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KANSAS FARMER.

Established in 1863.

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Wheat harvest in southern Kansas has commenced. The yield is reported to be large and the quality good.

By a flood last Saturday evening the town of Heppner, Ore., was almost entirely destroyed. Not less than 300 and probably 500 people lost their lives.

A new high-water record of the Mississippi at St. Louis was made when the Kansas floods reached that place. East St. Louis is well protected by embankments but the water went over and through some of them. It is now receding. A suggestion has been made to raise the entire town above high water. This will require a fill of about twenty-two feet over large areas.

Every farmer in Kansas should read a live agricultural paper. At all times and especially at times like the present such a paper will gather and present most useful information concerning ways and means of making the best possible use of one's opportunities. It is not too much to say that the information set out in this number of the KANSAS FARMER is worth to every flood sufferer several times the cost of the paper for a year. In this connection we have a special request to make of every reader who is acquainted with a flood sufferer. Please say to him that the KANSAS FARMER will be sent to him for one year free of charge and that he will be under no obligations to continue taking the paper after the expiration of the year. Let the names be sent in immediately.

BLOCKS OF TWO.

The regular subscription price for the KANSAS FARMER is one dollar a year. That it is worth the money is attested by the fact that thousands have for many years been paying the price and found it profitable. But the publishers have determined to make it possible to secure the paper at half price. While the subscription price will remain at one dollar a year, every old subscriber is authorized to send his own renewal for one year and one new subscription for one year with one dollar to pay for both. In like manner two new subscribers will be entered, both for one year, for one dollar. Address, Kansas Farmer Company, Topeka, Kans.

THE FARMERS AND THE FLOOD.

The magnitude of the destruction wrought by the late flood upon farm property can be conceived by those only who visit the devastated farms. The writer spent a few hours last Saturday among desolated fields, orchards and farm-buildings near the little station at Tecumseh, a few miles east of Topeka. As the Santa Fe train drew out from Topeka among green and flourishing fields and pleasant farm-homes which seemed the more prosperous on account of the liberal rains, among fields where the cultivator was

promoting the growth of the already luxuriant crops, the feeling of exhilaration was irresistible. But after about three miles of this kind of scenery had been passed the prospect changed suddenly. A fall in the valley so slight as to be almost imperceptible brought the train between fields devastated by the flood. This devastation continued to Tecumseh and beyond and was ended only by the nearness of the bluffs to the river. In the Tecumseh station the water was 10 feet deep. The stout little building is the only one of the several which composed the new town that is now anywhere to be seen. The flood which devastated North Topeka ran against the Calhoun Bluffs just below the city and was deflected to the south side of the river where it rushed across the strip of land between the river and the Shunganunga. This whole peninsula was covered to a depth of 6 to 10 feet of swift flowing water. The usually sluggish creek became a deep torrent making escape possible only by the railroad bridge and rendering it utterly impossible to rescue animals other than dogs.

The situation in the vicinity of Tecumseh is in a measure typical of that in other flooded districts. To give some idea of the actual condition the writer made notes of a few farms in this neighborhood.

Mr. H. E. Goodell is a well-known fruit-farmer whose home stands about a half-mile northwest from Tecumseh station, had shoveled the mud from his house, scrubbed it out and left it to dry at the time of the writer's visit. The road to the Goodell place was washed into holes so that it was impassable for teams or even for a horse. The fields were covered with silt and so soft that persons on foot had to observe much care to avoid miring. The fine orchard which had made unusual development by the irrigations and the generous culture which has been given it presented a sorry appearance. Many noble trees were lying on their sides or leaning almost to the ground, while the roots of some were turned up to the air. From some all of the limbs were broken off leaving bare stumps. The thick coat of mud seemed to be killing the foliage on those leaning over. On the lower side of the orchard some of the trees seemed little damaged. The current left on the lea-side of the trees drifts of silt, some as deep as 2½ feet. The out-buildings were wrecked; the barn had lodged against some trees near the house. The crops in the fields were entirely destroyed. By promptly cleaning the house the furniture had been saved with less damage than had resulted in houses which were longer in the mud and water. The stock was all drowned. Farming implements were damaged and broken but can probably be repaired. All grain and feed on the place was destroyed. Wire fences had the posts broken unless very strong but

the wires held and the materials are usually not far from where they belong. Some of the fences are partly buried and will have to be raised. Hedges caught drift below them but seem otherwise little injured.

Across the road from Mr. Goodell's is the farm of Mr. David Williams, a Topeka contractor. This farm has about as many buildings as before the flood but several of them came from places higher up stream. The stench of 200 bushels of rotting corn was only less offensive than that from the many dead animals on the farms of this vicinity. A portion of Mr. Williams' farm had been planted to potatoes and melons by Mr. George Shadbolt, who lives back of the bluffs. These crops were buried under one to two feet of silt. There were no animals on this place to perish. Mr. Williams thinks he got off pretty well.

Adjoining Mr. Goodell on the up-river side is the farm of his mother, Mrs. E. A. Goodell. This is farmed by Mrs. Goodell's son-in-law, Mr. S. H. Chubb. Mr. Chubb was found in the yard diligently at work clearing up the rubbish. He was burning drift, and shoveling mud from the cellar. The house had been cleaned but much of the furniture fell to pieces soon after it was taken out. The stench of the mud from the cellar was intense. This, arose in a peculiar way. When the family deserted the house a lot of young chickens were allowed to come into the kitchen. They were afterwards drowned. Mr. Chubb visited the house in a boat while the water was high and threw the dead chickens out into the swift current. Instead of floating off as expected they were drawn around the house and into the cellar and buried in the mud. This house stands on high ground and is a substantial stone building. People came to it from the lower lands. Finding the situation becoming dangerous the entire party waded across the fields to the Santa Fe railroad, crossed the creek on the railroad bridge and found refuge with neighbors on the high lands. An attempt to rescue the water-bound animals succeeded as to one horse. Mr. Chubb lost two mules, three cows, three calves, four hogs, and a lot of chickens, while his harness and farming implements are nearly ruined. He also lost twenty-two acres of wheat, fourteen acres of oats, one acre of potatoes, ten acres of corn, twenty cords of wood, and 100 posts. Notwithstanding these losses and the dilapidated condition of his once beautiful home Mr. Chubb's courage was refreshing. He has one horse left from the flood, his brother has given him another and an uncle will help him to a third. He is taking the best medicine in the world for the blues; viz., work and plenty of it. When the fields become sufficiently settled he will plant corn, potatoes, and vegetables. He has his family

(Continued on page 656.)

Agricultural Matters.

HOW TO MEND FLOOD DAMAGE—CROPS AVAILABLE.

[After the KANSAS FARMER had gone to press last week the following timely and excellent presentation and discussion of practical measures for the farmer who has suffered from the flood was received from Prof. A. M. Ten Eyck, of the Agricultural College. That it might reach KANSAS FARMER readers at the earliest possible moment it was printed as a supplement and inserted in each paper. We this week repeat the bulletin and follow it with a bulletin from the Iowa Agricultural College. A further letter from Professor Ten Eyck appears on page 649 of this issue, followed by one from Prof. H. M. Cottrell, and one from Prof. F. B. Mumford, on this important subject.—Editor.]

Press Bulletin No. 124.

AGRICULTURAL DEPARTMENT, EXPERIMENT STATION, KANSAS STATE AGRICULTURAL COLLEGE.

LATE CROPS.

The crops on much of the river bottom land have been totally destroyed by the extensive floods, and farmers are undecided as to what to plant in order to gain some income and secure fodder and grain for their stock next winter. The information and general suggestions given below may assist some in taking advantage of the opportunity of producing crops which still remain.

DATE OF FIRST KILLING FROSTS.

The dates of the first killing frosts for the last twenty-three years, as they have been recorded at this station, are given below:

Year.	Date of first killing frost.	Year.	Date of first killing frost.
1880.....	October 4	1892.....	October 8
1881.....	September 17	1893.....	October 15
1882.....	October 13	1894.....	October 8
1883.....	October 14	1895.....	September 30
1884.....	October 9	1896.....	September 29
1885.....	October 4	1897.....	October 29
1886.....	October 1	1898.....	October 14
1887.....	October 10	1899.....	September 30
1888.....	September 28	1900.....	October 8
1889.....	September 27	1901.....	October 5
1890.....	September 13	1902.....	October 5
1891.....	September 29		

Average, October 5.

During the twenty-three years no frost has been recorded earlier than September 13. Although a light frost occurred in 1902 on that date, and light frosts occurred in September in 1889, 1893, and 1894. Eight years out of twenty-three, killing frosts have occurred in September. October 5 is the average date of killing frosts, while the average date of September frosts is September 25, and of October frosts the 10th day of that month. It should be noted also that many of the frosts recorded as killing frosts were not so severe as to entirely stop the growth of corn and of Kafir-corn. By a killing frost is meant frost hard enough to destroy tomato vines, sweet potatoes, melons, etc.

CORN.

At this station early varieties of corn, King of the Earliest, Pride of the North, Early Huron Dent, Dakota Dent, Minnesota King, and early flint varieties have matured in 95 to 100 days when planted about the 1st to 10th of May, while medium early varieties, as Leaming, Kansas Sunflower, Early Mastodon, Iowa Gold Mine, Legal Tender, Silver Mine, Champion White Pearl, and Boone County White have matured in from 105 to 120 days. The first varieties named are usually classed in the seed catalogues as ninety-day corn, the last as 100-day corn. Corn planted in June, with good growing conditions, will mature in a shorter period than corn planted in the early part of May. Any of the varieties named in the second class planted in June, with ordinarily favorable conditions of growth, ought to mature in about 100 days. Therefore these varieties may be planted before June 15 with a fair promise of a crop. After June 15 and until June 25 the varieties which belong to the ninety-day class may be planted with a reasonable promise of a crop, assuming September 25 as being the possible date of the first killing frost. If the frost should hold off until October 5, June-planted corn ought to be a safe crop as far as injury by frost is concerned.

Trials at this station in 1895 and 1896 (average seasons) in planting corn (Leaming Variety) at different dates favored early planting. Corn planted May 30 gave about three-fourths the yield of corn planted May 1 to 10. A wet season should favor

late planting more than the average season.

In a five-years' trial (1891 to 1896) the early sorts yielded on the average two-thirds as much corn as the medium and late varieties.

KAFIR-CORN.

In 1895 Red Kafir-corn planted May 20 required 123 days to fully mature seed. In 1890 Kafir-corn planted May 4 was ripe September 12, 130 days after planting. On the average, Kafir-corn planted in May at this station takes 125 days to fully mature the seed. The Red Kafir is a week or ten days earlier than the Black-hulled White, but at this station the last-named variety has yielded five to six bushels more seed per acre in a two-years' trial than the Red variety.

The yield of Kafir-corn as compared with corn in a ten-years' trial at this station is as follows: Kafir-corn, 43.8 bushels per acre; corn, 31.6 bushels per acre. Corn has 10 to 20 per cent greater feeding value than Kafir-corn.

At this station the practice has been to plant Kafir-corn in drill-rows three to three and one-half feet apart, with a grain-drill set to drop single seeds an inch apart in the row. If the development of seed is the main object, a little thinner planting is better. Kafir-corn may be planted with a corn-drill or drill corn-planter if special plates are provided to drop the seed at the proper distance. "On warm soils and in late planting, listed Kafir-corn does well." Planted as above stated, one bushel (fifty-six pounds) of seed will plant five acres.

Since Kafir-corn requires more time to mature than corn, since it can not be so readily converted into money, since it is more difficult to harvest and store, and since it is adapted to dry seasons rather than to wet seasons, it would seem to me advisable to plant a large amount of corn on wet bottom-lands rather than too much Kafir-corn. With a light corn crop, Kafir-corn-seed will sell well at a fair price, but with a good corn crop, it can only be used as feed on the farm. If Kafir-corn fails to mature a full crop of seed it may still make excellent fodder; but this is true of corn also.

SORGHUM.

Sorghum may be sown broadcast for fodder as late as July 10, or it may be planted in drill-rows as described for Kafir-corn. When sown broadcast or in close drills, 50 to 100 pounds of seed per acre will be required.

Early Amber cane ripens in about 90 days.

Early Orange cane ripens in about 100 days.

Coleman and Kansas Orange in 120 days.

SOY-BEANS AND COW-PEAS.

In 1890 soy-beans planted June 7 matured as follows:

Extra Early Dwarf, 70 days.

Early Yellow, 90 days.

Early Soy, 124 days.

Late varieties, 128 to 166 days.

The average yield at this station for twelve seasons was twelve bushels per acre. At this station soy-beans are usually planted with the grain-drill in drill-rows thirty to thirty-six inches apart, beans one to two inches apart in the row. The beans may also be planted with the lister in warm soils or late in the season. Planted in drills thirty inches apart will take three to four pecks of seed per acre. The Early Yellow variety has yielded best at this station.

Cow-peas may best be used as a forage crop. The hay is similar to alfalfa hay in composition and feeding value, being even richer in protein than alfalfa. In the average season the yield per acre should be three tons. Cow-peas may be sown broadcast and disked in, or they may be planted with the grain-drill in close drills. This method requires one and one-half bushels of seed per acre. Some plant in rows and cultivate as described for soy-beans, which requires much less seed. The Whippoorwill is the earliest and one of the best varieties to grow in this State. The Clay, Black and Black-eye are other well-known but later-maturing sorts.

Cow-peas may be planted even later than soy-beans. The crop should be mowed for hay when the peas are well formed and the leaves and pods are just beginning to turn yellow. The hay-making process is a difficult one and requires even more care than the making of alfalfa hay. Cow-peas planted with corn and cut for fodder make excellent forage for all kinds of stock and is also recommended for ensilage. Soy-beans and cow-peas belong to the legume family and tend to increase the fertility of the soil and

make an excellent rotation crop for corn or wheat.

MILLET.

Millet may be sown for forage late in July, if the soil remains in good condition to sprout the seed. Usually early seeding is best, as millet should have a good start before dry weather sets in. Millet may be safely cut for hay any time during the period from complete heading to late bloom. Siberian, Hungarian, and common millet will make hay in from sixty to seventy days from seeding. German millet requires seventy to eighty days. The first-named varieties will mature seed in 90 to 100 days, the last in 110 to 120 days.

For seed-production, Hog or Broom-corn millet is preferable to the foxtail varieties. Some early strains of Hog millet will mature in seventy days. Japanese barnyard millet is a late variety but a rank grower and will produce more fodder than the early millets.

Sown broadcast or in close drills requires two to three pecks of the foxtail or broom-corn sorts. One to two pecks of the Japanese variety is sufficient. Sow thinner for seed-production than for fodder-production.

RAPE.

Rape may be sown for pasture as late as August 1. Sown with the grain-drill in drills thirty inches apart will require three or four pounds of seed per acre. Rape makes excellent pasture for hogs and may be used for sheep and cattle.

PASTURE.

Millet, or millet and oats, or oats and field-peas, may be sown for early pasture. Sorghum will furnish a large amount of pasturage and may be sown any time up to August 1. Cow-peas sown broadcast as described above make an abundant and excellent pasture. There is nothing better for dairy cows. Cow-peas sown with oats, sorghum or corn make excellent pasture. When two crops are planted together, use a little more than half as much seed of each as would be used in seeding the crop alone.

ALFALFA.

The fields which have been flooded should be disked as soon as the ground is dry enough. There is a possibility, if the crop has not been under water too long, that the alfalfa may start again. It is practical to reseed the fields at once, after thorough disking and harrowing. In case of an old field in which alfalfa has been cut for seed or allowed to mature, it will not be necessary to sow nearly so much seed as is usually required for the first planting. Eight to ten pounds per acre ought to be enough to reseed an old field. In case the field has grown alfalfa six or eight years, it may be advisable to rotate with other crops and seed alfalfa on new fields.

OTHER CROPS.

Broom-corn, buckwheat, navy beans, and garden crops may be planted, if convenience and time permit, as extras, to bring in a little pocket money.

SOIL MOISTURE.

The soil is full of moisture. Every means should be used to drain off the surface-water at once. But do not forget that Kansas is noted more for her drouths than for her floods. Practice the best methods of tillage and cultivation so as not to waste the capillary water now stored in the soil. With the large store of water now in the soil, by careful cultivation corn should make a profitable crop, even if drouth should prevail in the latter part of the season.

A. M. TEN EYCK.

Late Crops and Forage Plants.

DEPARTMENT OF AGRONOMY, IOWA STATE COLLEGE EXPERIMENT STATION.

Unprecedented rains have prevented many farmers in Iowa from preparing and planting all their land intended for corn. In some sections floods have ruined the growing crop. It will be the middle of June before many can work their land and the Experiment Station has had many inquiries about late crops to utilize the land.

If possible to obtain the seed, a ninety-day corn, like Farmer's Reliance, Pride of the North, or Early Longfellow Dent, can be planted as late as June 20, with reasonable assurance of reaching maturity before the close of the growing season. Nothing can fully take the place of corn.

Where farmers can not obtain these early-maturing varieties of corn, we wish to call their attention to the following forage crops that can be ma-



Your Feeble Old Wagon
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tured in the growing season that yet remains.

CORN HAY.

For corn hay for this season, select the earliest maturing variety of corn you can obtain in your locality. It can be sown broadcast, planted or drilled. Plant the hills as close together as you can with your corn planter, or if you use a corn drill place in drill-rows 36 to 42 inches apart and kernels 2 to 4 inches apart in the rows, using from 20 to 25 pounds of seed to the acre. For roughage this corn hay is most excellent and it will probably give more rough feed of good quality per acre than we can now hope to get in any other way this late in the season.

By using a corn-harvester the crop is harvested quite easily. If sowed very thick a grain-binder can often be used. Corn can not be readily or easily cured if mowed and harvested as we do hay. When bound and placed in shocks that are not too large it usually cures out quite well.

SWEET CORN FOR FODDER.

By planting sweet corn in rows similar to the plan just mentioned or drilling in rows 24 to 30 inches apart, a very fine quality of fodder can be obtained which is greatly relished by all kinds of farm stock. Stowell's Evergreen has, in the few experiments tried, yielded the largest amount of forage per acre. There are earlier maturing varieties, such as Peep-O-Day and Country Gentleman that may be preferred even though they have a lower per cent of foliage, and give a lighter yield.

SORGHUM.

Sorghum is well known to Iowa farmers as a forage crop. The Early Amber, especially the Minnesota Early Amber variety, has proven quick maturing and is the one best adapted for this year's planting.

If the ground is in good clean condition now, the seed can be sown broadcast. It may also be drilled in with a grain-drill, the same as wheat, planted with one-horse drill or a two-horse corn-planter with drill plates. Care need to be taken to prevent a coarse growth and thick seeding tends to prevent this. Drilled in rows 3 to 3½ feet apart, 15 to 16 pounds; broadcasted or with grain-drill 22 to 25 pounds seed per acre.

Sorghum can be harvested in many ways. If planted in rows 3 to 3½ feet apart it may be cut with a corn-binder and shocked. When broadcasted or drilled in close rows, if not too coarse it is often cut with a mower, cured and stacked as hay, or can be left in small cocks in field with little or no danger of its spoiling no matter what the weather is and can be left in field and fed as wanted.

