding are about the same as those employed in ordinary field culture. There is no danger of using too much seed. The thicker growth the better blanket it affords during the winter and the more vegetable matter is grown to plow under. To prove that the system of clean cultivation with cover crops pays, I am going to submit the following figures from the State College of Agriculture at Cornell:

Niagara County.		Per Acre.	
	Bu.		Income
Tilled 10 years or more...	280		\$120
Tilled 5 years.....	254		100
Tilled 3 years at least....	239		97
Sod 10 years or more.....	194		75
Sod 5 years.....	197		76
Sod 3 years.....	209		67
Orleans County.		Per Acre.	
	Bu.		Income
Tilled 10 years or more...	327		\$182
Tilled 5 years.....	274		138
Sod 10 years or more.....	176		87
Sod 5 years.....	204		108

Study these figures if you are interested in working out a good system of soil management in your orchard.



Blossom Time is a Period of Promise—the Birthday of a Fruit Crop. Good Results at this time are made more certain by Orchard Management which Insures Thrifty Trees.

SOME RASPBERRY INSECT PESTS.

I heard several complaints made last season by growers of black raspberries, that many of their new canes, after attaining a length of 19 or 20 inches, broke off near the root. Much inquiry was made as to the cause, and what could be done to prevent it. I venture the following reply, trusting it may prove beneficial to some in the future.

The canes of black raspberries are sometimes broken off by winds. Banking up with earth has a tendency to prevent this; tying the canes to a stake of trellis has the same effect. Another and more serious cause of trouble are the raspberry borers—two of which work on the young canes or shoots. The work of either of them can readily be told by the wilting of the canes some distance from the top, but not quite to the ground, which may have caused the trouble complained of. One of the girdlers is a slender female beetle, which cuts two circles about one-half inch apart and between these circles lays an egg in the cane, thus preventing the crushing of the egg before it hatches. The young borer works down into the cane, through the pith and usually kills it before the next spring. By fall the borer is nearly an inch long—slender, shining, dull yellow, with a dark brown head. The beetle which comes from it the next spring is about half an inch long, slender, dark brown with a reddish yellow thorax on which are two or three dark spots.

The other girdler is a comparatively new pest to the raspberry. It works entirely on the young shoots springing from the roots. It is a little white maggot with black jaws and bores an irregular channel down through the center from near the top. When a few inches from the ground, the maggot girdles the shoot on the inside and so close to the outside bark that it can be seen at work through the bark. After the shoot is girdled, the maggot continues its way downward toward the root. It is cone-shaped, and not quite a quarter of an inch long when it does the girdling.

Were I troubled with bushes breaking down I should give my plantation a careful examination to see if perchance, this pest were not the cause. The remedy recommended for these girdlers is to watch for the wilted shoots and cut them off some distance below where they wilt; then burn or destroy the injured parts.

Another pest that sometimes works mischief in the raspberry patch is the red-necked agrilus, which causes an irregular swelling of the canes. The bark becomes roughened and cracked, much as it does in anthracnose, and when split through the swelling, little burrows with slender, yellowish white borers will be found. These borers will appear in June or July as small, slender beetles with the characteristic red collar. For this reason the galls should be cut out early in the spring and destroyed before the borer matures and escapes.

Oceana Co. MRS. J. M. WILLSON.

TROUBLE DEPARTMENT.

Oyster Shell Scale.

I am enclosing a piece of bark taken from an apple tree. Can you tell me what the trouble is? I thought it might be San Jose scale, but as I am not acquainted with it I am not sure.

Mecosta Co. J. J. W.

The sample you sent was covered with oyster shell scale. This scale insect is not as dangerous as the San Jose scale because it does not spread as fast but is more difficult to control because it is in the egg stage during the dormant season when scale spraying is carried on.

In orchards which are annually sprayed for San Jose scale this scale rarely becomes noticeable as the lime-sulphur keeps it in check. But the use of lime-sulphur in orchards badly infested with it does not give desired re-

sults because the lime-sulphur does not sufficiently come in contact with the eggs which are under the scale. For this reason one of the reputable oil sprays, such as Scalecide, will be better to use as they spread under the scaly covering and destroy the eggs.

The oil spray, being a manufactured article, should be used according to the directions given by the maker. If lime-sulphur is used the strength should be the same as for San Jose scale, or one gallon of the concentrated commercial mixture to eight of water. The dormant season, either spring or fall, is the only time that any effective work can be done to control this scale. Neither of the mixtures as suggested above can be used except during the dormant time without injury to the trees.

PRODUCING FINE TOMATOES.

When one takes to market unblemished and rich, red tomatoes, a question often asked is: "How can you grow such tempting fruit?" Fine appearing tomatoes are not difficult to produce in any garden if the plants are staked. Staked tomato vines hold the fruit up where it cannot come in contact with the ground. Lying on the damp and cool ground in the shade of the vines, the fruit often rots or becomes spotted which results in a great deal of waste when it is prepared for canning, and it is unfit for marketing purposes on account of its softness and bitter taste.

Staked vines lift the fruit high where the air can circulate freely through them and the sun reach them for at least a portion of the day. It ripens quicker and more uniformly, it bears the rosy blush of the fruit desired, and it is much easier harvested.

The stakes should be about four or five feet high. If lumber is scarce one may use stakes cut in the woods, or when pruning the orchard cut the stakes from trimmed off limbs. Drive two stakes securely into the ground at each vine, so that they form an inverted V, and tie them together at the top. Fifteen inches apart at the bottom is sufficient generally.

Staking need not be done until the vines have produced a good growth and the fruit setting, or it will interfere with cultivation. Use soft, heavy twine, and tie each vine to the stakes in two or three places so that they will not be whipped about by heavy winds. Six or seven dozen vines well staked will supply a family with an abundance of delicious, unblemished tomatoes both for summer use and canning.

J. J. JUSTICE.

TAKING THE FARM TO THE MARKET.

If the market refuses to come to the farm, why not take the farm to the market? When peaches were selling for twenty-five cents per bushel in the fruit sections of Michigan last year, the people in towns a few miles away were paying \$1.00 to \$2.00 for them. Two men in this neighborhood, who have a few acres of peaches, sold several hundred bushels for \$1.00 to \$1.50 per bushel right in the orchard, with no expense except for growing and picking, and could have sold several hundreds of bushels more if they had had them. At the same time, peaches were selling for 50 to 75 cents in the city twelve miles away.

Would it not be well for any fruit grower looking for a location to consider the advisability of getting one away from the great commercial orchards and where there is a good local market? In many states fruit can be grown over a much wider area than is generally supposed, and it is not difficult for a man with some experience to select a favorable location near a good local market. If in addition to the local market the place is within reach of a fair sized city, by means of electric road or motor truck, the situation is ideal.

O. F. EVANS.

Top Dress your wheat

The Rural New-Yorker says: "This is a Season when top-dressing for the winter grain will pay good dividends. By 'top-dressing' we mean spreading a moderate quantity of soluble plant food over the grain fields. There are some seasons when the grain comes through the Winter in such shape that this top-dressing would hardly pay, but this year, the sudden cleanup of Winter reveals the need of a little stimulant to start the grain off quickly. Much of the wheat was late seeded last Fall, and did not have a good chance before Winter set in. Then came a season of cold weather with bare ground and then ice and snow. Now comes a quick thaw with a hot sun on the plants as they are uncovered. Add to this condition the fact that prices will be high, demand heavier than ever, and the total crop a little short, and we have every argument in favor of using available fertilizer this Spring. It will be impossible to obtain potash economically this year, *but nitrogen and phosphoric acid will pay now if they ever did.*"

There are no better Top-Dressing Fertilizers than the

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Ask our nearest Sales Office for prices on quick-acting top-dressing fertilizers for this season. The Rural New-Yorker's advice is good and practical.

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We have a factory near you. We ship from 27 different factory points East of the Mississippi. Agents wanted in unoccupied territory.

87

BEE KEEPERS' SUPPLIES



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Send for catalog B for prices of thoroughbred Italian bees and queens.

BERRY BASKETS

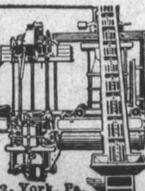
Send for catalog C for prices of Berry Baskets and crates. Special—200 Waxlined paper berry baskets postpaid for \$1.00 or 200 A grade Wood berry baskets postpaid for \$1.25 to any point within 150 miles of Lansing.



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Late Petoskey. The best late potato for yield, market and freedom from blight and scab. Medium size, graded potatoes. 2 to 10 bu., \$1.25 per bu.; more than 10 bu. \$1.20 per bu. Bags free. Special prices on large orders.

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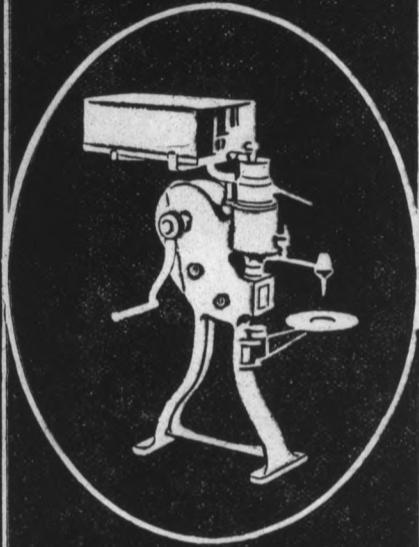
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National Dairy Convention

THE national convention or conference of milk producers and other dairy interests of the country, held at Washington, May 5-6, was an unqualified success and should prove an important advance step in dairy legislation and organization in this country. The conference was called by officials of the National Butter-makers' Association and the National Dairy Union, Secretary Wm. T. Creasy of the latter, and Mr. W. E. Skinner of the former body, being prime movers. The object of the conference as announced was to develop uniform practical regulations governing the production and care of dairy products. The conference was inspired by the recent proposals in Congress to extend federal inspection of dairy farms, creameries, skim-milk stations, etc., but the discussions uncovered many phases of inspection and regulation now practiced that alone justified the conference.

The meeting was perhaps one of the most representative and widely attended that has ever been held. There were about 350 present at every session, and the promptness of gathering and uniformity of attendance at all sessions spoke volumes for the earnestness of purpose of all there. Thirty states were represented by from one to six delegates, ranging from Maine to Oregon and from Michigan to South Carolina. Every dairy breed association was also represented in addition to delegates from local and trade bodies representing every branch of the dairy industry.

The purposes of the conference were definitely stated in a short opening address by Wm. T. Creasy. Co-operation of the Department of Agriculture in development of the dairy industry was promised in the address of welcome by Assistant Secretary Carl Vrooman. Response was made by the Hon. M. D. Munn, president of the National Dairy Council. Mr. Munn sounded the keynote of the conference, declaring that all had come for a definite purpose to secure improvement of certain definite conditions and secure definite legislation. He asked for the reorganization of the Dairy Division of the Bureau of Animal Industry to care for the growth of the industry and give more efficient attention to the specialties developing in the industry. He urged all to deal with the general principles involved and not in personalities, but to be firm in appeals for only such regulation and inspection as is necessary and then have these on just and equitable grounds and administered by officials who have a close and intimate knowledge of the business.

Permanent organization was effected by election of M. D. Munn, of Minnesota, president; N. P. Hull, of Michigan, vice-president; Wm. T. Creasy, of Pennsylvania, secretary.

The Dairy Field.

N. P. Hull, president of the National Dairy Union, opened the regular program with an address on the general needs of the dairy industry. He appealed for remedial measures that would permit a living profit to practicing dairymen; such profit being the first necessity in development and permanency of any industry. He declared that we have put too much emphasis on production in all lines and not enough on soil fertility conservation, which in general demands more dairy cows and a return of fertility to the soil. Dairying is not profitable in the large dairy areas today. Feeds, labor, care and equipment have all increased in cost much more rapidly than the selling price of milk. We are advised to cheapen cost of production, but the trend of prices reaches a point where cost can not be cheapened and there is still no profit. Milk must improve in quality, but more particularly it must advance in price. A big factor in increasing cost is illogical, unjust and

unreasonable inspection and regulation by city, state and federal governments, and lack of uniformity in regulation demands. Mr. Hull advocated municipal distribution of milk with city bacteriological tests as a check on wholesomeness. Duplication of equipment, investment and time in distribution accounts for much of the difference in price to producer and consumer. This could be eliminated by municipal distribution. Let the city establish its grades and test fairly and openly and the farmer who fails to meet the requirements will ask for inspection of premises and be in the proper frame of mind to act on reasonable suggestions.

Standardization.

Dr. H. A. Harding, dairy bacteriologist of the University of Illinois, discussed "The standardization of conditions under which milk and cream are handled from producer to consumer." This discussion was based upon a duplicate series of careful experiments, the findings of which should be read by every city board of health. Kindly keep in mind that practically all city inspection and regulation has been based upon herd and stable scores, and then note the results of these experiments as reported by Dr. Harding.

He declared that all regulation of milk trade can be based logically only on food value, healthfulness and cleanliness. Food value depends primarily upon amount of total solids. The present standard of 11.75 per cent of total solids is about as far as such standards can go and is generally accepted as just and reasonable. Healthfulness depends upon absence of disease germs. Pasteurization is the only feasible remedy at this time, but must be administered by distributors or dealers as pasteurization at the farm is not yet practical. The time has not come for universal pasteurization in interstate shipment because of the cost of producing end.

Cleanliness.

Cleanliness is most difficult to control and is the factor in which greatest error has been made in past regulations. Bacterial examination is at present the best test of cleanliness. Using the bacterial count as test, investigations show that condition of the barn as ordinarily scored has very little effect upon bacteria content of milk except in extreme cases. Cleanliness of cow has little effect, and with milking machines properly handled this effect is greatly lessened. The two greatest sources of bacteria infection are seeding with germ life in processes of straining, aerating, transporting in cans, in bottling machinery, and in temperature. Of these, responsibility for contamination at strainer and pail (which tests show to be least common) is with the farmer; responsibility for contamination from machinery in bottling (which tests show to be greatest) lies with the retailers. Time and temperature of handling, the two greatest factors in control of bacterial growth, are in the hands of the transportation companies and the retailers. The facts in hand indicate that the factor of cleanliness, as indicated by bacterial examination, is largely in the hands of the transportation companies and retailers, and least of all in the hands of the producers who have been made the target of all kinds of herd and stable inspection and scoring. Federal inspection is not feasible for universal enforcement and federal inspection of herds and stables alone will fall far short of effective control.

Pasteurization.

Prof. O. F. Hunziker, chief of dairy husbandry at Purdue University, discussed "pasteurization in the dairy industry." He declared that the commercial and economic feature of the industry demanded pasteurization of dairy products; it was necessary in order to kill disease germs and keep

the products in condition to market. In handling of market milk, pasteurization is necessary in order to keep in condition to market, and if properly done does not injure food value. It kills lactic acid bacteria if kept close to the boiling point but is not objectionable at commercial temperatures. If pasteurized by holding method at 145 degrees temperature, the disease germs are killed and digestibility is not injured. Dealers have objected to pasteurization because the treatment tended to diminish the cream line. This is true only at the high temperature near the boiling point. The holding process at near 145 degrees not only retains but hastens the formation of the cream line. These facts were demonstrated by recent careful experiments. The professor also advocated pasteurization of cream for butter making and declared if pasteurizing was done with sweet cream there was no difficulty and no bad effects. Sour cream can not be pasteurized successfully because of combination of high acid and high temperature forming a powerful corrosive that not only injured metal equipment but imparts a disagreeable off flavor to the product. Heating to 145 degrees temperature and holding from 15 to 20 minutes at that temperature was the process advocated.

The value of pasteurization in destroying disease germs in butter has not been definitely proven, but the process is at best advisable, and if properly done it improves rather than impairs the quality of the product. He quoted charts showing scores of butter from both raw and pasteurized cream in which the pasteurized product gave best scores, both when fresh and when coming out of storage. Summing up, he declared that the only practical weakness in pasteurization of products in commercial trade was with sour cream and even here the use of neutralizers would overcome the difficulty. Cream grading and quality paying is the secret of better butter but until we reach that practice, pasteurization must be used with cream as it comes to the butter maker today.

Reasonable Legislation.

W. J. Kittle, secretary of the Northern Illinois Milk Producers' Association, and the man who brought the recent Chicago "milk strike" to a successful close, discussed the "kind of legislation under which the farmer can succeed." He gave a brief review of the organization of his association. It has a membership of 10,000 dairy farmers, 62 per cent of which are renters. These dairymen have carried the burden of city regulations, changing with every city administration for years until the only profit in the business was the calf and the manure. Over 9,000 of the members stood together in the recent strike and, acting as one man, won recognition and a higher price. The only legislation he thought desirable was what he characterized as "reasonable" legislation; reasonable in being based upon essential things and stable enough to avoid frequent and expensive changes. He asked for a check upon city officials and greater uniformity of city regulation. He thought there should be a federal law or ruling definitely defining market milk and then provisions to protect the producer who turns out a product that measures up to the requirements. Tuberculosis control should have reasonable enforcement, with uniform laws in every state and reasonable remuneration for animals slaughtered. If animals are killed for public protection, the public ought to pay for such animals.

Legal Standards.

Prof. G. L. McKay, secretary of American Association of Creamery Butter Manufacturers, discussed "Legal Standards of Butter." Present standards are rather indefinitely fixed by food products' committee calling for 80 per cent fat in butter and the federal or-

der limiting moisture content to 16 per cent. Mr. McKay quoted investigations in various countries showing that these requirements were approximately correct and declared that the 16 per cent moisture ruling was the best thing that could have happened for the stability of the butter business in this country. The trade demands that butter be of good flavor, good texture and good aroma. These requirements are met in an 80 per cent fat content, and a higher fat standard is not called for. The proposal to increase it to 82½ per cent is unjust, unreasonable and unnecessary. France permits an 18 per cent moisture content. Denmark calls for a 16 per cent limit for export butter and 20 per cent for domestic use. England, after long investigation, fixed a 16 per cent limit.

Surplus Products.

Utilization of surplus dairy products was discussed by B. H. Rawl, Chief of the Federal Dairy Division. His subject presupposes a surplus, which, he declared, does not exist in the country as a whole. Certain sections now have a surplus and will face a grave problem ten years from now unless new markets are developed. All dairy products are cheap when compared with other food products on a food value basis. Domestic consumption must increase by advertisement and development of this fact. When that is done there is an unlimited field in the export trade if wisely and skilfully handled with first-class products. He called for greater development of the cheese business, particularly of the fancy grades now being so largely imported; also in manufacture and sale of by-products, such as skim-milk, buttermilk, cottage cheese, casein, milk powder, etc.

Reasonable Regulations.

L. J. Tabor (a practical dairyman who had taken his place in line and milked ten cows down in the sun-kissed hills of Belmont county, Ohio, the evening before the convention), master of the Ohio State Grange and representing the National Grange, discussed "What are Reasonable Regulations for a Milk Producer to Operate under." Mr. Tabor introduced the co-operative idea and cited the case of his local organization as evidence. Organize the producers and set organization standards to meet market requirements and you will accomplish more than by years of legislation. In his home community a local association controls all but 20 cows in the township. A committee of three sells all the milk. A local committee establishes association standards and acts as inspectors. They have made more money and cleaned up stables, built more milk houses, eliminated more old manure piles and improved the product more in six months than has been accomplished by eleven years of city inspection. Association regulations have been based upon factors affecting health and comfort of the cow, clean milking, early aeration and cooling of milk and handling in well cleaned and sterilized utensils. Producers know the reason for every precaution taken and there is no objection to following the regulations.

Commenting on this discussion, Prof. Oscar Erf, of the Ohio University, declared his belief that the co-operative association idea was the secret of regulation success. Congress will never take the power of regulation from the cities and producers must meet it as outlined by Mr. Tabor. Co-operation removes misunderstanding and suspicion and puts all classes on a basis of better understanding, not only of each other but of actual requirements of the business. Prof. Erf predicted that cities would eventually establish grades for milk, and the lowest grades would have the greatest demand. He cited cases of cows in expensive stables, elaborately cared for, showing high bacterial counts in milk, simply because they were unhealthy, due to pampering. Make stables comfortable, keep cows healthy and they will produce wholesome milk. He suggested

an annual conference of delegates from every state dairy organization to draft rules for local observance.

Dairy Inspection.

Hon. J. J. Farrell, Dairy and Food Commissioner of Minnesota, and president of the National Creamery Butter Makers' Association, discussed "Constructive Dairy Inspection." He declared that inspection alone is not a measure of improvement. As long as there must be inspection it should be educational rather than mandatory. As such the inspectors should be capable of instructing and should know that the basis of their instruction is sound. Mr. Farrell touched off the real fireworks of the conference in a mild but firm reference to attitude of Bureau of Animal Industry officials toward the dairy industry. He referred specifically to the report of that bureau for 1912, which gives incomplete figures and statements on the conduct and management of creameries and skimming stations calculated to create unjust impressions derogatory to the dairy industry as a whole. He declared that a portion at least of that report was written by someone vitally interested in discrediting the dairy business and that the report of 1912 has been and is being used by a propaganda to destroy confidence in the butter industry as it is now conducted. He charged that bureau officials admitted that figures in the report were misleading, but they have taken no steps to correct the erroneous impressions. He further declared that this same report is being used as the basis for further federal regulation proposals in Congress. He called attention to the fact that federal inspection and regulation of the meat packing business has given the packers a virtual monopoly, and he warned that federal inspection of creameries would do the same thing with the dairy industry.

NORTHEASTERN MICHIGAN HOLSTEIN BREEDERS MEET.

At the close of fine addresses by Prof. A. C. Anderson, of the M. A. C., and by Hon. T. F. Marston, of Bay City, for the Northeastern Michigan Holstein-Friesian Breeders' Association was formed.

The following officers were elected: Dorr D. Buell, president; C. J. Franks, vice-president; Carl C. Marschner, secretary-treasurer.

The board of directors consists of the following members: Wallace Cogswell, Abram Van Auken, F. J. Stafford, F. W. Humeston, R. D. Bailey.

Annual meetings will be held the third Thursday of June.

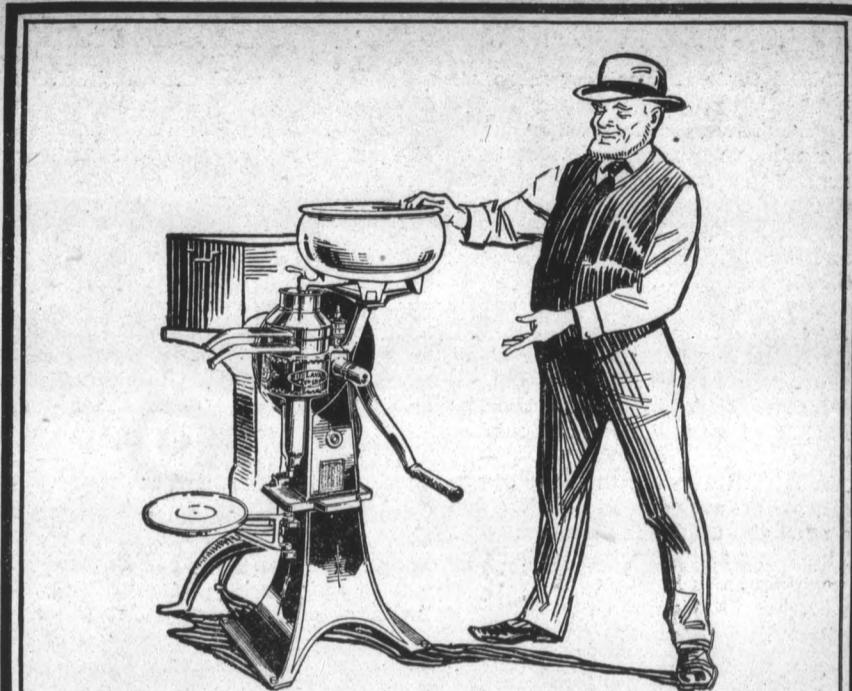
President Dorr D. Buell appointed as a committee to formulate working plans for the association R. D. Bailey, F. W. Humeston and Carl G. Marschner.

The by-laws as recommended by Prof. Anderson were adopted.

The formation of this association is no surprise to the community as steps leading to it have been taken for over a year. It is a result of a determination on the part of observant farmers to unite on one breed of dairy stock, in order to get better stock and receive the impetus of community effort.

In his address before the association Prof. Anderson made it clear that both the beef stock and the dairy stock of this region are wasteful in that being of inferior breeding they do not convert the feed consumed into the maximum amount of beef or dairy products. The mixing of breeds does not turn out well. Calves from grade cows at the College sell for about \$5.00, while those of pure-bred dairy animals sell on the average for \$75. The pure-breds there average twice as much net income as the grades. Prof. Anderson also illustrated how the raising of pure-bred cattle will not be overdone in our day.

Hon. T. F. Marston showed how advantageous it is to give up individual breeding work and to unite on one breed of cattle in a neighborhood, and that a cow that does not produce 7,000 pounds of milk in a year is not profitable. He urged keeping at least a record of milk and feed for one day each week, and the formation of cow-testing associations.



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Then if you go a step farther and turn the cranks of the two machines side by side for fifteen minutes, running milk or water through the bowl, you will see still more difference.

And if you will run the two machines side by side in practical use, as any De Laval agent will be glad to have you do, the De Laval one day and the other machine the next, for a couple of weeks, you will see still greater difference in the work of the two machines.

Every De Laval agent considers it a privilege to show the difference between the De Laval and other separators and to afford every prospective buyer the opportunity to try out and prove the difference to his own satisfaction, if on first examination he feels the slightest doubt about it. If you don't know the nearest De Laval agent write to the nearest office as below.

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Cost less than all wood—last 5 times as long—can't sag, drag, warp or twist. Boards double bolted (not nailed) between 8 angle steel up rights. Guaranteed 5 years. You can get complete Gates or just the Gate Steels so you can make your own gates and save money. Write for Catalog. ALVIN V. ROWE, Pres. ROWE MFG. COMPANY 2913 Adams St., Galesburg, Ill. (13)

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U. P. Live Stock Possibilities

THIS topic is receiving more attention each year in the Upper Peninsula of Michigan. Inquiries are coming to my office almost daily in regard to almost every condition of live stock husbandry. The inquiries come from Ohio, Pennsylvania, Indiana, Iowa, Montana, Alberta, Canada, Colorado and Utah. These inquiries embrace the growing of beef cattle, dairy cattle, sheep, hogs and horses.

There is a mistaken notion about the cut-over lands, due no doubt, to the fact that the Upper Peninsula is looked upon as a lumber and mining country. It is. When the heavy crop of timber is taken off, then the opportunity to grow live stock begins, and not until the timber is removed.

There is a mistaken impression also in regard to the length of the feeding period. In 1915 on the State Experiment Farm at Chatham, Alger county, the live stock were turned on pasture April 26 and taken from pasture November 15 and, except the dairy cows, were fed nothing else but the pasture. In 1916 we are about ten days later. We do have deep snow and cold winters. It is continued cold without the freezing and thawing one has in southern Michigan and northern Ohio and Indiana.

Clover is Indigenous.