This is one of the great advantages of this forage, as it can be preserved in field as no other forage-crop can be, and when hauled to stock in winter is eaten with great relish.

Professor Connell, of Texas, recommends the following method of curing sorghum for hay: "After mowing, allow the sorghum to lie upon the ground sufficiently long to dry out at the ends of the blades. If the crop is thick, it should be turned over upon the ground to expose the bottom portion of the crop to the sun for a short time; usually one to three or four days' sun is required to dry it sufficiently to put it in the 'cock.' These hay-cocks may be 5 feet high and 4 feet in diameter, of the shape of an old-fashioned beehive. All the hay that is put up in this manner should be well settled as it is laid on the pile.

"After having constructed it to the proper height, rake the loose sorghum away from the sides, leaving a neat pile of sorghum hay that will turn water in case it should rain. Allow it to remain in this shape for two or three days for fermentation to take place, which is evidenced by the 'heating' and the deposit of dew upon the interior of the cock. When thoroughly warm and before the hay loses its natural color, open the cock and expose the hay to four or six hours' sun, according to the weight of the crop to the acre and the size of the cock. Then

the hay is ready to haul to the barn or be placed in stacks, where it may safely be expected to remain without molding or heating seriously. If the season should be rainy it will take longer than this to properly cure the crop. Use no salt or other applications to preserve the product."—(Tex. Bull. 37, p. 674.)

The few experiments made show that the best time to cut sorghum forage either green or dry, when we can consider both quality and quantity, is when it is in the bloom. Well grown and properly cured sorghum is highly relished by stock, and being easily grown and a heavy yielder, it commends itself as a good substitute for corn-fodder as roughage and in some respects it is even superior. It may be planted as late as July first with good results.

MILLET.

Millet is not a primary crop in our State but it is a supplementary crop, to be grown on land where corn has been destroyed or can not be readily grown. It is a forage crop that we can this year substitute for corn on lands not already planted. Millet heads in from 45 to 60 days from seeding. It can be sown either broadcast or drilled: the latter method gives a more even stand usually and requires less seed per acre. Of the five leading varieties generally grown for hay, experiments show German millet to be the best. If seed for this variety can not be obtained, either common millet or Hungarian should be sown. Professor Chilcott, of the South Dakota Experiment Station, who has had much to do in growing and feeding millet, says it should be cut for hay when a majority of the heads have distinctly appeared. It allowed to approach maturity the stems become tough and beards on the heads stiff, reducing the palatability of the hay. The earlier cut hay is a much safer food for all kinds of stock, although experiments show that when cut too early it has a laxative effect upon stock. Millet hay should be cured in the same manner as alfalfa or clover. When harvested for seed it should be cut when seed is in stiff dough. When left until fully ripe the seed shells and falls out badly during the curing and harvesting process. It can be handled in the same manner as any other small grain. The three varieties of millet best adapted for farm purposes, in order of earliness ranks as follows: Hungarian, common millet, German millet; in order of yield: German millet, Hungarian, common millet.

KAJIR-CORN.

This is a "warm-weather" plant well adapted for dry regions and usually requires from 15 to 18 weeks to mature a crop. It is questionable whether a crop could be matured in Iowa, planted at this time. Kafir-corn is a valuable forage crop however even if it does not mature a crop of grain, and when it ripens usually yields from 30 to 50 bushels of grain per acre. A small area of Kafir-corn should be tried as an experiment.

There are two varieties that Kansas farmers have found most desirable for forage—the black-hulled white and the red Kafir. The black-hulled white has a short, stocky stalk, with short joints and quite numerous leaves of medium size.

The red Kafir is from seven to ten days earlier than the white variety, but grows taller, has a smaller per cent of foliage and grows a reduced yield of grain.

Kafir-corn can be sown broadcast or drilled in rows. The latter method seems to have proven most satisfactory. It can be drilled in rows the same distance apart as corn—3 to 3½ feet apart. The kernels should be drilled in, one in a place a few inches apart in the row. It can be planted with grain-drill, a one-horse corn-drill or a two-horse corn-planter with drill attachment. If the grain-drill is used it is best to stop up all but two holes.

The amount of seed the Kansas station finds best is one bushel to five acres, seed weighing 56 pounds per bushel. The seed should be put in about as deep as wheat. It should be cultivated same as corn, but care need be taken not to cultivate too deep as the roots early in the plant's growth reach from row to row. If the crop be desired for both grain and fodder it should be cut with a corn-binder, when the seed is ripe and put into shocks. The Kansas station reports the average yield for 11 years as 46 bushels, while corn for same period averaged 34¼ bushels per acre.

Stock soon tire of Kafir-corn when fed alone. The feed lacks fat, is deficient in protein, and has an excess of starch. Fed alone it is constipating to

all farm animals. It has to be fed with laxative feeds to obtain the best results.

SOY-BEANS.

The soy-bean has proven to be a most excellent forage plant and fed in connection with other roughage furnishes a most desirable food for farm stock. While the plant may not mature seen this season, yet it will yield a forage rich in protein and fat. It can be sowed broadcast or drilled in rows from two to three feet apart. The plant has an upright bushy habit which is much to its advantage during wet weather. The stems of the matured plant have a high per cent of woody fiber and the leaves which are rich in protein and fat tend to drop off as the pods mature, therefore the best forage is obtained by cutting the plants just as the pods are forming.

BUCKWHEAT.

Buckwheat can generally be matured if sown before July 1. It is a rapid growing plant and chokes out or smothers most weeds. It can be drilled or sowed broadcast, using one-third to one-half a bushel to the acre. As a catch-crop it is a success and the seed usually brings a good price on the market, or it can be ground and used as feed for stock. Mixed with other feeds, it is quite palatable and nutritious.

The following table shows the digestible nutrients of the above-named feeds in comparison (from Bulletin No. 93, Kansas Experiment Station):

	FEED.		
	DIGESTIBLE NUTRIENTS, PER 100 POUNDS.		
	Protein.	Carbohydrates.	Fats.
Corn.....	7.8	66.7	4.3
Kafir-corn (grain).....	7.3	65.2	0.
Kafir-corn (fodder).....	3.5	52.8	1.3
Corn-fodder.....	2.	33.2	0.6
Sorghum hay.....	2.4	40.6	1.2
Millet hay.....	4.5	51.7	1.4
*Soy-bean hay (just in pod).....	14.41	46.83	3.78
†Soy-bean (seed).....	34.0	28.8	16.9
‡Buckwheat (seed).....	10.	64.5	2.2

*Farmers Bulletin No. 58, U. S. Dept. of Agriculture.

†Henry's Feeds and Feeding.

The acres a farmer has yet to plant, his present meadow acreage, together with the number and kind of live stock for which he must provide feed, must govern the kind and character of crop he will now plant on land formally prepared for corn. The list given above may prove suggestive to farmers now questioning what best to plant in June to mature before the frost.

A bulletin will be issued later in the season giving more in detail suggestions as to methods of harvesting, storing and feeding these crops.

P. G. HOLDEN,
Professor of Agronomy.

W. H. OLIN,
Asst. in Farm Crops.
Ames, Iowa, June 5, 1903.

TILLAGE AND FERTILITY.

The following papers are from members of Prof. A. M. Ten Eyck's class in "Agriculture," and are a part of the regular class work:

The Science and Practice of Plowing.
C. S. JONES.

One of the most essential things in order to get a good crop, is good plowing. A person can not do good plowing unless he knows what is wanted. The objects of plowing should be, to pulverize the soil, bury the trash, prepare a seed-bed, get the ground in a condition to take as much water as possible, promote capillarity and aeration and decay of humus, and bring fertility to the surface. It is true that land will produce much if left to itself, but it will produce more if cultivated. The soil will also bring forth products when cultivated that it otherwise would not.

Only a very small portion of the draft in plowing is due to the friction of the soil on the moldboard, therefore we should use the plow that will do the best pulverizing. When plowing sod, the furrows should not be completely inverted, but left partly on edge. This enables the vegetable matter to decay better. However, when plowing old ground, the furrow should be more completely inverted and all trash well covered. A plow with a short, steep moldboard will pulverize the soil more than one with a long, sloping moldboard. If the ground is pulverized with the plow it can be worked with less labor than when inverted without pulverizing. The water will not go into the ground readily if the ground is not plowed, but will run off often when the soil needs it, thus plowing helps to retain moisture.

Grain crops such as oats are great surface-feeders, and the plant-food

should be brought to the surface by plowing. Another thing to be considered in plowing is the dead furrows. They should be close enough together to carry off the surface water and prevent puddling.

The furrows should not be plowed the same depth every year for the weight of the implements and tramping of the horses will tend to pack the ground where the division is made, but by plowing deeper one year and shallower the next year, this may be avoided. This packing of the soil will tend to prevent the water from percolating freely.

Subsoiling is hardly practical as it is very slow and expensive work. If a person will get large horses to work and let his plow run deep there will be no need of subsoiling.

Plowing plays an important part in assisting the moisture to rise to the surface by capillarity, thus bringing the moisture within reach of the plant. Also land may be able to hold the moisture in suspension near the surface if properly treated. The ground must not be too open or the moisture that arises to the top will evaporate, and a larger amount of moisture will be lost. On the other hand, the soil must not be too compact for the admission of the air, for the roots of the plants must have air. Therefore we see that it is very important to get the ground in proper condition to give the best results.

If the land is plowed in the fall and becomes compact, it should be plowed in the spring. In some lands fall plowing is a great help. When there is hardpan, the freezing in the winter will cause it to crumble, and the ground will be in good condition in the spring. When land is plowed in the spring it has a better chance to become dry and warm. The land should not be plowed when in a bad physical condition.

Several things govern the time to plow, the condition of the soil, the location, and the weather. Ground plowed in the spring should be plowed early, and it may be done when the ground is slightly wet, providing some little freezing follows. In midsummer and in fall deep plowing is desirable; in early spring rather shallow furrows are best, as the subsurface soil is much colder and wetter than the surface.

The Selection and Breeding of Seed-Corn.

FRANK E. BALMER.

Every progressive farmer, every feeder, or any person interested in plant-culture should be glad to lend a hand in producing a better quality and a larger quantity of the most important field crop—corn. Such an undertaking would not end with a day, nor even with a year; hence we see that it will be no small task.

Probably the first question to consider would be, what object should one have in selecting a variety of corn? And what kind of type should one desire? Selecting and breeding should increase the yield as well as obtain a higher feeding value. As to type, a general improvement must be sought for in a better stalk-development, more perfect ears in size, shape, and color, sound kernels of good vitality, and a perfect germinability, and a large leaf-development for feeding purposes.

Of course thoroughbred corn is best to start with and if selecting and breeding is to be carried on extensively, such should be secured; for the thoroughbred corn produces less barren stalks, the corn grows with greater vigor and the ears have a greater proportion of corn to cob.

The selection and breeding should be carried on for a number of years and at all times throughout the year. Hence, say we, begin with the planting of thoroughbred seed which is adapted for the purpose intended, a sample which is true to type in size, shape, and color, is pure of itself, is well-matured, and is sound.

A place for planting will be sought having favorable conditions as regards the soil, its physical conditions and productivity, and the location which should be far from other fields of corn to prevent the crossing and mixing of varieties. As concerns the matter of planting, this would be governed largely by the climatic conditions of the region in which the corn is planted. Thus if in a dry region, it should be planted deeply; if in a comparatively wet one, it should not be planted so deep. Again it is necessary that the corn should be planted evenly, only one grain in a hill, and all seed planted should be sound and free from injury.

After being planted, good care and cultivation will have much to do with the success of the undertaking in breeding and maintaining the variety. High-bred corn, like high-bred animals

Ninety Day Seed-Corn

We are in receipt of the following telegram which shows the promptness with which this great seed house arises to the emergency occasioned by the disastrous flood.

The J. R. Ratekin & Son
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Shenandoah, Iowa, June 9, 1903.

Business Manager Kansas Farmer, Topeka Kansas:

Announce we are well supplied with ninety day seed-corn, both white and yellow. Price One Dollar per bushel on cars here.

which have been reared and kept under favorable conditions, will not do well under adverse conditions. We see that it is only due to this care that the plant or the animal is able to attain a certain degree of perfection and such conditions must be maintained to perpetuate these required qualities in plant or animal.

During the growing season all plants that show the least imperfection should be destroyed, or at least the tassel of such plants before the pollen is ripe. In order to prevent the fertilization of perfect plants with imperfect ones. For example, plants that grow suckers, that have three or four shoots, that grow an ear with a long shank or that grow the ear too low or too high, are undesirable and must be rejected.

Much loss of the vitality of the seed may be caused by picking the seed too soon, the ear should always be allowed to mature on the stalk. The selection of the seed should be carried on at the same time that the corn is gathered, thus keeping the type before him and selecting corn as regards the stalk in size, the placing of ear on the stalk, the size of leaves, the thickness of husk, and the type of ear as regards its conformation to the standard. In this selection fancy points must be disregarded, the estimation of the judge must be based on the real value of the corn as related to its purposes, the feeding value, and the use for seed.

After careful selection proper storage must be obtained for the seed, which consists in keeping it in a place free from dampness, from injury of mice or insects, stored in small quantities so that air can freely circulate about it, and left on the cob until ready to plant.

When ready to plant the corn should be gone over carefully by hand, shelling off and rejecting all injured kernels, and leaving all others on for planting. In examining the corn particular attention should be given to correct type, especially as regards soundness, purity of seed, shape and setting of kernels on cob.

It must be remembered that one year's selection is not enough but that selection must be carried on continuously. Much difficulty will be met with and extra work will be required, but to increase the yield and to better the quality will bring such profits on the investment that it will soon prove the only satisfactory method.

Points to Be Observed in the Selection of Seed-Corn.

WAYNE WHITE.

Corn is a plant that is very easily affected by selection of seed. In five or six years it is possible that the best field corn of Kansas can be bred very close to the desired standard of type. Corn can be bred for different uses or purposes. The height of the ear on the stalk can be controlled, the value for fodder increased or diminished, the type of ear, and even the composition of the grain can be affected, in regard to protein and carbohydrates. It is evident from the results of numerous experiments by the experiment stations of the United States that there is a wide field for corn-breeding.

The chief object in seed-selection is to obtain a better and more uniform ear of corn, one that will shell as large a percentage of corn in proportion to

the cob as possible, and to maintain the desired type of corn, after it is obtained.

The first step in seed-selection is to go over the field from which the seed is to be selected and detassel all barren stalks before the silks appear.

The object of this operation is to prevent the pollen of barren stalks from reaching the silks of producing stalks. If the pollen were allowed to float over the field, the seed that it would produce would be likely to produce barren stalks the next year.

Maturity of seed is one of the most essential points in selection. This includes soundness and good market condition. The pronounced objection to immature seed is that the germ is not so strong as it is in a perfect kernel, hence the plant from it will not be so vigorous, and this directly affects the ear of corn.

While harvesting, a good, practical method of keeping the desirable ears is to have a box holding several bushels on the back end of the wagon, and when a decidedly good ear is found, it can be tossed where it belongs.

Selection should be governed by the kind of stalks as well as the type of ears. In all cases a good, vigorous stalk should receive due attention.

After the seed is harvested it should be resorted much more closely and stored in a well-ventilated and dry room. Care should be taken to protect from dampness and mice or rats. The mice may be kept out by storing the grain in boxes, covered with fine wire netting or screening. There is a difference of opinion as to whether corn should be shelled or left on the cob all winter. The objection to cob corn is that the cob absorbs water during the moist weather of January and February, which effects the grain injuriously. The cold snaps which are prevalent during this time freeze the water in the kernels and weaken the germ. Shelling does away with this objection. However, I think shelling will not be necessary until seeding-time if a perfectly dry room is used.

Uniformity is the next important point, in that it shows the breeding of the corn. Seed that produces ears of decidedly uneven length and size, also great difference in individual ears as to the percentage of corn to cob, crooked rows, and undesirable butts or tips, and no uniformly shaped kernels indicates a mongrel strain or poor variety, which will always prove unprofitable.

Uniform color and shape of kernels are a good indication of well-bred corn. The most desirable kernel is deep, somewhat wedge-shaped, well-dented, and of even thickness at butt and tip. Ears with kernels of a different color than the standard type should be rejected.

A large germ is always important as it shows the amount of protein and oil the grain contains, also the vitality of the seed. In the selection of seed-corn, the chief object is to get an ear that will produce the largest amount of shelled corn. For this a large ear is necessary, other conditions being equal. In general the standard for the different varieties grown are ten to eleven inches long and seven to eight and one-half inches in circumference. No objection is raised to a larger ear, providing it is proportional with deep kernels and will mature during the season.

How to Score Corn.

W. A. COMMER.

Scoring corn, practically unknown until the last ten years, is fast coming into practice. Many of the farmers of the different States have formed associations by means of which they wish to better the production and breeding of corn.

There are many points to be observed in scoring corn. The first thing to notice is the size and shape of the ear. Some farmers prefer ears that are large in circumference, not thinking of the shallowness of the grain and the large percentage of cob in proportion to the amount of corn. Others prefer long ears which many times also have shallow grains, and hence a small percentage of corn.

The method of judging corn at street fairs has been a very unfair way of judging and until recently has been practiced very much. The impracticable method was for farmers to bring their corn to the fair in boxes or baskets and the judge would glance over the different varieties, and pick out the largest corn, not observing the shallowness of grain and the large cob and many times not observing the way the butts and tips were filled out.

In selecting a standard ear to score by, we should select ears of uniform size, shape, color, and indentation. A

uniform sample of corn is nearly always the result of careful selection and breeding. The shape of the ears should be cylindrical. In being cylindrical we mean they should be well filled out from butt to tip with regular kernels and straight rows. The tips should be well filled out, the corn covering the end of the cob. At the butt the kernels should swell out evenly about the shank. A good many times where the butt-kernels swell out in this way they have a tendency to make the shank small and the ear hangs down; while on the other hand if the ear is not well filled out about the shank the shank is apt to be large and hard to break, and there will be an over-abundance of husk.

In shelling an ear for seed the irregular kernels about the butts and tips should be shelled off and discarded. If the corn is yellow the cob should be deep red, if white the cob should be pure white. In the present standard varieties the color has not been closely observed and consequently the varieties are usually impure. The mixing of color means the mixing of varieties, which is injurious to improved varieties. When white and yellow varieties are mixed it can be told by the white cap in the yellow ears, while in the white ears the flinty portion is yellowish.

The market condition of corn should be a point well worth noticing. If the ear is not sound, firm, free from chaffy kernels and well developed, it indicates that the ear has not fully matured under the conditions where it was grown.

The kernels should be nearly uniform from butt to tip except at the extreme ends. To study kernels they should be taken out about one-third of the way from butt to tip and laid beside the ear for close examination. The best shape of the kernel is slightly wedge-shaped. This shape will permit a large number of rows of kernels on the cob. There should be only a small space between the rows of kernels; that is, the furrow between the tops of the kernels should be very narrow.

In measuring the length of an ear of corn it should be measured from extreme butt to tip. The length in general of a good ear of corn is from 9½ to 11 inches. The circumference of an ear varies with the variety. In ordinary corn the circumference is 7½ to 8 inches, in proportion to the ordinary length. The farmer raises corn for the large percentage of corn which may be produced. When the ear is large with rough, deep kernels and a large number of rows to the ear the percentage is greater. To find the percentage of corn, weigh the ear, then shell the corn and weigh the corn, divide the weight of the corn by the weight of the ear, or the corn and the cob, and this is the per cent of corn. The per cent varies with the variety but is generally about 88 per cent in the high-bred corns.

The composition of the kernel is the next thing to be considered. This is very important to feeders, stockmen, and glucose factories. By breeding corn we try to increase the percentage of protein, thus making it valuable for feeding stock. The composition of a kernel can be studied by cutting the kernels in halves. The soft white portion is starch, which is the least valuable for feeding. The hard flinty portion is mainly starch but contains more protein than the white soft part. The germ or central portion of the grain contains the oil and most of the protein and is a very important part, being the most valuable for feeding purposes. Therefore, in breeding we must try to increase the size of the germ and thus increase the amount of protein and oil.

The Factory Products of Corn.

WM. LJUNGDAHL.

When a large field of waving corn presents itself to our vision perhaps the principal thought that presents itself to us is the large amount of feed for farm animals. We seldom stop to consider that there are other very important uses of corn. In fact if the demand for corn to-day were only that of feed for fattening purposes, a much smaller amount would be necessary than is now annually consumed.

What we mean by the products of corn are the compounds which are made from the different portions of the corn individually and collectively. Something might also be said regarding the uses made of the different parts in manufacturing different articles.

The corn of to-day is proving to be the most important of all our cereal plants. Not confining itself to one particular use, for for animals, it is providing food and clothing for man and its products are also put to many other uses.

When we sit down to a meal we find corn in all our food. The bread, the pastry, the cakes, the syrup, all contain ingredients which were corn or some part of corn in some form or other. The starched clothing which we wear is treated with an important part of the corn kernel. If it rains, as it sometimes does in Kansas, the farmer puts on his rubber suit and goes out in the rain, wearing nothing more or less than some of his corn in the form it assumes after passing through the manufacturer's hands. (A product resembling rubber is made from corn-oil.)

Ten years ago the products of corn were comparatively few. To-day they include something for nearly every branch of business. The baker uses the starch, syrup, glucose, and sugar. The oil is also a new product which is finding considerable use. The morning meal finds some concentrated breakfast-food with which to soothe the palate and satisfy the inner man.

The principal products of the corn kernels are starch, glucose, syrup, dextrin, corn-bran, corn-oil, breakfast-food, grape-sugar, and the ordinary corn-meal. Whisky and alcohol are also among the important products made from corn.

Horticulture.

Plums Suited to Kansas Conditions.

EDITOR KANSAS FARMER:—The article which appeared in the KANSAS FARMER a few weeks ago under my name and dealing with the general subject of plum-culture, was prepared in the first place for an Eastern audience and I think some changes ought to have been made in it in presenting it to the readers of the KANSAS FARMER. This would apply more particularly to the choice of varieties. For New England I am inclined to recommend the Japanese and domestic varieties almost exclusively. In Kansas the Japanese varieties, especially Burbank, satsuma, Abundance, and one or two others do exceedingly well; but the Domestica plums are usually a failure. There are a few exceptions to this last part of the rule but they are hardly worth mentioning, according to my information. On the other hand, there are various plums which are entire failures in the East but which do exceedingly well in Kansas. Among these we might mention some of the hybrids such as Wickson. Another hybrid which may be expected to succeed is Gonzales and several others of the same type. Then in the southern part of the State, particular varieties of the Wild Goose group or Chicasaws, like Pottawattamie, succeed admirably. In the northern part of the State and still more in Nebraska, Minnesota, and the Northwest, the Americana succeed best. Such varieties as De Soto, Hawkeye, Weaver, and Wolf, with such improved sorts as Terry, Craig, and the like, are the most reliable for that district. F. A. WAUGH.

Amherst, Mass.

A Kansas Man in the Old Bay State.

Wherever a real live Kansas man is found, there is something doing. This has been preeminently the case in the several positions in which the rapid advancement of Prof. F. A. Waugh has placed him. He is now professor of horticulture and landscape gardening at that venerable and honored educational institution, Amherst College, in Massachusetts. The following from his announcement of the work of his department is so plain and conveys so much useful information and is withal, so much like the diligent young man who came to the Kansas Agricultural College from McPherson County and has done good work in every position he has held, that the editor deems necessary no apology for transferring it to these columns:

ANNOUNCEMENT OF COURSE IN LANDSCAPE GARDENING.

The courses of study at this college have recently been revised, and the elective system considerably extended. This has opened the way for a material enlargement of the work in landscape gardening, and the trustees and the faculty have undertaken to make the most of this opportunity. The force of instructors has been strengthened with this plan in view, and suitable equipment has been provided.

The work has been arranged so that students matriculated in the regular four-years' course may occupy the junior and senior years almost exclusively with landscape gardening and closely related branches, a thorough foundation for these special studies having



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been laid during the freshman and sophomore years. The studies of the junior year include agriculture, horticulture, botany, engineering, free-hand drawing, mechanical drawing, geology, chemistry, entomology, English and economics, in addition to the landscape gardening. During the senior year the student may elect practically his entire course, and can arrange to spend a large part of his time in landscape gardening.

The landscape gardening proper includes the general theory of design as applied to this particular art; the knowledge of trees, shrubs, and flowering plants and their use for decorative purposes; the propagation, cultivation, and care of such plants. Engineering includes earthwork, construction, and maintenance of roads, drainage, etc. Besides this, the student receives instruction in such closely related matters as surveying, free-hand drawing, mapping, etc.

From the beginning the work is largely practical and calculated to give every student actual experience in the different operations. In the field the student propagates, handles, and plants out the trees and shrubs. Every spring the department of horticulture has a large amount of planting out to do, much of which is done from scaled plans; and the students take part in this work.

In surveying and engineering the work is likewise carried on largely in the form of practical field exercises.

In the landscape gardening drafting-room the student begins by copying classic designs from the masters of landscape gardening, just as students of painting or sculpture begin by making copies from the classic works in their respective fields. At first only small details are copied, such as the design of a simple gate, or a park entrance. Gradually more complicated subjects are taken up until the student finds himself able to make an intelligible drawing of any landscape gardening construction. The student then passes to original exercises. Here again the simplest problems come first, but those of greater complexity are taken up as rapidly as each student's ability justifies. At first the problems are merely suppositions, but as soon as possible the student passes to concrete conditions. Short sections of drive or pathway are designed between given buildings; a certain house-yard is assigned for improvement; small planting plans are made; a scheme is prepared for regrading a certain piece of ground; and similar problems of detail are given in large number; after which the student is ready for larger undertakings, such as involve location of buildings, drainage, grades, drives, various constructions, planting, etc. Before the close of the course each student is expected to complete one or more designs for improvement or construction work of fair proportions. Such problems involve the entire work—surveying, mapping, design-



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ing all grades, drainage, drives, walks, plantings, etc.; estimating the cost of all details, preparing full planting plans, and getting complete estimates from reliable nurserymen on the stock required. In certain cases also the student will be able to supervise the execution of his plans and to see them worked out in material form.

The Department of Horticulture and Landscape Gardening and the Department of Engineering are the ones chiefly cooperating in giving the instruction in this course. The instructors are as follows: Professor F. A. Waugh, landscape gardening; Professor J. E. Ostrander, engineering; Professor P. B. Hasbrouck, mathematics, mathematical drawing; Mr. Geo. A. Drew, general propagation and nursery management; Mr. Francis Canning, floriculture and greenhouse management.

During the four years' course of which the landscape gardening work is a part, instruction is given by all the members of the general faculty, numbering about 25 in all.

Master of Forestry.

Of the many lucrative professions open to young men, but few offer greater inducements than the care and management of forestry. It is a subject that is annually receiving increased consideration by the general government, as well as the several States. There is a bureau of forestry connected with the Agricultural Department at Washington and the Cornell university has taken the initiative in adding a course of forestry to its curriculum.

The forest area of the United States is estimated at 1,094,514 square miles, or 699,500,000 acres, not including the forests of Alaska. About 36 per cent of the land area of the United States is covered with timber. The annual consumption of manufactured forest-products in the United States aggregates more than 18,000,000,000 cubic feet, divided into lumber, fuel, ties and pulp for the composition of paper.

The 300,000 miles of railway in the United States, with 3,000 ties to the mile, require no less than 900,000,000 ties to equip the roads for operation. In the construction of bridges, depots and to replace the natural wear of equipments a vast quantity of lumber is used annually in the maintenance of the roads. So important a factor has this become in annual operating expenses that several railways have purchased large forests reserves and are furnishing their own supplies. The total area of forest reservations owned by the general government is 40,425,527 acres.

Many of the States own large forest reservations, and private individuals and corporations also own vast acreage of forests. The preservation of the forest reservations require an immense corps of trained masters of forestry. The government employs an army of foresters to look after its large forest domains. Private individuals want skilled young men to superintend their holdings. The railways and State bureaus give permanent employment to increasing numbers of proficient foresters. The demand practically opens a new profession, with a very limited sufficiency of qualified help to supply the service.

The majority of the masters of forestry formerly came from Europe, where for a long period the governments have paid special attention to the economic management of their forest reservations, and where schools are endowed to teach the science of forestry. The present demand and limited supply of trained help leaves openings for young men to act as helpers to masters of forestry in the government service, and two years' experience as assistant, with a short course at Cornell university, or other institution of forestry will equip a young man to enter the service at a good salary. There is the advantage of forestry that it is a healthful, honorable, permanent and lucrative profession and a branch of service that is not likely to be overcrowded for many years. The forest reservations are annually increasing in value and their owners, whether States, the general government, corporations or private individuals, have inaugurated a system of methodical conservation which has created a demand for skilled supervision that has made the master of forestry one of the most desirable of the scientific professions.

The Canning Industry.

The canning industry is something that has had its development within this generation. The first experiments along this line were made in Portland, Maine, about 1840, but probably with little success, as the business did not at that time assume anything of a com-

mercial character. The idea seemed to have a spasmodic existence for the next twenty years, and might fairly be looked upon as an experiment that had been tried and abandoned. The next we hear about canned goods was a lot put up in California in 1861. Then the idea was laid hold of by some Maryland farmers. The business grew slowly, and by 1865 not more than 8,000 cases were put up in that State. At about the same time pickle-factories began to be established, and the two industries thenceforth developed side by side. By 1880 the value of pickles, preserves and sauces put up in factories amounted to \$2,407,342. In the next ten years this increased to \$9,790,855, and by 1900 the value was \$21,507,046. The value of vegetables and fruits put up in cans in 1880 was \$17,599,576; in 1890 this had reached \$29,862,416, and in 1900 it was \$56,668,313. The total for the two industries in 1900 was \$78,175,359. It is estimated that one-half of this consisted of vegetables. Of the vegetables, about two-thirds consisted of corn and tomatoes. Peas, however, formed a very respectable proportion. The list of vegetables now offered is a very long one and includes asparagus, lima beans, string-beans, beets, cabbage, okra, tomatoes, pumpkins, spinach, squashes, succotash, and sweet potatoes. The great increase in the canning of nearly all vegetables is accounted for by the improved quality of the canned product, its healthfulness and its decrease in price.

An illustration of the latter is shown in the past and present values of tomatoes, corn, and peas. In 1870 the canner's price for a case of one dozen 3-pound cans of tomatoes was \$2.10. In 1871 this had increased to \$2.50, which is the highest since 1870. After that there was an irregular decline till 1896, when the price was 58 cents a dozen. In the census year it was 73 cents a dozen, or about 2 cents a pound. A dozen 2-pounds cans of peas cost \$1.85 in 1886 and \$1.15 in 1900. A dozen 2-pounds cans of sweet corn cost \$2.00 in 1876, \$1.30 in 1886, and 80 cents in 1900. A dozen 3-pound cans of tomatoes cost \$2.10 in 1870, \$1.75 in 1876, \$1.15 in 1886, and 88 cents in 1900. The canning industry is carried on to some extent in almost every State in the Union, but the bulk of the output comes from a comparatively few States. In the canning of tomatoes the ten States that turn out the bulk of the products, in the order of their volume of output, are: Maryland, New Jersey, Indiana, California, Delaware, Ohio, Virginia, Missouri, New York, Illinois. In the putting up of corn the nine leading States, in the order of their importance, are: New York, Illinois, Iowa, Maryland, Maine, Ohio, Indiana, Vermont, Virginia. In the canning of peas the eleven most important States, in the order of their output, are: Maryland, New York, Wisconsin, Indiana, Delaware, New Jersey, California, Michigan, Ohio, Pennsylvania, Illinois. There is a tendency to centralize in certain States. Thus, while the tomato output doubled in ten years, the output of Maryland and Indiana quadrupled.

Flooded Alfalfa.

EDITOR KANSAS FARMER:—Your letter of June 9 just received. Professor Shoemith starts on his vacation tomorrow and it will be practically impossible to accept your proposition and examine the flooded districts in the valley of the Kansas and Blue Rivers.

On June 7 I drove five miles north of Manhattan through the flooded district in the valley of the Blue River. The waters had practically disappeared from the surface soil but the ground was very wet and soft in most of the fields at that time. I believe that practically all crops which were covered by water three or four days have been destroyed in this district. It is possible that alfalfa on well-drained fields may revive. By careful examination of fields which were under water for four or five days I observed that new shoots were starting from the crowns of about 10 per cent of the plants. The old stems seemed dead and on the stems and leaves were more or less of a deposit of mud which gave the fields a very unfavorable appearance. I am advising disking of these fields as soon as the ground is

dry enough. In may be necessary in many cases to cut the alfalfa before disking. This will be no small undertaking because of the deposit of mud and the lodged condition of the crop. I advise disking in order to break up the cemented close condition in which the surface soil will be left when the ground dries. The great need of the alfalfa roots is for air and perhaps if air is supplied soon enough the plants will survive, at least the disking will do no harm.

It does not seem to be a fact that alfalfa is always destroyed by being flooded with water for short periods of twenty-four to forty-eight hours as has been stated in some of our publications. I quote from Bulletin No. 66 of the Texas Experiment Station, which has just been issued: "Alfalfa is naturally opposed to wet soils, but where favorable soil-conditions exist, well-matured alfalfa has a wonderful power of recuperation. * * * The destructive effect of the overflows is greater on the immediate river-front land and in practically every instance where such lands were devoted to alfalfa the crops were killed out to an unprofitable stand. The heavy deposit of sediment on the plants, in some instances completely covering them, prevent the natural life-functions of the plants. As we go farther back from the river front the amount of sediment carried by the river is materially reduced."

"Mr. O. J. Chance, who has a large acreage of alfalfa in the Brazos bottom about two miles from the river, in speaking of the effect of the overflow, said, 'The overflow of last summer did not completely cover my crop, but remained on the land for the greater part of six days. It was running water. My alfalfa land is well drained except in spots. The crop was only slightly injured except in the low places where the water stood for some time after the overflow water had receded. In such places it was killed out.'

"Robert F. Smith, of the Smith & Carson plantation, said, 'A large part of our alfalfa was under water for nearly eight days last summer, and being located near the river-front was covered with eight to ten inches of sediment. Almost four weeks later this land was prepared for fall oats. A good sprinkling of alfalfa came up with the oats, having survived the severe conditions to which it had been subjected. I believe that there is very little danger to alfalfa from overflows back from the river, say from one to two miles, except in poorly drained spots. A light rain following the receding of the overflow waters is a great help, as it washes the sediment off of the plants. The overflow of this winter did not injure my crop planted last fall, although it was on the land for two days and completely covered it for a part of that time.'

"Mr. John Nabors said, 'If there is not too much sediment and it is running water, alfalfa will stand overflows of long duration, and especially so if the overflow is followed by light rains to clean off the sediment from the plants.'

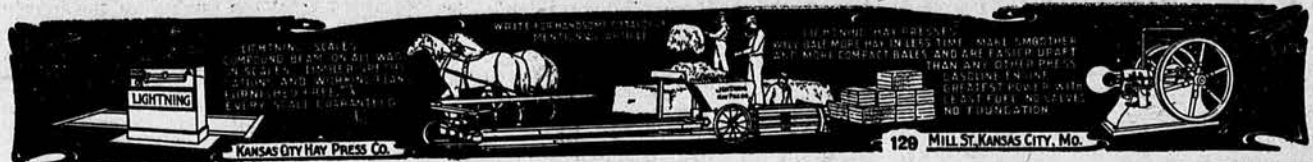
"The alfalfa on the Koppe plantation is located about one mile from the river. The overflow of last summer completely covered this field for at least five days—the fence-posts were almost entirely under water. The alfalfa only died in poorly-drained spots and where scalded by the sun."

The water did not recede from the alfalfa lands in the part of the Blue Valley visited soon enough for the rains to wash the sediment from the plants. Yet taking into account that the alfalfa was practically matured and ready for cutting I believe that if the fields can be cleared and disked before the ground bakes much of the alfalfa on the Blue River bottom will be saved. This will doubtless hold true for other flooded districts.

There was little washing of the fields noticed in the Blue River district. Fences were sometimes swept away and some damage and inconvenience was occasioned by the floating away of farm apparatus and machinery. Stock was largely saved.

In regard to recommendations to farmers as to crops to grow, etc., I can do not better than to refer to press bulletin No. 124 just issued by this station, a copy of which I enclose.

I should be very much pleased to undertake the work which you sug-



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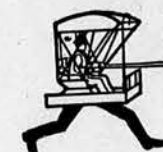
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gest but being unable to do so have given you the above short report.

A. M. TEN EYCK.

Kansas Experiment Station.

Replacing Drowned Crops.

Remembering that Prof. H. M. Cottrell, formerly of the State Agricultural College, was raised on a Kaw Valley farm and that through intimate association with farmers of all parts of this State he has an unsurpassed acquaintance with Kansas conditions and possibilities, the editor wrote asking Professor Cottrell to make suggestions for the best possible use of the opportunities remaining to the flooded districts for this season. True to the generosity of his nature, Professor Cottrell promptly responded with the following timely letters:

Editor Kansas Farmer:—Stockmen in the flooded districts of Kansas can secure an abundant supply of feed from plantings made as late as the first week in (Continued on page 658.)

The Stock Interest

Roweled for Blackleg.

EDITOR KANSAS FARMER:—I see many inquiries, and much has been said about blackleg. All cattle-raisers will agree that it is much cheaper and more satisfactory to prevent than try to cure this much-dreaded disease. I think there are different preparations which are reliable as preventives. For this purpose I have roweled with flannel saturated in the following preparation: Corrosive sublimate, 1/2 ounce; gum camphor, 1/2 ounce; alcohol, 4 ounces; spirits of nitre, 4 ounces; and have never lost any that were roweled.