This region has been given the name "Cloverland," and rightly so, because alsike clover grows on every logging or tote road, around every logging camp and everywhere there is an opportunity for it to get enough sunlight to grow.

The pasture on the hardwood cut-over lands is our great asset in the production of mutton, wool and beef. By burning the brush and logs and seeding right on the burnings without any further labor after the seeding is done, in August, without removing any of the stumps one can get a pasture that will gladden the heart of any stockman. If he will seed with two pounds of alsike, two pounds medium, two pounds mammoth clovers, two pounds alfalfa and four pounds of timothy per acre on all uplands, and four pounds timothy, four pounds of red-top, four pounds alsike clover on low lands; there will be no time during the growing season that he will not have an abundance of feed. The Upper Peninsula is blessed with over nine inches of rainfall during the growing season and it is well distributed through the season, making this an ideal grass growing country.

This county is developing in live stock husbandry from Sault Ste. Marie to Ironwood, from Menominee to Keweenaw and it is not only developing in numbers but in quality. Since January 1, 1916, there have been bought by the common farmers 36 registered bulls, 34 of them dairy bulls and two beef bulls. I have the record of the purchase of that many bulls and I presume there have been as many more that I know nothing about. On the average these bulls will breed 40 cows each and that means a large increase in quality as well as quantity of young stock produced.

Live Stock Organizations.

Cloverland has some large cattle associations. The Standard Holstein Association of Bruce's Crossing, and the Chippewa County Cow Club, Holsteins only, are among the very progressive live stock associations of the state. The Superior Guernsey Association of Ironwood is another live stock association. There are over 20 of these live stock associations in Cloverland and are all alive and doing good work.

Among the private herds of beef cattle are the Schley Bros., of Ralph, with their herd of white-face cattle; Hargrave and Roberts, of Germfask, with Shorthorns; Dr. Dixon, of Sault Ste. Marie, with pure-bred Shorthorns; Donald McLean with Shorthorns, and Semer and Erickson, of Escanaba, with white-face herds. As far as I know

all are making good growing beef. In dairy herds F. H. Vandenberg, Marquette, has the largest herd of about 100 milch cows, while C. E. Johnson, Ironwood, has 70 cows, and Mr. Bergman, Bark River, about the same number. All over the Peninsula in every settlement the dairy cow is a source of income and in most cases proves a very profitable investment. The herds of pure-bred cattle rank among the best in the United States. Emblagaard, Northern State Hospital, National Pole Company, White Marble Lime Company, Julius Linstedt, Upper Peninsula Experiment Station and many others have herds of excellent Holsteins.

Roycroft Jerseys are known wherever Jerseys are kept. Bergman, of Bark River, Johnson, of Ironwood, Malloy, of Lathrop, and many others are breeders of pure-bred Guernseys and a ready market is found here for all surplus stock. The opportunities for dairying are unexcelled as we have the feed, the climate and a home market for all and more than is now produced.

A Developing Sheep Industry.

The sheep industry has been neglected until a few years ago, a start was made by getting western ewes for breeding and raising lambs here. There are a few flocks of pure-bred mutton sheep; Carroll of Trout Creek; Belding, of Whitney, National Pole Company, Whitney; Hill, of Ozark; McLean, of Gould City, and others. Those that bought western ewes are more than pleased with the results of their investments. Among the most successful are Mashek, Escanaba; National Pole Company, of Escanaba, and Brown, of Matchwood. This is truly a good country to grow sheep. The sheep men from the western states that have looked this section over with a view of locating sheep ranches pronounce it the best they have ever seen but say they do not want to pioneer the proposition as where they are most everyone is in the sheep business and there is always a good market for wool and sheep, with no end of buyers. The industry has started and it has proven very profitable to the ones that started it. I predict that within five years there will be many thousand good sheep in Cloverland. We have a good market for the heavy draft horse, and nowhere can better draft horses be grown, as proven by the good horses and colts seen in Chippewa and other counties.

In conclusion I will say that the possibilities of live stock growing in the Upper Peninsula are among the best in every way. Forage, pasture, water, cheap land, climate and all else that pertains to stock growing are here.

W. F. RAVEN,
Extension Specialist.

FEEDERS' PROBLEMS.

A Ration for Growing Pigs.

I would like to ask what would be the best feed for growing pigs? I have no skim-milk to feed them. I can get plenty of wheat middlings—average price \$1.60 per cwt. I have about three-fourths of an acre to put in rape. Would it be advisable to feed ground oats, oil meal or tankage with the middlings and if so, what proportion?

Oceana Co. SUBSCRIBER.
While it is impossible to get as large or as economical gains in growing young pigs on a ration of grain alone as where a supplementary feed of skim-milk is available, yet with intelligent care and feeding very fair results can be secured. Where pigs are to be grown without skim-milk, it is very important to feed them liberally through their dams, in order that they may get a good start before weaning, which should be longer delayed than where milk is available as a supplementary feed.

For very young pigs, middlings should be made the basis of the grain ration, as middlings is a well-balanced feed for pigs. Ground oats will also

be a helpful factor in the ration, although at the start when the pigs are very young, the oat hulls contain too much fibre to make them readily digestible where oats is made a large factor in the ration. Tankage is at all times a valuable supplementary feed for pigs where corn or other carbonaceous grain is fed. A little oil meal would prove beneficial by way of adding variety to the ration, although only a small quantity could be used to advantage in pig feeding. Some molasses will add to the palatability of the ration and will promote better digestion and assimilation of the feeds given where it is mixed in small amounts with the slop feeds. The rape pasture will prove very beneficial in promoting the rapid growth of the young pigs, and with corn in addition to the feeds suggested, very good gains could be expected.

At the Iowa station where extensive experiments were conducted last year to determine the best methods of feeding hogs, pigs weighing 42 pounds at the beginning of the feeding period where feed on self-feeder under the free-choice system up to 155 pounds in weight consumed an average daily ration for the period of 3.4 pounds of corn, 1.61 pounds of wheat middlings and 0.62 pounds of tankage. These pigs required for each 100 pounds of gain 299.9 pounds of corn, 53.5 pounds of wheat middlings and 54.6 pounds of tankage, making the cost of 100 pounds of gain \$5.90 with shelled corn at 70 cents per bushel, wheat middlings at \$1.45 per cwt., and 60 per cent protein tankage \$2.50 per cwt. These pigs were fed in a dry lot, and would have made more economical gains as well as more rapid gains on good pasture. The average daily gain was 1.13 pounds per pig.

The experiments above referred to seem to have demonstrated conclusively that it pays to feed a liberal grain ration to pigs on pasture, since they not only make larger but, as well, more economical gains, and at the same time consume more pasture because of their more rapid growth, consequently greater capacity for coarse feeds.

Feeding Value of Oat Hay.

Can you tell me the feeding value of oats cut green? How does it compare with timothy or clover hay for cattle or horses? In what stage ought it to be cut and how is the best way to handle it, like hay or cut with a binder in bundles and cured that way?

Shiawassee Co. C. G. F.
Oat hay contains 88 per cent of dry matter, 4.5 per cent of digestible protein, 38.1 per cent of carbohydrates and 1.7 per cent of fat, giving it a nutritive ratio of 1:9.3.

This hay would have a somewhat greater feeding value than timothy hay cut under favorable conditions, from the standpoint of chemical analysis, having a larger protein content and a narrower nutritive ratio. Clover hay on the other hand, has a higher protein content and a considerably narrower nutritive ratio, and is consequently a more valuable forage for any kind of live stock than oat hay. Oat hay should be cut when the plants have attained nearly maximum size after the blossoming period, and before the berry of the grain has commenced to form.

Spring Sown Forage Crops for Calves.

Can you tell me what I can sow that will make good pasture for this spring calves, on clay soil?

Kent Co. C. S.
A combination of oats, peas and rape would make as good calf pasture as anything which could be sown at this season of the year, using about one bushel each of oats and peas and five pounds of rape seed per acre. Where sown a little later in the season, oats, millet and rape will give good results.

FEEDING YOUNG PIGS.

It pays to feed the young pig as much as possible, both through the mother and later directly from the trough. Never again will he make such rapid and cheap gains and it

pays to keep him growing as rapidly as possible while young. To this end the sow should be given all the good milk-producing feed she will eat. When the pigs are about a month old they will begin to need something in addition to the mother's milk, even though she is well fed.

As soon as the pigs will eat they should have skim-milk in a shallow pan. Then a slop made of milk, some shorts, a little bran, and some oil meal or tankage. If this is fed with corn and the pigs are given plenty of exercise there should be no trouble from either thumps or scours. Mix by weight rather than measure four parts of corn, four parts of shorts, one part of bran, and one part of tankage. The little pigs should always be fed in a creep of some kind, that is, in a small pen into which they come through and shuts out the sows and older pigs that would otherwise rob them. As the pigs become older, the amount of corn in the ration may be gradually increased until it has been doubled.

Mo. Ag. College. L. A. WEAVER.

THE MULE-FOOT IN MICHIGAN.

There have been a few scattering breeders of Mule-Foot hogs in Michigan since this breed came into prominence by the organization of a national association a few years ago. Not until recently, however, have Michigan patrons of this breed gotten together in an organization of their own. Such an organization was effected at a meeting held in Jackson this spring, called by Mr. Ralph Emery, a prominent and well-known banker and business man of south central Michigan, who is also an enthusiastic farmer. The object of the association is the advancement of the breed in Michigan by every legitimate means at the command of the organization. The new association will be represented at the future sessions of the general live stock meeting which is held at the Agricultural College each winter.

The officers of the association are as follows: President, E. LeRoy Pelletier, of Orchard Lake, who has bred Mule-Foots for about five years and has one of the largest herds in the state; secretary and treasurer, S. L. Pierce, of Kalamazoo, to whom applications for membership from Mule-Foot breeders desiring to affiliate with the organization should be addressed. By way of giving publicity to the breed the association plans to get out a folder giving the history of the breed and information pertaining thereto, which folders can be secured from the secretary or any member of the association.

Mr. Emery who took the initiative in effecting the organization expressed deep regret that this breed of hogs is suffering from the action of its patrons in the organization of and adherence to two separate national associations, each of which claims to be the "only one," a situation which has hindered the development and distribution of many other breeds of improved live stock. The newly formed association will use its influence to bring about a consolidation of these two national organizations.

Regarding the claim often made that individuals of the Mule-Foot breed are immune to cholera, it was the consensus of opinion among the breeders who effected this organization that this broad claim should not be made, as evidence is lacking to prove absolutely that all individuals of the breed are immune. It was thought that the idea that Mule-Foots are immune to cholera emanated from the fact that hogs of this breed have proved extremely resistant to cholera as well as other forms of disease. The patrons of all improved breeds will welcome this new organization which will add to the fame of Michigan as a state in which pure-bred live stock of quality can be secured in quantity by prospective purchasers from all sections of the country.

The Farm Horse

A MERCIFUL man is merciful to his beast," is an oracle quoted by ancient religionists as being a binding command that should be heeded, for they declared that it was a message from the gods. If the pagans of old had a love and reverence for the most intelligent and faithful servants of man, the more should not we, as more enlightened and appreciative beings, entertain a high regard for the animals to which we owe much for his services and assistance in accomplishing much which has tended to advance us in civilization and making present opportunities for enjoyment possible, we should preserve an attitude of mercy and kindly feelings toward our horses which will insure for them the kind care and considerate treatment to which they are justly entitled.

Notwithstanding all that has been and will be accomplished by the inventors of horseless carriages and horseless plows, the horse is still with us as a factor with which, and for which, we must reckon for some time to come. The rapid movements of the steam boats and steam cars are a great help in commercial affairs, but they do not eliminate the necessity for horses. Those improved methods of transportation made it possible, and desirable, to develop a better class of farm horses, and we have reasons to believe that the more modern inventions will lead to a still farther improvement of the farm horses.

Conditions vary so much in rural communities that I apprehend that for several reasons the horse will, for all time, be a companion and servant of man. His faithfulness demands great consideration and kind treatment.

Common Errors in Treatment.

It is in the spring and summer that the farm horses meet conditions and treatment which brings to them misery and to their owners difficulties and losses in value. After a long winter's rest the horses are generally crowded too heavily at first with hard work. They are full of life, and because they are willing, they are too often allowed to do too much in the first few days, and consequently become jaded and almost lifeless, a condition which lasts all summer.

From an economical point of view it is bad practice to crowd the horses when first beginning the spring work. This is especially true when beginning to work on plowed ground. Few seem to realize that it worries, especially heavy horses, to travel on recently plowed and uneven ground. I have sometimes thought that the mental worry caused by the uncertain foothold was similar to that with men, and had much to do with exhausting the strength and ambition of the horses. An occasional rest will break the worry in a great degree, and prevent a good deal of sweating and chafing under some parts of the harness.

It is a mistake to not look well to the places where the harness rubs, both at noon time and night. It is a good plan to keep a sponge at hand and wash those spots with clean water and let them dry before the harness is put on again. Those sweaty spots catch and hold small particles of dust, and when the harness presses on them the dust cuts the skin, making sore places. Some very excellent horses have been badly damaged by neglecting to keep the dust out of the hair in places where the harness rubs, and makes a sore. Some horses are so sensitive that a sore back or neck will make them ugly. If, when the sores are first started, a wash of equal parts of tincture of myrrh and soft water is used twice or three times a day, the trouble can be avoided.

Grooming horses is not emphasized as much as formerly. If more attention were paid to grooming there would be fewer jaded and galled horses than there are at the present time. Giving

the horses a good rubbing at night, after they have cooled off, does them good and helps to rest them. Then a thorough brushing in the morning, using the currycomb only when absolutely needed, will put the horses in a good condition, as far as the surface of their body is concerned. Grooming encourages better circulation of the blood at the surface, and as it promotes the secretion of oil there, greatly improves the appearance of the horses.

Feeding the Horses.

I have repeatedly said that feeding live stock of any kind is a fine art. For several reasons more attention should be paid to the feeds, and the best methods of feeding horses, than any other kind of stock. Moldy and damaged hay that will not injure other stock will poison and kill horses. Dusty and dirty hay injures the breathing apparatus of horses, but does not injure cattle or sheep. Abrupt changes in feed for horses will impair digestion and often produce colic and death but do not endanger the other stock to such an extent. Horses appreciate regularity in feeding more than the other stock, and yet, all kinds of stock do better if regularly fed. As the horse has but a single stomach he has nothing to draw from when it is empty. Feed regularly.

On account of the continuous rainy weather at haying and harvest time last year, there is a good deal of damaged hay and oats. I have seen horses fed damaged hay that I would hesitate to feed to sheep or cattle. Under present conditions the best hay should be selected for the horses. To a pail of water add two single handfuls of burnt lime and one handful of salt. Sprinkle the hay with the limed water, shake up the hay well, and much of the danger from feeding dry, dusty hay will be avoided.

Some horses are inclined to eat too much of the damaged hay at a meal. Better feed sparingly of the poor hay and depend more on the grain feeds for nourishment. A horse that is not engorged with bulky feed can breathe better and can do better service than is possible if the heavily loaded stomach is crowding on the lungs.

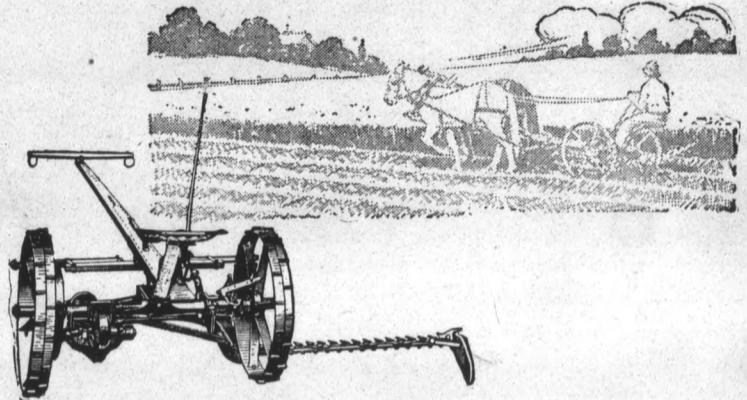
I find it is difficult to find oats that were raised in 1915 that are not musty. Such grain is not good feed for horses. It is better to grind such oats with other grains and feed the mixture. An excellent combination of feeds is corn and oats ground together, equal parts, and mixed with half the bulk of wheat bran. The bran helps to bulk up the feed, allowing the stomach juices to penetrate the mass, and digestion is more easily and completely accomplished than would be possible if the other feed were given alone. The bran also adds much to the nutritive elements in the feed. It will pay well to do the best that can possibly be done in feeding the horses under present conditions.

Wayne Co. N. A. CLAPP.

As is usual about this time of the year, killers are wanting fewer heavy steers averaging around 1,600 to 1,650 lbs., showing a decided preference for fat steers that tip the scales at from 1,350 to 1,500 lbs. This should cause owners to lose no time in getting their heavy cattle on the market, as further declines in prices are likely to take place at any time. As warm weather draws nearer, prime long yearlings are meeting with a much better demand, and prices are headed unmistakably in an upward direction, but killers are not disposed to buy immature yearling steers except at low prices.

News from the northwestern range country is cheering, cattle having come through the unusually severe winter in excellent shape, losses having been small, thanks to the prevailing practice of furnishing an abundance of hay. This is in striking contrast to the former practice prevailing prior to five years ago of letting the cattle rustle on the range all through the winter period.

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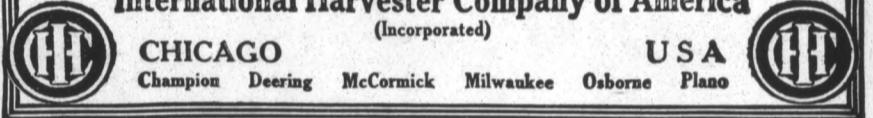


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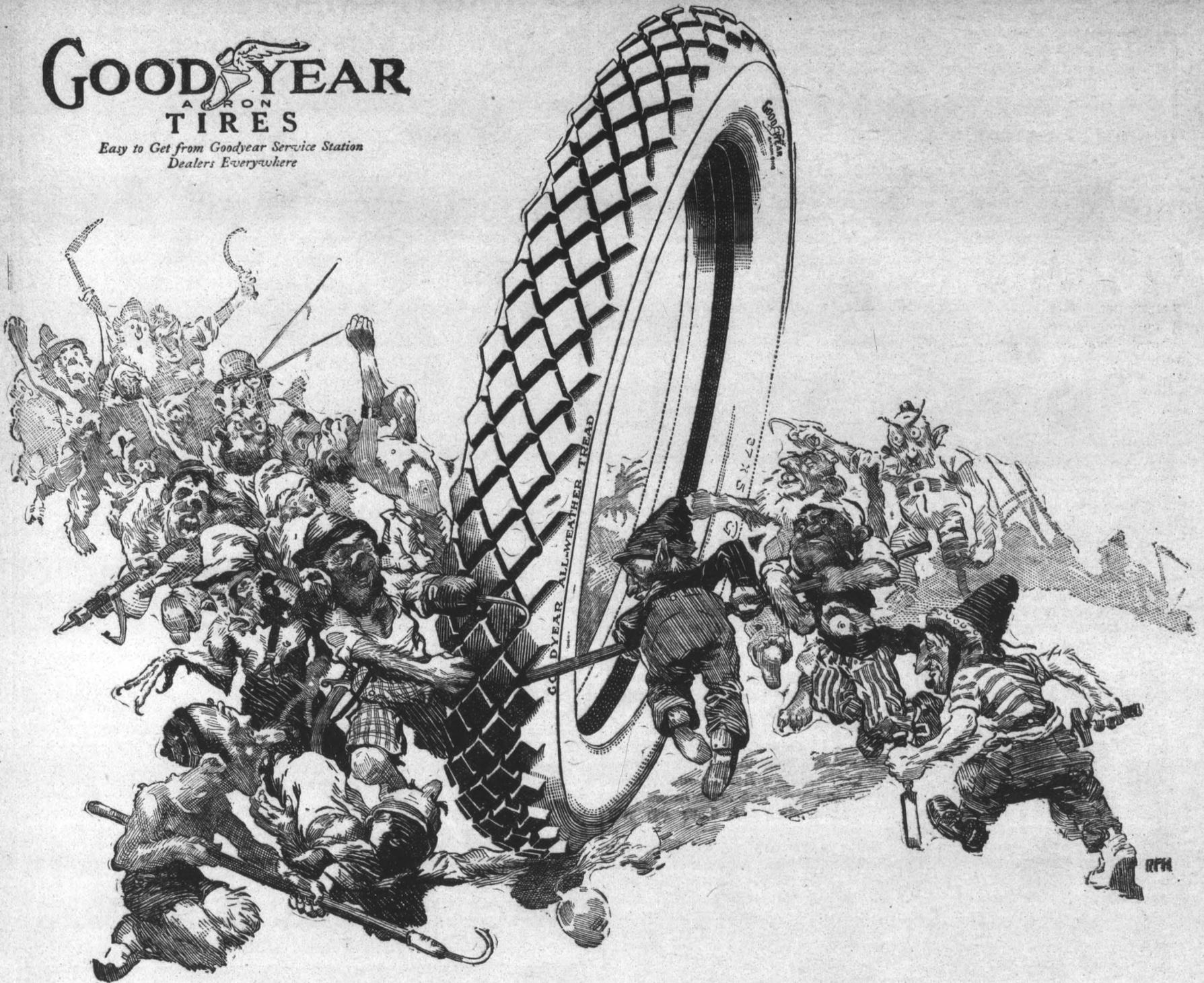
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This Magazine Section forms a part of our paper every week. Every article is written especially for it, and does not appear elsewhere

Organized Agriculture in Wales and Scotland

By WILLIAM B. HATCH

IN Wales, under the co-operative movement there have been organized societies for development work. They conduct experiments under intelligent direction to ascertain whether certain crops are suited to the soil and climate of certain sections and can be grown so as to make them commercially profitable. These societies collect and compile data on local agriculture, and prepare reports to be pre-

served as permanent records of the industry in which they are engaged.

Each individual farmer willing to set apart a portion of his land for carrying out experiments under the direction of the Agricultural Organization Society, is admitted as a member on his taking up a nominal share holding. The society provides materials for the

experiment and finds a market for the crop. State funds are provided during the experimental stages to finance the operation. After the experiments have been conducted for a sufficiently long time to test their commercial possibilities, the society will be wound up and a new society organized on co-operative lines, which will, if sufficient sup-

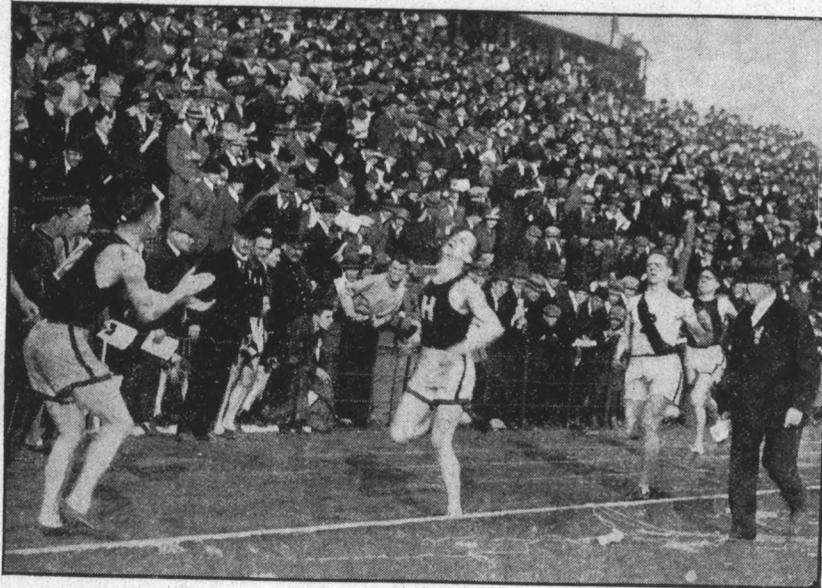
port is forthcoming, take over the plant, etc., of the Development Society and run the society as a purely trading concern. The state-aid money is spent in the purchase of seed, hiring of land, and the payment of labor, without regard to the crops. The farmer is paid a rental for the land. He would be guaranteed the ordinary farming profit and from ten to twenty-

(Continued on page 666).

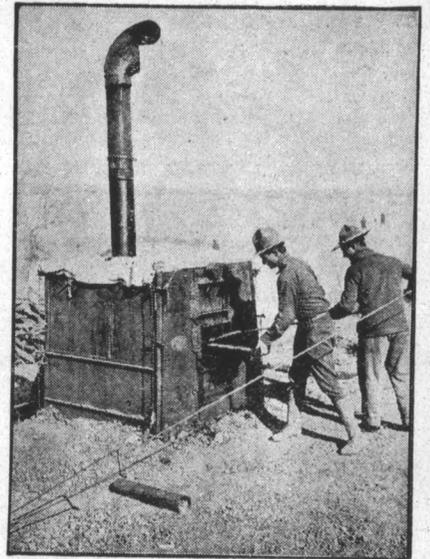
WORLD EVENTS IN PICTURES



Augustus Birrell, Chief Secretary for Ireland in British Parliament.



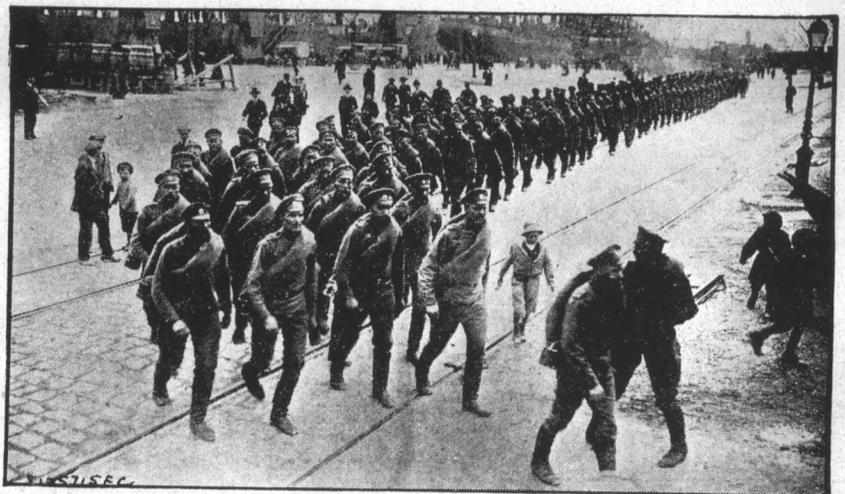
Harvard Wins Sensational One-mile Relay Race at Penn Relay Carnival



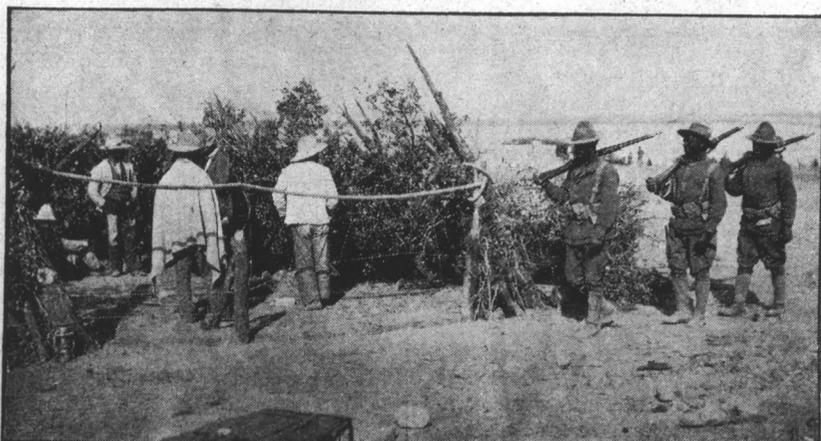
Baking Bread in Field Oven for the Troops in Mexico.