Last fall I neglected them, but after having lost one, I made preparations to rowel, but before doing so I found a second one about 6 months old that was affected. Its left foreleg was as useless as though it had been broken. I took it to the barn and roweled it. When I went to a veterinarian but got no consolation. I returned home and gave her one-half pound Epsom salts. Then I concluded to experiment some, and put a rowel in the left leg, just above the ankle. The next day it was much better and I thought I had effected a cure; but on the third day her right foreleg was as lame as the left had been, so I roweled the right ankle as I had the left. The lameness left both legs and it has been free from any sign of blackleg ever since.

I do not say my treatment cured the calf, but I think it did. At least we should not let a calf die with this or any other fatal disease without making an effort to save it. If any one has a tried cure we would like to hear from him.

E. A. S.

Montgomery County.

For Worms in Pigs.

EDITOR KANSAS FARMER:—As I have raised and handled hogs most of the time during the last forty years, I will drop a line for the benefit of your correspondent, M. B. Jameson. He need not go far for a sure, safe remedy for worms in his pigs, a simple, inexpensive remedy that I have used successfully for many years. Take wood ashes and bran equal parts, add a pint of salt to a pailful of the mixture, and keep salt and ashes where his hogs, young and old, can have free access to it the year round. A little sulfur added to the salt and ashes will be beneficial, and his pigs as well as older hogs will never be troubled with worms. And if Mr. Jameson can add to this remedy alfalfa pasture and plenty of pure water, comfortable quarters in winter, and shade in summer, his hogs will never have the cholera.

Sheridan County. L. T. DELAPLAIN.

Water-Tanks as Boats.

EDITOR KANSAS FARMER:—The recent high water in the Saline River which is the highest since 1885, has brought many new thoughts and adventures to notice, and some of them may be useful to people living on or near streams, in times when there is danger from high water.

Nearly every farmer now has one or more large round water-tanks, and these can be used to a very good advantage in time of high water. They are really better than a boat as the averaged sized water-tank will carry more weight than four boats. They are very easily handled in the water and it is next to impossible to upset one. If it had been universally known before the recent flood that these tanks could be used as boats, the loss of stock and life would have been far less. To prove to the doubtful ones that they do make good boats, I will relate two instances where they were used successfully and to good advantage. Mr. Alex Smith, of this place, had about twenty head of hogs ranging in size from 150 to 400 pounds. These hogs were floating around in the water out of the reach of land and Mr. Smith gave them up for lost, when it suddenly occurred to him that he might use the large water-tank for a boat and save some of the smaller ones. He found that the tank was easily to propel and guide, that it would not easily upset, and that it would carry an enormous weight. The hogs were easily gotten into the tank and all of them were saved. The other instance was that of Mr. and Mrs. Ed Elrod, of Lincoln, Kans. They were surrounded by water and were on the verge of giving up all hopes of getting to land when they thought of the large round water-tank. They placed some of their personal effects in it and traveled to shore, a distance of about one and one-half miles without so much as getting the feet wet.

I might go on and enumerate several instances of this kind, but this is enough to prove that they furnish a safe and effectual way of getting over the water in the absence of anything better, and they are far safer than a boat for the inexperienced navigator. I am writing this for what it may be worth to others and I hope and trust that I may never hear of any of the readers of KANSAS FARMER drowning while there is a water-tank handy.

Lincoln County.

R. F. BAIRD.

Warts on Show Cattle.

Prof. H. M. Cottrell, formerly of the State Agricultural College at Manhattan, and now with the Odebolt Farm, gives something of his experience in removing warts from cattle. As the Kansas Farmer has frequent inquiries about these troublesome and unsightly formations on the skin of cattle we publish Prof. Cottrell's experience as follows: "We had much trouble with the pure-blood stock, and several successful methods were employed in their extermination. In order to experiment on taking off warts, a Red Poll heifer was selected on which the warts were so thick that it was impossible to place one's hand on her without coming in contact with several large growths. We tried two different ways on different parts of the animal's body. On her head and shoulders were applied castor oil—well rubbed in—twice daily for a week. Shortly after each application a portion of the wart would scuff off, and in two weeks the warts were entirely cured without any pain to the animal in any respect. On the back and hips of the same heifer we used concentrated acetic acid, applying it with a fountain-pen filler, and soaking the wart up thoroughly after applying grease around the root to keep the acid from eating the flesh. About twelve hours after the operation the warts could be pulled out easily. This was the quicker way, but it caused considerable pain and irritation, and is accompanied by some danger of the acid being dropped upon the skin and thus causing trouble."

Barr's East Side Poland-Chinas.

It will do to keep a keen eye on W. H. Barr's East Side Herd of Poland-Chinas at Elliott, Iowa, this year. Mr. Barr has a great breeding herd of Poland-Chinas with four great boars in service, the leading sire being Royal Blue 27642 by Big Chief Tecumseh 2d. There are twenty-four of the spring litters, and while that means lots of pigs it also means good ones. Mr. Barr uses matured sows in the main, and he will positively not price a poor pig. When you buy of Barr you get blood, bone, and constitution. He will be glad to confer with men who contemplate the purchase of a herd-boar, or who may need foundation stock for a breeding herd. Write Mr. Barr for any information about his various spring litters. He can send you a printed list of sows and their litters if you ask for it. See the East Side Herd advertisement on page 666.

Gossip About Stock.

At the sales of Shorthorn cattle held during the first week in June at Walla Walla and Colfax, Wash., under the auspices of the American Shorthorn Breeders' Association, the satisfactory average of \$193 for females and \$117 for bulls was realized.

N. A. Lind, Rolfe, Iowa, sold a draft from his Beaver Creek Shorthorns at the home town on June 3. In this sale sixty-one head brought \$14,025, average \$230. Fifty females brought \$11,970, average \$239.40. Eleven bulls brought \$2,055, average \$186.80.

Following the Lind sale came the sale of Shorthorns by Brown, Randolph Bros. and Igo, at Indianola, Iowa, on June 4. In this sale a total of fifty-two head were disposed of for \$6,047, average \$116.30. Forty-one females brought \$5,317, average \$129.70. Eleven bulls sold for \$730, average \$66.35.

Saturday, June 6, wound up the week of the Iowa Shorthorn sales with a joint offering by A. Alexander and R. G. Robb & Son, Morning Sun, Iowa. In this sale twenty-nine head brought \$5,925, average \$204.30. Twenty-eight females brought \$5,675, average \$202.75. And one bull brought \$250.

On June 5, J. W. Smith & Son, Allerton, Iowa, held their second annual sale of Shorthorns. In spite of the bad train service following the floods the twenty-four head of cattle brought \$5,050, average \$210.40. Twenty females brought \$4,225, average \$212.25. Four bulls brought \$805, average \$201.25.

On June 2, E. R. Stangland, at Marathan, Iowa, held a sale of Shorthorn cattle which was the first of a series of five held in that State during the first week in June. Stangland's contribution consisted of thirty-five head which averaged \$237.55. Of these thirty-one were females, which averaged \$257.90, and four bulls averaged \$80.

O. B. Smith & Sons, proprietors of the Republica County Herd of Poland-China swine, Cuba, Kans., in writing to claim date for their sale, mentions that their pigs are doing nicely although some of them were compelled to wade in the water during the period of the recent flood. Incidentally they have a nice bunch of extra fancy fall boars for sale yet.

The Kentucky Shorthorn sale held at Dexter Park, Chicago, last week by E. K. Thomas, of North Middleton, Abram Renick and T. C. Robinson, of Winchester, was in part a disappointment. The females consigned to this sale averaged \$250 and the general average was \$193. It will be remembered that this was a sale of pure Bates cattle from the most famous herds of Bates breeders now in Kentucky; and while the sale was fairly good it

seems smaller in average than might be expected from the quality of the offering and the reputation of the breeders.

McGlaughlin Bros., of Kansas City, Mo., and Columbus, Ohio, notify us that they have just received a cable message from France from Mr. Jas. McGlaughlin notifying them that their Percheron stallions won every first prize and also that they won first prize as the best collection of stallions at the great Concours Regional held at Evreux during the past week.

At a late sale of Poland-China hogs at Disco, Ind., sixty-eight head were sold at an average price of \$285. The top price of the sale was \$1,700 paid for a sow, and no animal in the sale brought less than \$100. While these figures are much out of the ordinary it shows the possibilities ahead for the young breeder and proves that in some instances at least there is "Money in hogs."

Secretary H. A. Heath, of the Kansas Improved Stock Breeders' Association, is receiving many letters from breeders throughout the country as well as many notices in the live-stock press in regard to the Stock Breeders' Annual. His announcement that there are a few copies remaining on hand that can be used for general distribution and that will be mailed on receipt of five cents to cover postage.

News comes to the effect that F. Barteldes & Co., have completed arrangements whereby they will build a structure suitable for their needs and establish a branch of their great seed-house at Oklahoma City. Their business has grown so rapidly that they find it difficult to supply the patrons in the two territories from the home establishment at Lawrence as promptly as they wish and so the branch house becomes necessary.

Frequently it is impossible to obtain the services of a veterinary surgeon and as a result valuable stock dies for want of proper treatment. Every farmer should be protected by learning how to take care of his animals in sickness. The "Complete Stock Doctor," advertised elsewhere in this issue, is just what every farmer needs. It contains a vast amount of information and our readers should be interested in it.

Probably the highest prices ever paid in this country for coach-horses at auction have been realized at the sale in New York on June 12 of thirty-four animals which have been used two months in working the coach Pioneer between New York and Ardsley. The total proceeds of the sale were \$24,000. Among the buyers were Harry Payne Whitney, G. G. Haven, Jr., and other well known whips. The former paid the top price, \$4,750, for one pair. Several others were sold singly at \$1,000 to \$1,800.

The daily press brings the information that the American Hereford Cattle Breeders' Association has been placed in the hands of a receiver and that the receiver has posted notice on the door of the rooms formerly occupied by the association in the Live Stock Record Building at Chicago that it had taken possession. This is interpreted to mean a continuation of an old fight within the association itself. Financially the association is in excellent condition and the breed has never had a better standing than at the present time.

The fourth public sale under the auspices of the Wisconsin Shorthorn Breeders' Association was held at the experiment station farm, Madison, Wis. In spite of the fact that many of the cattle were plainly bred and in thin flesh the sale was a fairly good one. Forty-three head averaged \$122.44. Of these thirty-seven were females which averaged \$125.90, and six bulls which averaged \$95.83. The top of the sale was brought by the Scotch cow, Ury Maid with bull calf at foot who brought \$310. The top for bulls was \$150 brought by Prince George.

On June 23-26, the American Association of Farmers' Institute Workers will hold its eighth annual meeting in Toronto, Canada. The program is an elaborate one which may be divided into two general sections, one of which is made up of a series of papers on "How to get the people together for institute work," and the other one a series of papers on methods of institute work. These general topics with the president's address, the report of officers and the entertainment of visitors will fill the four days. The present officers of the association are: President, W. C. Latta, Lafayette, Ind.; vice-president, J. G. Lee, Baton Rouge, La.; secretary-treasurer, G. C. Creelman, Toronto, Canada.

The combination sale of Shorthorn cattle, under the management of F. W. Harding, of Waukesha, Wis., was one of the most satisfactory sales ever held at the Chicago yards. The 48 head sold for \$17,820, or the very satisfactory average of \$371.25. The averages made by the several consignors to the sale were as follows: J. F. & J. W. Prather, 5 head, \$2,260, average \$452; I. M. Forbes & Son, 5 head, \$1,960, average \$392; E. W. Bowen, 4 head, \$1,000, average \$250; George E. Ward, 9 head, \$4,645, average \$516; D. R. Hanna, 16 head, \$4,920, average \$307.50; A. G. Leonard, 5 head, \$1,760, average \$352; F. W. Harding, 4 head, \$1,370, average \$342.50.

Gov. G. W. Glick, Atchison, whom everybody knows as the "grand old man" of the Shorthorn breeding industry in Kansas, is still making his influence for the good of his State a potent one. Having been so long actively engaged in breeding the best of good Shorthorns and having had his experience in political life and held the highest office in the gift of the people it would seem that he might choose to rest from his labors upon the laurels already won. Such, however, is not the case. He has interested himself in the good-roads movement as well and has just ordered a supply of Kansas Farmers of the issue of May 21, which contains the excellent article on road-dragging by D. Ward King, of Missouri. The writer has had the privilege of traveling over a number of Missouri roads which have been operated upon with this home-made drag and can bear testimony

that this simple treatment has produced wonderful results in a very short time. This device, or a modification of it could be used to a great advantage on most roads not paved in eastern Kansas.

So confident is James J. Hill, the Northern Pacific magnate, of the fact that the Asiatic markets can be opened for American wheat, that he has now in process of construction five large vessels for the purpose of carrying wheat from Seattle to China, Japan, the Straits Settlements and other oriental ports. He bases his belief on the known fact that wherever wheat-flour has been introduced to any race, excepting the black, they are thereafter ready to consume it regularly. By figuring only a small per capita consumption of American wheat he estimates that the Chinese trade alone will consume nearly \$4,000,000 worth of wheat a day for every day in the year. At any rate he is making a move in the right direction and the results of his enterprise will be watched with interest.

We have just received a letter from R. W. Parks, secretary of the American Galloway Breeders' Association, in which he says that he has just received information from two prominent breeders in Kansas, one of which has just sold thirty-two registered Galloways to the western part of Kansas. He moreover states that he has sold all the Galloways that he can spare and the demand was never better in the West than at the present time. The other breeder sent a number of applications for transfer and also stated that he had sold out so that he could not fill orders. The secretary adds that this is very encouraging news and goes to show the healthy condition of the trade and a strong private demand for Galloways. He sees in this movement of Galloways the fact that this class of cattle is wanted and public sales are not necessary. He adds that the number of transfer certificates is the largest number that he has ever issued to one breeder at one time to cover private sales. The difficulty experienced by western breeders is in raising enough animals to supply the demand for these cattle which are constantly gaining in popularity in the West.

The Louisiana Purchase Exposition Company have set aside \$250,000—a quarter of a million—to be used as prizes for live stock at the great exposition next year. In view of the fact that the largest sum previously offered by any world's fair was \$142,500 by the Columbian Exposition at Chicago, and in view of the fact that the present appropriation is larger than the aggregate offered by all previous world's fairs, it will be seen that a classification much in advance of any heretofore attempted, with a generosity of premiums heretofore unknown, will be the satisfactory condition which live-stock exhibitors will meet with at St. Louis. As previously mentioned in the Kansas Farmer, the live-stock department has been allotted thirty acres on which will be erected about fifty buildings for the accommodation of stock on exhibition. The buildings will also include a very large show- and sale-pavilion, well built, seated and ventilated for the accommodation of spectators. It is expected that the Kansas Commission will duplicate prizes offered by the exposition so that the Kansas breeder will find it well worth his while to be represented by his herd at St. Louis in 1904.

In the disaster which has come to Kansas in the way of flood the property losses have been heavy. In many cases individuals and associations have lost more than they can now realize. Business has been paralyzed and it will take time to get it readjusted. Among the heavy losers we have in mind the great creamery companies who suffered much in the way of losses of cream that was in transit and about which they have as yet not been able to get full information. The large creameries represent an immense amount of capital which has been of direct benefit to the farmers of the West, in fact it has almost created a new industry; and we bespeak for these companies patience on behalf of their patrons until they can get their business into working order again. We know of one of these great companies that had several thousand dollars' worth of cream in transit which the express company was obliged to deliver at any point where it could be churned, even going as far west as Pueblo, Colo. By the way, the thought occurs that if the patron finds he has lost a can of cream he must remember that the companies have lost thousands of them. While the loss of one can of cream would not be a serious one to be borne by the individual the loss of hundreds of these cans by one company makes it serious. Without the knowledge of any of these companies we suggest to our friends that patience is a virtue that should be exercised at this time, and that a minor loss borne by a patron will aid the companies by distributing the burden so that they can more readily continue the business that has been so profitable to all.

With the breaking up of the great ranges west of the Mississippi River and the consequent loss of free pasturage to stockmen, has come the change in the method of raising and fattening cattle. The smaller area of pasture lands available to any one feeder makes necessary the provision by which feed of some sort must be raised as a substitute. This of itself operates to increase the cost of raising fat cattle and many old-timers who are familiar with the old methods of raising cattle have felt that the increase in cost would hardly pay for the profits received and the time and labor expended. Efforts have been made to overcome this condition by a combination of grain-raising with beef-production. This has been a distinct step in advance as there is always a considerable amount of forage and inferior grain that can be utilized as cattle feed on any large farm. The real solution of the matter, however, lies in the proper combination of grain and cattle when the cattle are of high quality. Formerly our people farmed by the mile, now they must farm by the acre. As the acre now available represents as much capital invested as did the mile of earlier days, it is necessary that the acre be made to produce as good an interest on investment as did the mile. No one who has studied the conditions will doubt that the profits to be made from an acre properly handled and properly stocked with good cattle can be made much greater than those formerly received from the

mile with its crude methods and inferior stock. One of the most satisfactory evidences of the coming of the newer and better methods lies in the fact that pure-bred cattle may now be had in numbers at a price which is at once profitable to the breeder and not prohibitive to the ranchman. Plenty of good bulls may be bought at from \$100 to \$200 that are well bred and good individuals and that will make for their purchasers big profits on investment. With good cattle, plenty of alfalfa, and a part of the farm devoted to grain-raising the combination lacks but one thing. This is a bunch of good hogs to follow the cattle. Land is becoming too expensive and the area owned by the individual too small to make profitable the raising of inferior stock. Good stock well cared for means profit for its owner. Poor stock means a poor man.

Publishers' Paragraphs.

"Be Your Own Judge" is the title of an interesting and instructive booklet relating to farm-separators and how to apply business principles to the testing and selection of a separator. Every dairy farmer will be interested in perusing this booklet which will be sent free upon application to the De Laval Separator Company, 74 Courtlandt Street, New York. Be sure to mention Kansas Farmer when writing for it.

If you have a colt that is not doing well or a horse which is wormy, hide-bound or in any way out of order, feed them Rex Conditioner. It will correct the troubles they have and put them in a natural, thriving condition. Do not confound this with ordinary condition powders. It is just as much better as an electric light is above a tallow candle. Rex Conditioner is advertised in this paper by the manufacturers, the Rex Stock Food Co., Omaha, Neb.

Recognized Infringement.—The Plymouth Cream Separator will be withdrawn from the market after June 15. This is in accordance with agreement made with the Superior Fence Machine Company, of Detroit, Mich., who claim infringement on patents held by them for the Superior Cream Separator, advertised in these columns. The Plymouth Separator is withdrawn in consideration of no claim for damage being made by the Superior Fence Machine Company.

Midsummer Cookery.—The Delineator for July offers a number of features of interest to the culinary department of the household. Miles Bradford's entertaining paper in the "Carlotta and I" series, An Emergency Luncheon, includes some admirable suggestions for the utilizing of left-overs. A feature of especial timeliness is the two pages portraying hot-weather beverages, daintily arranged on trays for serving and with the recipes for the same. Fruit salads is the subject of a paper; tempting ways of serving tomatoes are given in another, and the preparation of toasts, both plain and sweet, is also explained.

The Bolle City Manufacturing Co., Box 78, Racine, Wis., are offering two machines that are especially timely in this week's issue of the Kansas Farmer. One of these is a small and compact thrashing-machine of great capacity, very strongly built and requiring light power. The other one is their feed- and ensilage-cutter which has self-feeder and blower attachments. These machines are accompanied by a full line of sweep and tread powers. They are both time- and money-savers. They publish a book about ensilage which they will be glad to send, together with their illustrated catalogue and price-list, free to any reader of the Kansas Farmer who will mention this paper and write them. Their card appears on page 635.

The large demand for that famous book, "Piggies' Troubles," has caused another edition to be printed. Much valuable information is contained, giving symptoms and cures for many of the diseases to which the hog is heir, such as cholera, hog-lice, mange, fly and maggot, granular eruption, nettle-rash, eczema, surfeit, sore tails, thumps, canker, paralysis, rickets, scours, infectious arthritis, worms, abortion, garget, castration, and other things hog-owners ought to know. We have arranged that each subscriber to this paper shall have a copy. You had better write at once, addressing the Zenner Disinfectant Company, manufacturers of Zenoleum, 61 Bates St., Detroit, Mich. You will be much interested in this book, and ought to have a copy with you always.

The Kansas Farmer is frequently in receipt of inquiries as to where good, serviceable and cheap mail-wagons may be purchased for use on the rural free-delivery mail-routes of the West. Very many wagons have been built by different manufacturers to meet this want. Most of them have proved quite satisfactory though some have proved very heavy for sections of the country that are at times troubled with muddy roads. The Erhardt Wagon Manufacturing Co. puts out a drop-sill wagon that is at once light, handsome, durable and cheap. It is fitted with Sarven wheels of the best selected hickory and is so built that the driver can stand erect in his wagon. The axles are fitted with Collinge collar, dust-proof, mounted on open-hearth, oil-tempered spring. The Erhardt Wagon Company is making specially low prices on all sorts of vehicles and can furnish anything with wheels on, but their leader is the buggy shown in their advertising card on page 668 and the rural mail-wagon on which prices will be quoted to anyone who will write for them.

Hay-balers on a large scale will be interested in the Eli Power Presses which are advertised elsewhere by the manufacturer, the Collins Plow Company, Quincy, Ill. All told, this Company manufactures near two score of presses, including about everything that could possibly be desired in pattern and size. The power "Ells" are distinguished by numerous specially valuable features, such as being self-feeding, automatic condensing hoppers, automatic block placers, signal bells for regulating size of bales, etc. These presses are made in both wood and steel cases. They have a record of three bales a minute, which, considering the shapely and solid, compact character of the bale, ought to meet the requirements of the most exacting buyer. The Eli press is past the experimental stage. It has es-

tablished a character—a most enviable character—by long service in the field. Most of our readers are acquainted with it. Such as are not and are thinking of buying should not think of placing an order until they have procured the Eli catalogue and made a study of its claims. Consult the ad. and write for catalogue. It is mailed free.

In the June number of Pearson's magazine is an article devoted to beet-sugar industry by W. Frank McClure. The article is a comprehensive one and is interesting in its showing of the possibilities of the beet-sugar manufacture in this country. From the farmers' standpoint, however, it does not make so strong a showing. In addition to the ever present fact that the farmer who raises sugar-beets for manufacture is under the necessity of hauling those beets to the factory or shipping point comes a question of profits for the labor expended. The highest returns mentioned in the article are a gross receipt of \$54 per acre received by the Colorado farmers. This is coupled with the statement that these returns are higher than those from any other crop in the State under normal conditions. However, this statement is immediately followed by one showing that the expenses of producing and marketing this crop are \$42 per acre. As before mentioned this article is interesting, but the writer offsets the impression which he evidently sought to create by making the following statement: "Beet-raising can not be continued for any length of time unless the amount of plant-food taken out of the soil by the beet is restored and every by-product turned into money by some economic use." Sugar-beets have proved to be a profitable crop in very many localities but from observation and testimony their value lies in their use as a food for dairy and other cattle rather than from any returns that can be expected from the sugar-factory.

The Low Down Handy Wagon.

The advantage of a low-down wagon on the farm is so well understood that we need not refer to them except in the briefest manner. They are wide-tired and can be taken into fields when the ground is too soft to use narrow-tired wagons. They can be used on meadows and pastures without injuring the sod, no matter how soft the ground is. They are handy in every sense of the word for hauling hay, grain, live stock, plows, harrows and similar implements to and from the field. A big load can be put on without pitching or lifting the load to a great height. The only question to decide is where to get a handy wagon and get the best. The Farmers' Handy Wagon Co., Saginaw, Mich., make one of the best if not the very best one made. This wagon has a long, broad platform and is equipped with either wooden or metal wheels. The wooden wheels are guaranteed in every way, being made of solid white oak, three thicknesses. The inner section presents the end of the grain to the tire while the two outer ones have the grain running crosswise of each other. The tire can not be driven off with a sledge hammer nor can the wheel ever shrink so as to make the tire loose. The metal wheels made by this company have the spokes swedged in instead of cast in. Spokes that are cast in come loose after a little wear, while those swedged in never come loose or rattle. The whole wagon is made on the same solid plan and every part of it is guaranteed in every way. This company publishes a book about these wagons which shows by pictures and printed description just how they are made and what kind of a guarantee goes with them. The book will be sent free to any of our readers who ask for it and mention Kansas Farmer. Address Farmers' Handy Wagon Co., Saginaw, Mich.

Vehicle Economy.

The word economy has so many different meanings that it is often misinterpreted. In the matter of buying vehicles; to one it may mean doing without altogether; to another, using the old rattletrap affair that long ago outlived its usefulness; another will tell you that it means to buy the cheapest priced style to be found; while another, after careful consideration, will decide that it is true economy to buy from an old established manufacturer, who has a deserved reputation for making first-class goods and selling them at moderate prices.



One concern which meets these requirements is our advertiser, the Elkhart Carriage & Harness Mfg. Co., of Elkhart, Ind. We show one of their late patterns above. These people have been manufacturing high-grade vehicles and harness continuously for thirty years and during all that time have sold only direct to the consumer. This fact, taken with the high character of their work, constitutes the truest economy for the vehicle buyer, who thus gets his goods at first hand without paying unnecessary profits. The Elkhart Co. actually manufacture everything they sell and can show the goods. Hundreds of buyers come every year to Elkhart, some from long distances, to select in person, as they more than save their railroad fare on the price. The new catalogue is now out, and shows 195 styles of vehicles and 65 styles of harness. It is a book of 224 large pages, showing photographic views of all their styles. From this catalogue one may order as safely as from a store exhibit, for the company takes all the risk of satisfying the purchaser. A copy will be sent free to any reader. Write to-day and mention the Kansas Farmer.

Well Known County Official.

Windom, Minn., February 9, 1902. I have been troubled with blind piles and have used Watkin's Vegetable Anodyne Liniment and found great relief. I don't want to be without it.—H. E. Hanson.

Kansas Fairs for 1903.

Following is a list of fairs to be held in Kansas in 1903, their dates, locations and secretaries, as reported to the State Board of Agriculture and compiled by Secretary F. D. Coburn:

Allen County Agricultural Society: J. T. Tredway, Secretary, Iola; September 8-11.
Barton County Fair Association: Jas. W. Clarke, Secretary, Great Bend; August 25-28.
Brown County—Hiawatha Fair Association: Elliott Irvin, Secretary, Hiawatha; September 8-11.
Butler County Fair Association: J. W. Robison, Secretary, El Dorado; October 5-9.
Chautauqua County—Hewins Park and Fair Association: P. N. Whitney, Secretary, Cedar Vale.
Clay County Fair Association: E. E. Hoopes, Secretary, Clay Center; September 8-11.
Coffey County Agricultural Fair Association: J. E. Woodford, Secretary, Burlington; September 8-11.
Cowley County—Eastern Cowley Fair Association: Ed. E. Reed, Secretary, Burden; September 16-18.
Cowley County Agricultural and Stock Show Association: W. J. Wilson, Secretary, Winfield; September 8-11.
Finney County Agricultural Society: A. H. Warner, Secretary, Garden City; August 5-7.
Franklin County Agricultural Society: Carey M. Porter, Secretary, Ottawa; September 15-18.
Harvey County Agricultural Society: J. C. Nicholson, Secretary, Newton; September 22-25.
Jackson County Agricultural and Fair Association: S. B. McGrew, Secretary, Holton; September 1-4.
Jefferson County Agricultural and Mechanical Association: Geo. A. Patterson, Secretary, Oskaloosa; September 1-4.
Jewell County Agricultural Association: H. R. Honey, Secretary, Mankato; September 14-17.
Marshall County—Frankfort Fair Association: J. D. Gregg, Secretary, Frankfort; September 1-4.
Marshall County Fair Association: E. L. Miller, Secretary, Marysville; September 15-18.
Miami County Agricultural and Mechanical Fair Association: W. H. Bradbury, Secretary, Paola; September 8-11.
Mitchell County Agricultural Association: H. A. Phelps, Secretary, Beloit; September 16-20.
Morris County Exposition Co.: M. F. Amrine, Secretary, Council Grove; September 22-25.
Nemaha County Fair Association: W. R. Graham, Secretary, Seneca; September 1-4.
Neosho County Fair Association: H. Lodge, Secretary, Erie; September 29 to October 2.
Neosho County—Chanute Agricultural Fair, Park and Driving Association: A. E. Timpane, Secretary, Chanute; September 1-4.
Ness County Agricultural Association: I. B. Pember, Secretary, Ness City; September 2-4.
Norton County Agricultural Association: C. J. Shimeall, Secretary, Norton; September 1-4.
Osage County Fair Association: E. T. Price, Secretary, Burlingame; September 1-4.
Reno County—Central Kansas Fair Association: Ed. M. Moore, Secretary, Hutchinson; September 14-19.
Rice Agricultural Fair and Live-Stock Association: W. T. Brown, Secretary, Sterling; September 1-4.
Riley County Agricultural Society: E. C. Newby, Secretary, Riley; September 1-4.
Rooks County Fair Association: Olmer Adams, Secretary, Stockton; September 8-11.
Saline County Agricultural, Horticultural and Mechanical Association: H. B. Wallace, Secretary, Salina; September 8-11.
Sedgwick County—Wichita State Fair Association: H. G. Toler, Secretary, Wichita.
Smith County Fair Association: E. S. Rice, Secretary, Smith Center; August 18-21.
Stafford County Fair Association: Geo.

E. Moore, Secretary, St. John; August 19-21.

Sumner County—Mulvane Agricultural Association: Newton Shoup, Secretary, Mulvane.

Wilson County—Fredonia Agricultural Association: J. T. Cooper, Secretary, Fredonia; August 25-28.

About Binder Twine.

Naturally at this season of the year wheat-growers are looking about for prices on binder twine. We are reliably informed that the market is about bare as regards raw fiber; very little in the hands of importers and jobbers, and mills have their supply well worked off; in fact, several of the largest mills in the country are entirely sold out. Even with an ordinary or fair crop of wheat and oats, it looks as though there would be a shortage, or at least a considerable advance in prices of twine held in dealers' and jobbers' hands, and we believe our readers will do well to make arrangements for their supply at once.

You can make arrangements with A. J. Child & Son, 10 Market St., St. Louis, Mo., for future delivery, and on club orders for 500 pounds or more, they will sell payable September 1, 1903. This should be an inducement to a good many people. It will pay one to get their circular matter, samples, etc.

Boston Excursions.

via the Nickel Plate Road, June 25 to 27, inclusive; also July 1 to 5, inclusive, at popular rates. Write City Ticket Office, 111 Adams St., and Union Ticket Office, Auditorium Annex, Chicago. (17)

The Earth and the Man.

have close relations and "Farming in the Great Southwest" is a true exponent. Write for copy of this and other publications bearing on prospects for money-making on the line of the M. K. & T. Ry. Address,

"KATY."

511 Wainwright Bldg., St. Louis, Mo.

Statistics show that one person in every four has a weak heart, and that weak hearts are as common as weak stomach, lungs, kidneys, etc.

While a person might have heart disease for twenty years and not know it the symptoms are plain if understood. Since the heart circulates the blood and distributes nourishment to every organ, it is not strange that the symptoms frequently seem to indicate the weakness of some organ other than the heart.

A weak heart never cures itself. It grows constantly worse. A slight extra strain upon the heart will cause it to flutter and palpitate. Soon there will be pain and tenderness in the left side and in the region of the heart; there will be shortness of breath after slight exertion, such as climbing stairs, walking, running, sweeping, singing, talking, etc. From this condition it is but a step to smothering spells at night, the blood becomes thin, the circulation poor, the extremities become cold and often become swollen during the day time.

Neglected, a weak heart soon becomes a diseased heart. A diseased heart means fatty degeneration, dilatation or enlargement of the heart. It means a chronic weakness about which hovers the awful shadow of sudden death.

If you have any of the symptoms noted above you should give Dr. Miles' Heart Cure a trial. A weak heart can not be rested, it can only be helped by outside aid, such as Dr. Miles' Heart Cure alone can give. It strengthens the nerves which control the heart's action, changing the irregular pulse to the steady beat of a healthy heart; it enriches the blood and drives out the impurities and by creating a new and sufficient supply of rich, red blood for the nourishment of the entire body and its various organs, speedily replaces the disagreeable symptoms of a weak heart with restful sleep, good appetite and digestion; the springy step, the clear brain and the tireless muscles of vigorous health. All druggists sell and guarantee it to benefit or money refunded. Send for free Book on Diseases of the Heart and Nerves.

Dr. Miles Medical Co., Elkhart, Ind.



A Hog Waterer Guaranteed to Give Satisfaction.

It is the Improved Dewey Hog Waterer which is the only perfect one on the market and is guaranteed to dealers and farmers. If an Improved Dewey does not give satisfaction, it may be returned to the dealer and money refunded, or fountain replaced by a new one. Out of the 200,000 now in use not over 100 have been returned, and they, due to imperfect construction and careless workmanship. It is easy to understand why we are not afraid to guarantee our fountain.

There are no complicated attachments to get out of order. To control water, air, gas and electricity, requires the greatest of care, experience, and patience. Pigs, too, are wise. If the least opportunity for meddling is presented dire results follow. The drinking bowl of a fountain should be free of any and all complications, or a farmer will at once have a worthless hog waterer to throw aside. It is now time for all farmers to purchase a stock waterer, commencing early to furnish pure water (thus keeping their hogs in good condition to more thoroughly resist the usual hog cholera epidemic.) Shallow wells, ponds, cess pools, and running water breed cholera germs. If you want your hogs to thrive and keep healthy you must constantly have pure water before them. This can only be done successfully by the use of the Improved Dewey Hog Waterer.

An Improved Dewey will last for years; costs but a trifle; the value of several hogs saved in a small herd of from twenty to fifty. Write for literature. Buy from your dealer. He will take care of the guarantee. If the dealer does not handle them we do. Write The E-B Mfg. Co., 11 Masonic Temple, Davenport, Iowa.

The Young Folks.

Conducted by Ruth Cowgill.

A LITTLE DAUGHTER OF THE REVOLUTION.

Yes, it's truly true, you know—
Dear old granny told me so;
And this very doll (who'd think
That its face was ever pink?
But it was, long time ago!)
Was a present sent to her
By the Yankee officer.

It was in the old, old days
When King George had funny ways,
Interfering with the plans
Of us free Americans.
(Or, if not exactly free
At that time, we meant to be!)

Well, my granny's father then
Had a farm on Medford Hill.
Wish we had that farm again,
With the old tree on it still!
Such a dear old hollow tree,
Overgrown with vines and things—
Just the greatest place for swings
And all kinds of jollity!
Granny kept her rag dolls there,

And her kittens, too, she said,
When there was no room to spare
In the kitchen. Overhead
There were squirrels chattering.
Birds that used to build and sing,
Grapes all purple-ripe and sweet,
Nuts so nice to crack and eat!

Dear me! I've a doll's house here,
Full three stories from the floor—
Staircase, hall with chandelier,
Double parlors, big front door,
Every kind of furniture,
But it isn't half so good
As that playhouse in the wood.

One day, rummaging around
In the hollow, granny found
There was something like a pit
Far in at the back of it—
Just a sinking of the ground,
I suppose, among the roots,
Handy for the nuts and fruits
That the squirrels hide, you see;
"But 't would hide a man," thought she.

So she hurried down the hill,
Told her mother what she thought;
And that night, when all was still,
To the hollow tree was brought
Meat and drink a man to feed—
And the man himself, indeed!

'Twas a rebel officer
(That was what they called us then,
When we fought King George's men),
And to make him prisoner,
As my granny was aware,
Men were hunting everywhere.
It was only just that day
Officers had come to say
That whoever hid the man,
Fed, or helped him on his way,
British or American,
He would have King George to pay!

So it was a risky plan
For her father, don't you see?
British constables and kings
Must have been right awful things!
But he wasn't scared—not he!
Neither granny, you would judge,
If next day you'd seen her trudge
Up the hillside to the tree!

There with playthings spread about,
Acorn cups and saucers set,
Kittens running in and out,
She amused herself—and yet
Wasn't likely to forget!
Like a pious little maid,
I am sure she watched and prayed,
But was frightened all the same
When at last the soldiers came.

For they did come—oh, of course!—
Two afoot and one on horse,
All to catch one Yankee man!
And the biggest one began
(You should see my granny frown
As she tells it) to pull down
All her beautiful bows
Till they tumbled at her feet—
Purple grapes and yellow flowers,
Clematis and bittersweet.

Oh, I would have liked to see
That man's face as out she came,
Flashing eyes and cheeks aflame,
From the hollow of the tree!
And (as if against the cat,
Tooth and nail, had sprung the mouse)
"Shame!" she cried, "for doing that—
Now you've spoiled my baby-house!"

How her heart beat in her dread!
But she bravely stood her ground,
And the burly man in red,
Casting watchful eyes around,
Saw within the hollow tree
Just her rag dolls, two or three,
And her kits, a sleepy pair,
But, except the pretty child,
Not another creature there.
So half sheepishly he smiled,
—Having children of his own—
Said a kindly "Never mind!"
Turned about, and left behind
Kits and dolls and child alone.

How that "rebel" officer,
Under his thick coverlid
Of dry leaves so snugly hid,
Must have praised and petted her!
Fancy what a grateful kiss
Paid the little maid for this
When, the anxious hour past,
She came gayly home at last.

For, as afterward they knew,
There were papers that he bore
Worth their weight in gold, and more—
Papers planned to serve the State
When its need, they said, was great,
That was only saved to it
By her ready mother-wit.

So I truly think—don't you?—
That we "Daughters" ought to claim
And be proud of our fine name;
And I hope, if ever need
Comes again, that daughters still
May be brave in word and deed
As was she on Medford Hill.
—Mary Bradley, in St. Nicholas.

Wild Flowers.

I thought I would write about some
wild flowers that grow in the country
where I live. First there comes the

daisy; some are white and some are
blue. They have long stems and tall
green leaves. Violets come next; they
are light and dark blue. I like the
dark ones best.