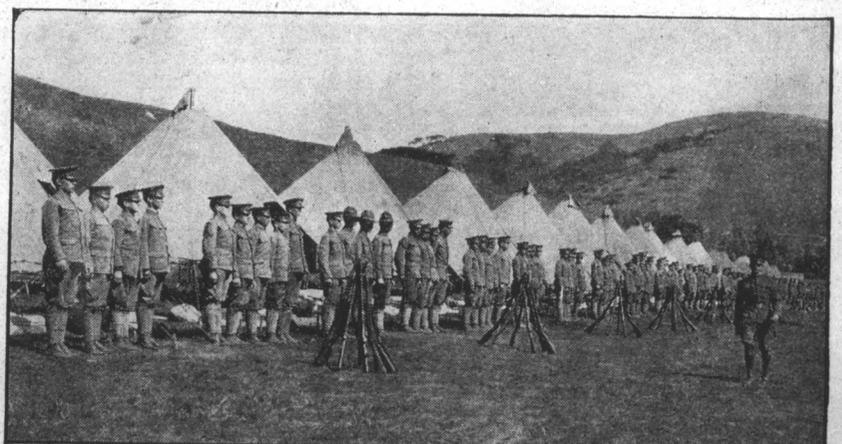
Fully 1,000 American Society Girls Turn Out for Military Training.



Russian Troops Are Being Landed in Southern France to Assist at Verdun.



Villista Bandits who Took Part in Columbus Raid are Held Prisoners.



Schoolboys of San Francisco get Training in Details of Soldier's Duties

Light of Western Stars

By ZANE GREY

The man holding the bridle of the horse on which Bonita had been bound was the big-bodied, bullet-headed guerilla who had found the basket of wine in the spring at camp. Redder of face, blacker of beard, coarser of aspect, evidently under the influence of liquor, he was as fierce-looking as a gorilla, and as repulsive.

Three other men were present, all mounted on weary horses. The one in the foreground—gaunt, sharp-featured, red-eyed, with a pointed beard—she recognized as the sheriff of El Cajon.

Madeline hesitated, then stepped in the middle of the porch. Albert, Florence, and several others followed her out; the rest of the cowboys and guests crowded the windows and doors. Stillwell saw Madeline, and, throwing up his hands, roared to be heard. This quieted the gesticulating, quarreling men.

"Wal now, Pat Hawe, what's drivin' you like a locoed steer on the rampage?" demanded Stillwell.

"Keep in the traces, Bill," replied Hawe. "You savvy what I come fer. I've been bidin' my time, but I'm ready now. I'm hyar to arrest a criminal."

The huge frame of the old cattleman jerked as if he had been stabbed. His face turned purple.

"What criminal?" he shouted.

The sheriff flicked his quirt against his dirty boot and twisted his thin lips into a leer.

"Why, Bill, I knowed you hed a no-good outfit ridin' this range, but I wasn't wise thet you hed more than one criminal."

"Cut that talk! Which cowboy are you wantin' to arrest?"

Hawe's manner altered.

"Gene Stewart," he replied curtly.

"On what charge?"

"Fer killin' a greaser one night last fall."

"So you're still harpin' on that? Pat, you're on the wrong trail. You can't lay that killin' onto Stewart; but if you insist on bringin' him to court, let the arrest go today—we're havin' some fiesta hyar—an' I'll fetch him into El Cajon."

"Nope! I reckon I'll take him when I got the chance, before he slopes."

"I'm givin' you my word," thundered Stillwell.

"I reckon I don't hev to take your word, Bill, or anybody else's."

Stillwell's great bulk quivered with his rage, yet he made a successful effort to control it.

"See hyar, Pat Hawe, I know what's reasonable. Law's law; but in this country there always has been, an' is now, a safe an' sane way to proceed with the law. Pat, you're not overlaked in these parts; but your're the sheriff, an' I'm respectin your office. I'm

respectin' it this much—if the milk of human decency is so soured in your breast that you can't hev a kind feelin', then try to avoid the unpleasantness that'll result from any contrary move on your part today. Do you get that hunch?"

"Stillwell, you're threatenin' an officer," replied Hawe angrily.

"Will you hit the trail quick out of hyar?" queried Stillwell in a strained voice. "I guarantee Stewart's appearance in El Cajon any day you say."

"No! I come to arrest him, an' I'm goin' to."

"So that's your game!" shouted Stillwell. "We-all are glad to get you straight, Pat. Now, listen, you cheap, red-eyed coyote of a sheriff! I reckon there's been some dozen or more killin's in the last year. Why don't you take to trillin' some of the others? I'll tell you why. You want to hound Gene Stewart an' put him where he's never been yet—in jail. You want to spite his friends. Wal, go ahaid an' try to arrest him!"

Stillwell took one mighty stride off the porch. His last words had been cold. His rage appeared to have been transferred to Hawe. The sheriff had begun to stutter and shake a lanky red hand at the cattleman when Stewart stepped out.

"Here, you fellows, give me a chance to say a word!"

As Stewart appeared the Mexican girl suddenly seemed vitalized out of her stupor. She strained at her bonds, as if to lift her hands beseechingly. A flush animated her haggard face and her dark eyes lighted.

"Senor Gene!" she moaned. "Help me! I so seek. They beat me, rope me, mos' keel me. Oh, help me, Senor Gene!"

"Shut up, er I'll gag you!" said the man who held Bonita's horse.

"Muzzle her, Sneed, if she blabs again!" called Hawe.

Madeline sensed something tense and strained working in the short silence. Was it only a phase of her extraordinary thrilling excitement? Her swift glance showed the faces of Nels and Monty and Nick to be brooding, cold, watchful. She wondered why Stewart did not look toward Bonita. He, too, was now dark-faced, cool, quiet, with something ominous about him.

"Hawe, I'll submit to arrest without any fuss," he said slowly, "if you'll take the ropes off that girl."

"Nope!" replied the sheriff. "She got away from me wunst. She's hawg-tied now, an' she'll stay hawg-tied!"

Madeline thought she saw Stewart give a slight start; but an unaccountable dimness came over her eyes, at brief intervals obscuring her keen sight. Vaguely she was conscious of a clogged and beating tumult in her breast.

"All right, let's hurry out of here," said Stewart. "You've made annoyance enough, Hawe. Ride down to the corral with me. I'll get my horse and go along with you."

"Hold on!" yelled Hawe, as Stewart turned away. "Not so fast! Who's doin' this? You don't come no El Capitan stunts on me. You'll ride one of my pack-horses, an' you'll go in irons!"

"You want to handcuff me?" queried Stewart with a sudden start of passion.

"Want to? Haw, haw! Nope, Stewart, thet's jest my way with hoss-thieves, raiders, greasers, murderers, an' sich. See hyar, you Sneed, git off an' put the irons on this man!"

The guerilla called Sneed slid off his horse and began to fumble in his saddlebags.

"You see, Bill," went on Hawe, "I swore in a new depooty fer this particular job. Sneed is some handy. He rounded up thet little Mexican cat fer me."

Stillwell did not hear the sheriff; he was gazing at Stewart in a kind of exploring amaze.

"Gene, you ain't goin' to stand fer them handcuffs?" he pleaded.

"Yes," replied the cowboy. "Bill, old friend, I'm an outsider here. There is no call for Miss Hammond and— and her brother and Florence to be worried further about me. Their happy day has already been spoiled on my account. I want to get out—quick!"

"Wal, you might be too durned considerate of Miss Hammond's sensitive feelin's." There was now no trace of the courteous, kindly old rancher. He looked harder than stone. "How about my feelin's? I want to know if you're goin' to let this sneakin' coyote put you in irons an' hawg-tie you an' drive you off to jail?"

"Yes," replied Stewart steadily.

"You, Gene Stewart! What's come over you? Why, man, go in the house, an' I'll tend to this feller. Then tomorrow you can ride in an' give yourself up like a gentleman."

"No—I'll go. Thanks, Bill, for the way you and the boys would stick to me. Hurry, Hawe, before my mind—changes!"

Stewart's voice broke at the last word, betraying the wonderful control he had kept over his passion. As he ceased speaking he seemed suddenly to become spiritless and dropped his head.

Madeline saw in him then a semblance to the hopeless, shamed Stewart of earlier days. The vague riot in her breast leaped into conscious fury—a woman's passionate repudiation of Stewart's broken spirit.

Once she had entreated him to become her kind of a cowboy—a man in whom reason tempered passion. She had let him see how painful and shocking any violence was to her. And the idea had obsessed him, had grown like a softening lichen upon his will, had shorn him of the wild, bold spirit which she now strangely looked to see him feel.

When the man Sneed came forward jingling the iron fetters Madeline's blood turned to fire. She would have forgiven Stewart then for lapsing into the kind of cowboy it had been her blind and sickly sentiment to abhor. This was a man's west—a man's game! What right had a woman reared in a softer mold to use her beauty and her influence to change a man who was bold and free and strong?

But Stewart held forth his hands to be manacled. Then Madeline heard her own voice burst out in a ringing, imperious command.

"Wait!"

As she stepped to the porch, facing the men, she not only felt anger and pride summoning their forces to her command, but there was something else calling—a deep, passionate, mysterious thing not born of the moment.

Sneed dropped the manacles, Stewart's face took on a chalky whiteness. Hawe, in a slow, stupid embarrassment beyond his control, removed his sombrero in a respect that seemed wrenched from him.

"Mr. Hawe, I can prove to you that Stewart was not concerned in any way whatever with the crime for which you want to arrest him."

The sheriff's stare underwent a blinking change. He coughed, stammered and tried to speak. Manifestly he had been thrown completely off his balance. Astonishment slowly merged into discomfiture.

"It was absolutely impossible for Stewart to have been connected with that assault," Madeline went on swiftly. "He was with me in the waiting-room of the station at the moment when it happened outside. I assure you I have a distinct and vivid recollection. The door was open. I heard the voices of quarreling men speaking in Spanish. Evidently they had left the dance-hall opposite and were coming toward the station. I heard a woman's voice mingling with the others. It, too, was Spanish, and I could not

understand, but the tone was beseeching. Then I heard footsteps on the gravel. I knew Stewart heard them—I could see from his face that something dreadful was about to happen. Then, just outside the door, there were hoarse, furious voices, a suffle, a muffled shot, a woman's cry, the thud of a falling body, and the quick footsteps of a man running away. Next, the girl Bonita staggered into the door. She was white, trembling, terror-stricken. She recognized Stewart, appealed to him. Stewart supported her and endeavored to calm her. He asked her if Danny Mains had been shot, or if he had done the shooting. The girl said no. She told Stewart that she had danced a little, flirted a little with vaqueros, and they had quarreled over her. Then Stewart took her outside and put her upon his horse. I saw the girl ride down the street and disappear in the darkness."

As Madeline spoke another change appeared to be working in the man Hawe. His discomfiture wore to a sullen fury and his sharp features fixed in an expression of craft.

"Thet's mighty interestin', Miss Hammond, 'most interestin' as a story-book," he said. "Now, since you're so obligin' a witness, I'd surè like to put a question or two. What time did you arrive at El Cajon thet night?"

"It was after eleven o'clock," replied Madeline.

"Nobody there to meet you?"

"No."

"The station agent an' operator both gone?"

"Yes."

"Wal, how soon did this feller Stewart show up?" Hawe continued with a wry smile.

"Very soon after my arrival. Perhaps fifteen minutes, possible a little more."

"Some dark an' lonesome around thet station, wasn't it?"

"Indeed, yes."

"An' what time was the greaser shot?" queried Hawe, his little eyes gleaming like coals.

"Probably close to half past one. It was two o'clock when I looked at my watch at Florence Kingsley's house. Directly after Stewart sent Bonita away he took me to Miss Kingsley's. So, allowing for the walk and a few minutes' conversation with her, I can pretty definitely say the shooting took place at about half past one."

Stillwell heaved his big frame a step closer to the sheriff.

"What're you drivin' at?" he roared his face black again.

"Evidence!" snapped Hawe.

Madeline marveled at this interruption. As Stewart irresistibly drew her glance she saw him gray-faced as ashes, shaking, utterly unnerved.

"I thank you, Miss Hammond," he said huskily, "but you needn't answer any more of Hawe's questions. He's—he's—it's not necessary. I'll go with him now, under arrest. Bonita will corroborate your testimony in court, (Continued on page 664.)

Just Friends



Gettin' Acquainted



Utility of Birds

By H. A. BINGHAM

AMONG civilized people, those are the most cheerful and happy who have acquired by habit and education the power of deriving pleasure from the objects that lie immediately around them.

The most delightful influences of nature come from sights or sounds that appeal to a poetic sentiment through impressions made upon the eye and ear. The music of birds though delightful to all, conveys active and durable pleasure only to those who have learned to associate their notes in connection with the scenes of nature.

Next to woods, flowers, green trees and pleasant prospects, the presence of birds as companions of a home in the country is desirable to all. Nature owes more to the lively motions, songs, and chattering of the feathered race as a natural accompaniment of scenery, than to any other. But civilization is driving them away and in spite of laws we may soon be in a birdless world.

If we would let the birds have their own way they would soon fall into civilized if not domesticated habits, for they have no hostile feelings toward us, and have ever sued for peace in the long, bitter war of extermination, and in spite of all they know of us they choose our proximity over the wilderness, and the longer we live together the less they fear and suspect us.

Experience has taught us that the principal value of birds does not consist alone in their power of conferring pleasure by their songs, for some years before people knew the real value of birds they tried to exterminate certain species that they thought were destroying the forests, and as a result of this forests over hundreds of acres were destroyed by the larva which had been the favorite food of the birds they were killing. If they had tried to protect this species of bird the forest would have been saved. The woodpecker is especially indispensable as a means of protecting the forest trees. Birds also protect the fruit orchards, grains and flowers from insects.

The several different kinds of birds are distinguished by their habits of foraging. Some birds that take their food chiefly from the surface of the ground, forage in a different manner from those that collect it from under the surface. Some birds, such as the swallows, catch all their food while on wing and take only winged insects. Although two or more kinds of birds consume the same kinds of food they have different modes of obtaining them.

Woodpeckers reside chiefly in the forests where the food of their choice is nearly as abundant in winter as in summer; therefore, they do not migrate in winter and as their food is not everywhere abundant, like that of the granivorous birds, woodpeckers never forage in flocks. Wrens and chickadees seek their food while creeping about the branches but do not stop to examine the buds and blossoms, as does the humming bird. The humming bird gets its food from the blossoms of trees and from the garden flowers, especially the columbine.

Birds do not have to struggle as hard for existence in the summer as they do in winter, for in winter the supply of food is very short, sometimes limited to only a few weed seeds. But where do the birds have their winter beds? They do not sleep in the nests they built in summer, neither do they build themselves winter homes. They sleep upon their feet in the grass, in hollow trees or in the branches, but this bed is nothing more than a roost which they must find new each night. The sparrow, the snowbird and the chickadee sleep in thick evergreens. The meadow lark always roosts upon the ground and keeps under the grass



Consistency

WHEN you invest several hundred dollars in a motor car, you should feel assured on one important point. And that is whether or not you can expect consistency in performance.

Any car can run a hundred miles or so without trouble. Any car can go that far without readjustment of its mechanism. Almost any car can go short distances under favorable conditions and make a satisfactory showing on gasoline and oil consumption.

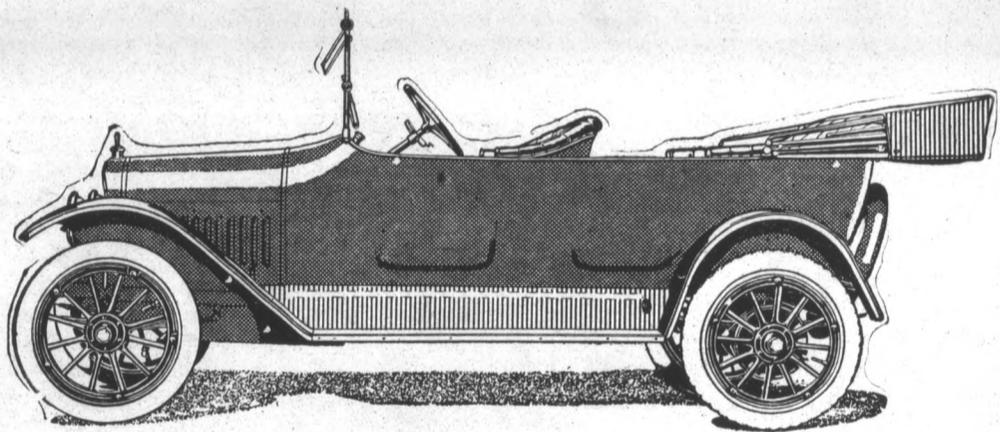
But you want to know that your car can be relied upon day in and day out. You want high mileage per gallon of gasoline and per set of tires. You want freedom from repairs; and you want all of these things, not occasionally, but continuously—day after day; season after season.

While there may be other cars of higher price that will serve you faithfully and consistently, you know that the Maxwell will. You have the proof—the verified facts and figures. And these facts are worth more to you than anyone's claims or promises.

When the Maxwell became the World's Champion Endurance Car by traveling continuously for 44 days and nights (covering 22,023 miles) it averaged almost 22 miles to every gallon of gasoline. It went the whole distance without repairs of any kind and the tires showed a record of more than 9,000 miles each.

This great distance is probably farther than you would drive in two or three years. And it is a guide to what you could expect from the Maxwell in the way of economical and consistent service.

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and shrubbery and if the wind is high or it snows they squat close to the ground while the cold white flakes fall about them and while thus protected from the wind and enemies they have a safe winter bed. Quails sleep on the ground under cedar thickets and crows roost in pine trees with their heads under their wings. This, however, is a dangerous bed for on very cold, stormy nights they often freeze the eye that is not covered. Wild geese and other water birds find safe winter beds in the marshes and in old salt holes.

Both from our regards for their utility to agriculture and for their pleasant companionship with man, we have many motives for protecting the birds. A few laws have been made for their protection, but they are not always enforced. There are two principal ways of preserving the birds: We may avoid destroying them and we may promote the growth of certain trees, shrubs, and plants that will furnish them shelter and subsistence.

LIGHT OF WESTERN STARS.

(Continued from page 662).

and that will save me from this man's spite."

Madeline, looking at Stewart, seeing a humility which she at first took for cowardice, suddenly divined that it was not fear for himself that made him dread further disclosures, but fear for her—fear lest she might suffer shame through him.

Pat Hawe cocked his head to one side, like a vulture about to strike with his beak, and cunningly eyed Madeline.

"Considered as testimony, what you have said is sure important an' conclusive. But I'm calculatin' thet the court will want to hev explained why you stayed from eleven thirty till one thirty in thet waitin'-room alone with Stewart!"

Stewart gave a tigerish start. Stillwell's big hands tore at the neck of his shirt, as if he was choking. Alfred strode hotly forward, to be stopped by the cold and silent Nels. Monty Price emitted a sudden noise which was both a hiss and a roar.

In the rush of her thought Madeline could not interpret the meaning of these things which seemed so strange at the moment; but they were portentous. Even as she was forming a reply to Hawe's speech she felt a chill creep over her.

"Stewart detained me in the waiting-room," she said, clear-voiced as a bell. "But we were not alone—all the time."

For a moment the only sound following her words was a gasp from Stewart. Hawe's face became transformed with a hideous amaze and joy.

"Detained?" he whispered, craning his lean and corded neck. "How's thet?"

"Stewart was drunk. He—"

With a sudden passionate gesture of despair Stewart appealed to her:

"Oh, Miss Hammond! Don't! Don't!"

Then he seemed to sink down, his head lowered upon his breast in utter shame. Stillwell's great hand swept to the bowed shoulder and he turned to Madeline.

"Miss Majesty, I reckon you'd be wise to tell all," said the old cattleman gravely. "There ain't one of us who could misunderstand any motive or act of yours. Mebbe a stroke of lightnin' might clear this murky air. Whatever Gene Stewart did that on-lucky night—you tell it!"

Madeline's dignity and self-possession had been disturbed by Stewart's importunity. She broke into swift, disconnected speech:

"He came into the station—a few minutes after I got there. I asked—to be shown to a hotel. He said there wasn't any that would accommodate married women. He grasped my hand—looked for a wedding-ring. Then I saw he was—was intoxicated. He told me he would go for a hotel porter; but he came back with a priest. Padre Marcos. The poor priest was—terribly

frightened. So was I. Stewart fired his gun at the padre's feet. He pushed me into a bench. Again he shot—right before my face. I—I nearly fainted; but I heard him cursing the padre—heard the padre praying or chanting—I didn' know what. Stewart tried to make me say things in Spanish. All at once he asked my name. I told him. He jerked at my veil. I took it off. Then he threw his gun down and pushed the padre out of the door. That was just before the vaqueros came with Bonita. Padre Marcos must have seen them—must have heard them. After that Stewart grew quickly sober. He was mortified—distressed—stricken with shame. He told me he had been drinking at a wedding—I remember it was Ed Linton's wedding. Then he explained that the boys were always gambling, and he had wagered he would marry the first girl who came to El Cajon. I happened to be the first one. He tried to force me to marry him. The rest—about the assault on the vaquero—I have already told you."

Madeline ended, out of breath, and panting, with her hands pressed upon her heaving bosom. The revelation of what she had so long kept secret made her throb and tremble and burn. She thought of Alfred and his wrath; but he stood motionless, as if dazed. Stillwell's attention was centered upon Stewart, who seemed utterly crushed.

Hawe rolled his red eyes and threw back his head.

"Ho! Ho! Ho! Say, Sneed, you didn't miss any of it, did ye? Haw! Haw! Best I ever heard in all my born days! Ho! Ho!" Then he ceased laughing and, with glinting gaze upon Madeline, insolent and vicious and savage, he began to draw: "Wal, now, my lady, I reckon your story, if it tallies with Bonita's an' Padre Marcos's, will clear Gene Stewart in the eyes of the court." Here he grew slower, more biting, sharper, and harder of face. "But you needn's expect Pat Hawe or the court to swallow thet part of your story about bein' detained unwillin'!"

Madeline had not time to grasp the sense of his last words. Stewart had convulsively sprung upward, white as chalk. As he leaped at Hawe, Stillwell interposed his huge bulk and wrapped his arms around the cowboy. There was a brief, whirling, wrestling struggle. Stewart appeared to be besting the old cattleman.

"Help, boys, help!" yelled Stillwell. "I can't hold him! Hurry, or there's going to be blood spilled!"

Nick Steele and several others leaped to Stillwell's assistance, Stewart, getting free, tossed one aside and then another. They closed in on him. For an instant a furious, straining wrestle of powerful bodies made rasp and shock and blow. Once Stewart heaved them from him; but they plunged back and finally conquered him.

"Gene! Why, Gene!" panted the old cattleman. "Sure you're locoed to act this way! Cool down! Why, boy, it's all right! Jest stand still—give us a chance to talk to you. It's only old Bill, you know—your old pal who's tried to be a daddy to you. He's only wantin' you to hev sense—to be cool—to wait!"

"Let me go! Let me go!" cried Stewart, and the poignancy of that cry pierced Madeline's heart. "Let me go, Bill, if you're my friend. I don't care what Hawe's said or done to me. It was that about her! Are you all a lot of greasers? How can you stand it?" Then his voice broke and fell to a whisper. "Bill, dear old Bill, let me go! I'll kill him!"

"Gene, I know you'd kill him if you hed an even break," replied Stillwell soothingly; "but you ain't even packin' a gun, an' there's Pat lookin' nasty, with his hand nervous like. He seen you hed no gun. He'd jump at the chance to plug you an' then holler about opposition to the law. Cool down, son! It'll all come right."

Suddenly Madeline was transfixed by

a terrible sound. Her startled glance shifted from the anxious group round Stewart to see that Monty Price had leaped off the porch. He crouched, hunched down, with his hands below his hips, where the big guns swung. From his distorted lips there again issued a sound that was combined roar and bellow and Indian war-whoop, and, more than all, a horrible, warning cry. He looked like a hunchback about to leap on his foe like a malicious demon. He was quivering, vibrating. His eyes, black and hot, were fastened with piercing intentness upon Hawe and Sneed.

"Git back, Bill, git back!" he roared. "Git 'em back!"

With one lunge Stillwell shoved Stewart and Nick and the other cowboys up on the porch. Then he crowded Madeline and Alfred and Florence to the wall and tried to force them further. Failing to get them through door and windows, he planted his wide person between the women and danger. Madeline grasped his arm, held on, and peered fearfully from behind his broad shoulder.

"You, Hawe! You, Sneed!" called Monty in that same wild voice. "Don't you move a finger or an eyelash!"

Madeline's faculties nerved to keen, thrilling divination. She grasped the relation between Monty's terrible cry and the strange, hunched posture he had assumed. Stillwell's haste and silence, too, were pregnant of catastrophe.

"Nels, git in this!" yelled Monty, and all the time he never shifted his intent gaze as much as a hair's breadth from Hawe and his deputy. "Nels, chase away them two fellers hanging' back there. Chase 'em, quick!"

These men, the two deputies who had remained in the background with the packhorses, did not wait for Nels. They spurred their mounts, wheeled, and galloped away.

"Now, Nels, cut the girl loose!" ordered Monty.

Nels ran forward, jerked the halter out of Sneed's hand, and pulled Bonita's horse in close to the porch. As he slit the rope which bound her she fell into his arms.

"Hawe, git down!" went on Monty. "Face front an' stiff."

The sheriff swung his leg, and, never moving his hands, with his face a deathly, sickening white, he slid to the ground.

"Line up there beside your guerilla pard! There! You two make a fine pictoor—a fine team of pizened coyote an' a cross between a wild mule an' a greaser. Now listen!"

Monty made a long pause, in which his breathing was plainly audible. Madeline's eyes were riveted in fascination upon him. Her mind, swift as lightning, had gathered the subtleties in action and word succeeding his domination of the men. Violence, terrible violence—the thing she had sensed, the thing she had feared, the thing she had sought to eliminate from among her cowboys—was, after many months, about to be enacted before her eyes. It had come at last!

She had softened Stillwell, she had influenced Nels, she had changed Stewart; but this black-faced, terrible Monty Price now rose, as it were, out of his wild past, and no power on earth could stay his hand. Madeline did not shudder; she did not wish to blot out from sight this little man, fearful in his mood of wild justice. She suffered a flash of horror to feel that Monty, blind and dead to her authority, cold as steel toward her presence, understood the depths of a woman's soul. For in this moment of strife, of insult to her, of torture to the man she had uplifted and then broken, the passion of her reached deep toward primitive hate.

With eyes slowly hazing red she watched Monty Price; she listened, with thrumming ears; she waited, slowly sagging against Stillwell.

"Hawe, if you an' your dirty pard hev loved the sound of human voice,

then listen, an' listen hard!" said Monty. "Fer I've been goin' contrary to my ole style jest to hev a talk with you. You all but got away on your nerve, didn't you? 'Cause why? You roll in here an' flash yer badge, an' talk mean, an' almost bluff away with it. You heerd all about Miss Hammond's cowboy outfit stoppin' drinkin' an' cussin' an' packin' guns. They've took on religion an' decent livin', an' sure they'll be easy to hobble an' drive to jail! Hawe, listen. Ther was a good an' noble woman came out of the east somewhere, an' she brought a lot of sunshine an' happiness an' new idees into the tough lives of cowboys. I reckon it's beyond you to know what she come to mean to them; but wunst they wuz only a lot of poor cowboys, an' then, sudden like, they was human bein's, livin' in a big world thet had somethin' sweet even fer them—even fer an ole, worn-our, hobble-legged, burned-up cowman like me! An' you, Pat Hawe, you come along, not satisfied with ropin' an' beatin' thet friendless little Bonita, you come along an' face the lady we fellers honor an' love an' reverence, an' you—you—"

With whistling breath, foaming at the mouth, Monty Price hunched lower, his hands at his hips, and edged inch by inch farther out from the porch, closer to Hawe and Sneed.

"Thet's all!" roared Monty. Lower and lower he hunched, a terrible figure of ferocity. "Now, both you armed ossifers of the law, come on! Flash your guns! Throw 'em, an' be quick! Monty Price is done! There'll be daylight through you both before you fan a hammer, but I'm givin' you a chanst to sting me. You holler law, an' my way is the ole law!"

Hoarser and more demoniacal he grew with each panting breath, lower he hunched his shoulders. All his body, except his rigid arms, quivered with a muscular convulsion.

"Dogs! Skunks! Scorpions! Buzards! Flash them guns, er I'll flash mine! Aha!"

To Madeline it seemed that the three stiff, crouching men leaped into instant and united action. She saw streaks of fire and puffs of smoke. Then a crashing volley deafened her.

Smoke veiled the scene. Slowly it drifted away, to disclose three fallen men, one of whom, Monty, leaned on one hand, a smoking gun in the other.

He watched for a movement from the other two. It did not come. Then, with a terrible smile, he slipped back and stretched out.

In the days that followed, whether she was awake or asleep, Madeline Hammond could not release herself from the thralling memory of that tragedy. She was haunted by Monty Price's terrible smile. Only in action could she escape; and to that end she

(Continued on page 667).

THINGS MIGHT BE WORSE.

BY IRMA T. SOPER.

Folks call me "old Cy Weatherby,"
Reckon thet's who I be.
And when they look they act as tho
They sorter pitied me.

'Cause I ain't got much money,
My house is just a shack
A-settin' in among th' trees
Up river thar, way back.

My overalls are patched up good
My wampus, now, thet matches,
But goodness me, I'm very glad
I hed th' cloth fer patches!

The river's handy by th' house
It can't be beat fer fishin,
And in th' spring in thet deep pool
I keep a trout line swishin'.

I've got a dorg. He's just a cur—
No fancy breed. But listen—
There's just as many friendly wags
In that there tail o' his'n.

I ain't much on th' singin' act
Can't sing: "Go Tell Aunt Abbey."
I've got a cat thet likes ter sing
So I leave thet ter Tabby.

But I am great at whistlin'
I'm thankful I kin do so—
When things goes wrong I start a tune
And almost beat Caruso.

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DANDELIONS.

BY L. MYRTLE SOURS.

Heads of gold,
Too many to be told,
I saw one sunny day
Along a grassy way.
O, dandelions yellow,
Where light all rich and mellow
Is shining down on you
Out of a sky of blue!
You are so bright and gay
And stretch so far away—
Did all the stars of night
Drop down their golden light
To lie here in the grass
And shine while here we pass?
Or did the shining sun
Forget, when he was done
To gather up his rays
Of light for many days,
Until his threads of gold
The wind in heads had rolled,
And tossed them in the grass
Like balls of golden glass?
O, dandelions bright,
You dazzle with your light
The eyes that gaze on you
Under the sunny blue!

ORGANIZED AGRICULTURE IN WALES AND SCOTLAND.

(Continued from page 651).

five dollars per acre. The experimental crops in North Wales and in five or six counties in England comprise one hundred and twenty acres for tobacco and three thousand acres for sugar beets. Thirty acres is the largest single field. It is regarded as more desirable and efficient than conducting the experiments on one large experimental farm, because the farmers conduct the experiment on their own land and know their own needs.

Agricultural co-operation in Wales has profited the farmer, especially in protecting him from fraud and deceit and short weights in his purchase of fertilizers, feed stuffs, and especially seeds. The result has been to drive out very largely the unscrupulous dealer in these commodities. It is claimed that "If all farmers traded through co-operative societies the doubtful firms would cease to exist. Now a firm's only chance is with individuals whom they solicit on fair and market days and at shows. They thrive on individuals and will continue to do so as long as farmers choose to make their bargains individually. Many sad bargains have been and are being made under the influence of treating, and moreover, stuff is forwarded very often when no order at all has been given."

In Wales we find in operation ten small holding societies. Five of these hold approximately 877 acres of land. The membership is 248, with a paid-up capital of a little over \$1,000. The co-operative land-renting movement is confined to Glamorgan and Monmouth. Members of these societies consist of men who have been on the soil some time or other and who still retain a liking for it. They follow some constant employment and work on the land in their leisure hours, or join together in employing workmen. Houses are only built for them by the county councils and in a few instances out-buildings have been built also. They co-operate for buying their requirements in many cases, and provision for this is made in their rules, thus avoiding necessity for registering a separate society.

There are seventy-five co-operative societies at present in Wales made up as follows: Ten small holding societies, three credit societies, one surplus milk society, one live stock society, one bulb society, three egg depots. The rest are societies for the supply of requirements, but many of these sell produce as well. Their total turnover was something over a million dollars for the year under consideration. The largest society is that of Carmarthen. This has two branches and covers an area of ten by twenty-four miles. It is efficiently conducted, showing an increase in membership over the previous year of 133 and an increase of turnover of \$155,000.

The co-operative movement in Wales has been in existence about eleven years but is still regarded as only in its infancy. We need to consider, how-

ever, that the figures for Wales, while not large, apply to a small country. Its total area is only 7,500 square miles and a large part of this is not adapted to agricultural purposes. If you draw a line from Bay City to Port Huron the enclosed part of the "thumb" would about equal Wales in area.

Scotland.

The Scotch have not made the progress in co-operative agriculture that the Irish have. A Scottish commission was sent to Denmark in 1904 and reported favorably upon its findings. The Irish and the English Agricultural Organization Societies lent their assistance and now considerable progress has been realized. The largest development is along the line of small holdings, egg, produce and poultry societies; and stock breeding on the co-operative sale has become more and more prominent and successful. The societies for the co-operative purchase of seeds, feedstuffs, fertilizers and the equipment of fishing boats, has accomplished much.

Co-operative credit in Scotland is really needed as it is everywhere, as the basic requirement for promoting co-operative business. We do not get very far in promoting any kind of a

submitted by the United States Consul at Glasgow, from the bank, "for they are usually men of recognized ability, experienced in carrying on good farms, and often have considerable sums credited to their account on deposit. Tenants of small farms in some sections of Scotland, however, have difficulty in obtaining bank credit, owing to inability to give the required security. Consequently there are throughout Scotland a considerable number of tenant farmers who are not allowed the slightest credit by the existing banks."

The financing of the small holdings work in Scotland as elsewhere in Great Britain, does not seem to be taken care of by its present banking facilities. The land, too, is held quite largely in comparatively large tracts so that throughout the British Isles the so-called "evils of landlordism," especially complained of in Ireland, will probably be solved through some form of agricultural co-operation backed up by proper credit facilities.

My personal observations of agricultural conditions in Scotland were confined to the southern part. I naturally went to see the old home of my Scotch ancestors in Dumfriesshire. This is a



Cattle Grazing About Ruins of Ancient Home of Sir Robert Bruce.

business without adequate credit facilities. One of the reasons, and probably the chief reason why co-operative credit has not been more largely developed in Scotland, is because the large banks of Scotland have extended branches generally throughout the country. There are ten of these great banks that are the most prominent. Their headquarters are in Edinburgh, Glasgow, Aberdeen and one in London. Each of these banks have branches in every large city and town in Scotland, while in the smaller towns and villages, one or more of them are represented, and each of them has correspondents in every section of the business world. Credit is extended, it is said, to the farmers, in precisely the same way as to other customers of the bank. The account current is applicable to anyone who deposits money from \$5.00 upwards. Farmers can generally secure credit, according to a statement

beautiful country. One can easily see why a Scotchman loves the hills. He has grown upon the hillsides for a thousand years. The land here is productive and some of the highest rent-commanding land in the world is said to be in Scotland. This section, however, is richer in other contributions than agriculture. Five miles away from Lockerbie, where my grandparents lived, is Craigen Puttock, the home and burial place of Thomas Carlyle. Twelve miles away at Dumfries is the home and burial place of Robert Burns, the plowman poet. About here were bred the Maxwells, Douglasses, Kirkpatricks, Crichtons, Johnstones, Jardines, Carlyles, Irvings, Graemes, Elliots and Armstrongs, who are mentioned among those who fought and fell between the Lowthers and the walls of York. It was Lord Maxwell, of Dumfriesshire, who, away back in 1543, secured from Parliament



A Business in which the Monetary Receipts are not the only Compensation.

the right of the lieges to peruse the Bible in the Vernacular tongue. Edward Irving and Washington Irving came from the Dumfriesshire stock and so did "Rare Ben Johnson" and the Malcolms. Dr. John G. Paton, the noted missionary, was a native of Thorwald, Dumfriesshire.

The accompanying picture of the cattle grazing about the ruins of Lochmaben Castle, the ancient seat of Sir Robert Bruce and his forbears, illustrates the picturesque beauty of the rural landscape of Scotland. This old castle was erected not later than 1300. In driving over to Lockerbie from Dumfries I persuaded my driver to detour enough to give me a chance to see the ancient home of the Bruces. He stopped suddenly at an elbow in the road and said, "It's a wee bit of a walk beyond yon trees." I climbed over a stone fence, followed a cow-path, as it wound its way among the ancient beeches, fully three feet in diameter, for a distance of forty rods. There I came upon the old walls which are now the nesting place of pigeons and the trellis of ivy. The hum of a mower, for this was the eleventh of July, in a nearby field, contrasted the pruning hook of today with the spears of yesterday. These castles were built chiefly as fortifications. Romans, Norseman, Island peoples and Clans for a thousand years have given battle and shed blood in defence here in Dumfriesshire.

The same stable character of European architecture predominates in Scotland. The buildings are of stone with tile roofs to last another thousand years. Thrift is written prominently over the landscape and upon the streets and the buildings and the homes of the cities. Lockerbie, as an example, has only about 2,500 inhabitants, yet it has constructed a town hall that will not be excelled by many of the county buildings of Michigan outside of the larger cities and thickly populated counties. In front of this town hall in the open square, were being exhibited for sale an American mowing machine. Over the doors of the business places were exhibited the same names as those of about every Scotchman in our part of the country.

Lord Raleigh's Farms.

Before leaving the British Isles I want to refer to the English farms of Lord Raleigh.

About two-thirds of the 4,000 acres is arable and one-third grass. The arable land is rather heavy, needing careful under-draining. It is situated in the dry part of England. The manner of handling the farms is somewhat in the nature of a co-partnership. A bonus is given to employes when the result of the year's farming have been satisfactory. The bonuses have been awarded fifteen times in the last eighteen years and continuously since 1915. The total amount thus far paid out in bonuses has aggregated about \$50,000. Until recently the amount was paid into accounts opened on behalf of the men with the Post Office Savings Bank. More recently, however, a co-partnership scheme was instituted, whereby the bonus could be credited to accounts opened between the men and the farms. Passbooks are provided, and the men are free to withdraw their money if they wish to do so. They may also add any savings of their own, their wives or their children, to the amounts standing to their credit. Interest at four per cent per annum is guaranteed, and to this is added such dividends as is earned by the farms after all expenses have been met. It has been found possible to declare a satisfactory dividend every year since the institution of the scheme, and the number of shareholders have steadily increased from thirty-two to 191. The sums at present invested by the employes amount to about \$19,000.

Careful field accounts have been kept for the last nineteen years, showing an average profit for a number of them of about \$10 an acre.

LIGHT OF WESTERN STARS.

Continued from page 664).
worked, she walked, and rode. Overcoming a strong feeling, which she feared was unreasonable disgust, she waited on Bonita, who lay ill at the ranch, bruised and feverish, in need of skillful nursing.

Madeline felt that something inscrutable was changing her soul. She was never spiritually alone. There was a step on her trail. Indoors she was oppressed. She required the open, the light, the wind, the sight of endless slopes, the sounds of corral and pond and field.

One afternoon she rode down to the alfalfa fields, round them, and back up to the spillway of the lower lake, where a group of mesquit-trees, fed by the water that seeped through the sand, had taken on the bloom and beauty of renewed life. Under these trees there was shade enough to make a pleasant place to linger.

Madeline dismounted, desiring to rest a little. She liked this quiet, lonely spot. It was really the only secluded nook, near the house. If she rode down into the valley, or up on the foothills, she could not go alone. Even now probably Stillwell or Nels knew her whereabouts; but as she was comparatively hidden here, she imagined a solitude that was not actually hers.

Her horse, Majesty, bobbed his head and flung his mane and switched his tail at the flies. He would rather have been cutting the wind down the valley slope.

Madeline sat with her back against a tree and took off her sombrero. The soft breeze, fanning her hot face, blowing strands of her hair, was refreshingly cool. She heard the slow tramp of cattle going in to drink. That sound ceased, and the grove of mesquits appeared to be lifeless, except for her and her horse.

Yet, listening and looking with keen ears and eyes, she found that the place was far from dead. Desert quail, as gray as the bare earth, were dusting themselves in a shady spot. A bee, swift as light, hummed by, squatting low in the sand. A brown bird darted down from an unseen perch and made a swift, irregular flight after a fluttering insect. Madeline heard the sharp snapping of a merciless beak. There was death, as well as life, in the shade of the mesquits.

Suddenly Majesty shot up his long ears and snorted. Then Madeline heard a slow pad of hoofs. A horse was approaching from the direction of the lake.

Madeline had learned to be wary. Mounting Majesty, she turned him toward the open. A moment later she felt glad of her caution, for, looking back between the trees, she saw Stewart leading a horse into the grove. She would as willingly have met a guerrilla as this cowboy.

Majesty had broken into a trot when a shrill whistle rent the air. The horse leaped, and, wheeling so swiftly that he nearly unseated his rider, he charged back straight for the mesquit. Madeline spoke to him, cried angrily to him, pulled with all her strength upon the bridle, but was helplessly unable to stop him.

He whistled a piercing blast. Madeline realized then that Stewart, his old master, had called him, and that nothing could turn him. She gave up trying and attended to the urgent need of saving herself from mesquit boughs that Majesty thrashed into motion.

The horse thumped into an aisle between the trees, and stopping before Stewart, whinnied eagerly. Madeline, not knowing what to expect, had no time for any feeling but amazement. A quick glance showed her the cowboy in rough garb, dressed for the trail and leading a wiry horse, saddled and packed.

When Stewart, without looking at her, put his arm around Majesty's neck and laid his face against the flowing mane, Madeline's heart suddenly

began to beat with unwonted quickness. Stewart seemed oblivious to her presence. His eyes were closed. His dark face worked into softer mold, lost its hardness and sadness, and for an instant became beautiful.

Madeline instantly divined what his action meant. He was leaving the ranch; this was his good-bye to his horse. How strange, sad, fine, was this love between man and beast!

A dimness confused Madeline's eyes; she hurriedly brushed it away, and it came back wet and blurring. She averted her face, ashamed of the tears, Stewart might see. She was sorry for him. She fought a mounting wish to take him again into her service. He was going away, and this time, judging from the nature of his farewell to his horse, it was to be forever.

Like a stab from a cold blade, a pain shot through Madeline's heart. But why Stewart's departure?

"I want to talk to you," he said.

Madeline started, turned to him, and now she saw the earlier Stewart, the man who reminded her of their first meeting.

"I want to ask you something," he went on. "I've been wanting to know something. That's why I've hung on here. You never spoke to me, never noticed me, never gave me a chance to ask you; but now I'm going over—the border, and I want to know. Why did you discharge me?"

At his last words that hot shame, tenfold more stifling than before, rushed over Madeline, sending the scarlet in a wave to her temples. It was as if his words made her realize that she was actually face to face with him—that somehow he must discover what she would rather have died than reveal. Biting her lips to hold back speech, she jerked on Majesty's bridle, struck him with her whip, spurred him.

Stewart's iron arm held the horse. Then, in a flash of passion, she struck at Stewart's face, missed it, struck again and hit.

With one pull, almost drawing her from the saddle, he tore the whip from her hands. It was not that action on his part, or the masterfulness of his look, so much as the livid mark on his face that quieted her fury.

"That's nothing," he said with something of his old audacity. "That's nothing—to how you've hurt me!"

Madeline battled with herself for control. This man would not be denied. The piercing eyes he bent upon her burned her, went through her, as if he were looking into her soul. Then her quick sight caught a fleeting doubt, a wistfulness, a surprised and saddened certainty in his eyes. She saw it shade and pass away. Her woman's intuition, as keen as her sight, told her that Stewart in that moment had sustained a shock of bitter, final truth.

For the third time he repeated his question. Madeline did not answer; she could not speak.

"You don't know I love you, do you?" he continued passionately; "that ever since you stood before me in that hole at Chiricahua I've loved you? You can't see that I've been another man, loving you, working for you, living for you? You won't believe that I've turned my back on the old, wild life; that I've been decent and honorable and happy and useful—your kind of a cowboy? How could you tell that a wild fellow, faithless to mother and sister, except in memory, riding a hard, drunken trail straight to perdition, had looked into the eyes of a beautiful woman infinitely beyond him and above him, and had so loved her that he was saved—that he became faithful again—that he saw her face in every flour and her eyes in the blue heaven? Who could tell you, when at night I stood alone under these western stars, how deep in my soul I was glad just to be alive, to be able to do something for you, to be near you, to stand between you and trouble or danger, to feel somehow that I was a part, just a little part, of the west you had come to love?" (Continued next week).

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Woman and Her Needs

At Home and Elsewhere

The Domestic Crucible—26

Mrs. Martin Turns Laundress with Disheartening Results

JOHN LUDLOW took the back steps three at a jump promptly as the kitchen clock chimed 12 M. He was as hungry as a bear after a morning in the field, and visions of the dinner his mother-in-law would have ready had been tantalizing him since the middle of the forenoon. One thing Mrs. Martin could cook, if she did get on his nerves. He and the hired man had dug a half bushel of dandelion greens the night before, he had brought in a half ham, smoked and cured to the queen's taste, and left a pan of Spies handy as a suggestion for one of those flaky, melt-in-your mouth, cinnamon-seasoned pies for which Grace's mother was famous.

He sniffed expectantly as he turned the door knob, but his sniff turned to a snort of disgust as a whiff of steamy soapsuds struck his face instead of the odor of ham and cinnamon he had expected. Mrs. Martin, worn, steamy, hot and disheveled, stood in the middle of the kitchen floor looking in despair at the clock which had just announced the dinner hour, and the stove showed no signs of dinner. A glance through the half-open dining-room door—Grace kept it shut when she washed, to keep the steam from spoiling the paper, showed the table like Mother Hubbard's cupboard. There was not a single preparation for dinner, and, crowning insult of all, Mrs. Martin was washing, a thing absolutely forbidden by Grace when she left for a week's visit in the city.

"Why, I had no idea it was so late," the poor woman quavered helplessly. "I was just going to wash out a few pieces, but there were so many when I got to looking around it took me longer than I expected it to."

"But Grace didn't want you to wash," exploded John. "You don't do it at home, and she'll be back next week. She'll be furious when she finds out. We didn't need the things and now you'll be down sick." Visions of a sick mother-in-law on his hands turned John's blood cold. One that could get about was enough to manage.

"Oh, it won't hurt me any, and Grace has so much to do," broke in Mrs. Martin. "She'll be all tired out when she gets back, and I didn't want her to have to pitch in and wash the first thing. I'll fly right around and get you men something. It won't take me a minute."

But "flying around" after a morning spent over a washboard was quite beyond Mrs. Martin's powers. Her attempts to soar brought down Grace's choicest salad bowl, which held the remains of a cold custard intended for dessert. This so flustered the poor lady that it was fully one o'clock before she could get things finally together, and then the men sat down to a few scraps of cold fried bacon, some dry pieces of bread, potatoes half warmed, and weak tea. Mrs. Martin was too tired to eat and excused herself to finish "her rinsing" while the men ate. John choked down his food in moody silence. Why couldn't old ladies be reasonable? Mrs. Martin knew, or at least she ought to if she knew anything at all, which he very much doubted, that she was not strong enough to wash. Why couldn't she stick to the original agreement and just get meals and keep things picked up while Grace was away? He washed down a mouthful of stale cooky with a swallow of weak tea, banged

his chair savagely against the wall and stalked moodily out the front way to work.

Mrs. Martin spied him going to the barn and sighed dismally. She had meant to be such a help to poor overworked Grace, and this was what it amounted to. John was mad, more because he hadn't got a good dinner than because she had worn herself to a frazzle washing his dirty shirts, she thought, and he would set Grace up against her. She sniffed resignedly, dabbed her eyes with her handkerchief and sank into a chair by the kitchen table to drink a cup of tea, which by virtue of having stood on the stove while the men were eating, had now assumed the properties of lye.

It took her until three o'clock to get the last of the clothes on the line. Then the kitchen had to be straightened up, the beds were unmade, the dining-room table stood as the men left it at noon, and the living-room was untouched. Dandelion greens, boiled ham and apple pie were out of the question. She just managed to cut off a few slices of ham to fry, boil some potatoes, open a can of Grace's tomatoes and bake a tin of baking powder biscuit. She should have made bread that day, but the washing had seemed more important.

Frosty politeness characterized the atmosphere of the supper table. Neither she nor John referred to the day's work, but after supper John cleared the table and awkwardly offered to dry dishes. After all, she was Grace's mother and probably meant well. Besides she looked woefully drawn and shaky, and if she should not be able to get up in the morning the fat would be in the fire. Mrs. Martin accepted his offer as awkwardly as it was put. She had much rather be left alone, but she recognized the olive branch, and, after all, he was Grace's husband and Grace loved him, though how on earth she could—Mrs. Martin stopped there and tried hard to think of John's many good points.

She was too tired to make beds, and John firmly ordered her to her room, promising faithfully to make his own and the hired man's. But when Mrs. Martin dragged herself into their rooms next morning, she was morally certain that both men had tumbled into unmade beds the night before.

DEBORAH.

THE PASS-IT-ALONG CLUB.—III.

BY ELLA E. ROCKWOOD.
The May meeting of the club, it had been decided at the previous one, was to be devoted to poultry. The members all being farmers' wives, were anxious to get as much as possible out of their flocks and wisely decided that in a multitude of counselors there would be something for each to gain on this important topic.

"I do not feel competent to advise others as to the care and feeding of poultry in general," said Mrs. Allen, in opening the discussion, "but I do think I have learned several very essential facts in relation to rearing young turkeys and our farm has been making a specialty of the Mammoth Bronze for several years. We used to have much difficulty in getting the little things started right. Bowel trouble was almost sure to set in and kill so many of them. Then I determined to start in feeding only hard boiled eggs

and sour milk curd, the latter well scalded and drained. Since I began this practice there has been no more bowel trouble. Eggs are cheap when it is turkey time and two eggs a day will feed a dozen of them up to a week old, when they can gradually be shifted to baked corn meal bread. We keep food plates very clean, provide clean water and some green feed."

"Dry bread dipped in sweet milk then squeezed very dry is my main dependence for young turkeys," responded Mrs. Ames in continuing the talk. "I save every scrap for weeks in advance, being sure it does not become moldy. Sloppy food of any kind is fatal to very young turkeys and I never over-feed. I give onion tops chopped fine, or lacking this, lettuce as soon as it is big enough. But our bed of winter onions can usually be depended on to supply the turkeys with green stuff, as well as ourselves with the tender young onions in the spring. I'd like to give the ladies my method of dealing with setting hens," she continued. "Where a number are setting, one is apt to forget when the hatch is due, and marking a date on the calendar is sometimes confusing as to which is which. I write on a card the date of setting the hen, also the date she is expected to hatch. This card I either tack to some solid surface near the nest, or slip it underneath if the hen is setting in a box. By the way, I like boxes for setting hens' nests very much. They are light and easy to move around when necessary. If a hen starts sitting where I do not want her I place a cracker or soap box on the exact spot, filling it first with straw or chaff then gently place the broody hen on it, with an egg or two to keep her quiet till I see she means business. If she stays on the nest I put eggs under her next day, and after dark she can be moved elsewhere. It is safer to have a small building by itself for sitting hens where they are free from disturbance and where they can be kept inside by providing food and water."

"I never knew that a turkey would sit on a nest after being moved from her original location until this spring," Mrs. Brown remarked as her name was called. "We wanted to break up one of ours when she commenced to sit. So we put her in another place, but she insisted on sitting. Finally we put eggs under her and she settled down as steady as an old clock."

"Dear me," began Mrs. Collins, when her turn came. "How wise you ladies are on the poultry question. Now there is a lot I don't know about it, having, as you know, lived on a farm only a few years. We tried last year to raise some turkeys but while they did not appear to have bowel trouble, as Mrs. Allen complained of, with hers, ours failed to thrive for some reason and I would like to ask the ladies for some advice. since we are trying again this year and hope for better success. Our little turkeys hatch all right and appear smart and healthy until about a month old. Then they begin to droop, hang the wings down and stand around peeping so mournfully that it makes me just sick myself to hear them. After a few days they die. Now, can any of you tell what is the matter with them?"

"It is nothing but lice, Mrs. Collins," spoke up Mrs. Allen. "We used to have that same trouble until I found out what was the cause. If you had examined one of the little things carefully under the wings, you would have found that the very life blood was be-

ing sucked out by those pests. You should dust the mother well with insect powder two or three times during incubation and probably that would put an end to them. However, I keep a can of the pyrethrum powder handy and sprinkle it liberally over the little fellows' backs occasionally, just before they creep under the hen for the night. Always examine both chicks and turks during the first 48 hours for the large head lice and rub on a little pure lard if any are found, but don't try kerosene as a substitute. I did that once and it killed every chick."