There are verbenas, and dandelions,
wild roses, columbine, and cactus. The
cactus comes in all colors, yellow, red,
purple, pink, and white. Some are single,
some are double, but all are beautiful.
There is the spider-lily and the
Indian-root. There is the wild plum,
the elderberry, black haw, and dog-
berry. Then last but not least comes
the flower of our own sunny State, the
great tall sunflower. It smiles at us
from every fence-row. We see its
cheery face in every pasture; and it
even turns the ravines to a golden
color. GLADYS VAUGHN.

Arkansas City.

The Brown's New House.

HILIE B. WALLACE.

"Oh, them miserable rats! Quick's I
stop up one hole in these old sod walls,
they dig another," exclaimed Mrs.
Brown, straightening her aching back
after pounding corn-cobs into a hole in
the wall behind the kitchen safe.

"Well, never mind, Lizzy," said her
husband. "Ye won't haf to live in the
old soddy long now. I'm going to take
a load o' wheat to town to-morrow, an'
I'll bring out a load o' lumber along. A
load o' wheat'll jest about fetch a load
o' lumber at present prices. I mean to
take a load every day now as long's
the roads are good and make the ex-
change—kind o' kill two birds with one
stone, ye know."

Then noticing the glad light that
shone from his wife's tired eyes, he
went up to her and stroking her hair
said caressingly, "Ye've been a good
wife, Lizzy; ye've been real patient in
the old soddy with its leaky roof a
dirtyin' up your clean carpets and cur-
tains an' ye've made it real snug and
homey notwithstanding all the discour-
agements, an' now I mean ye shall
have the handsomest house in the
township. If ye have time after sup-
per, jest set down an' draw a plat o'
the house ye would like an' I'll take it
to town an' show it to Jones an' let him
finger on it. I spoke to the mason 'bout
the stone-work last week an' he said
he could come any time, an' ye know
the stone is all hauled this two years."

"But, Hiram, can we really afford
it?" asked his wife.
"Course we can. Last year's crop
straightened us up with the world, an'
what with the big wheat crop this year,
an' steers in the feed-lot, an' hogs on
the alfalfa, an' the butter an' eggs
keepin' the family, we're in very com-
fortable circumstances. So draw up your
plans, mother, an' we'll move in afore
Christmas. Be sure ye have plenty o'
bedrooms, a big kitchen an' settin'-
room, an' plenty o' cupboards an' closets,
as you've always wanted."

It was late that night before the
plan, which Mrs. Brown and her oldest
daughter, Maude, had succeeded in
drawing to their satisfaction after
many trials and many conferences with
father, was stowed away in his pocket
ready for the next day. Mr. Brown
laughingly declared that if they wasted
so much paper they would break him
up and he could not build the new
house. They had so often planned this
house together—mother and daughter—
that they were surprised to find it so
difficult to put on paper. But then, not
only every room, cupboard, and closet
had to be arranged for, but every article
of furniture must have a place de-
signed for it and the windows and
doors placed where they would best
light and ventilate the house, and yet
not conflict with the arrangement of
the furniture. It was 1 o'clock when
they at last retired well satisfied with
their evening's work.

"Father," said Maude next morning
at breakfast, "if the prospect of the
new house makes mother look ten
years younger, which you can see for
yourself it does, what will the reality
do? When we actually live in it, she'll
look younger than her daughter."

"Mother always did look young for
her years," said Mr. Brown.

"I must say, Maude, I believe it has
improved you in the opposite direc-
tion," said brother Joe. "Did you not-
ice, folks, Maude hasn't spilled or
broken anything this morning? I de-
clare, I believe she'll make a woman
some day yet!"

"Yes, and oh, wonder of wonders!
Joe has actually combed his hair with-
out being told," laughed Maude good
naturedly.

Maude's carelessness about spilling
milk, coffee, water, or whatever she
chanced to have in her hands, and
Joe's disregard for his personal ap-
pearance, were proverbial in the fam-
ily, and had been a source of grief and
anxiety to their mother.

As Mrs. Brown went about her morn-
ing duties, it really seemed to her she
had suddenly grown younger. Her
husband's kind words, the improve-
ment in the conduct of both son and
daughter, and the prospect of a new
house so soon, seemed to lift heavy
burdens from her shoulders, and she
found herself singing snatches of the
half-forgotten songs of her Eastern
home and young girlhood days.

In the history of every new country
there comes a transition period. In
timbered countries, the rude log hut
gives place to the more pretentious
frame dwelling. In those prairie coun-
tries in which the buffalo sod is a close
woven mass of roots below, and tan-
gled leaves above, the houses of the
first settlers are nearly all built of this
material which nature has kindly pro-
vided in lieu of timber, and which
makes really, the most comfortable
dwelling for the changeable climate of
the plains. The walls, from two to
three feet in thickness, keep out both
the blizzard of winter and the hot
winds of summer, and provide a dim
coolness, a shelter from the hot, glar-
ing sunshine, which is most refreshing.

The Browns had "taken a claim" in
western Kansas when they were young,
very young, married folks, twenty
years before, and the old soddy had
been home to them ever since. Mr.
Brown often boasted that it was the
best sod house in the county.

"Put 'em up slow, boys," he would
say to new settlers, when helping them
lay up their houses. "One day to lay
sod an' two to settle, then another lay-
er o' sod an' another settling till they're
high as ye want 'em; trim 'em down
nice and smooth and square, then ye
have a house to be proud of, says I."
The last sod house built in the neigh-
borhood was thrown up in one day,
by a new settler named Clark. He
then moved his family into it one fall,
and when spring rains set in his house
crumbled one night like salt, killing
his wife and little boy. This tragedy
sent a thrill of horror through the
neighborhood and was the cause of
many abandoning their houses for
small, hastily constructed frame-
houses.

"No need o' you leavin' your soddy,
Jim," Mr. Brown would say to his
neighbor when he saw one preparing
to build. "It was put up in the sod-age,
when the sod was firm an' good, and
done in the right way, too. Ye recol-
lect I helped ye on it. It's good for
years yet. Don't build till ye're able
and then put up a house that'll be a
credit to the country. I'd rather have
my old soddy than any ramshackle,
skeleton frame-house lettin' in every
bit o' cold an' heat, too. When I build
a frame, it'll be jest as good a frame as
the soddy is, fer a soddy. When ye
do a thing, do it right, says I. Too
bad, too bad about Clark now. Good
fellow, but high-headed an' stiff-necked
an' that little wife o' his'n that was
killed, why she was nearly as good as
my wife, an' that's sayin' a good deal.
I warned Clark. I told him, says I,
'Clark, the sod ain't fit to build with
now; too much rain o' late years. It's
rotten,' says I. 'Time for buildin' sod
houses in this country is past,' says I.
'We're out o' the sod age. Houses that
was built an' built right, ten or fifteen
years ago is all right.' He'd order taken
advice from an old settler, but he
didn't, more's the pity."

"Mother," said Maude, about two
hours after Mr. Brown started for town
with his first load of wheat, "I believe
it's going to blow to-day. See the dust
whirling now."

"Yes," said Mrs. Brown, "I suppose
we must expect some wind now. We've
had a beautiful summer and fall, so far,
but it is near the equinox now. I wish
your father had got the fire-guards
burned. It isn't like him to put it off
so long. He said last Friday he
guessed he'd burn them that night, and
then Mr. Holmes came over to get him
to help lift his sick horse, and when he
got back it was too late, and something
or other has happened every night since.
If the wind goes down, him and the
boys must burn them to-night."

"I don't see any use in burning
guards," said Maude. "We never have
any prairie fires now."

"I always feel uneasy when there's a
south wind, since the big fire ten years
ago, unless there's a wide south guard.
There's no danger from any other di-
rection—too many fields now—but that
big tract of speculation land on the
south gives a fire a big sweep."

"That land has served us well as
herding ground, mother. Belle Lewis
threw it up to me the other day, that
father had made his money herding on
other people's land."

"Your father made what money he
has by hard work and good manage-
ment, and Belle Lewis had no right to
talk that way. He did herd on that

land, or part of it, but he bought the
right from the agents, and because Mr.
Lewis was too late to get it, he has
held a grudge against father ever since.
He believed, or claimed to believe, that
Joe, while herding, set the fire, though
it started six miles beyond our herd.
Because we had a guard and didn't
lose anything but the range, which at
that time of year was loss enough, and
they were burnt out, they have never
felt friendly since."

"Didn't they stay here till they got
their house built again, mother?"

"Yes, and father helped them build
it and subscribed ten dollars in money
to buy lumber. But let's talk on a
pleasanter subject, the new house for
instance."

The forenoon passed pleasantly in
the discussion of the new house. About
1 o'clock, Maude came running in from
feeding the chickens, exclaiming,

"Oh, mother! it's coming at last—
the fire you're always looking for. I
saw one start up away south toward
the river."

Mrs. Brown ran to the door and sure
enough there was a long spire of smoke
pointing up to the sky, which spread
out into a broad sheet, while they
watched it.

"Oh Maude," said she, "what shall
we do. The wind is blowing straight
as an arrow from that fire to us. It
will surely burn us out if we don't do
something to stop it. It won't be long
getting here either, with such a wind."

"Yes, and mother, it will get into the
big haystacks and then nothing can
save the wheat. I don't see why father
built the granary just north of the
stacks."

"Well, Maude, as the boys are gone
to the timber and all the men of the
neighborhood are at the speaking in
town (you know this is Senator Harris'
day) you and I must save the wheat.
You are better at handling the team
than I am. I'll help you hitch old Dock
and Dolly to the plow—I think they're
in the stable—then you plow a dozen
furrows across from the east to the
west field, while I pump water and
turn the cattle out of the feed-lot.
They will find a plowed field and be
safe."

Maude was soon hurrying the horses
and plow to the strip of buffalo-grass,
ten rods wide, which had been left
south of the buildings, as an exit for
the cattle when they were driven out
to the herd-land. She was used to
driving a team hitched to a wagon, but
had never before attempted to break
raw prairie. She found it much hard-
er work than she had supposed. It
seemed as if the horses had never been
so hard to control. They smelled the
smoke and it excited them, for they
knew the danger as well as if they
were human.

When she had half a dozen crooked,
wavering furrows plowed, her mother
came with some matches, two buckets
of water, and some old clothes. She
had locked the younger children in
the house as the safest place. A sod
house seldom burns in a prairie fire—
never until the lighter, more inflam-
mable material surrounding it is con-
sumed, when it is safe to leave it.

"Will this be enough, mother, called
Maude, as her mother approached.

"No, indeed," said her mother. I
would not dare light a fire so near the
stacks with such a narrow breaking.
It must be at least twice as wide. Here,
I will lead the horses, and we will hur-
ry all we can, for we've no time to
lose."

Maude wiped her streaming face
with a corner of her apron, grasped the
plow-handles with a firmer grip and
went at it again. The horses went bet-
ter when led, but by the time they had
plowed six more furrows, and loosened
the horses from the plow, that they
might seek a place of safety, the fire
was in sight crossing the divide south
of them.

"Here Maude, put on these overalls

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quick," called Mrs. Brown. She had donned a pair before leaving the house. While Maude put on the overalls, Mrs. Brown ran to the stacks and got a large armful of hay.

"You begin at the east field and I'll begin at the west, and we'll meet in the middle," said she, giving Maude half of the hay and some matches.

Maude had often heard the process of back-firing described, and knew just what to do. Lighting a wisp of hay, she trailed it along the south side of the plowing in the buffalo-grass. When the two women met half way between the fields there was a narrow ribbon of fire all along the south side which slowly crept southward against the wind, leaving a black swath behind it. They then retreated to the north side of the breaking, and each taking a cloth and a pail of water, were ready to beat out any spark which might be blown over. They were kept busy for they must spy the spark the instant it lit or it blazed up and spread rapidly. At last the back-fire met the head-fire and both died down together for want of fuel, and they knew the danger was over.

When Mr. Brown drove over the burnt prairie on his way home, he expected to find all his hay, stables, and wheat, and perhaps his stock and house gone, and upbraided himself severely for leaving his property unguarded; but when he found he had not suffered one cent of loss, he praised the courage and thoughtfulness of wife and daughter, and declared that not only should they have the finest house in the township, but Maude should have a new piano and mother a steel range, best to be found.

Our friends were so kind in their quick response to our request for the poem, "St. Peter at the Gate," that we venture to ask once more. One of our readers desires us to publish "Adam Never Was a Boy." If any one has the poem in such shape that it can be sent, we shall be grateful for the favor. "The Actor's Story," also, has not yet been found. We should be very glad to be able to publish it.

For the Little Ones

ROBERT OF LINCOLN.

Merrily singing on briar and weed,
Near to the nest of his little dame,
Over the mountain-side or mead,
Robert of Lincoln is telling his name.
Bob o' Link, Bob o' Link,
Spink, spank, spink!
Bob o' Link, Bob o' Link,
Chee, chee, chee!

Snug and safe in that nest of ours,
Hidden among the summer flowers.

Robert of Lincoln is gaily dressed,
Wearing a bright black wedding coat;
White on his shoulders, and white his crest.

Hear him call his merry note:
Bob o' Link, Bob o' Link,
Spink, spank, spink!
Bob o' Link, Bob o' Link,
Chee, chee, chee!

Look, what a nice new coat is mine,
Sure there was never a bird so fine.

Six white eggs on a bed of hay,
Freckled with purple, a pretty sight!
Then as the mother sits all day,
Robert is singing with all his might.

Bob o' Link, Bob o' Link,
Spink, spank, spink!
Bob o' Link, Bob o' Link,
Chee, chee, chee!

Nice good wife, that never goes out,
Keeping house while I frolic about.
—William Cullen Bryant.

Jack.

Jack was a dog that belonged to a little boy who lived on a farm. Jack was very small, but, like some little boys, he thought he was very big. He liked to bark at the neighbors when they came or at the wagons passing. But what he liked best was to fight. He felt that he was wonderfully brave, for the cats all ran whenever he looked at them. One day a little black and white dog, just about his size, came his way.

"Now for some fun," said Jack, and went tearing after the other dog as if he would eat him up. But instead of running, as the cats did, this other dog turned quickly, and bit Jack's ear, and in a moment Jack found himself in the worst fight he had ever dreamed of, and he was getting the worst of it. He howled and squeaked until the man who owned the other dog came out, and called him off. Then Jack stole away under the back step. He stayed there all day, too ashamed to come out to eat, even when his little master brought a bone and called him. Next morning he came out, trying to seem as important as ever. But whenever he saw a cat he looked the other way, for he knew how it felt to be afraid. And whenever a dog came near, he was very friendly indeed, but kept at a safe distance. He had learned a lesson.

The Home Circle.

Conducted by Ruth Cowgill.

RETROSPECT.

"It was in the little swimming hole,
In the cow patch long ago;
When my face was full of freckles,
And the stone bruise on my toe;
That I caught my first fish, with a pin
hook and a worm,
And how I did enjoy myself to see that
sucker squirm."

"Now just what that sucker thought,
To be fooled and caught that way;
Never came into my childish mind,
That was so full of play;
And another section of red worm, put
quickly on the pin,
I dropped into the swimming hole to
catch the next of kin."

"Lines of care now mark the place,
Where the freckles used to grow;
And the bruise is on the heart,
That used to swell the toe;
I know now how that sucker felt, as I
landed him ashore,
For many a time I've played his part
and swallowed bait galore."
—E. M. Giles.

Sight to a Man Born Blind.

In this age of wonderful surgery, it takes and unusually remarkable case to cause widespread comment. Yet to the patient who is healed, the event must ever seem a miracle. In a recent number of the Scientific American is an account of one such case which can not but be interesting to the most casual reader. The case described was of a man totally blind from his birth, whose sight was restored by a skillful operation. The account follows:

The patient, aged 30 years, blind from birth, was brought to the Glasgow Ophthalmic Institution on February 24, 1903. He had been allowed to run about as he pleased, no attempt to educate him having ever been made. He became, however, so familiar with the country district (a few miles from Glasgow) in which he resided that he could go about without the slightest fear; and his hearing was so acute that he knew at once if there was anything unusual on a road along which he was walking, and thus he never had any difficulty in keeping himself out of danger. As he passed along a road he could tell a wall from a hedge by the sound of the air coming through the leaves and branches of the latter. He could easily go on an errand to any house in his native village, for the resonance of his footfall—quite different in sound when he was passing a building from what it was when he was opposite an open space—enabled him; perfectly familiar as he was with his surroundings, to count the houses as he passed, and thus to turn corners and finally to stop at the one which he wanted. He distinguished different blossoms partly by touch but chiefly by smell, and by dint of asking questions he got at last to know so much about their form and color that he could arrange them in a bouquet. Occasionally he worked in the harvest field and he could bind the corn and arrange the stocks as well as any of the other laborers.

The patient was quite unable to distinguish objects, although he could tell day from night and could easily perceive a light and locate it accurately; he seemed to have had no perception of bright colors.

As a cataract seemed to be the only obstacle to vision Dr. Ramsay resolved to operate and extracted the lens from the right eye on March 11, and that from the left eye a week later. Both lenses were small and shriveled and the nucleus of the right was calcareous. For about ten days after the operation on the left eye the patient appeared to be quite dazed and could not realize that he was seeing. The first thing he actually perceived was the face of the house surgeon. He said that at first he did not know what it was that he saw, but that when Dr. Stewart asked him to look down, the sense of hearing guided his eye straight to the point whence the sound came, and then, recalling what he knew from having felt his own face, he realized that this must be a mouth, and that he must be looking at a face. Once he properly understood what vision meant he made very rapid progress and his extraordinarily retentive memory enabled him to take full advantage of everything that he was told. He was quite ignorant of color, but learned to distinguish hues very quickly. The first tint that he saw was red. A red blanket lay across the foot of his bed. He asked what it was and was told, and never afterward did he have the slightest hesitation in discriminating red again. He was shown a narcissus, and on being asked to describe it he immediately recognized the flower and knew from his old bouquet-making experience that it was white and yellow,

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but he now for the first time also became aware of the little red band in the center and at once called attention to it. When he was shown a bunch of daffodils he recognized them by their smell and immediately said that they must be yellow. The color that took him longest to master was green, but he can now name all ordinary tints readily and correctly. His difficulty with green is hard to explain unless it be that with green he has no small-association such as he had with colored flowers. Unlike Locke's blind man, who imagined that "scarlet was like the sound of a trumpet," he does not seem to connect any distinct ideas with particular colors except that he said that red gave him a feeling of pleasure and that the first time he saw yellow he became so sick that he thought he would vomit. The latter feeling, however, has never recurred.

He rapidly learned the letters of the alphabet and figures and he will soon be able to read and to reckon. From the very first he saw everything in its actual position, showing that the retinal inversion of a picture is interpreted psychically without any education.

He could count accurately after he had looked at objects one by one and seemed to derive much help in his calculations by pointing with his finger. Here again he seemed to translate touch into vision and to arrive at a perception of the whole through the perception of the individual parts. He can not take things in at a glance. He does not see the passers-by on the opposite side of the street quickly. He looks most intently and moves his head backward and forward and from side to side as if trying to get a view of them all round before he can make up his mind what he is seeing; in a room, however, he can distinguish things much more quickly. With any complex outline, however, or group of outlines, he still has considerable difficulty, though pictures are no longer to him, as they were at first, mere masses of confused color.