"I am selling my eggs this year in a new way," said Mrs. Holmes, the last to respond to roll call for the day. "I get the cases or cartons which certain firms give away through grocers for advertising purposes. These hold one dozen eggs each. I select the largest eggs, always perfectly fresh, and deliver them to my butter customers at three cents a dozen more than the retail market price. My husband says we should have five cents more but I am satisfied with three until we get our trade worked up. Next year we are going to have cartons stamped with our own name. Every egg is guaranteed and I find people are willing to pay more for the large ones."

It was decided that the topic for the next meeting should be pet economies.

NEW WAYS WITH STRAWBERRIES.

BY M. A. L.

New ways of serving old friends are always welcomed by the ambitious cook. As a starter for dinner, strawberry cocktail is liked in most families, and as this is made without alcohol in any form, no one can object to it. To make it, mash the hulled and washed berries, and for every quart of berries allow the juice of one lemon and one orange, one cup of sugar and four of cold water. Stir all well together in a stone jar or preserving kettle and let stand for two hours. Then strain it through two thicknesses of cheese, cloth, chill and serve in glasses as a first course. Pineapple cocktail may be made in the same way by putting the fruit through the finest of the food chopper knives and substituting for the strawberries.

A pretty strawberry salad may be made by selecting the largest berries, cutting in halves and serving with whipped cream garnished with halves of English walnuts.

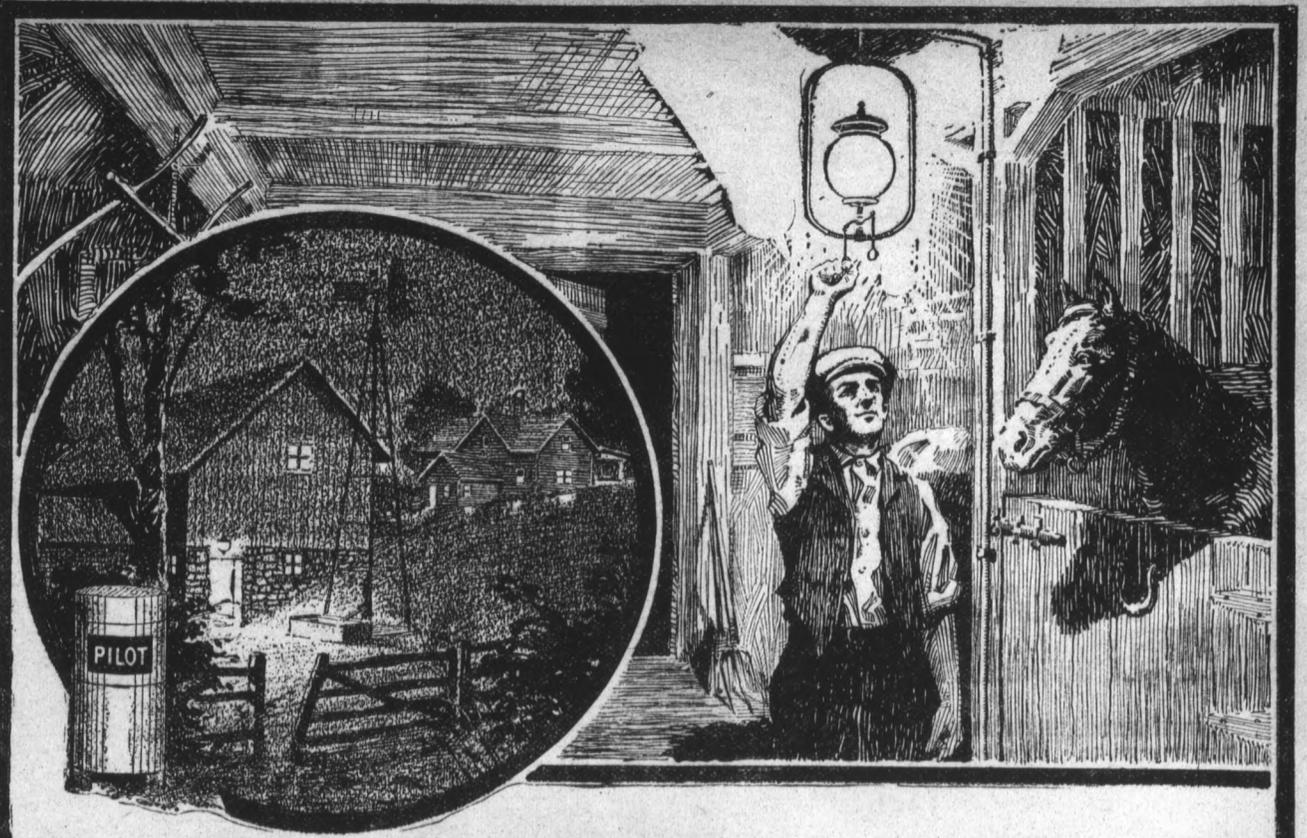
A strawberry cream pie is a change from short-cake. Make a rich pie crust and cut out three circles of equal diameter. From one cut the center, leaving only a ring. Bake the crusts on a flat tin, and put the two crusts together with a rich cream filling. Spread the top crust with the cream, and cover with berries. On top of all lay the ring and pile with chilled berries sprinkled with powdered sugar. To make the cream, mix one cup of sugar with one-fourth cup of cornstarch and two beaten eggs. Add slowly one and a half cups of milk and one tablespoon of melted butter and cook in the double boiler 20 minutes. Salt to suit, and flavor with orange flavoring.

Many families are fond of strawberry custard. This is made by adding crushed and sweetened berries to your usual custard recipe. Of course the dessert must be served as cold as possible. It is better if covered with the stiffly beaten whites of eggs, colored with strawberry juice and sweetened.

A strawberry sauce which is nice to serve with stale sponge cake, steamed for pudding, is made by beating together one egg white and one cup of powdered sugar, and adding a cup of crushed berries.

Catsup Salad Dressing.

Mix together two tablespoonfuls of olive oil, two of sugar and two of vinegar. When well blended beat in one teaspoon of salt, one-half cup of tomato catsup and lastly one cup of sour or sweet cream. The olive oil may be omitted.



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TEMPERATURE IN COOKING.

BY CHARLOTTE BIRD.

What is more acceptable for the breakfast table than a fresh well boiled egg, and what is more wholesome? Almost any woman would resent the implication as absurd that there is any difficulty offered by the process of boiling an egg, and yet many a woman who cooks other things well every day for a family does not know how properly to boil an egg.

Once I saw a woman plump some eggs into a pan of violently boiling water and keep them boiling at a gallop for the prescribed length of time. Now this woman was an old experienced cook and one whose dishes ordinarily gladdened the palates of those fortunate enough to sit at her table. If she wished to boil her eggs soft, she would never neglect them and leave them in the water too long. Nevertheless, she did not understand the supposedly easy process of boiling an egg. By her method the whites could not but promptly congeal into a tough, leathery, indigestible substance while the yolks were still uncooked.

To boil an egg successfully it must be cooked slowly at a lower temperature than the boiling point. The eggs should be put into plenty of boiling water, covered closely and then pushed back on the stove where they will stay hot but not boil. At the end of six minutes the eggs will be cooked soft. If they are desired very soft, the time should be shortened. To cook them hard they should be allowed to remain in the water for 35 minutes and then be put into cold water.

By this slower process the eggs will cook evenly, the yolks with the whites, and the whites will be soft and jelly-like and as palatable as they are digestible. The taste of the egg will be different, because the natural flavor will be brought out.

Again, any woman who can boil water, is sure that she knows how properly to boil potatoes. In fact, the boiling of potatoes appears to be so simple a process as to require no skill whatever. And yet skill is required as one cannot but recognize in the results of the efforts shown by different cooks.

For instance, potatoes should never be put to cook in cold water. By this process, according to those who claim to have tested the matter in laboratory experiments, much of the original nutrition of the potato is lost and the potato has no nutritious qualities which should be lost. On the other hand, potatoes should not be kept boiling at a gallop. Nearly every food tastes better from being cooked slowly and potatoes follow the rule. Then it is too rapid boiling which makes them fall to pieces in cooking.

If the potatoes are to be mashed, again, just a little difference in the handling will make or ruin them. They can be made into a sodden, lumpy mass to be eaten rather from a sense of duty than from inclination. Or a very little more care and effort will bring out these excellencies which will make them add to the flavors of accompanying foods, rather than detract from them.

First, after being well cooked the potatoes should be carefully drained and then dried and salted, if not already salted. They cannot be mashed too finely. The milk and butter should be well worked in and the whole beaten into a white flaky mass. If desired they may now be made more attractive by being run through a ricer into a hot dish. But this is merely a matter of taste.

If the butter supply is short or too expensive, hot pork fryings poured directly from the hot meat, will make a very acceptable substitute and provide a different but agreeable flavor. This, with the thoroughly mashed potatoes, will far excel the lumpy, carelessly mixed potatoes, though seasoned with the choicest cream and butter.

Then the making of plain old-fashioned mush! How could anybody fail

to make mush good enough to pass? Yet this also is a skillful process which, however excellent the quality of the corn meal, will bring or deny success in the undertaking. In mush-making, also, the real secret is the one of the temperature of the water. Before a grain of the corn meal is stirred in the water should be, not simmering, but merrily boiling. And all the while the corn meal is being stirred in the water should be kept at the boiling point. This high temperature is required to bring out both the flavor and the nutritive qualities of the corn meal.

Thus, by the time the mush is thick, which means not too thick, the corn meal is cooked as it could not possibly be by any number of hours of subsequent cooking on the back of the range. Still, much cannot be cooked too thoroughly and even properly made mush will be vastly improved by later hours of slow cooking. But the one real secret of successful mush-making is the temperature of water.

SUGGESTED BILLS OF FARE FOR THE HOME LUNCH.

1. Eggs, boiled, coddled, poached or scrambled; bread and butter; spinach or other greens; cake.
2. Beef stew with vegetables; milk; crisp, thin tea biscuits; honey.
3. Dried bean or pea puree; toast; baked apple; cookies.
4. Vegetable-milk soup; zwieback; rice with maple sugar and butter or with milk or cream.
5. Potato chowder; crackers; jelly sandwiches.
6. Cold meat; creamed potatoes; peas; bread and butter; frozen custard or plain ice cream and plain cake.
7. Lamb chop; baked potatoes, bread and butter; sliced mixed fruits; cookies.
8. Baked omelet with spinach, kale, or other greens; bread and butter; apple sauce; cake.
9. Milk toast; string beans; stewed fruit; cake.
10. Boiled potatoes; codfish gravy; bread and butter; lettuce; custard.—U. S. Dept. of Agriculture.

MAKING BUTTON HOLES.

To make a good buttonhole, begin the slit about a quarter of an inch in from the edge. Cut on a thread through both or all thicknesses of the cloth, making the slit the length of the diameter of the button to be used. Use a thread a little heavier than the cloth in which the buttonhole is worked and of sufficient length to complete it. The needle should be as fine as will carry the thread.

In working a buttonhole, first put in two or more stitches across the lower end of the slit to keep it from stretching. Then take two or more stitches down the side, across the end and up the other side, a sixteenth of an inch from the edge, bringing the needle out at starting point. This will strengthen the buttonhole. In overcasting the edges, sink the stitch a thread beyond this stranding. Four or five overcasting stitches on each side are sufficient to prevent raveling and to keep the strands in place. The last stitch in overcasting should bring the needle out at the end of slit ready to begin working the buttonhole.

In taking the buttonhole stitch, the needle should be brought through deep enough to cover all stitches that have been made before and prevent pulling out. When the end is reached, take seven or nine spreading stitches, making a fan, if a rounded end is desired. If a bar is used, put the needle into the opposite purl at the end of the slit, draw the two sides together and make several long stitches the length of the width that the buttonhole is cut. Work the bar across the end, working from left to right with the blanket stitch. Finish by taking a few tiny stitches on the wrong side.—Mo. Ag. Col.

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Yields as high as 60 bushels of wheat per acre are reported from all parts of the country; while yields of 45 bushels per acre are common. Thousands of American farmers have taken part in this wonderful production. Land prices are still low and free homestead lands are easily secured in good localities, convenient to churches, schools, markets, railways, etc.

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The Pasteurization of Milk

By FLOYD W. ROBISON.

IN the interests presumably of public safety many cities have passed ordinances requiring the pasteurization of all milk sold at retail, within the city, which is not produced under special conditions and which is not bottled on the farm where produced. It has been conceded that this provision should be allowed in the interests of public safety. It is an admission that present inspection methods have not been sufficiently far reaching or so perfected as to make it possible to accept milk on farm inspection alone. Indeed, such is the conceded danger from a contaminated milk supply that even in the Association of Medical Milk Commissioners, who consider methods for certified milk and measures for the promotion of the distribution generally of certified milk, it has been openly advocated that even in certified milk, pasteurization should be resorted to.

That pasteurization does accomplish certain desirable things is evident; that it fails to remedy all of the evil conditions existing in the milk supply is fully as evident; which leads us to a consideration as to whether its advantages outweigh its disadvantages.

Flash Pasteurization.

There are two or three methods in vogue in the pasteurization of milk. In the many cases where pasteurization is resorted to, for instance, in some creameries, to make it possible to simply hold the milk and prevent its souring, what is termed flash pasteurization is employed. This consists simply in raising the temperature of the milk nearly to boiling for an instant only, and then allowing the same to become rapidly cooled. The organisms first killed in this flash system of pasteurization are the lactic organisms which promote souring in milk. The spore forms which may exist are practically unaltered and develop rapidly. The result of the development of these spore organisms in the absence of the lactic organisms is frequently the promotion of putrefactive conditions in the milk. Consequently when milk is treated to flash pasteurization it is very desirable that it should be consumed or made into a new product within a very few hours after the pasteurization. The flash pasteurization method cannot be depended upon to destroy pathogenic organisms in the milk. It is by no means a sufficient safeguard for retail milk in the city and decidedly should not be permitted where the purpose claimed for pasteurization at all is public safety. The employment of flash pasteurization should be confined exclusively to certain commercial conditions where other purposes are in view than the consumption of retail city milk.

The Holding Process.

Where the freedom from disease-producing organisms is the desideratum, as it obviously is under an ordinance which requires the pasteurization of the retail milk supply then what is known as the holding method should be required. The holding method consists in heating the milk to a temperature of from 140 to 145 degs. F., and holding it at this temperature for a full period of thirty minutes. If this method is properly followed out and the temperature is maintained during this entire period of thirty minutes at 140 to 145 degrees, nearly all of the organisms present in the milk will be destroyed and the milk at the end of the period will contain in comparison with the original a very few bacteria indeed.

Pasteurized Milk More Sensitive than Raw Milk.

The weight of scientific evidence indicates that milk after pasteurization is more susceptible to germ influence than before. In other words, any organisms which may be alive in the milk, or any which may gain access to

the milk after pasteurization will operate more vigorously in the heated milk than in raw milk. Therefore it is necessary that pasteurized milk should be guarded in every possible way to prevent contamination subsequent to its pasteurization.

Along with the process of pasteurization of milk there has been steadily increasing the consumption of certain raw milks such as certified milk which is produced under special methods of inspection on the farm and bottled on the farm. Most physiological chemists maintain or admit that raw milk is more desirable for children and infants than pasteurized milk or heated milk. Consequently there is provision in the ordinance for the marketing of milk of the certified or Class A types which is produced under conditions which indicate the maximum degree of safety.

Pasteurized Milk Deficient in Mineral Matter.

One of the very great criticisms which has been aroused regarding the use of pasteurized milk for infant feeding and for children, has been that it is apparently deficient in the mineral matter desired. There is evidently some considerable basis for this opinion. One of the best evidences of this deficiency is shown in the fact that the whipping principle of cream is almost entirely destroyed by the pasteurization of the cream. Most of the milk which is pasteurized in the city will not yield a cream which will readily whip except by some special treatment. This condition is remedied by adding a soluble salt of lime to the milk.

Why Pasteurized Cream Does Not Whip.

The experiment station of the University of Wisconsin originated a product which subsequently became known as Viscoken, which was nothing more nor less than a combination of sugar and lime in soluble form, which when added to milk restored to pasteurized milk the whipping principle. It was therefore conceded that the whipping quality of milk and cream was in some way bound up in its lime salt content. It has been conceded that the condensing or evaporating of milk, together with the pasteurization of milk robs the milk to a certain extent at least of its lime salts.

The Only Drawback to Milk as a Food

One great fault with milk on the whole—the one great detracting feature from this otherwise apparently perfect food product—is its low content of mineral matter. Children who have lived beyond the natural period on a milk diet exhibit in a marked degree the evil consequences of a too steady milk diet. This condition in nutrition circles is known as rickets and other bone diseases of children. It is figured that a child at least at the end of the tenth month, should be receiving a decidedly supplemental diet of milk in order to build up the bone structure of the body. Some children who have been fed for a considerable period exclusively on pasteurized milk or particularly condensed milk, exhibit this same condition of mal-nutrition of the bone, which does not exist in an infant nourished on raw milk when milk exclusively as a diet does not extend beyond the ten or twelve months' period.

The results of infant feeding then quite fully corroborates the finds as shown by the deficiency of lime salts in a milk which has been pasteurized and sterilized and since the addition of soluble lime salts to a pasteurized milk or cream restores the condition whereby it will whip with facility, as it originally existed in the raw product, it can be seen that there is some considerable ground for the opinion that in pasteurized milk a very serious fault is this removal of the lime salts.

(To be continued).



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Markets.

GRAINS AND SEEDS.

May 16, 1916.

Wheat.—Although wheat prices have fluctuated, they remain on practically the same basis as prevailed a week ago. Both sides of the market are finding favorable news from the producing states. Hessian fly reports have been sufficiently large to cause advances, while the general rainfall occurring this week had a depressing effect upon values. The world outlook however, is bullish, owing to the small acreage seeded in Europe. On the other hand, heavy purchasing has not been evident lately. The cash situation is weak, owing to the heavy supply of old wheat in store. The promise of a small crop, however, will tend to support the cash market, in that much of the 1915 crop will be needed next year. The visible supply for the United States decreased 1,160,000 bu. last week. One year ago No. 2 red wheat was quoted on the local market at \$1.55 per bushel. Last week's quotations were:

	No. 2	No. 1	May
	Red.	White.	
Wednesday	1.23 1/4	1.18 1/4	1.24
Thursday	1.22 3/4	1.17 3/4	1.23 1/2
Friday	1.22 1/2	1.17 1/2	1.23
Saturday	1.23	1.18	1.23 1/2
Monday	1.22	1.17	1.23
Tuesday	1.23 1/2	1.18 1/2	1.24

Chicago.—May wheat \$1.16 1/4 per bu; July \$1.17 1/2; Sept. \$1.17 1/2.

Corn.—Corn values have followed those of wheat quite closely. Heavy rains throughout the corn belt are delaying the preparation of the soil and planting. The United States visible supply decreased 400,000 bushels during the week. No. 3 corn was quoted at 76 1/2c per bushel a year ago. Detroit's quotations for last week were:

	No. 3	No. 3
	Mixed.	Yellow.
Wednesday	75 1/2	78
Thursday	75	77 1/2
Friday	74 1/2	77
Saturday	74 1/2	77
Monday	74	76 1/2
Tuesday	74	76 1/2

Chicago.—May corn 75c; July 74.2c; Sept. 73c.

Oats.—There has been a lack of general demand for oats, and prices as compared with those of a week ago are lower. While recent rains have benefited the crop in some sections, in the northern districts the excessive moisture has further delayed seeding and thus contributed to the advantage of the bulls. The early sown fields are, however, looking good. The United States visible supply shows a decrease of 458,000 bushels. One year ago standard oats were quoted at 55 1/2c per bushel. Last week's Detroit quotations were:

	Standard.	No. 3
		White.
Wednesday	48 1/2	47 1/2
Thursday	48 1/2	47 1/2
Friday	48	47
Saturday	48	47
Monday	47 1/2	46 1/2
Tuesday	46 1/2	45 1/2

Chicago.—May oats 46 3/4c per bu; July 43c; Sept. 40c.

Rye.—This market is steady and inactive with cash No. 2 quoted at 95c per bushel.

Beans.—The local market is firm and higher. The demand continues steady with offerings scarce. Immediate prompt and May shipments are quoted at \$3.95, and June \$4. Chicago market dull. Pea beans, hand-picked, \$3.85@3.95; red kidneys \$4.75@5.

Clover Seed.—Prime red clover and prime alsike \$8.85.

Timothy Seed.—Prime timothy \$3.50 per bushel.

FLOUR AND FEEDS.

Flour.—Jobbing lots in one-eighth paper sacks are selling on the Detroit market per 196 lbs., as follows: Best patent \$6.50; seconds \$6.20; straight \$5.90; spring patent \$6.80; rye flour \$6.

Feed.—In 100-lb. sacks, jobbing lots are: Bran \$24; standard middlings \$22; fine middlings \$30; cracked corn \$33; corn and oat chop \$28 per ton.

Hay.—No. 1 timothy \$22.50@23; standard timothy \$21.50@22; light mixed \$21.50@22; No. 2 timothy \$19@20; No. 1 mixed \$16@16.50; No. 1 clover \$13@14.

Chicago.—Choice timothy hay \$21@22; No. 1 do \$19.50@20; No. 2 do \$17.50@18.50.

DAIRY AND POULTRY PRODUCTS.

Butter.—The supply is large and the market is easy at a decline of 2c. Ex-

tra creamery 28c; firsts 26c; dairy 25c; packing stock 21c.

Elgin.—Receipts are increasing slowly and buyers are operating close to necessities, anticipating lower prices. Price for the week, based on sales is 28c a pound.

Chicago.—The feeling is firm and good demand continues. Under-grades are best sellers. Prices are slightly lower. Extra creamery 28 1/2c; extra firsts 28c; firsts 27@27 1/2c; dairy extras 23 1/2c; packing stock 23 1/2@24c.

Eggs.—Market is firm and active at an increase of 1c in price. Current receipts are quoted at 21 3/4c; firsts 22 1/4c per dozen.

Chicago.—Market is ruling steady at unchanged prices. Demand is good and receipts are liberal. Firsts 20 1/2@21c; ordinary firsts 19@19 3/4c; miscellaneous lots, cases included 19@20 3/4c.

Poultry.—Market is firm at slightly lower prices. Fowls 18@19c, according to quality; broilers 35@40c; ducks 21@22c; geese 12@13c.

Chicago.—The supply is large but former prices are maintained. Quotations for live are as follows: Hens 17 1/2c; ducks 16@18c; geese 10@13c; roosters 11 1/2c; broilers 1 1/4@1 3/4 lbs., 35c; 1@1 1/4 lbs. 30@32c.

FRUITS AND VEGETABLES.

Apples.—Apples are in fair demand and good supply. Quotations as follows: Baldwins \$3@3.50; Steele Reds \$4@4.50. At Chicago the market is active for stock which is sound. Off-grade stuff is hard to get rid of. No. 1 Greenings are quoted at \$2.50@3.25 per bbl; Golden Russets \$3@3.25; Baldwins \$3@3.25; Spys \$3.50@4.50; Ben Davis \$1.75@2.25; Steele Reds \$4@5.

Potatoes.—Potatoes are in good demand at prices slightly lower than last week. Carlots on track 95c@1 for white and 90@95c for red. At Chicago the trade is quiet, the warm weather is restricting the demand. No Michigan stock is quoted but others sell from 80@92c per bushel.

WOOL AND HIDES.

Boston.—The new clip is now moving rapidly. In Michigan prices reported range from 28@35c. The demand is good and the situation continues to be very strong. Manufacturers have a large number of orders, and more are promised. Many farmers are holding for better prices.

Hides.—No. 1 cured 17c; do. green 15c; No. 1 cured bulls 13c; do. green 10c; No. 1 cured calf 25c; do. green 24c; No. 1 horsehides \$4.50; No. 2 \$3.50; No. 2 hides 1c and No. 2 kip and calf 1 1/2c lower than the above; sheepskins, as to amount of wool, 50c@52.

DETROIT EASTERN MARKET.

The variety of offerings was small but there was a goodly number of teams on the market Tuesday morning. The best potatoes were selling at \$1.10. Only a few apples were offered at around \$1; lettuce \$1.25; chickens \$1.40 per pair; asparagus 75@90c per dozen; eggs 25c; rhubarb 10c per bunch. There was no loose hay in sight.

LIVE STOCK MARKETS.

Buffalo.

May 15, 1916.
(Special Report of Dunning & Stevens, New York Central Stock Yards, Buffalo, N. Y.)

Receipts here today as follows: Cattle 150 cars; hogs 90 d. d.; sheep and lambs 50 d. d.; calves 2000 head.

With 150 cars of cattle today, there were around 50 cars of shipping cattle. The demand was strong from all the eastern buyers and the general market was 25c higher than last Monday's average. There was one fancy heavy load of cattle that sold at \$10.50, but they were in a class by themselves and would sell at a premium on any market. We look for a fair run of cattle next Monday and a good trade, and if they do not have a heavy run in Chicago on Wednesday and break the market, would advise letting cattle come right along, as these present prices look very attractive.

We had a fair supply of hogs today, about 90 double decks; demand good for all classes, best grades selling 5@10c higher than Saturday's close, and pigs in most cases 40c per cwt. higher than Saturday's best time. One or two loads of strictly choice medium hogs sold at \$10.60, with the bulk of the yorkers and light mixed \$10.50@10.55; pigs and lights generally \$10; roughs \$9.25@9.40; stags \$6.50@7.50. Everything sold at the close and present prices look plenty high to operate on. Market was active on sheep and lambs, with prices a quarter higher than the close of last week. About all sold and we look for steady to possi-

bly shade higher prices last of the week.

We quote: Clipped lambs \$10.75@10.90; heavy lambs \$9.25@9.50; cull to fair \$6@10.50; yearlings \$9.25@9.50; bucks \$4.50@7; handy ewes \$8@8.25; heavy ewes \$7.50@8; wethers \$8.50@8.75; cull sheep \$4@6.50; veals, good to choice \$11.25@11.50; common to fair \$8@11; heavy \$6@9.

Chicago.

May 15, 1916.

Cattle. Hogs. Sheep.
Receipts today..14,000 32,000 12,000
Same day 1915..18,276 36,190 11,344
Last week.....38,028 105,283 58,941
Same wk 1915..36,715 97,732 56,318

The meager Monday cattle supply offered today was sold quickly at an advance of 10@20c, sales looking largely about 15c higher at least. Hogs advanced fully 15c with sales at \$9.75@10.35, making another high record. Sheep and lambs sold largely about 15c higher.

Cattle advanced last week to the highest prices of the year, with inadequate offerings of the choicer class and a strong demand for them, as well as for other descriptions. The Purdue University Experiment Station had a consignment of prime steers on the market that sold at fancy prices, comprising 69 steers that averaged 1098 to 1184 lbs. and sold at \$9.10@9.25, besides 22 steers that averaged 1201 lbs. and brought \$10.25. The bulk of the steers offered brought \$8.50@9.75, there being smaller offerings of choice beefs than usual. Common to fair steers of light weight brought \$7.75@8.75, while medium to good steers sold at \$8.80@9.20, good to choice steers at \$9.25@9.60 and choice to fancy steers at \$9.65@10.10. Yearlings sold anywhere from \$8.25@8.75 for the cheaper kinds up to \$9.50@10 for the better class. Butchering cattle sold satisfactorily, cows being taken at \$5.70@8.65 and heifers at \$5.75@9.50, with yearling heifers the prime favorites with killers. Cutters were good sellers at \$4.90@5.65, canners going at \$3.50@4.85 and bulls at \$5.40@8.25. Yearling bulls went highest, and stock and feeding bulls sold at \$5.90@6.40. Calves were marketed freely, with the accustomed good supplies on Tuesday from dairying districts, and there was a good outlet at \$5@7.50 per 100 lbs. for the heavier calves up to \$9.25@10.50 for attractive looking light vealers. There was a good call for desirable stockers and feeders, with the former going at \$5.75@8.50 and the latter at \$7.40@8.80. Wisconsin buyers were looking around for fleshy, well-bred steers of this class, and they paid up to \$8.80 for prime feeders, a new high price for the year, two car-loads fetching that price. Killer competition for these cattle has run them up to prices that are extraordinarily high, few lots selling under \$7. Stock and feeding heifers have sold at \$6@6.90. Beef and feeder cattle prices were the highest ever known in May. 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THIS IS THE FIRST 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.

May 11, 1916.

Cattle.

Receipts 2249. There was a good fair run in all departments at the local stock yards this week and nearly everything arrived and was yarded early, the only straggler being a string off the northern division of the Pere Marquette which arrived at 3:00 p. m.

In the cattle division the trade was again active and all grades brought steady last week's prices, the quality was unusually good and several carloads brought \$9 per cwt. Michigan cows were very scarce and the few here were of an inferior quality. Quite a number of country buyers were on hand after stockers and feeders and several carloads were bought and returned for feeding. The close was steady as follows: Best heavy steers \$8.50@9; best handy weight butcher steers \$8.25@8.50; mixed steers and heifers \$7.25@8; handy light butchers \$7@7.75; light butchers \$6.50@7; best cows \$6.50@7.10; butcher cows \$5.50@6.25; common cows \$5@5.25; canners \$3.50@4.50; best heavy bulls \$7@7.25; bologna bulls \$6@7; stock bulls \$5@6; feeders \$7.25@7.75; stockers \$6@7.50; milkers and springers \$4@7.5.

Bishop, B. & H. sold Mason B. Co. 1 bull wgh 1080 at \$7.10, 2 do av 815 at \$6.75, 1 do wgh 1330 at \$6.75, 1 do wgh 1240 at \$7.50; to Parker, W. & Co. 6 cows av 1060 at \$6.50, 1 do wgh 1020 at \$5, 3 do av 1073 at \$7, 20 do av 1078 at \$6.25, 2 do av 1075 at \$6.50, 14 steers av 904 at \$8.50; to Kull 23 do av 965 at \$8.65; to Bresnahan & B. 6 cows av 1190 at \$6.50; to Thompson Bros. 12 steers av 873 at \$7.85, 10 do av 736 at \$7.65; to Newton B. Co. 27 do av 1100 at \$8.85, 5 do av 762 at \$8, 1 bull wgh 850 at \$6, 20 steers av 887 at \$8.30; to Thompson Bros. 10 do av 1033 at \$8.75, 23 do av 1019 at \$8, 3 bulls av 823 at \$6.25; to Sullivan P. Co. 10 steers av 1117 at \$8.75; to Parker, W. & Co. 2 cows av 1170 at \$6, 1 do wgh 730 at \$5.50, 2 do av 985 at \$5.15, 2 do av 920 at \$7; to Hammond, S. & Co. 2 bulls av 1285 at \$6.75, 1 do wgh 870 at \$6.75, 7 steers av 1050 at \$9, 2 do av 1070 at \$8.50, 4 bulls av 1130 at \$6.50, 5 do av 1004 at \$5, 10 steers av 1029 at \$8.50, 4 do av 942 at \$8, 14 cows av 1073 at \$6.60; to Fromm 3 butchers av 870 at \$6.25, 3 do av 817 at \$6.25, 4 cows av 1020 at \$5.65; to Garber 2 do av 1285 at \$7.25, 2 do av 1065 at \$7.25.

Veal Calves.

Receipts 1132. The veal calf trade was active and 50c higher than last week and the quality was fair. Shippers are advised not to buy bob calves or thin heavy grades as they are being watched closely by the meat inspector and are sure to be condemned. Best grades \$10@10.50; medium and common \$6.50@9.50.

Haley & M. sold Sullivan P. Co. 7 av 140 at \$10, 6 av 140 at \$10; to Hammond, S. & Co. 12 av 160 at \$10.25, 2 av 135 at \$8.50, 12 av 170 at \$10.25.

Erwin & S. sold Parker, W. & Co. 7 av 140 at \$10.25, 18 av 145 at \$10.25, 2 av 115 at \$10; to Burnstine 5 av 155 at \$10; to Fineman 8 av 125 at \$9.

Sheep and Lambs.

Receipts 2160. The supply of sheep and lambs on sale was common and the general market steady. Swift & Co. paid \$9.75 for a few extra fancy but the bulk of the good brought \$9@9.50. The close was steady. Best lambs \$9.25@9.75; fair lambs \$7.25@8.25; light to common lambs \$6.75@7; fair to good sheep \$6.50@7.25; culls and common \$4.50@5.50.

Bishop, B. & H. sold Thompson Bros. 124 lambs av 65 at \$9; to Sullivan P. Co. 126 do av 65 at \$9; to Parker, W. & Co. 84 do av 75 at \$9, 18 mixed av 90 at \$7.50; to Sullivan P. Co. 9 sheep av 120 at \$7.25, 11 lambs av 63 at \$8, 12 do av 55 at \$8, 7 sheep av 90 at \$4.50, 26 do av 95 at \$7, 13 do av 75 at \$7; to Sullivan P. Co. 43 lambs av 55 at \$8; to Thompson Bros. 10 sheep av 118 at \$7.15; to Sullivan P. Co. 44 lambs av 68 at \$9.50; to Swift & Co. 58 do av 80 at \$9.75, 100 do av 88 at \$9.50, 143 do av 80 at \$9.75.

Sandel, S., B. & G. sold Parker, W. & Co. 110 lambs av 70 at \$9; to Sullivan P. Co. 3 sheep av 110 at \$7.25, 95 do av 65 at \$8.60.

Hogs.

Receipts 10,734. In the hog department the trade was very slow on Wednesday and packers would not pay over \$9.60 for anything. The quality was fair. On Thursday the market was \$5@10c higher. Pigs \$8.50@8.75; mixed grades \$9.50@9.75.

Crop and Market Notes.

Michigan.

Washtenaw Co., May 9.—Cool wet weather has helped pastures, meadows and wheat, but has also delayed the spring work. Many fields of oats are not yet sown. Preparations are for a large acreage of oats and corn. The spraying of fruit trees is very general. The spring pig and lamb crops were large. We are getting \$1.15 for milk at receiving station. Beans \$3.50; cattle \$7.50@8; hogs \$9.25; eggs 19@20c.

Van Buren Co., May 9.—Weather is cold and wet and no corn is planted. Grains are looking well and hay is growing rapidly. The majority of orchards in this section are sprayed, and fruit outlook is good. Wheat \$1.10; corn 75c; hay \$15@18; wool 28@32c; potatoes 75c; white beans \$3@3.25; red kidneys \$4@4.25; butter 28c; eggs 19c per dozen.

Mecosta Co., May 9.—Farmers are just finishing oat seeding. Pastures are late; wheat short; hay promising. Some spraying has been done, and fruit prospects are favorable. The pig crop is small but lambs are doing very well. Some farmers are still holding their potatoes; the price here is 75c. Butter-fat 37c; eggs 18c; cattle \$3.50@5; hogs \$9.

Branch Co., May 9.—The season is 15 to 20 days late. Wheat looks about 80 per cent of a crop. Meadows late but look good. About the usual amount of spring crops will be put in. Fruit trees are in blossom. Wheat \$1.14; corn 65c; oats 40c; potatoes 50@60c; butter 25c; eggs 20c.

St. Clair Co., May 10.—Farmers are busy sowing oats. Wheat and meadows are looking fine, and pastures are now fair. Spraying is general and the fruit trees are in good shape. Most of the farmers are buying potatoes. Butter-fat 35c; wheat \$1.12; beans \$3.40.

Cheboygan Co., May 11.—Much stock is already on pasture. Wheat and rye are looking fine, except where the ice smothered the plants. About one-third of the oat crop is in, also a portion of the peas. Fruit prospects are fair. Quite a large acreage of beans will be planted in this section. Wool 30c; butter-fat 30c; eggs 18c; beans \$3.25.

Emmet Co., May 8.—Cool, backward weather has delayed spring seeding. Winter grains, meadows and new seeding are promising. Usual acreage of oats and peas will be planted. An increased interest is being taken in alfalfa, and a large acreage will be sown. Plenty of fruit buds are showing. Butter-fat 34c; beans \$2.75@3; eggs 18c; chickens 15@17c.

Eaton Co., May 11.—Winter wheat, new meadows and pastures are looking good. Some oat fields are still unseeded. Not much plowing done for corn or sugar beets. Orchards have been sprayed for scale. Spring stock is looking well. Wool 35c; butter-fat 30c; beans \$3.50; wheat \$1.15; hens and chickens 16c; eggs 19c.

Ohio.

Brown Co., May 10.—Wheat and pastures are looking well. There are a good many oats sowed but are mostly all later than common. There is some corn planted but the most of the farmers are waiting for warmer weather. The ground was mostly plowed wet and if a drought comes it will be hard to get in shape. There is a good lamb crop but only a fair pig crop. Wool is the highest-priced in years. Wool 35@40c; butter-fat 32c; eggs 18c; butter 22c.

Fairfield Co., May 11.—Wheat is in bad shape. Perhaps it will make half a crop. Meadows are fair; pastures good; very little oats sown. Some farmers are planting corn; others not done plowing. Fruit trees generally in good shape with a prospect for good crop. Spring pig and lamb crop is fairly good. Butter-fat 35c; hogs 8½@9c; cattle 5@7¼c; hay \$12@14; butter 25@35c; wheat \$1.10; oats 45c; corn 75c; chickens 16c; eggs 19c.

Indiana.

Elkhart Co., May 8.—Farmers are busy plowing for corn. More corn and less oats will be raised this season. Wheat and meadows are looking fine. Fruit trees are in blossom and prospects are for a good crop. More spraying is being done every year. Live stock is doing well with a good average crop of young pigs and lambs. Roads are in good shape although we have been having frequent rains. Eggs 20c; butter 28c; wheat \$1.14.

Wisconsin.

Jackson Co., May 9.—Fine growing weather at present, but April was cold and wet, delaying all farm work. Oat seeding about finished and early gardens planted. Cattle are out of pasture, which is still short. Meadows and winter grain were damaged some by winter-killing. Fruit trees starting well; little spraying here. About the average pig crop with some losses reported. Good demand for young pigs at \$2@3 each. Butter-fat 32c; potatoes 75c; oats 45@50c; plowing for corn is in progress.



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- 1 large size box Golden Gull Remedy..... .50
- 1 Indigo Blue, 23 inch square Cambric Pocket Handkerchief..... .19
- 1 Farm, Stock and Account Book.... .25 (One farmer wrote he would not take \$10 for his if he could not get another)
- 1 Vest Pocket Memorandum Book.... .05
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High Scoring—Blue Andalusians and R. I. Reds. Eggs delivered 10 cents each. W. T. FRENCH, Scottville, Michigan.

IMPROVE your poultry. My Young's strain S. C. White Leghorns great money makers. Strong, vigorous, free-range stock. Baby chicks \$8 per 100 and up. Satisfaction guaranteed. Free catalogue. W. Van Appleton, Holland, Mich.

Leghorns, Baby Chicks, Prices Reduced. S. C. White and Brown, \$8. per 100, 5000 chicks first of June. Order Early. SUNNYBROOK POULTRY FARMS, Hillsdale, Michigan.

LILLIE Farmstead Poultry, B. P. Rocks: R. I. Reds: L. W. Leghorns. 15 eggs \$1; 25 eggs \$1.50; 50 eggs \$2.50. P. P. delivery free. Colon C. Lillie, Coopersville, Mich.

ORPINGTONS—White, Single-Comb Kellestrass Eggs, Chicks, Special prices. M. E. THOMPSON, Redford, Mich.

Pine Crest S. C. White Orpingtons—Eggs \$5 and \$3 per 100. Chicks 40 cts. and 25 cts. each. MRS. WILLIS HOUGH, Pine Crest Farm, Royal Oak, Michigan.

RHODE ISLAND REDS and PLYMOUTH ROCKS. Males 5 to 12 lbs. according to age \$2 to \$5; P. H. hens weight 5 to 10 lbs., eggs 15 for \$1.00; 100, \$5; 120, \$6. Mammoth Bronze Tom Turkeys, 8 to 39 lbs. according to age \$5 to \$25, 10 eggs \$3. A. E. Cramton, Vassar, Mich.

R. I. Reds, Both Combs, Most Popular strain in Michigan for hatching, Baby Chicks. Write for catalogue. INTERLAKES FARM, Box 39, Lawrence, Michigan.

Rose Comb Brown Leghorn Eggs \$1 per setting, \$5 per 100. W. China Geese 25 cents each. CLAUDIA BETTS, Hillsdale, Mich.

RHODE ISLAND WHITES win at the National Egg R Laying contest. Cold weather don't stop them. Eggs \$1.50, 2 settings, \$2.50. H. H. Jump, Jackson, Mich.

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Heavy Winter Layers—Long, large bodied, S. C. W. Leghorns, Wyckoff strain. Eggs, \$1.00 per 15; \$3, per 50; \$5, per 100. H. A. Magoon, R. 5, Ann Arbor, Mich.

A FINE TIME TO BUY S. C. REDS Let us sell you a trio or pen of this year's breeding stock at half the price you pay at other times of the year. A good chance to start with well-bred stock. Hatching eggs ¼ price after May 15th. Order chicks now. Remember this, (Satisfaction or your money back.) Babcock & Son, Battle Creek, Mich., R. D. 4.

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ROSE and S. C. R. I. Red eggs by mail \$1.50 per 15 or 25c per egg from special pens; \$5 per 100. Hens for sale. JENNIE BUELL, Ann Arbor, R. 3, Mich.

Rose Comb Brown Leghorns—Eggs \$1 per 15; \$4 per 100. Stock is from Philadelphia winners. D. Elon Spotts, Hillsdale, Mich.

S. O. WHITE LEGHORNS, bred for size, shape, vigor, egg production. 14 years' experience breeding Leghorns. Hatching eggs \$1.50 per 100. Baby Chicks \$10 per 100. A. O. HOWARD, Tecumseh, Mich.

Tom Barron S. C. W. Leghorns. Large, vigorous stock. Eggs \$5.00 per 100, \$1.25 per 15, post paid. No Chicks. Bruce W. Brown, Mayville, Mich.

Buff Wyandotte and Barred Rock Cockerels \$2.00 each, eggs for hatching \$1.00 per 15. Mrs. R. W. BLACK, Caro, Michigan.

SILVER GOLDEN and WHITE WYANDOTTES. Eggs from all matings, 1.50 per 15, \$2.50 per 30 until July 1st. C. W. Browning, R. 2, Portland, Mich.

White Wyandotte Cocks & Cockerels, Eggs \$1, \$2, \$3, per 15, \$4 per 50, \$7 per 100. DAVID RAY, 202 Forest Ave., Ypsilanti, Michigan.

WHITE WYANDOTTES. Eggs \$1.50 per 15, \$2.50 per 30, \$7.00 per 100. From choice stock. A. FRANKLIN SMITH, Ann Arbor, Michigan.

White Wyandotte Eggs Half Price balance of the season. EGGADAY POULTRY RANCH, Marshall, Michigan.

"PREMIER" PARTRIDGE WYANDOTTES 80's winter layers. Eggs \$2.00 per 15. W. H. BAOON, Petersburg, Mich.

White Wyandotte eggs and baby chicks, Mammoth Pekin duck eggs \$1.25 per 11, postpaid, satisfaction guaranteed. Hemlock Poultry and Stock Farm, Prescott, Mich.

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(Additional Poultry Ads on page 676).

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Farm Commerce.

Fruit Exchange Prospers

THE interest in co-operative enterprises among farmers has increased wonderfully during the past few years. The main reason for this is that we have now successful examples of co-operative work. We have something tangible about which we can speak when we talk co-operation and facts upon which we can base our arguments on co-operation. Theory does not appeal to the majority of people, they have to be shown, but when they are shown they are at once interested.

One of the co-operative associations which has recently done much to promote the cause of co-operation in this state by its success, is the South Haven Fruit Exchange. We have given several accounts of its work and now that we have a record of the past season's business we give it to prove still more conclusively that the principles of co-operation are sound.

Last year, its third year, was the most successful yet. The Exchange has more than doubled its membership since the date of organization, the charter members numbering thirty-two while the total at present is sixty-eight. It could undoubtedly have filled its full quota of members, one hundred, if it had more room in its packing house to take care of the business. Its present quarters were taxed to the limit, and a large number of applications will have to remain on the waiting list until the association gets its new \$10,000 home built. This condition with reference to membership is made more significant by the fact that membership fees have been raised from \$100 to \$150. The officers and directors of the association take the position that a membership composed of serious minded men is necessary.

The loyalty of the members is one great essential in co-operative work. A high-priced membership will tend to keep the members loyal, but efficient management is also necessary. That the management of this Exchange is a

greater than that handled by the individual.

An experience with peaches last year shows the value of selling through an association. One of the members who is a very good peach grower thought that he could sell his peaches to better advantage than the Exchange could. The result was that 2,500 bushels netted him about \$75, while another mem-

An Illinois fruit dealer was pleased with the pack and wishing to use the same kind of package, asked the association to send him some, which it did. Although his pack was as good his fruit, when sold in direct competition with that of the association, brought only 85 cents, while that of the association sold for \$1.25 because the brand it was packed under had a reputation.

The Exchange is very fortunate in having for a general manager a man who has had years of experience buying and selling fruit, and a board of directors, the members of which have been successful in farming and business. In addition to the general manager a packing manager is hired during the packing season. Last year this



Fruit is Loaded Directly into Refrigerator Cars from the Packing House.

ber with peaches of no better quality got a net of \$140 from 500 bushels sold through the Exchange.

Secretary James Nichols says that a central packing house is necessary for success in the co-operative selling of fruit, especially when perishable fruit like peaches are handled. In packing on the farm, even though the packing is good, the packages have to travel over several miles of road in the heat, while fruit packed in the central packing house is sorted after it travels over the road, packed and immediately put into a refrigerator car. This insures the arrival of the fruit upon the market in a much better condition. For that reason buyers are willing to pay

man incurred the enmity of members and packers by his strictness. On account of the large crop of peaches the association was very careful in packing nothing but the best. Many growers brought down fruit which had to be refused on account of poor quality. But this insistence on a quality pack brought higher prices and added greatly to the reputation of the Exchange among buyers, as all of the fruit could be guaranteed.

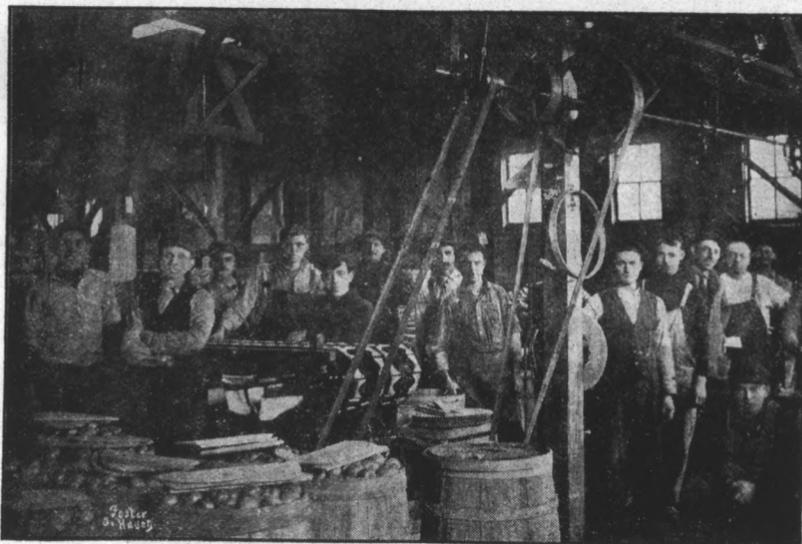
To a small extent the Exchange preserved some surplus and over-ripe stock. It has been very successful with this line of work so far, and will enlarge upon this method of saving fruit which is practically waste now, when it gets into more commodious quarters.

The association covers the territory within a ten mile radius from South Haven. One member, twelve miles from town, crates his fruit and ships it to the packing house by railroad. The association also has an application from a grower fourteen miles from town.

The volume of business done was about \$30,000 over the year before, or about \$135,000. During the year 257 cars of apples, pears and peaches, and 23 cars of small fruit were shipped. In addition thirty cars of supplies were bought and sold to the members at an increase of five per cent above the cost price. During the winter the Exchange also runs a beanery and does a big business buying, sorting and selling beans.

The South Haven Fruit Exchange is one of the permanent institutions of South Haven. It is a farmers' business institution which will do South Haven and vicinity an untold amount of good by establishing a reputation and maintaining a high standard market for its soil products. Furthermore it is a model in its plan of organization and business management for the formation of other farmers' co-operative organizations.

A protest is being made against a section in the rural credits bill now before Congress which provides that all attorneys, experts, assistants, clerks, laborers and other employees, and all registrars and appraisers of the Federal Farm Loan Board shall be appointed without complying with the requirements of the civil service law.



Through the Use of Mechanical Sorters and Other Labor-saving Devices the Work is Done Better and Cheaper.

good one is indicated by the fact that only five of the members did not fully support the association last year, but every one of the five was willing to buy barrels from the association at reduced prices and wanted the association to sell their peaches when they had difficulty in disposing of the fruit themselves.

One reason why the people around South Haven are loyal to the Exchange is because they have come to realize that as individuals they cannot hope to compete with well organized associations of the west and south, good business methods, fruit packed under a guarantee and a volume of business

a premium price for association fruit.

Several brands or trade names under which various good grades of fruit have been packed and sold have become valuable assets to the association because an annual demand has been created for them. The association also uses a destructive pack in a common package which has become a recognized one in the markets for fancy fruit. The package is the standard bushel basket in which fancy apples are carefully packed from the bottom up. The reason for using the basket instead of the box was to distinguish the pack from the large amount of western fruit it has to come into competition with.

A New Idea in Marketing

A NEW idea in the solution of the market problem is to go into effect this coming season in the southern portion of Oceana county. "Necessity is the mother of invention." Last season's peach crop was a big one throughout the United States, and it sold for the most part at a very low price. Here in the "Great Peach Belt" peaches brought less than it cost to grow them and left nothing over to compensate for a year in which the crop may be short, or practically a failure, though we are glad to admit that this last named condition is not likely to occur once in a generation.

But at any rate, the prices which were possible last fall, under our present system of marketing, if indeed we may be said to have any system, were so low that many people allowed their fruit to rot in the orchard rather than to pick it and take a chance on finding a market for it even at the nominal prices which prevailed.

It seems to require a year like the last one to set people to thinking. I do not recall having heard as much talk of forming a company for the purpose of co-operative marketing in the last five years put together, as there has been since the unfortunate developments of last fall.

Co-operate with Business Men.

We people of Oceana county are fortunate in having some business men who have spent their entire business lives so far in our midst, and have made good. Everything they have—their investments, their reputations, their families, their homes and their ambitions are here. They want to keep on doing business, and there are not more of them than are needed. Some of them own a canning factory in a prosperous little village, and they also buy green fruit and ship it to some extent. Now while the fruit growers were talking co-operation, another company to handle fruit in our midst—more competition, and more work and worry—someone had a new thought. "Why not use the canning company as the new means of distributing the fruit? Why not contract with the growers to handle the fruit for a stated price per bushel, canning the fruit that could not be shipped, and shipping that which would bring a good price in the market?" Thus if the market became congested at any time, and fruit could not be shipped with a fair prospect of a remunerative price, it could be put into cans and stored, in which case it would bring as much as any fruit disposed of in that manner. Then, too, all the inferior fruit that would not be desirable for shipping, could be canned, with that which was over-ripe, and practically everything could be saved.

What fruit is going to sell for after it is canned is always a problem. Last fall for a time it looked as though canning peaches with a prospect of any profit was out of the question, but suddenly the market took a change, and later peaches sold faster than they could be secured and canned. I know one company that began canning largely to help out the growers, expecting to have canned peaches around in the way for two or three years, but who had scarcely a can left after the first of November.

But to return to the discussion of the new plan. Most of the growers in the southern part of the county have signed an agreement to let the canning company handle their fruit, and the matter will be given a thorough trial. I am not going to try to say just how it will turn out, but it is an experiment that will be watched with interest. In the mind of the writer the plan has much to commend it.

Some Advantages Enumerated.

In most places where perishable products are grown there are already too many people trying to make a living

by handling them. This plan does not contemplate a new company. When a number of farmers or fruit growers go together for the purpose of marketing men with practical experience in the new line of work are lacking, which places the co-operators in an unfavorable competition at once with the dealer who is well established, has had long experience and is well informed of the whole field of opportunity in his particular line.

The growers who have contracted with this company have placed their confidence in men of long and successful business experience, and it will not add a care to a single one of them. All they will have to do is to grow the fruit, deliver it in good condition and pay the company for handling it in the way in which the most can be gotten out of it.

Looking at the matter from the doubtful side, neither the canning company nor the growers can say at this time whether the price fixed for handling the fruit is fair to all the parties concerned. But after the plan has been tried during the coming season results will show whether or not either party has an unfair advantage over the other and if so, adjustments can be made accordingly. It is hardly to be expected that the season will pass by without some unfortunate experiences. If the fruit crop should be generally large doubtless there will be times when the market conditions will be very bad. It may not be possible for the company to anticipate these conditions in time and in consequence some fruit may be shipped that should have been canned or held for a time in cold storage. In such a case the grower would probably receive less for his fruit than he could have gotten by selling it to a competing dealer, who not knowing the condition of the market, would pay more for it than he could afford to.

Help to Dodge Glutted Markets.

Experiences like these will doubtless create a good deal of anxiety among the growers, and may discourage some of them, but matters will right themselves later on when the market recovers again and when the results of the season's business are all summed up, it will be seen that the plan has something in it, if we have not guessed wrong.

In our mind, one of the advantages of this arrangement is that it tends to control the market in the interest of both the producer and the shipper. When prices are low if the fact is known soon enough, the fruit need not be shipped, for the company has the option of either canning it, or putting it in cold storage until prices are better.

Another advantage is found in the long and successful business experience of the men composing the company. They are widely and favorably known outside by the people who buy these goods, and thus their ability to discover a good market in a time when fruit is a drug in many places, will result to the advantage of all concerned.

There are yet quite a number of growers who will not be likely to contract with the company herein referred to, and I have heard some talk of organizing a co-operative company among them. Should this be accomplished, we shall have the privilege of trying out both plans on much the same ground, and the results may prove of value to the community in an educational way.