He was able to estimate size and distance more readily than might have been anticipated, although he said that he felt that if he were out of doors by himself he would be "wandered." From the time he got out of bed after the operation he could guide himself with ease through a doorway and walk about on the level, but he had considerable difficulty in ascending a stair, because the steps seemed so high that to begin with he raised his foot much farther than was necessary and without meaning to do so went up two steps at a time. Whenever he discovered his mistake he began to pay attention to the rise of each and he has now no difficulty in estimating their height. This, of course, was part of his difficulty in judging distance, though when he first looked out of a window on to the street and saw the pavement below he said that he felt that if he had a stick he should be able to touch it. Before the operation he could guide himself fearlessly through a ward without coming in contact with the beds or any other obstacle that might be in the way, but since he has been able to see he says that he has lost all that feeling of confidence and when his eyes are shut he is afraid to move and is impelled to open them to ascertain where he is going—so much so that he does not know what he would do if he again became blind.

Recipes from Star Valley Woman's Club.

Scalloped Corn.—Butter a shallow baking-dish and put in alternate layers

of corn, seasoned with salt and pepper, and cracker-crumbs well buttered, until the dish is full, having crumbs on top. Pour over enough milk to nearly cover it. Bake one hour in a good oven.

Fried Cabbage.—Cut the cabbage very fine on a slaw-cutter, sprinkle salt and pepper over it, stir well and let it stand five minutes. Have a skillet smoking hot. Drop one tablespoonful of lard into it, then the cabbage. Stir briskly until quite tender. Heat one cup of sweet cream, stir it well, and after taking from the stove, beat into it three tablespoons of vinegar. Pour over the cabbage and serve hot.

Strawberry Pudding.—Place one quart of berries in a dish and sprinkle over them one-half cup of sugar. Put one pint of milk in a double boiler. While this heats beat well together the yolks of three eggs, one-half cup of sugar, and one-fourth cup flour. Stir this into the boiling milk and cook twenty minutes, stirring often. Remove from fire and add one-fourth teaspoon salt. When cold pour over the berries. Beat the whites of the three eggs to a stiff froth, add three tablespoons sugar and heap it on top of the pudding. Decorate with large berries.

Ginger Cookies.—One cup shortening, 1 cup sorghum, 1 cup sugar, 3 teaspoons soda, 3 teaspoons ginger. Dissolve the soda in five tablespoons sour milk. Mix quite stiff with flour.

Buttermilk Yeast.—Take three cups of buttermilk, boil and thicken with corn-meal. When cool add one cup nearly full of dry yeast which has been dissolved in warm water. Put in one tablespoonful each of salt and sugar. Let it stand till morning, then thicken with cornmeal, pinch into cakes, and dry.

Apple-Butter Cake.—Beat up any plain cake recipe and before putting in the baking-pan fold in three tablespoons of apple-butter, jam, or jelly. Bake in a loaf. The fruit makes the cake much more moist but it will not make it fall.

The recipes given on this page came from a very young but very earnest country club. We hope the doubters who read the club department will try the recipes, as practical proofs that club women are not unfitted for excellent domestic work, by their meeting together.

Club Department.

Our Club Roll.

Mutual Improvement Club, Carbondale, Shawnee County (1895).
Give and Get Good Club, Berryton (1902).
Osborne Woman's Literary Club (1902).
The Ladies Reading Club of Darlington Township (1902).
Woman's Club, Logan (1902).
Domestic Science Club, Osage, Osage County (1888).
Ladies' Crescent Club, Tully (1902).
Ladies' Social Society No. 1, Minneapolis (1888).
Ladies' Social Society No. 2, Minneapolis (1889).
Ladies' Social Society No. 3, Minneapolis (1891).
Ladies' Social Society No. 4, Minneapolis (1897).
Chillico Club, Highland Park (1902).
Cultus Club, Phillipsburg (1902).
Literatae Club, Ford (1903).
Sabean Club (1899).
Star Valley Woman's Club, Iola (1902).
[If mistakes are made in the above roll, please inform us at once. Let each club look for its name, and see that all information concerning it be correctly given.]

The Star Valley Woman's Club.

MRS. JESSIE ADAMS, IOLA, KANS.
The Star Valley Woman's Club was organized August 1, 1902. We adopted the name of our school district and
(Continued on page 664.)

The Stock Interest.

THOROUGHbred STOCK SALES.

Dates claimed only for sales which are advertised or are to be advertised in this paper.

September 1, 1903—Horses and jacks, L. M. Monson & Son, Smithton, Mo.
September 1 and 2, 1903—100 head of Herefords, at Hamline, Minn. C. R. Thomas, Secretary.
September 3, 1903—Central Missouri Hereford Breeders' Association, Macon, Mo.
October 2, 1903—Poland-Chinas, J. R. Killough & Sons, Ottawa, Kans.
October 7 and 8, 1903—Combination sale of Poland-Chinas and Shorthorns. Poland-Chinas on the 7th, Shorthorns on the 8th. James P. Lehr, Sabetha, Kans., Manager.
October 12, 1903—C. O. Hoag, Centerville, Kans., Poland-China hogs.
October 15, 1903—Central Missouri Hereford Breeders' Association.
October 16, 1903—W. S. Wilson, Manager, Shorthorns and Herefords, at Monroe City, Mo.
October 19, 1903—Oak Grove, Mo., Poland-Chinas. E. E. Arline.
October 19-24, 1903—American Royal, Kansas City, sale by Galloway Breeders' Association.
October 22, 1903—100 head of Herefords, at Kansas City, Mo. C. R. Thomas, Secretary.
October 27, 1903—Duroc-Jerseys, Peter Blocher, Richmond, Kans.
November 10-11, 1903—Marshall County Hereford breeders' annual sale at Blue Rapids, Kans.
November 13, 1903—Central Missouri Hereford Breeders' Association, animal sale; S. L. Brock, Macon, Mo., Secretary.
November 17, 18, 19, 1903—Armour Funkhouser, Hereford, at Kansas City, Mo.
December 3, 1903—100 head of Herefords, at Chicago, Ill. C. R. Thomas, Secretary.
February 4, 5, 6, 7, 1904—Percherons, Shorthorns, Herefords, and Poland-Chinas, at Wichita, Kans., J. C. Robison, Towanda, Kans., Manager.

Principles of Horse-Feeding.

C. F. LANGWORTHY, OFFICE OF EXPERIMENT STATIONS, WASHINGTON, D. C.

INTRODUCTION.

The scientific study of different problems connected with the feeding of farm animals has been followed for something over half a century. Some of the very early work was with horses, but more generally it was carried on with other domestic animals. Within the last few years this phase of the problem has received much more attention, and feeding tests, digestion experiments, and more complicated investigations have accumulated in considerable numbers. The bulk of this work has been carried on in France and Germany; a creditable amount, however, has been done in this country, notably by the agricultural experiment stations, and the results of these experiments and observations have been published from time to time, and are very useful. Mention must be made also of the work of practical feeders, which is of great value.

In the present bulletin the attempt is made to bring together some of the more important results and deductions which may be gathered from the American and foreign experimental work, especially that of recent years. It is not the purpose to provide practical feeders with directions for feeding according to a particular formula; indeed this is not necessary, if it were possible, for practical feeders to a great extent understand the needs of their horses and how to meet them. The object is rather to summarize matter which seems interesting and valuable, and which in many cases may give the reason for something of which the wisdom has long been recognized in practice.

The problem of horse-feeding is one which each feeder solves more or less for himself, the opinion regarding what is and what is not satisfactory feed varying more or less with the time and place. Opinions may differ as to the value of this food or that, but it is evident that the actual food requirements of a horse performing a given amount of work can not vary as a result of a change of opinion on the feeder's part. With horses, as with all animals, including man, the real problem is to supply sufficient nutritive material for building and repairing the body and furnishing it with the energy necessary for performing work, whether it be that which goes on inside the body (the beating of the heart, respiratory movements, etc.), or the work which is performed outside the body (hauling a load, etc.). The body temperature must also be maintained at the expense of the fuel ingredients, but whether material is burned in the body primarily for this purpose, or whether the necessary heat is a resultant of the internal muscular work, is not known with certainty.

The problem of successfully feeding horses differs somewhat from that encountered in feeding most domestic animals. Cattle, sheep, and pigs are fed to induce gains in weight, i. e., to fatten them, or in the case of milch-cows to produce gains in the form of a body secretion (milk) rather than as fat in the body. In a similar way sheep are fed for the production of wool, and poultry for the production of eggs. Sometimes cattle are also fed as beasts

of burden. Horses are fed almost universally as beasts of burden, whether the work consists in carrying a rider or drawing a load.

Mares with foal require food for the development of their young, and after birth the colt needs it for the growth and development of the body as well as for maintenance. Such demands for nutritive material are common to all classes of animals. Sometimes horses are fed to increase their weight; that is, to improve their condition. For instance, animals are often fattened by horse-dealers before they are sold. However, generally speaking, the problem in horse-feeding is to supply sufficient nutritive material for the production of the work required and at the same time to maintain the body weight. The almost universal experience of practical horse-feeders, and the results of many carefully planned experiments, agree that there is no surer test of the fitness of any given ration than that it enables the horse fed to maintain a constant weight. If the animal loses weight it is evident that the ration is insufficient, while if gains in weight are made and the animal becomes fat it is evident that more feed is given than is necessary. Provided the horse is in good condition, it is seldom desirable to induce any considerable gain in weight. Reference is not made to the small daily fluctuations in weight, but to gains or losses which extend over a considerable period. The most satisfactory ration must necessarily be made up of materials which are wholesome and are relished by the horse. It should also be reasonable in cost. It must be abundant enough to meet all body requirements, but not so abundant that the horse lays on an undesirable amount of flesh.

PRINCIPLES OF NUTRITION.

The foundation principles of nutrition are the same in the case of all animals, including man. A brief discussion of the properties of food and the general laws of nutrition follows.

The study of foods and feeding stuffs has shown that although they differ so much in texture and appearance they are in reality made up of a small number of chemical constituents, namely, protein, fat, carbohydrates, and ash, together with a larger or smaller amount of water. The latter can be often seen, as in the juice of fresh plants. In dry hay no water or juice is visible. A small amount is, however, contained in minute particles in the plant tissues.

Protein is a name given to the total group of nitrogenous materials present. The group is made up mainly of the true proteids and albumens such as the gluten of wheat, and of nitrogenous materials such as amids, which are believed to have a lower feeding value than the albumens.

The group "fat" includes the true vegetable fats and oils, like the oil in cottonseed or corn, as well as vegetable wax, some chlorophyll (the green coloring matter in leaves, etc.), and other coloring matters; in brief, all the materials which are extracted by ether in the usual laboratory method of estimating fat. The name "ether extract" is often and quite properly applied to this group.

The group "carbohydrates" includes starches, sugars, crude fiber, cellulose, pentosans, and other bodies of a similar chemical structure. This group is usually subdivided, according to the analytical methods followed in estimating it, into "nitrogen-free extract" and "crude fiber;" the former subdivision including principally sugar, starches, and most of the pentosans, and the latter cellulose, lignin, and other woody substances which very largely make up the rigid structure of plants.

The group "mineral matter" includes the inorganic bodies present in the form of salts in the juices and tissue of the different feeding stuffs, the principal chemical elements found being sodium, potassium, calcium, chlorine, fluorine, phosphorus, and sulphur. The term "ash" is often and very appropriately used for this group, since the mineral matter represents the incombustible portion which remains when any given feeding stuff is burned.

The functions of food are (1) to supply material to build and repair the body, and (2) to yield energy. The chemical composition of a feeding stuff serves as a basis for judging of its value for building and repairing body tissue. Its value as a source of energy must, however, be learned in another way. The most usual way of measuring energy is in terms of heat, the calorie being taken as a unit. This is the amount of heat which would raise the temperature of 1 kilogram of water 1° C., or 1 pound of water 4° F. Instead of this the unit of mechanical

energy, the foot-ton (the force which would lift 1 ton 1 foot), may be used, but it is not as convenient. One calorie corresponds very nearly to 1.54 foot-tons.

The fuel value of any food is equal to its heat of combustion less the energy of the excretory products derived from it, and may be learned by taking into account the chemical composition of the food or feeding stuff, the proportions of the nutrients actually digested and oxidized in the body, and the proportion of the whole latent energy of each which becomes active and useful to the body for warmth and work. However, the fuel value may be and often is calculated from the composition of the food material supplied, on the assumption that 1 gram of protein furnishes 4.1 calories, 1 gram fat 9.3 calories, and 1 gram carbohydrates 4.1 calories, or 1 pound protein 1,860 calories, 1 pound fat 4,220 calories, and 1 pound carbohydrates 1,860 calories.

The relation between the quantities of nitrogenous and nitrogen-free nutrients in the ration is called the nutritive or nutrient ratio. In calculating this ratio 1 pound of fat is taken as equivalent to 2.25 pounds of carbohydrates—this being approximately the ratio of their fuel values—so that the nutritive ratio is actually that of the protein to the carbohydrates plus 2.25 times the fat.

All the organs and tissues of the body contain nitrogen. Protein is the only nutrient which supplies this element, and is therefore essential for building and repairing body tissues. The other elements required, namely, carbon, oxygen, and hydrogen, may be supplied theoretically by protein, fat, or carbohydrates; but a well-balanced diet or ration contains all the nutrients in proper proportion. Protein, fat, and carbohydrates may be burned with the formation of carbon dioxide and water, and therefore all may serve as sources of energy.

The mineral matter in food is required for a number of different purposes, a considerable amount being needed for the formation of the skeleton. Some is also present in the organs and tissues. It can not, however, be regarded as a source of energy, according to commonly accepted theories, since it can not be burned with the formation of carbon dioxide and water. The water present in food is not a nutrient in the sense that it serves for building tissue or yielding energy, but it is essential, serving to carry the food in the digestive processes, to dilute the blood, and for many other physiological purposes. The oxygen of the air is required by all living animals for the combustion, or oxidation, of the fuel constituents of food.

When foods are burned in the body, i. e., oxidized, they give up the latent energy present in them. In determining the fuel value of protein, due allowance is made for the fact that combustion is not as complete in the body as in a furnace.

The body is often likened to a machine, but it differs from one in a number of important ways; for instance, it is itself built up of the same materials which it utilizes as fuel, and further, if an excess of fuel, i. e., food, is supplied, it may be stored as a reserve material for future use, generally in the form of fat or glycogen, a sugar-like body.

The amount of work performed by a horse, for convenience in measurement, may be resolved into several factors, as follows: (1) The energy expended in chewing, swallowing, and digesting food, keeping up the beating of the heart, circulation of the blood, respiratory movements, and other vital processes; (2) the energy which is expended in moving the body, walking, trotting, etc., which is usually spoken of as energy required for forward progression; and (3) the energy which is expended in carrying a rider, as in the case of a saddle horse, or drawing a load, as in the case of a draft animal or carriage horse.

The character of the road, whether level or up or down hill, is an important factor in determining the amount of work. It is evident that more energy is required to lift the body at each step and move it forward when climbing an incline than when walking on a level. In the same way, when a load is drawn uphill it must be raised as well as drawn forward.

Work may be measured as foot-pounds or foot-tons, or by any other convenient unit. A foot-pound is the amount of energy expended in raising 1 pound 1 foot; a foot-ton, that expended in raising 1 ton 1 foot; a commonly used unit of force is the "ton power," equivalent to 550 foot-pounds per second. Work may also be measured in terms of heat, i. e., calories. This is

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especially convenient in discussing problems of nutrition, since the heat of combustion is one of the factors usually determined or calculated when foods are analyzed; and furthermore, the feeding standards which have been proposed for horses and other farm animals show the requirements per day in terms of nutrients and energy. One calorie corresponds, as stated above, very nearly to 1.54 foot-tons.

COMPOSITION OF FEEDING STUFFS.

The feeding stuffs of most importance for horses are cereal grains, such as oats and corn, either ground or unground; leguminous seeds, as beans and peas; cakes, and other commercial by-products, as oil-cake, gluten feed, and so on; fodder crops, green or cured; and different roots, tubers, and green vegetables. In quite recent times cane molasses, beet molasses, and other beet-sugar by-products have assumed more or less importance in this connection. The composition of a number of these different feeding stuffs may be seen by reference to

Table 1, which shows the average composition as determined by analysis, and when possible the digestible nutrients furnished by each 100 pounds of the feeding stuffs, the latter data having been calculated by the aid of figures obtained in digestion experiments with horses. In a number of cases such calculations have not been made, for the reason that experiments showing the digestibility of the feeding stuffs have not been found, nor were results of experiments made with similar feeding stuffs available. The comparatively large number of feeding stuffs of which the digestibility has not been determined indicates one of the lines of work which might be profitably followed.

COMPARATIVE VALUE OF FEEDING STUFFS. CEREAL GRAINS.

It will be seen that the cereal grains resemble one another quite closely in composition, being characterized by fairly low water content and a considerable amount of protein and nitrogen-free extract. Some crude fiber, derived

TABLE 1.—Average composition of a number of feeding stuffs.