This problem of distribution is a difficult one and is not going to be satisfactorily solved in one year, or two. The writer feels, however, that we are making some headway, and that we should proceed carefully, conservatively and steadily until our object is accomplished.

Oceana Co.

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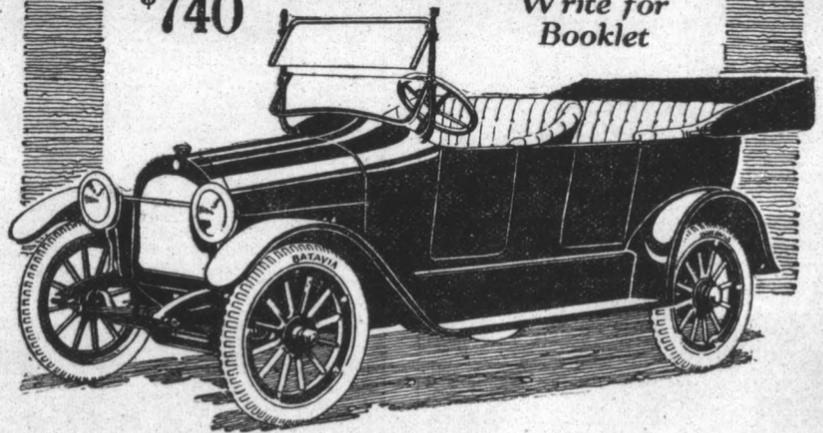
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32 by 3 1/2	8.90	9.75	2.60
32 by 4	11.95	13.65	3.30
33 by 4	12.10	14.25	3.50
34 by 4	12.25	14.75	3.60
35 by 4	12.75	14.75	3.60
35 by 4 1/2	16.30	18.55	4.25
36 by 4 1/2	17.39	18.95	4.35
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No More White Diarrhoea

Mrs. Claude Kane of Cataract, Wis., no longer worries about losing her little chicks from White Diarrhoea. She is only one of several thousand who last year learned of a simple method of preventing this disease. Mrs. Kane gives her experience below:

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BARRED Rocks Parks 200 Egg Strain with records to 290 eggs a year—\$1.50 per 15. Delivered. By Parcel post. Fred Astling, Constantine, Mich.

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Cousins Northern King Strain Barred Plymouth Rocks. Have won many prizes. Eggs \$2 for 15. Both matings. Satisfaction guaranteed. David W. Cousins, North Port, Mich.

CYPHER'S TRAPNEST strain of Single Comb White Leghorns. Eggs for hatching, 15, \$1.50, \$3, 100, \$5, 500, \$23. Thos. H. Barnes, Creston, Ohio.

JOHN'S Big, beautiful, hen-hatched Barred Rocks. Eggs, 30, \$2.50; 100, \$7.00. Select matings 15, \$4; 30, \$7.00, all postpaid. Photos. Circulars. John Northon, Clare, Mich.

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EGGS for hatching from pure bred White Plymouth Rocks and S. C. Buff Leghorns on free range. Kietzler & Webster, Bath, Mich.

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With the Growing Chicks

ADEQUATE range and an abundance of suitable green feed are important factors in the growth and development of young chicks. With clean yards and plenty of green feed it is comparatively easy to work out a system of feeding and management that will insure a flock of young pullets possessing size, quality and vitality. Overcrowding, careless feeding and foul yards are direct causes of more than nine-tenths of the ailments that check the growth and undermine the health and vitality of young chicks.

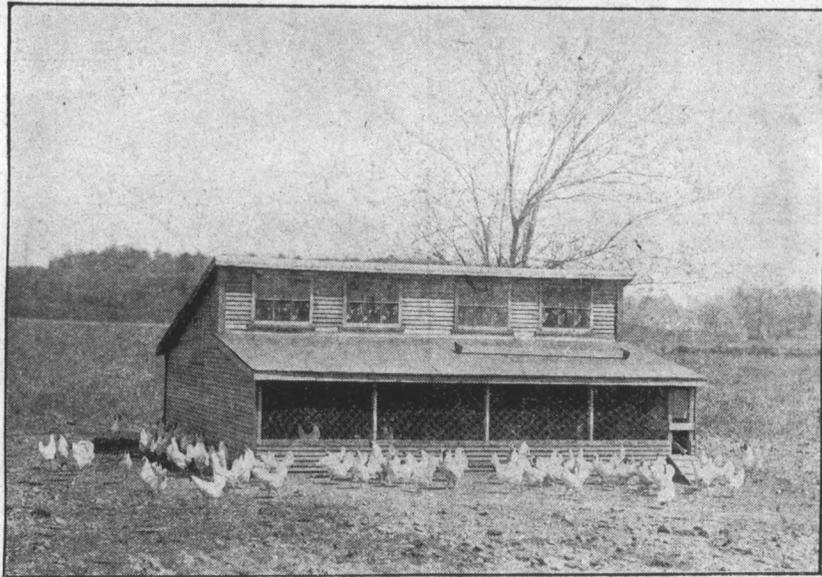
Overcrowding is by far the most common cause of disease and unthriftiness among the young chicks. On the average farm no means are provided for giving the chicks more space as they grow and the result is that by the time they are eight or ten weeks old the coops are overcrowded and the chicks become easy prey to disease and insect pests. Every farmer who wishes to have healthy, vigorous pullets in the fall should see to it that the growing chicks have clean, well ventilated, roomy coops, and that the range is adequate to furnish green feed and insect life in abundance.

Value of Sunshine.

Sunshine is an important factor in keeping the yards dry and sanitary, but the chicks need protection from

variety of grains for they will go out in search of worms and insects to balance up the ration. The moist feed when fed as a part of the daily ration should always be fed sparingly because of the tendency to become sour and cause intestinal disorders of various kinds. As a rule hopper-feeding is preferable as it saves labor and gives the chicks an opportunity to exercise their choice in their selection of feeds. For the very young chicks the prepared chick feeds usually give better satisfaction than the home-mixed feeds, but after they are three months old a grain mixture of 100 lbs. of cracked corn, 100 lbs. of wheat, 50 lbs. of kaffir corn and 50 lbs. of buckwheat makes an ideal ration. For the dry mash a mixture of 100 lbs. of wheat bran, 75 lbs. of middlings, 100 lbs. of corn meal and 75 lbs. of beef scrap will give good results. These mixtures can be prepared at home cheaper than they can be purchased in the prepared form. Grit, oyster shells, charcoal and cracked bone should be provided at all times.

An abundant supply of pure, fresh water is fully as important as the supply of food. A small stream, uncontaminated from sources further upstream is very desirable, but if such a source of supply is not available, clean



A Practical and Popular Type of Poultry House.

the direct rays of the sun during the heat of the day. Damp soils where the sunshine does not reach at some time during the day are the source of many diseases among poultry of all ages. A young fruit orchard provides almost ideal conditions for the chicks during the summer. If natural shade is not available one can improve conditions by providing artificial sunshades by setting four corner-posts about 6x10 feet apart and making a roof with boards, straw, cornstalks or swale grass. Such sunshades should be constructed in dry places and the ground under them should be kept sprinkled with lime to kill disease germs and destroy lice and vermin.

Another important factor in maintaining health and thrift among the growing chicks is to remove ailing and undesirable chicks and put them in a yard provided for the cull stock. By going through the flock once a week and culling out the inferior and ailing chicks one can dispose of them to advantage and the flock will thrive better and require less culling in the fall. Unless the chicks have plenty of range it is better to separate the males from the females when they are three months old. This gives the pullets more room and affords a better opportunity for them to develop rapidly.

The Feeding Problem.

Provided the young chicks are in good healthy condition at weaning time the feeding problem is comparatively easy. If they have an unrestricted range or large yards there is little danger of overfeeding if they have a

chicks and giving the houses and chicks immediate attention when needed will reduce the losses from these pests to a minimum.

New York. W. MILTON KELLY.

AN INSECT POISONOUS TO CHICKENS.

We have long considered that a plentiful diet of insects is an assurance of vigor and good health in chickens, especially in the case of young chickens, as they usually make rapid growth under such conditions. Recently, however, George H. Lamson, Jr., of the Connecticut Agricultural College, has published in "Science" the results of a number of observations and experiments which go to show that there is at least one insect which is decidedly and often even fatally, poisonous to this class of poultry; and a brief statement of his investigation cannot fail to be of interest to poultrymen.

The attention of the investigator was called to the matter by noting that many deaths of young chickens in June and July, the cause of which had been variously ascribed, were always preceded by the chicken eating freely of a certain insect, the rose chafer. In fact, the crop of a dead bird was usually so full of undigested insects as to suggest that death had been due to a "crop bound" condition. In order to test the matter some experiments were made in feeding the insects to chickens and it was found, indeed, that the birds did die after eating the chafers or if they did not die, at least showed symptoms of poisoning. The course of the poisoning is thus described:

"The chickens feed upon the insects ravenously, being attracted by their sprawly appearance and usually within an hour after eating they assume a dozing attitude, later leg weakness and the chicken usually dies within twenty-four hours of having eaten these insects, or begins to improve after this time."

In some cases death occurred as soon as nine hours after eating the chafers, and this early death suggested that the cause was likely not a "crop bound" condition. Accordingly a number of the chafers were ground up in distilled water and the resulting solution filtered off. When this solution, which, of course, could not plug up any part of the digestive tract, was fed the chickens with a medicine dropper they became poisoned and many of them died. The cause of the trouble, then, is clearly a water soluble poison found in the body of the insects.

It was found further that 15 to 20 chafers are enough to kill a chick one week old and that 25 to 45 of them are necessary to kill one three weeks old. Only a few nine-weeks-old chickens were killed and only one succumbed after having reached the ten-weeks' stage and its crop when examined after death, contained 96 undigested insects. Large doses of the water extract killed young chickens of considerable size but did not kill mature hens. The poison was found to be quite as active to rabbits as to fowls.

The rose chafer feeds on a number of plants, particularly daisies, and especially during years when the insects are more than usually abundant it would seem to be wise to keep chicks in mowed areas and away from grape vines and flowering shrubs during that portion of the year when the chafers are found.

H. E. MERN.

Poor growth and lack of thrift usually indicate something wrong with the feeding. A few grains of sand during the first few days after hatching help to prepare the stomach for food later, though the chick is still living on the yolk drawn into its body just before hatching.

The first chick feed should be a dry mixture of cracked grains. Cracked corn, wheat, kaffir, and pin-head oats are all good.

Grange.

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

STATE GRANGE OFFICERS.

Master—John C. Ketcham, Hastings.
Overseer—C. H. Bramble, Tecumseh.
Lecturer—Dora H. Stockman, Lansing.
Secretary—Jennie Buell, Ann Arbor.
Treasurer—Frank Coward, Bronson.

AMONG THE LIVE GRANGES.

A Great Meeting.—Saturday evening May 6, was a time never to be forgotten by the members of Aetna Grange No. 810, in Mecosta county. This date marked the close of a short membership contest which resulted in the addition of over 30 new members and a few reinstatements. The large class was led into the mysteries of the first two degrees of the Grange, the floor-work being done with clockwork precision was witnessed by a crowd of more than 150 Patrons from three neighboring Granges. The word had previously been circulated that the initiation would be carried on in a model way and the instruction in the secret work according to the cipher code to have it perfect, was given by the writer. A banquet closed the event, relished by the big crowd which lingered long after midnight, their faces illumined by the prevailing good fellowship. About twenty automobiles and numerous other rigs brought the big crowd to the hall, which proved too small for an occasion of this kind and talk of enlarging it is in the air. The young people with some help from the general fund, recently bought a new piano, which adds greatly to the delight of our meetings. Our membership now touches the 200 mark and what we have done here can, with the same effort, be accomplished elsewhere.—C. F. Kiefer.

Windsor Grange recently put a class of 24 through the fourth degree with the usual "feast" that attends those occasions, there being 225 present. This Grange has taken great interest in exemplifying the degree work, special teams having been organized and the work given in a very creditable manner, interspersed with very fine floor work. During the busy months for the farmer, Grange enthusiasm is liable to wane. However, Windsor Grange boasts that is an exception, as the lecturer, Mrs. Lou Wilson, directs that some individual or individuals be responsible for each lecture hour, and we have most anything in the entertainment line that the patron may desire, from a burlesque Grange to grand opera. On April 14 a burlesque Grange was given, 15 patrons and little folks having taken part and while the Grange was kept in a state of laughter most of the time many truths were brought out showing wherein we fail to carry to success some of our undertakings as Granges. Friday evening, April 28, a farce was given by five ladies, much to the enjoyment, as well as amusement, of about 125. All we have to fear now is that some of the lyceum bureaus may become acquainted with the fact that such talent exists in Eaton county and we will be sure to lose it. The fundamental idea underlying this "surprise program" idea is that so many of the members take an active part on the programs and when all are active enthusiasm increases. As the membership increased it became apparent that more room was needed than the spacious hall which we occupy afforded, therefore committees have been appointed and plans are under way looking forward to the owning of a real Grange home.

COMING EVENTS.

Eaton County Pomona Grange will meet with Northwest Walton Grange on May 20. This will be the first Pomona meeting held in the New Grange hall. It is expected that N. P. Hull, past master of the State Grange, and Mr. King will be present and discuss Grange Life Insurance. Mrs. Charles of Bellevue, will give a paper on the subject, "The Greatest Needs of Our Time, and Woman's Power to Meet those Needs." Prof. Jones, of Bellevue schools, will speak on the subject of "Vocational Training." The musical numbers will be a violin solo by Ermina Ford, with piano accompaniment by Miss Lenora Edman; vocal duet by Mrs. George Holden and Mrs. Clare Ellis, and others.

Farmers' Clubs

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.

The Visiting Nurse.—Mr. and Mrs. Jerome Sherman entertained the Burton Farmers' Club Thursday, May 4. After the dinner and social hour Club was called to order by Vice-President Mrs. W. J. Brookins. Mrs. Lee, the visiting nurse for Shiawassee county, was introduced. She is here representing the TBC association. She is prepared to visit every rural school in the county and is willing to address any gathering of people. Her salary is paid through the sale of Red Cross Christmas seals. Many children have this disease which may unfold probably in the prime of life. For it is at this time that the most energy is being used, that the death loss is heaviest. Michigan's death loss is 2,500 per year, which is more than any middle west state. Mrs. Lee examines the children for unfolded or open cases of tuberculosis and she is desirous of conferring with the parents as to the care of the child. Her work here in this county will be much more successful if parents will co-operate with her.

"The Farmer's Greatest Problem." Mr. Peterson believes the problem of many farmers is the conservation of the soils or preventing our farms from being enrolled in the roll of abandoned farms. Owen Snyder thinks tile drainage is another big problem, while Mr. Vincent believes weeds are a problem which we will have to continually fight to solve.

The Proper Way to Test Seed Corn. Albert Schultz would plant the corn which he desires to test out, in sandy soil on the sunny side of a building where it will have to grow under the same conditions as in the field a little later.

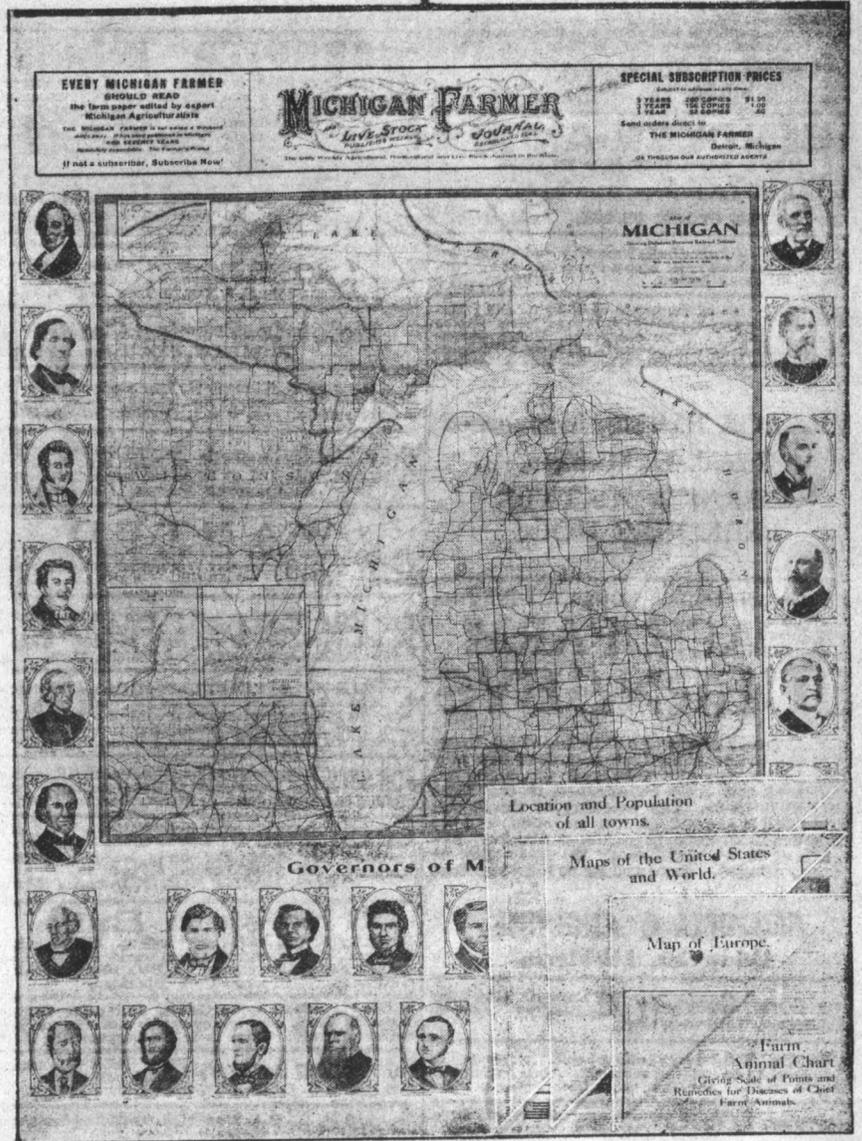
"Shall we Hire the Normal Trained Teacher for our Rural Schools?" Mrs. Clayton Potter read a letter from the principal of our county normal, Miss Walsh. There was some discussion on this subject. Some were dissatisfied with the school room management. Others thought the normal teachers should be trained to use appliances advised by the state to be used in the rural schools such as the heating and ventilating systems. Mrs. Lee said from her six years' experience in observing rural schools that time of the schools was much happier where the normal teacher was employed.

"If Michigan Farms were Tile Drained could we Compete with Ohio in Raising Corn?" O. J. Snyder said: "Only about one-half of Michigan raises corn, yet the average is of the whole state. The boys' clubs of Michigan have raised more corn per acre than the Ohio boys. The climate of Ohio is no better than lower Michigan. There is no reason why lower Michigan, if tile drained, (a drain every eight or ten rods), should not equal or exceed Ohio in raising corn." After the announcement of a fine program for next month the Club was adjourned to meet Thursday, June 1, with Mr. and Mrs. E. E. Putnam.

The Country School.—The Conway Handy Union Farmers' Club met at the home of Mr. and Mrs. Thomas Sharp, Sr., April 29. "In what way may country schools better train boys and girls for farm life?" In absence of Ora Holmes, Mrs. Holmes opened the subject. She said by first training teachers, by adding course in normal work, and organizing central high schools. Assign a small plot of ground to each child on school ground and award prize for best crops grown. Interest boys in county corn contest. Teach them to test seeds. Provide suitable social entertainment, and home co-operation will do much to interest them in farm life. Mrs. Clay Gordon thought fathers best teachers to teach boys farming, and mothers should teach girls domestic science; make home attractive and give partnership interest by letting them own a little stock.

"How can the County Fair be Improved." This subject was opened by A. Meyer, who thought the county fair well enough but a big improvement for Fowlerville fair would be ditching and tile. Give better premiums on stock to encourage more entries. An interesting discussion followed.

The Michigan Farmer's New Four-Sheet Wall Map and Atlas.



This Wall Map and Atlas contains four sheets or eight pages, size 26x36 inches, fastened at the top with a metallic strip, all ready for hanging on the wall.

The first sheet contains a fine map of Michigan, showing population and location of principal towns and cities, according to latest census returns. Shows the Congressional Districts, the Townships and the Ranges; all the Interurban Roads and the important auto roads of the state; half-tone portraits of all the Governors; Postal Rate table covering all the zones; a key to Railroads and Express Companies operating over each road.

The second sheet contains a fine map of the United States; a map of the World on Mercator's projection; ocean routes and railroads are shown; tables showing the great cities of the world, together with their population.

The third sheet shows illustrations, with descriptive matter, of the Horse, the Cow, the Sheep, in Health and Disease. It shows the Farm Animal Chart in five colors; the bony structure, the muscular and the circulation systems, the location and names of the vital organs of the Horse, Cow, sheep, Hog and Fowl. It gives the symptoms of each disease and how to treat these diseases with simple remedies near at hand. It also gives for each animal the Standard Scale of points. One small part of the information so carefully prepared for this chart may save you the loss of hundreds of dollars. It gives in boiled down form a vast amount of useful and up-to-the-minute information.

The fourth sheet contains a Map of Europe; the financial strength and national debts of the chief powers showing the triple alliance and the triple entente; some beautiful half-tone views of German, English and French Battleships; the population of the Earth by races; the distance between principal cities of Europe

Here you have a Complete Encyclopedia of hundreds of boiled down facts.

It is worth its weight in gold. It cannot be bought in any book-store, or through any agent. It is distributed exclusively through the Michigan Farmer in the state of Michigan. We want every reader of the Michigan Farmer to have one of these splendid charts.

If these maps were sold in stores, they would cost from \$1.00 to \$2.00, depending on the store. But we, buying them in so large a quantity, are able to sell them to our subscribers for only 40 cents, delivered, all charges paid.

When you send an order for your subscription to the Michigan Farmer for five years at \$1.50, or three years for \$1.00, or one year for 50 cents, or any of our clubbing offers, add 40 cents for the map.

Any subscriber who has his subscription already paid for one or more years in advance, may have them at the same price—40 cents.

Send all orders direct to the Michigan Farmer, Detroit, Michigan, or through any of our agents.

Or, a map will be sent FREE for two subscriptions to the Michigan Farmer, EITHER KIND.

BOYS WATCH.



Every boy, young or old, would be proud to carry one of these watches. It is 16 size, with a nickel case. Stem set and wind. Regular watch movement with hair spring. Guaranteed by the makers and repaired free of charge for one year, if given ordinary care. Any boy who really wants a watch can easily earn one in one afternoon.

The watch alone free for sending three subscriptions to the Michigan Farmer at 50c each.

BREEDERS' DIRECTORY.

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

CATTLE.

ABERDEEN ANGUS: We are offering 15 head of Choice young bulls, one two year old Trojan Erica at \$200.00 if taken in 6 weeks, 14 head from 8 to twenty months old including the first and second prize. Senior bull calves at the 1915 State Fair. Write for Particulars, and come to the farm to look our stock over, they are of the Blackbird Trojan-Ericas, and K Pride Families only. U. L. CLARK, Hunters Creek, Mich. SIDNEY SMITH, Mgr.

ABERDEEN-ANGUS HERD ESTABLISHED IN 1900. TROJAN-ERICAS and BLACKBIRDS only. Also breeders of Percheron, Hackney and Saddle Horses. WOODCOTE STOCK FARM, Ionia, Mich.

FOR SALE—14 Angus bulls 9 months and older, including our herd bull. Also a few cows and heifers. Geo. Hathaway & Son, Ovid, Mich.

AYRSHIRES—One of the foremost dairy breeds. The most economical milk producers. Calves for sale. White Leghorn cockerles; Duroc Jersey swine. Michigan School for the Deaf, Flint, Michigan.

VILLAGE FARMS, Incorporated

Grass Lake, Michigan,

GUERNSEY CATTLE

BERKSHIRE HOGS

MILO D. CAMPBELL CHAS. J. ANGEVINE

BEACH FARM GUERNSEYS

Average yearly production 422.3 lbs. of fat, three-fourths of them making their records as two year olds. By the use of a pure bred sire, a big improvement can soon be attained if the right selection is made. The breeding of the Beach Farm Herd is as good as can be found, and we guarantee them to be free from contagious diseases and to be satisfactory in every way or money refunded. Write and let us tell you about them.

CAMPBELL & ANGEVINE, Coldwater, Michigan.

Registered Guernsey Bull Calves for sale, May Rose breeding. Address Clint Bishop, Watervliet, Mich.

AVONDALE Guernsey bulls all sold. Sorry to disappoint those wishing our stock. Only registered bull calves left. Avondale Stock Farm, Wayne, Mich.

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

For Sale 2 Registered Guernsey Cows, 1 grade cow, 6 bull calves cheap if taken soon. JOHN EBELS, HOLLAND, MICH., R. No. 10.

AT Farmers' Prices Registered Guernsey Bull calves from A.R. dams and dams being tested. If interested write for photo, breeding and price. Byers & Barnes, Coldwater, Mich.

Guernseys—Bull calves sold, they were beauties, every one pleased, 3 cows to freshen this month, better write now for a good one. J. M. Williams, No. Adams, Mich.

GUERNSEYS

We offer a choice lot of high grade Guernsey cows and heifers, bred to registered bulls La Tertre of Maple Lane, No. 23192 and Sir Dena No. 3617. Prices reasonable. THE JENNINO'S FARMS, R. 1, Bailey, Mich.

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

Registered Guernseys: One yearling Bull, and three Bull calves for sale. Glenwood and May Rose Breeding. Special price for quick sale. August Morelock, Watervliet, R. 2, Mich.

Herefords—One Bull Calf. ALLEN BROS., PAW PAW, MICH.

HOLSTEIN BULLS FOR SALE

Four of them from 12 to 17 months old by 31 lb. sire dam's A.R.O. Price \$100.00 to \$150.00. Younger bull calves from \$50.00 up. BLISSVELDT FARMS, Jentson, Michigan.

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. 6 1/4 % 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.

FOR SALE

SOME VERY FINE YOUNG BULLS whose sires have as high as 31 lbs. of butter behind them. As they are young, will make a low price on them. BIGELOW'S HOLSTEIN FARMS, BREEDSVILLE, MICH.

HOLSTEIN Bull Calf: Born Nov. 8th. A nice individual, well grown, about evenly marked. His dam and sire's dam have A.R.O. records that average butter 7 days 24.83 lbs. Milk 563 lbs. W. B. READER, Howell, Mich.

HOLSTEIN-FRIESIAN CATTLE

Herd headed by grandson of King Segis Pontiac, and tuberculin tested annually. A few choice young bulls from dams having official records. PEACELAND STOCK FARM, Three Rivers, Mich. Chas. Peters, Herdsman. C. L. Brody, Owner, Port Huron, Mich.

For Sale: Big Holstein Bull 2 yr. old. Good breeding. Reg. bulls and heifers 10 mos. old. Ferd. J. Lange, Sebewang, Mich.

75 gets Hazel-let grandson of Maplecrest De Kol Parthena and Pontiac Maid 80.2 lb. Born March 26. Traces to De Kol 2d 17 times. Dam Pontiac Hesperia 2d, a Pontiac Korndyke, Pontiac Cornucopia and Pontiac Burke combination. M. L. McLaulin, Redford, Mich. J.

I Have Holstein Bulls, Bull Calves and Cows that I can show breeding records, individuality and attractive prices. L. E. CONNELL, Fayette, Ohio.

Duroc Jersey Herd Boars

Special Offering of High Class Fall Boar Pigs. Breeding and Individuality good enough for breeders who appreciate the best.

Also some good farmer's boars. This is the best lot of fall pigs we have ever had to offer. A cordial invitation is extended to visit the farm and inspect the stock. If you wish one of the best young Jersey bulls in Michigan we have him for sale. For further particulars, address,

Brookwater Farm, Swine Dept., Ann Arbor, Mich.

"TOP NOTCH" Holsteins

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.

REG. Holstein-Friesian cows and heifers, some fresh and some ready to freshen \$125. Reg. bulls \$30 up. Frank Staffen, R. 3, Box 38, Howard City, Mich.

Holstein-Friesian Cattle.

HOBART W. FAY, Mason, Michigan.

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.

Only \$40 Delivered: Handsome registered Holstein bull calf. Sire 25 lb. butter bull, Dam A. R. O. 17.62 lbs. butter. All papers. Rougemont Farms, Detroit, Mich.

WANTED

Six good men to buy pure bred HOLSTEIN BULL CALVES. Good notes on a year's time accepted in payment. GEO. D. CLARKE, VASSAR, MICH.

For Sale My entire herd of high grade Holstein Cows and Heifers. Also one Reg. 3-yr. old Percheron stud colt or will trade for Reg. Holstein cows. Arthur N. Birkholz, New Buffalo, Mich.

CHOICE HOLSTEIN BULLS—all from A.R.O. dams. Entire herd on Semi-of. test for yearly work. Jr. 2-yr. old just finished year's record of over 15,000 lbs. milk over 100 lbs. butter record in mature class. Cherry Creek Stock Farm, M.E. Parmelee, Prop., Billiards, Mich.

FOR SALE Reg. Holstein females, Pontiac Korndyke and Hengerveld De Kol Breeding. Price right. 1 to 5 years. John A. Rinke, Warren, Mich.

EXCEPTIONAL OPPORTUNITY: For sale, yearling, high-bred Registered Holstein heifers Beauties. \$125 to \$150 each. All papers. ROUGEMONT FARMS, Detroit, Mich.

6 Holstein Bulls

Ready for service, at farmers' prices. All have high testing A. R. O. daughters from world Record Sire, nothing better at any price. LONG BEACH FARM, Gull Lake, (Kalamazoo Co.) Michigan.

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

Hope Farm Jerseys FOR SALE—3 yearling bulls, 2 bull calves. GEORGE C. BORCK, Grand Haven, Mich.

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

One Jersey Bull READY FOR SERVICE, and several other heifers and calves for sale. NOTTEN FARM, GRASS LAKE, MICHIGAN.

Grade Jersey Herd For Sale

FORTY COWS

The result of twenty years careful breeding and selection, are now offered for sale. Individual milk records have always been kept and are open for inspection. If interested write for particulars and if possible visit and examine the herd and their record. Delivery will be made at any time desired during the spring or early summer. A few registered Jerseys also for sale. Address Geo. A. True, Armada, Mich.

The Wildwood Jersey Herd Majesty Breeding 40 head, tuberculin tested, herd now on R of M test. No females for sale. Choice young bulls for sale from Dams that are on test for Register of Merit. Write your wants or come and see them before buying. ALVIN BALDEN, Capac, Mich.

Hillside Farm Jerseys A 10 mos. old, solid color bull now offered for sale. Dam is a R. of M. cow with record of 546 lbs. of butter as a 3 yr. old. He is a fine individual. Price right. C. & O. Deake, Ypsilanti, Mich.

Maple Lane R. of M. JERSEY HERD offers for sale, tuberculin tested cows, heifers, bulls, and bull calves backed by several generations of R. of M. breeding. IRVIN FOX, Allegan, Michigan.

JERSEY BULL CALF FOR SALE

Ready for service. Majesty—Raleigh breeding. Meadowland Farm, Waterman & Waterman, Ann Arbor, Mich.

FOR SALE:—Our herd bull, Jacoba's Fairy Emanon age 4 years, kind, quick and sure. Must be seen to be appreciated. Reason for selling, must change sires. Also two yearling bulls from him. SMITH - PARKER, R. D. No. 4, Howell, Michigan.

BIDWELL SHORTHORNS

For "Beef and Milk" Registered bulls, Scotch-topped roans, reds and white for sale. Farm at N.Y.C. Depot; also D. T. & I. R'y. Address G. R. Schroder Mgr. BIDWELL STOCK FARM Box B. Tecumseh, Mich.

Shorthorn Cattle - of both Sex for Sale

W. W. KNAPP, Howell, Michigan.

DAIRY Bred Shorthorns of best Bates strains. No more females for sale at any price. J. B. Hummel, Mason, Michigan.

FOR Sale—12 Reg. Short Horn Bulls by Maxwellton Monarch 2nd, a son of Avondale, from 5 to 9 mos. old John Schmidt, Reed City, R. No. 5, Michigan

Shorthorn Cattle. Five cows, Ten heifers, Five bull calves; also herd bull for sale. Write. Wm. J. Bell, Rose City, Mich.

Shorthorn Cows and Bulls For Sale R. R. Station, Elsie. H. B. PETERS, Carland, Mich.

Shorthorn AND POLLED DURHAMS FOR SALE. Have red roan and white. Have over 100 head in herd. C. Carlson, Leroy, Mich.

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.

Two yr. red shorthorn Bulls. Roan Calf 9 mo. old Poll Angus Bull calf, 8 mo. old, not reg. Priced to move quick. CHASE'S Stock Farm, Marlette, Mich., R. 1.

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

HOGS.

Royalton Bred Berkshires. Male and female pigs October boars and gilts, registered with papers. Satisfaction guaranteed. D. F. Valentine, Supt., Temperance, Mich.

Berkshire Hogs Sows bred to farrow in April. Best of breeding. Write your wants quick. Mitchell's Lakeside Farms, R. 2, Bloomingdale, 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.

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.

Boars for Sale One yearling; two 10 mos; two 6 mos; first class specimens. J. H. BANGHART, East Lansing, Mich.

DUROC JERSEY BOARS a choice lot of spring boars all 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. OHERRY LAWN FARM, Shepherd, Michigan.

DUROC JERSEY Bred sows and gilts all sold. Booking orders for spring pigs. E. D. Heydenbrock, Wayland, Mich.

DUROC Jerseys—Fancy fall pigs (either sex). Buff Rock eggs \$1.25 per 15; S. C. W. Leghorn eggs \$1 per 15. John McNeill, R. 4, Station A, Bay City, Mich.

Duroc Jersey—Sept. boars ready for service also open gilts and some sows bred for Aug. and Sept. E. H. MORRIS, MONROE, MICH.

DUROC JERSEYS;— all sold out present. Wm. W. Kennedy, Grass Lake, Michigan.

DUROC JERSEYS—A few fall boars for sale. Carey U. Edmonds, Hastings, Michigan.

Duroc Jerseys I have some good last September Boars and gilts. Gilts will be bred for September farrow. H. G. Keebler, R. No. 5, Cassopolis, Michigan

DOBSON'S DUROCS Combine size, quality, breeding. Boars for sale. Pigs at weaning time. Registered Jersey bull. Orlo L. Dobson, Quincy, Mich.

Heavy Boned Durocs For Sale, Bred Sows, Service Boars and Sping Pigs. M. A. Bray, Okemos, (Ingham Co.) Mich.

Duroc Jersey Boars Ready for service. Big, Grand Champion blood lines. Gilts bred for Sept. farrow. F. J. DRODT, R. 1, Monroe, Michigan.

Chester Whites Spring pigs from the best blood lines for sale. Pairs not akin. F. W. ALEXANDER, Vassar, Mich.

O. I. C. BRED GILTS, Also young boars shipped C. O. D. J. CARL JEWETT, Mason, Mich.

Registered O. I. C. Swine Stock For Sale—All Ages Correspondence Solicited, Visitors Always Welcome. Brightside Farm Grand Ledge, Mich.

O. I. C. SPRING BOARS of good type and Red Polled bull calves. John Berner and Son, Grand Ledge, Mich.

O. I. C. Choice serviceable boars. Choice gilts all sold. Fall pigs, either sex, not akin. Write for low prices and description. A. V. HATT, Grass Lake, Mich.

O. I. C. Swine—A nice lot of spring pigs. Write your wants. Meadow View Stock Farm, Holland, Michigan. R. R. No. 5.

O. I. C. October boars weighing 200 lbs. at \$25 each, for April shipment. C. J. THOMPSON, Rockford, Michigan.

O. I. C. Boars for service. Gilts bred for May and June farrow. I prepay express. G. P. ANDREWS, Dansville, Mich.

O. I. C. Serviceable boars, gilts bred for June farrow. Booking orders for Spring pigs, no akin. H. W. MANN, Dansville, Michigan.

O.I.C. Swine. I am booking orders for Spring pigs. One yr. old Holstein bull for sale. Elmer E. Smith, Redford, Mich.

O. I. C. bred gilts all sold, am offering Sept. boars and gilts, large growthy ones, and booking orders for spring pigs. A. J. Barker, R. 1, Belmont, Mich.

O. I. C. SWINE, Oct. boars and gilts. 3 Registered Holstein Bulls sired by 27 lb. bull. Cloverleaf Stock Farm, Monroe, Mich. No. 1.

BIG TYPE O. I. C.'s, and Chester Whites. Special prices on all boars and fall pigs either sex. These are sired by Abo 2nd, this boar sired our unbeaten breeders young herd at every state fair we showed this year, other sires are Wonder Boy, White Hall and Allen, this boar was junior champion at Wis. State Fair last year. Now Mr. Buyer our pigs are all sired from champions, our price is no higher than other breeders and the Express Co. charges just the same for a poor pig as it does for a good one. Get our catalog and see where the good ones are. We are booking for Spring pigs sired by Schoolmaster, the highest priced boar of the breed and five times G. Champion. We Reg. Free and ship C. O. D. Rolling View Stock Farms, Cass City, Mich.

O. I. C.'s. A few bred sows to farrow in April, May, also gilts. Have them not akin. All good stock. Otto B. Schulze, Nashville, Mich. 1/2 mile west of depot.

O.I.C.s Some 2-year-old sows bred. Fall pigs, either sex. A. R. GRAHAM, Flint, Michigan.

O. I. C. Spring pigs, both sex, \$10.00 each at weaning time. Booking orders now. Recorded free. Satisfaction guaranteed. Julian P. Claxton, Flint, Mich. R. 8.

O. I. C.'s Strictly Big Type Four last September boars, large enough for service, right good ones. One 1914 Sept. Sow raised Nine pigs last fall. Due to farrow May, 10th. Will sell cheap if taken soon. NEWMAN'S STOCK FARM, Marlette, Mich., R. F. D. 1.

O. I. C. September pigs, both sex. Bred E. B. MILETT, Fowlerville, Michigan.

Boars at Half Price We still have a few big boned, big type Poland China Boars ready for service, weighing up to 250 lbs. not fat at \$20 & \$25 each. Registered in buyer's name. Also registered black Percheron Stallions 2 years old \$250.00. J. C. BUTLER, Portland, Mich., Bell Phone.

Big Type Poland China Pairs and trio not akin out of large litters. G. W. HOLTON, Route 11, Kalamazoo Michigan.

Big Type Poland Chinas—Boars of August farrow, booking orders for spring pigs. A. A. WOOD & SON, Saline, Michigan.

FOR SALE P. C. Sows, "Big Type" bred for Sept. farrow. Extra good 7 months boar. March and April pigs. S. O. B. Minorcas, R. W. Mills, Saline, Mich.

MY, OH MY! What an Opportunity

Starting May 1st, we are going to give to the farmers and breeders an opportunity to get started right in the breeding industry. We are going to give you a chance to get hold of foundation stock that will give you a nucleus for one of the finest and best herds in your community. We are going to show you, as we have others, that you will have greater success with our big type

POLAND CHINAS than with any other breed. Write for spring pig prices. Hillcrest Farm, Kalamazoo, Mich.

Large Strain P. C. A few choice fall boars ready for service, and 1 May boar. Gilts for early farrow all sold, a few choice. Gilts to farrow in Aug., and Sept., bred to black Wonder and Oakland Equal Jr. H. O. Swartz, Schoolcraft, Mich.

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 Junbo, four great best boars in state. Come or write. W. E. Livingston, Parma, Mich.

BIG Type Poland Chinas, Sired by Big Type King, our 1000 lb. boar. Spring pigs, sired by big type King, Feschenmeyer A. Wonder Jr., and Mow's Big Bone. W. Brewbaker & Sons, Elsie, Michigan.

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. Fall and Summer Pigs. Sows Bred. Eggs from big Harrod Rocks \$1.00 for 15. ROBERT NEVE, Pierson, Michigan.

REGISTERED Poland China Spring Boars and Sows at \$15 each. Making this special price to make room for others. A. G. Meade, Stanton, Mich., Colby's Ranch.

Large Type P. C. Sows & Gilts all sold. Have 3 extra good spring boars. Sired by Big Defender. W. J. HAGLESBAY, Augusta, Michigan.

Large Yorkshire Swine all ages. Red Poll Bulls sent to use \$75 each. E. S. CARR, HOMER, MICHIGAN.

Large Yorkshires August and September pigs. 2 year boars. Prices reasonable. W. C. COOK, Route No. 1, ADA, MICHIGAN.

GROWTHY THE DISEASE PROLIFIC "MULEFOOT" RESIST- PROFITABLE HOG ING

WE ARE NOW BOOKING ORDERS FOR SPRING PIGS

THE CAHILL FARMS KALAMAZOO - - - - MICHIGAN

Yearling Hampshire Boars \$25.00 each for quick sale. registered. John W. Snyder, R. 4, St. Johns, Mich.

Hampshire Swine. Bred Sows and gilts for August and September farrows. Spring pigs, both sex. FLOYD MYERS, R. No. 9, Decatur, Ind.

HORSES Registered Percherons Brood mares, fillies and young stallions priced to sell. Inspection invited. L. C. HUNT, Eaton Rapids, Michigan

Valuable Percheron Stallions & Mares Must be Sold to Close Estate A. A. PALMER ESTATE, R. R. Orleans, Mich P. O. Belding, Mich

FOR SALE A matched pair of black reg. Percheron mares, 4 and 6 years old, with colts 2 weeks old by side, weight 3000 lbs., well broken and good to work. A bargain if taken soon. WILLIAM BIRD, St. Johns, Michigan.

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

Grey Registered Percheron Stallion sold. Have the best one yet. \$400 takes him. T. H. LOVE, R. 3, Howell, Michigan.

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

FOR SALE: Percheron Stud Colt, 11 months old Duroc pigs, Feb. farrowed, either sex. E. J. ALDRICH, Tekonsha, Cal., Co., Mich., Bell Phone.

Breeders' Directory—Continued on page 679.

Veterinary.

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

Occult Spavin.—I have a 12-year-old gelding which went lame some time ago; our local Vet. thought at first that a spavin was developing, but later somehow changed his mind thinking perhaps that it might be rheumatism. This horse only shows lameness when first taken out of stable or the first half mile or so he travels, and I have thought him a little worse in stormy weather. C. E. C., Utica, Mich.—I am somewhat inclined to believe that your horse is suffering from incipient bone spavin lameness; therefore, you had better apply tincture iodine to hock joint every day or two. If he suffered from rheumatism the lameness would shift location.

Vaginal Hemorrhage.—My mare bleeds from vagina, but shows no symptoms of sickness. C. S., Rhodes, Mich.—Dissolve 2 ozs. of alum in a gallon of tepid water and wash out vagina with a fountain syringe two or three times a week.

Colt Born Blind.—I have a colt two weeks old that was born blind and I would like to know if there is anything I can do for her. J. E., Prescott, Mich.—Very seldom can a case of this kind be helped; however, if you are situated near a competent Vet., it would be well to consult him; however, I am inclined to believe the colt will always be blind and should perhaps be destroyed.

Barren Cow.—I have a cow that came fresh February 10, 1915, and came in heat May 23; was bred, came in heat again in August and then showed in heat every three weeks until November, then did not come in heat until January 10, and three weeks later came in season again, at which time I opened her, then bred her and she remained in good condition until April 25, when she lost her calf. This is a case that puzzles me and I would like to have your advice. J. H. B., Siloam, Mich.—A cow of this kind is pretty sure to prove unprofitable for dairy purposes; besides, she is perhaps suffering from contagious abortion. All things considered, I believe she had better be fattened and sold to butcher.

Caked Udder.—I have a four-year-old cow with second calf that has a small bunch in udder and I have been applying fish oil to soften it, but it does not help. H. H. S., Sherman, Mich.—Apply one part iodine and nine parts fresh lard to diseased portion of udder three times a week.

Chronic Indigestion.—My cows are inclined to chew bones and decayed wood. J. W. G., Belleville, Mich.—Mix together equal parts ground gentian, ginger, bicarbonate soda, charcoal and salt. Give each cow two tablespoonfuls at a dose in feed night and morning. Feed them a greater variety of food and as soon as possible turn them to grass.

Stunted Pigs.—We have some last fall pigs that are only about the size of pigs three months old, and I would like to know the cause. W. R., Allen, Mich.—Insufficient food supply or the improper care of your pigs is perhaps the cause of them stunting. Feeding them drugs will not benefit them very much. Unless their food supply is sufficient and nourishing. Mix together equal parts ginger, gentian, powdered charcoal and give each pig a teaspoonful at a dose in feed two or three times a day.

Sows Fail to Come in Heat.—I have two sows each ten months old that have failed to come in heat. I bought both of them last fall, and since then they have been fed ear corn, ground oats and skim-milk. H. L., Dearborn, Mich.—Give each sow 10 grs. of ground nux vomica and 30 grs. of ground capsicum in feed two or three times a day. They will perhaps both come in heat when warm weather sets in.

Rheumatism.—I would like to know what can be done for lambs three weeks old that are crippled and lame and some of them seem to be paralyzed. When standing they seem to wobble, lose their balance and fall, unless supported. We have five that are in this condition. M. O., Ann Arbor, Mich.—As soon as your lambs are born, apply one part coal tar disinfectant and 30 parts water to navel; also wash the udder of each ewe before she lambs and also apply one part coal tar disinfectant and 49 parts of water. As you doubtless know, the importance of cleaning the udder of ewes, at the same time having her lamb in a thoroughly clean and disinfected pen. Give each lamb one-twelfth of a grain of quinine and one-eighth of a grain of salicylate of soda at a dose twice a day. It is much easier to prevent this ailment than to treat it successfully after it has set in.

New Remedy for Grub in the Head of Sheep.—I notice in the Michigan Farmer of May 6 you prescribe treatment for grub in the head of sheep. I will give you my remedy—give three teaspoonfuls of dry flowers of sulphur; this is done by placing well back in mouth, holding head up until sheep swallows it. Best to give one teaspoonful at a time. A few years ago I had a sheep that had grub in the head and had not been on her feet for 24 hours. I gave her three teaspoonfuls of sulphur in the morning and before noon she got up and moved about six feet. I then gave her three more teaspoonfuls and before night she got up again and joined the flock. A few days later I treated a second case and saved her. If the noses of sheep are well tarred with pine tar during the month of July and August, this will prevent grub in the head. I am 63 years old and have handled sheep ever since I was big enough and thought perhaps you would be interested in knowing about this simple remedy. F. A. B., Pinckney, Mich.—Sublimed sulphur, commonly known as flowers of sulphur, is the chief form used in veterinary practice; its physiological actions when given internally is laxative and alterative. When applied externally, it is a destroyer of parasites and it is also used to disinfect premises. When burned and used as a deodorizer and disinfectant it is milder than many other fumigating remedies. In young animals sulphur is often given as a laxative and has a good effect; however, I fail to understand how it can have much effect in dislodging grubs from the head of sheep.—Ed.

Bursal Enlargement—Weakness.—I have a cow that has a soft puffy and tender swelling on hind leg which I believe is a spavin and this same heifer had a calf six weeks ago; now she is thin and when walking frequently staggers. I. A. L., Reading, Mich.—Rub bunch with equal parts tincture iodine, spirits of camphor daily, and give her 1 dr. ground nux vomica, ½ oz. ground gentian and 2 drs. of ground red cinchona at a dose in feed three times a day. Are you feeding her all the grain and roots she will eat?

Chorea—Azoturia.—I have a mare that had an attack of azoturia about a month ago and it left her with paralysis of the cheek and one hind leg. Her mouth is some better but she has not much use of her hind leg. The hip and thigh is pretty badly sweeneyed. L. W., Stanwood, Mich.—Rub lip with alcohol twice a day. Apply equal parts of turpentine, aqua ammonia and olive oil to sweeneyed thigh and hip every two days, but before treating her, clip hair off sweeneyed parts. Give her 1 dr. ground nux vomica and ½ oz. ground gentian at a dose in feed two or three times a day.

Tongue Loller.—Quarter Crack.—I wish someone would tell me what can be done to prevent a horse from hanging tongue out of mouth whenever she is driven. This is a nice young mare and seems to have contracted this habit lately and so far as I can tell the habit is growing worse. What can be done for quarter crack? F. B. D., East Jordan, Mich.—Horses that are properly bitted before they are broke are seldom tongue lollers. There are many different mechanical methods of correcting this vice, a nose and chin strap buckled snug enough to prevent the animal opening the mouth is one way of correcting the habit, another is using a spoon-bit to prevent the animal placing the tongue over bit and hanging it out of mouth. An arched bar bit is also very useful. By trying these different devices you will perhaps succeed in overcoming this vice. Thin edges of crack, relieve back part of wall of pressure, cut through hoof at coronet at right angles, either with a file or red-hot iron, then the hoof will grow down solid.

Warbles.—Have a number of young cattle that have bunches about the size of a small marble under the skin of their back and sides. We feed corn ensilage, mixed hay, some corn meal, about three parts, wheat bran two parts, and cottonseed meal one part. Has the feed anything to do with causing these bunches? L. A. W., Wheeler, Mich.—No the feed is a very good ration for your cattle. Take a sharp pen knife, cut through skin, squeeze out grub, kill it, then apply boric acid or any good home-healing remedy daily and they will soon get well.

Roarer.—I have a three-year-old mare that blows a good deal when exerted, but has a good appetite and does not appear to be sick. Is peach butter a proper remedy for heaves? H. F. S., Danville, Mich.—Rub her throat with camphorated oil twice a day and avoid feeding her too much bulky food. Peach butter will neither do a broken-winded horse any good or any harm.

Bruised Leg.—About ten days ago, the front shin of my seven-year-old horse became feverish and swollen, but is not producing lameness. When standing he points with his fore foot.

G. W. G., Reed City, Mich.—Dissolve ¼ lb. acetate of lead, 3 ozs. sulphate of zinc in a gallon of water; then add one pint of tincture arnica and apply to swollen leg three or four times a day and he should get well.

Film on Eye.—I have a three-year-old colt that has been troubled with a scum over the sight of one eye. W. C. C., Gaines, Mich.—Blow a small quantity of calomel into eye every day or two; or cautiously apply one part iodoform and five parts finely powdered boric acid with a camel's hair brush two or three times a week.

Chronic Cough.—I have a nine-year-old chunky built horse which I bought three years ago and ever since he has been troubled with a cough while standing in stable, but seldom coughs when outdoors and driven. He has been bedded with dusty pea straw lately and I am suspicious that it has something to do with making him worse. Is it incipient heaves, and if so can it be permanently cured? F. H. C., Coleman, Mich.—No person can tell whether your horse can be permanently cured or not; however, you have perhaps failed to properly ventilate and let sufficient fresh air into your stable; furthermore, the horse perhaps has been fed too much bulky dusty, badly-cured, non-nutritious food, which is an exciting cause of heaves. Without correcting and removing the cause of his ailment there is no use in giving him a whole lot of drugs. Feed mostly grain, roots and well-cured timothy. If he is a ravenous eater and somewhat pot-bellied, bed him with shavings or sawdust. Give him 1 dr. fluid extract lobelia, and ½ oz. of Fowler's solution at a dose in feed three times a day.

Injured Hock.—I have a horse that injured the point of hock; kicked by another horse that wore never-slip shoes. Immediately after the injury a watery fluid oozed out and he was very lame. I applied Sloan's liniment for two days but as he seemed to get worse I telephoned our local Vet., who told me to apply iodine, but the leg kept getting worse, then I called Vet. to see him. He prescribed an antiseptic powder and white liniment, but the horse is no better and I would like your opinion. G. M. P., Bear Lake, Mich.—Dissolve 1 oz. of permanganate of potash in a quart of clean boiled water and apply to wound once a day. The treatment your Vet. Prescribed is doubtless all right and these kind of cases should have the attention of a Vet; however, you should understand that many such cases are incurable.

Clinging Afterbirth.—Last fall I purchased a mare which is due to foal next May. Everyone of the three colts she has had caused her no trouble, but I am told she had to be cleaned; therefore, I would like to know what can be done to prevent a similar return. C. K., Conklin, Mich.—Feed her well, exercise her every day and avoid having her bowels constipated at foaling time; if the afterbirth does not come away in an hour or two, send for your Vet. and have him clean her.

Sprained Shoulder.—Bought a three-year-old filly a short time ago; was lame when I purchased her; the man I bought her from said she slipped and sprained leg last summer. J. J. S., Lakeview, Mich.—Apply equal parts of turpentine, aqua ammonia and olive oil to shoulder and sprained parts two or three times a week.

Breeding Question.—I have been a reader of your valuable paper for a number of years and have enjoyed the veterinary department. Kindly tell me if it will be safe to breed a 15-year-old mare that weighs about 1400 pounds? She has never been bred before and is quite a roomy grade Percheron. Would like to breed her to a Belgian stallion that weighs 2000 pounds. H. H., Kewadin, Mich.—You need not hesitate to breed her; however, I believe it would be a mistake to have her very fleshy when she foals.

Chronic Cough.—I have a horse that has been troubled with a cough all winter and it appears to me that the whole trouble is in his throat. The remedies I have applied failed to help him. J. H. D., Greenville, Mich.—Apply equal parts tincture iodine and camphorated oil twice a week to throat, and give ½ dram of fluid extract lobelia and ½ oz. powdered licorice at a dose in soft feed two or three times a day. Don't forget to keep him in a clean stable, free from foul gas and let in lots of fresh air.

H. R., Fosters, Mich.—I have been feeding my cows gentian, cooking soda, charcoal and salt as you suggested, to cure them of eating wood, brush and bone, and have also fed ensilage, hay, straw, cornstalks and ground oats twice a day, but they are inclined to chew wood just the same.—Give each cow a dessertspoonful of hydrochloric acid U. S. P. (diluted) in a quart of water and mixed with each feed; and furthermore, continue changing their feed.

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