Kind of food material.	Percentage composition.						Digestible materials in 100 pounds.				Energy in 100 lbs. digestible nutrients.
	Water	Protein	Fat	Nitrogen-free extract	Crude fiber	Ash	Protein	Fat	Nitrogen-free extract	Crude fiber	
GREEN FODDER.											
Corn fodder	79.3	1.8	0.5	12.2	6.0	1.2	1.2				
Corn-leaves and husks	66.2	2.1	1.1	19.0	8.7	2.9	2.9				
Cornstalks stripped	76.1	1.5	.5	14.9	7.3	.7	.7				
Kafir-corn	73.0	2.3	.7	15.1	6.9	2.0	2.0				
Rye fodder	76.6	2.6	.6	6.8	11.6	1.8	1.8				
Oat fodder	62.2	3.4	1.4	19.3	11.2	2.5	2.5				
Wheat fodder	77.3	2.3	.7	12.0	5.9	1.8	1.8				
Orchard-grass	73.0	2.6	.9	13.3	8.2	2.0	2.0				
Meadow-fescue	69.9	2.4	.8	14.8	10.8	1.8	1.8				
Timothy	61.6	3.1	1.2	20.2	11.8	1.1	1.1				
Kentucky blue-grass	65.1	4.1	1.3	17.6	9.1	2.8	2.8				
Red clover	70.8	4.4	1.1	13.5	8.1	2.1	3.44	10.94	3.79	83,796	
Alsike clover a	74.8	8.9	.9	11.0	7.4	2.0	3.05	8.91	3.46	28,681	
Alfalfa	71.8	4.8	1.0	12.3	7.4	2.7	3.75	9.96	3.46	31,986	
Cow-pea	83.6	2.4	.4	7.1	4.8	1.7					
Soy-bean	75.1	4.0	1.0	10.6	6.7	2.6					
SILAGE.											
Corn silage	74.4	2.3	1.1	15.0	5.8	1.5					
Sorghum silage	76.1	.8	.3	15.3	6.4	1.1					
Red clover silage	72.0	4.2	1.2	11.6	8.4	2.6					
Cow-pea vine silage	79.3	2.7	1.5	7.6	6.0	2.9					
HAY AND DRY COARSE FODDER											
Corn fodder, field cured	42.2	4.5	1.6	34.7	14.3	2.7					
Corn-leaves, field cured	30.0	6.0	1.4	35.7	21.4	5.5					
Corn-husks, field cured	50.9	2.5	.7	28.3	15.8	1.8					
Cornstalks, field cured	68.4	1.9	.5	17.0	11.0	1.2					
Corn stover, field cured	40.5	3.8	1.1	31.5	19.7	3.4					
Kafir-corn stover, field cured	19.2	4.8	1.6	39.6	26.8	8.0					
Barley hay	10.6	9.3	2.5	48.7	23.6	5.8					
Oat hay	16.0	7.4	2.7	40.6	27.2	6.1					
Wheat hay	8.8	6.0	1.8	55.3	22.5	5.6					
Redtop	8.9	7.9	1.9	47.5	28.6	5.2	4.51	0.39	26.93	11.35	81,234
Orchard-grass b	9.9	8.1	2.6	41.0	32.4	6.0	4.62	.54	23.25	12.86	77,068
Timothy	13.2	5.9	2.5	45.0	29.0	4.4	1.25	1.18	21.29	12.35	69,873
Kentucky blue-grass b	21.2	7.8	3.9	37.8	23.0	6.3	4.45	.81	21.43	9.13	68,536
Hungarian grass b	7.7	7.5	2.1	49.0	27.7	6.0	4.28	.43	27.78	11.00	81,905
Meadow-fescue b	20.0	7.0	2.7	38.4	25.0	6.9	4.00	.56	21.77	10.28	69,415
Italian rye-grass b	8.5	7.5	1.7	44.9	30.5	6.9	4.28	.35	25.51	12.11	79,410
Mixed grasses b	15.3	7.4	2.5	42.1	27.2	5.5	4.23	.52	23.87	10.80	74,554
Rowen (mixed) b	16.6	11.6	3.1	39.4	22.5	6.8	6.62	.64	22.34	8.93	73,175
Mixed grasses and clovers b	12.9	10.1	2.6	41.3	27.6	5.5	5.77	.54	23.42	10.96	76,957
Red clover	15.3	12.3	3.3	38.1	24.8	6.2	6.85	.95	24.19	9.27	78,984
Alsike clover c	9.7	12.8	2.9	40.7	25.6	8.3	7.13	.83	25.84	9.57	82,630
White clover c	9.7	15.7	2.9	39.3	24.1	8.3	8.74	.83	24.96	9.01	82,942
Alfalfa	8.4	14.3	3.2	42.7	25.0	7.4	10.67	.42	29.98	9.75	95,520
Cow-pea	10.7	16.6	2.9	42.2	20.1	7.5					
Wheat straw	9.6	3.4	1.3	43.4	38.1	4.2	.94	.85	12.20	6.74	40,544
Rye straw d	7.1	3.0	1.2	46.6	38.9	3.2	.83	.79	13.10	6.89	42,020
Oat straw d	9.2	4.0	2.3	42.4	37.0	5.1	1.11	1.51	11.91	6.55	42,770
Buckwheat straw	9.9	5.2	1.3	35.1	43.0	5.5					
ROOTS AND TUBERS.											
Potatoes	78.9	2.1	.1	17.3	.6	1.0	1.85		17.20	.05	35,525
Carrots	88.6	1.1	.4	7.6	1.3	1.0	1.09		7.13		15,290
GRAINS AND OTHER SEEDS.											
Corn, dent	10.6	10.3	5.0	70.4	2.2	1.5	5.95	2.39	62.09		136,636
Corn, flint	11.3	10.5	5.0	70.1	1.7	1.4	6.07	2.39	61.83		136,376
Corn, all varieties	10.9	10.5	5.4	69.6	2.1	1.5	6.07	2.58	61.39		136,363
Kafir-corn	12.5	10.9	2.9	70.5	1.9	1.3					
Chicken-corn	14.8	10.6	2.6	58.8	8.7	4.5					
Barley	10.9	12.4	1.8	69.8	2.7	2.4					
Oats	11.0	11.8	5.0	59.7	9.5	3.0	9.39	3.60	45.25	2.82	122,062
Rye	11.6	10.6	1.7	72.5	1.7	1.9	8.51	.12	63.29	1.70	139,747
Wheat	10.5	11.9	2.1	71.9	1.8	1.8					
Cottonseed, whole	9.1	19.6	20.1	28.3	18.9	4.0					
Cow-pea	11.9	23.5	1.7	55.7	3.8	3.4					
MILL PRODUCTS.											
Corn-meal	15.0	9.2	3.8	68.9	1.9	1.4	6.99	2.55	64.70	.38	144,454
Oats, ground	11.7	11.0	3.9	52.3	18.0	3.1	9.06	3.12	45.03	2.59	118,727
Corn-and-cob-meal	15.1	8.5	3.5	64.8	0.6	1.5					
Barley-meal	11.9	10.5	2.2	66.3	0.5	2.6					
Pea-meal	10.5	20.2	1.2	51.1	14.4	2.6					
Ground corn and oats (equal parts)	11.9	9.6	4.4	71.9	2.2						
BY-PRODUCTS.											
Corn-cob	10.7	2.4	.5	54.9	30.1	1.4					
Corn-bran	8.7	9.8	6.2	62.6	11.2	1.5					
Gluten-meal	8.6	30.0	8.8	49.2	2.6	.8					
Gluten-feed	7.8	23.4	8.3	53.2	9.2	1.1					
Oat-feed	7.7	16.0	7.1	59.4	6.1	3.7					
Brewers' grains, wet	75.7	5.4	1.6	12.5	3.8	1.0					
Brewers' grains, dried	8.0	24.1	6.7	44.8	13.0	3.4					
Rye-bran	11.8	14.7	2.8	63.9	3.3	3.5					
Wheat-bran	11.9	15.4	4.0	53.9	9.0	5.8					
Wheat-middlings	12.1	15.6	4.0	60.4	4.6	3.3					
Wheat-shorts	11.8	14.9	4.5	56.8	7.4	4.6					
Cottonseed-meal	8.2	42.3	13.1	23.6	5.6	7.2					
Cottonseed-hulls	11.1	4.2	2.2	33.4	46.3	2.8					
Linseed-meal, old process	9.2	32.9	7.9	35.4	8.9	5.7					
Linseed-meal, new process	9.9	35.9	3.0	36.8	8.8	5.6					
Beet-sugar molasses	25.7	27.3		58.2		8.8	7.3		58.2		259,182
Cane-sugar molasses	25.1	22.4		59.3		3.2	3.2		69.3		298,398

- a Digestibility calculated from values obtained with green alfalfa.
 b Digestibility calculated from values obtained with meadow hay.
 c Digestibility calculated from values obtained with red clover hay.
 d Digestibility calculated from values obtained with wheat straw.
 e Largely nonalbuminoid nitrogenous materials.
 f Very largely sugars.

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from the outer or bran layer of the grain, is also present. The superiority of one grain over another, if it exists at all, must therefore depend, in large measure, on some factor other than composition. It has been urged by many that oats possess a peculiar stimulating body called "avenin," and are on this account superior to other grains for horses. Oats undoubtedly possess a flavor or some such characteristic which makes them a favorite food with horses, but the most careful chemical study has failed to reveal any substance of the nature of the theoretical avenin. Recent experiments have shown that the fat of oats and oat straw is more thoroughly digested than that of other cereals. This is suggested as a possible explanation of the superior feeding-value of oats.

It is believed by many that horses show more spirit when oats form part of the ration. Discussing this subject, Director W. A. Henry, of the Wisconsin Experiment Station, says:

"Horses nurtured on oats show mettle which can not be reached by the use of any other feeding stuff. Then, too, there is no grain so safe for horse feeding, the animal rarely being seriously injured if by accident or otherwise the groom deals out an oversupply. This safety is due in no small measure to the presence of the oat hull, which causes a given weight of grain to possess considerable volume, because of which there is less liability of mistake in measuring out the ration; further, the digestive tract can not hold a quantity of oat grains sufficient to produce serious disorders. Unless the horse is hard pressed for time or has poor teeth oats should be fed in the whole condition.

"Horsemen generally agree that new oats should not be used, though Bous-singault, conducting extensive experiments with army horses, arrived at the conclusion that new oats do not possess the injurious qualities attributed to them."

The grain most commonly substituted for oats in this country is Indian corn or maize. It is so commonly used, especially in the South and West, that it is difficult to realize the prejudice which has existed against it in other countries. It has been asserted that there are climatic and other conditions which render corn a suitable horse-feed in America which do not exist elsewhere. This hardly seems reasonable, and has not been borne out by the numerous experiments undertaken in France, Germany, and other countries. Such experiments have demonstrated the value of corn and shown the truth of the opinions generally held in this country, namely, that it is a safe and satisfactory feeding-stuff for horses.

Barley, rye, and wheat are sometimes fed to horses. Their resemblance to oats in composition will be seen by reference to the table. All these grains should be substituted on the basis of chemical composition, and not pound for pound. As would be expected, the ground grains differ little from the same varieties before grinding.

Bran, shorts, middlings, and other by-products vary in composition, but all have a low water content, while the crude fiber content is generally rather high. Their nutritive ingredients are principally protein and carbohydrates. The high crude fiber content is due to the fact that these products represent the outer layers of the grain, which are more hard and firm in structure than the interior portion, which consists quite largely of starch.

The total number of tests to compare different feeding-stuffs for horses which have been undertaken by the agricultural experiment stations in the United States is not large compared with the tests made with other farm animals. The results obtained are, however, interesting.

The problem most often investigated has been the possibility of substituting other grains for oats wholly or in part in the ration of work-horses without lowering their efficiency. In this

connection the Maine Station studied the value of pea-meal and middlings fed in the ratio of 1 part of the former to 2 of the latter and of mixed grains as compared with oats. The Utah Station compared corn and bran and shorts with oats; the North Dakota Station, bran and shorts, barley and bran, and mixed grains. As a whole these and similar tests offered practical demonstrations of the fact that oats could be replaced by other grains when circumstances warranted it.

At the New Hampshire Station the value of different grain mixtures for horses was studied with a view to learning how the cost of a ration could be diminished by lessening the amount of oats fed. The rations consisted of different mixtures of oats, bran, corn, gluten feed, linseed-meal, and cottonseed-meal. Fairly good results were obtained with all the mixtures, that containing cottonseed-meal being least satisfactory, as it was not at first relished by the horses. The conclusion was reached that any mixed ration furnishing the desired nutrients at a reasonable price should be considered. A mixture of bran and corn 1:1 was regarded as a good substitute for corn and oats for work horses.

Tests carried on at the Utah Station have demonstrated the value of wheat for horses, a grain which sometimes has so low a market value that it may be profitably fed.

The North Dakota Station has carried on a number of tests with barley which furnish experimental evidence that this grain is a useful feed. When taxed to the limit by hard work it was found, in the experiments referred to, that the horses could not be supported upon barley quite as well as upon oats, and that it was worth slightly less per pound than oats with animals performing a medium amount of work. Mules did not take as kindly to barley as horses, and dainty horses would not eat it quite as readily as oats. On the Pacific coast barley is extensively grown as a horse feed, and its use for this purpose is old in other countries. Elsewhere barley is not extensively used as a feed in the United States, doubtless owing to the fact that it is in such demand for brewing purposes that it is usually high in price. Wherever it is grown, however, it is frequently possible to secure at a low cost grain which is off color owing to rain or fog during harvest, and which, for this or some other reason, is unfit for brewing, but valuable as feed.

Barley may be fed whole to horses having good teeth and not required to do severe work. Since ground barley, like wheat, forms a pasty mass when mixed with saliva, it is regarded as more satisfactory to crush than to grind it, if for any reason it is considered undesirable to feed the grain whole.

THE FARMERS AND THE FLOOD.

(Continued from page 645.)

housed on high land and proposes that they shall stay there until September, fearing to risk moving home sooner on account of danger to health.

These descriptions will serve to give an idea of the situation.

This devastated area is about 2½ miles long by an average of 1½ miles wide as estimated by several residents. The number of farmers in it was 18. If all flooded communities in Kansas were as well cared for as are these Tecumseh farmers the situation would soon mend. One of the most progressive farm communities in Kansas is that around Berryton, a few miles distant from Tecumseh and on high ground. When sudden destitution faced a thousand families in North Topeka, the Berryton farmers drove in with wagons loaded with provisions. As soon as the devastation of farmers at Tecumseh became known, Berryton farmers sent a car-load of such supplies as they knew would be needed. At the time of the writer's visit to Tecumseh, Dr. J. A. Read and the Methodist minister were making arrangements for receiving and distributing the Berryton benefaction.

The extent of the damage to farmers in Kansas is difficult to determine. Governor Bailey estimates that it is equal in area to a strip 200 miles long by 6 miles wide. Such an area would contain 1,200 square acres and would probably average four farms to the section. This would mean that 4,800 farmers have suffered. The amount of the loss may never be even approximately known. Some of these farmers have lost crops only while others have lost all but the land and part of the buildings. Those who have lost all horses, cows, and hogs, will have to replace them before they can again make their farms productive. The entire State of Kansas is financially interested in restoration at least to this extent. What will such restoration cost? Farmers whose losses are as complete as those at Tecumseh can not be placed in position for effective farming at a cost less than \$300 each. If the entire 4,800 of Governor Bailey's estimate were provided for at this cost it would involve an outlay of \$1,440,000. This is a sum which, it is safe to say, will not be raised. There are about 180,000 farmers in Kansas so that contributions would have to average \$8 per farmer to reach the sum needed. Governor Bailey thinks that not over \$100,000 will be contributed for the State relief work. It is thus evident that very little can be expected from this source and that this little will have to be devoted to relieving cases of acute destitution. All such should be presented to the township trustee or to the county commissioners to be forwarded to the relief board to be appointed by the Governor. All contributions for this relief should be forwarded to Governor W. J. Bailey, Topeka.

It is evident from the above estimates and in consideration of the slowness of all public movements that the farmer who is going to mend his case by making a crop this season will find his own efforts and his own credit the only valuable reliance. The man who evinces courage and hustling qualities will find encouragement and support in many quarters. He will find some Shylocks who will want to fatten on his misfortune, but he will find others ready to do a brother's part.

In some cases a community can stand together and thereby strengthen the credit of each. An experience from the past may illustrate this. In 1874 the grasshoppers ate every green thing in large areas of Kansas. Appeals for help were common. The case was peculiarly trying for new settlers on the frontier. In Barton County the Grange had been pretty generally organized. The members of this order resolved to help themselves. The writer knows about it, for he was one of them. We were all too poor to offer any basis for credit. The following plan was adopted and carried out:

Each member made a contract note for such supplies as he most needed. Each local grange endorsed the notes of its members and the County Grange—we had county granges then—endorsed all the notes. These notes were taken by Bro. E. J. Dodge to southwestern Iowa, the nearest possible source of supply, and negotiated with members of the order there. The notes drew 10 per cent interest. We got the supplies. The notes without one exception were paid. Thus these settlers were tided over a crisis and every one of them has always rejoiced that it was done in a business way.

If the Grange were universal in Kansas there would to-day be no trouble about placing every flood sufferer on

his feet and at the same time preserving his self respect. It is reported that the grocers' association will replace the stocks of grocers who have lost, and that the lumbermen's association is taking steps for the relief of lumbermen. While farmers are not so well organized as others, there will be found ways to repair their losses. The American spirit can not be destroyed.

But while urging upon the losers the possibility of reestablishing their fortunes, the KANSAS FARMER desires also to urge upon all who have been immune from the floods the duty and privilege of extending a helping hand. There is ample opportunity for giving. There is a larger good that may be done by extending credit without interest for a cow, a horse, a pig, some supplies. Don't be too particular about the security. It is always safe to trust a hustling Kansas farmer without security. The KANSAS FARMER Company knows this from experience. Every year this company has only its book accounts to show for many thousands of dollars owed by farmers of this State and the amounts are paid. A little friendly aid extended promptly will do more to place thousands of farmers on the road to independence than many times more will do a few weeks later.

In this connection the KANSAS FARMER desires to do a little. To read its columns every week is a real help to the farmer. To every farmer who has suffered from the flood the KANSAS FARMER will be sent one year free of charge. This applies to old and new subscribers alike. The recipient will be under no obligations to continue taking the paper more than the one year offered free. Even if the entire 4,000 or 5,000 farmers who have suffered from the floods take advantage of this offer the KANSAS FARMER Company will not fail to make good.

STORING FLOOD WATERS.

It has long been held by students of the irrigation problem that holding the water needed for crops in the regions where irrigation may be practiced with profit would eliminate the overflows which every year threaten and often devastate some of the most fertile lands on the continent. The great prevalence of floods within the last three weeks has properly directed renewed attention to the idea of holding the destructive waters for beneficial uses later in the season or at some succeeding dry season.

"A feature of this flood storage," said Guy E. Mitchell, secretary of the National Irrigation Association, "which may not be generally understood, but which would undoubtedly accomplish the desired result, may be termed a 'secondary storage.' The water-storage proposition applied to the Missouri and its great tributaries involves the question of the irrigation of the vast arid domain through which these rivers flow. If irrigation storage reservoirs were constructed on these rivers it is estimated that as much as 35,000,000 acres of present desert land would be reclaimed. The principal season of growing crops for this area would be April, May, June, July, and August, and the reason that the lands are not irrigated at present is that while there is plenty of water in the first three months, during July and August, when water is absolutely necessary to mature the crops, these streams are reduced to mere threads. If the storage reservoirs were built they would supply water for this land during July and August, during the three preceding months the water for this great area of land would be drawn directly from the streams themselves. By means of canals and ditches almost incalculable quantities of the flood waters coming down during April, May, and June, which can not be stored in the reservoirs, would be taken out of the rivers and spread upon this land which would take it up like a sponge, water which would go down the Missouri River and down the Platte River and down the Kansas River, and down the Arkansas River into the Mississippi, and thus add to the flow of the torrent there.

"Under such a system of irrigation the effect would be the same as though it had been possible last week to spread out the great flood of the Missouri, the Kansas, and the Platte and flood millions of acres of farming land in Wyoming, Colorado, Kansas, Nebraska, and the Dakotas, thus reducing the flow of the lower reaches of the Missouri to below the danger point.

"The combined volume of the water impounded in storage reservoirs at the head waters of these great rivers and their tributaries and that contained in a network of hundreds of miles of irrigation canals and ditches coupled with that absorbed by millions of acres

of arid land would have gone a long way toward palliating or preventing what will be known as the great flood of 1903."

KANSAS AT THE WORLD'S FAIR.

The Kansas Commission of the Louisiana Purchase Exposition held a meeting at their office in the State Capitol, Topeka, last week and decided to offer \$2,400 in cash prizes for display of Kansas agricultural products at the Kansas State Fair and Exposition at Topeka and the Central Kansas State Fair at Hutchinson both during the week of September 14-19, 1903. The cash prizes will be for county collective exhibits. Six prizes will be offered as follows: 1st, \$500 cash; 2d, \$250; 3d, \$150; 4th, \$125; 5th, \$100; and 6th, \$75.

These premiums as above designated will be offered both at Topeka and Hutchinson and are open to every county in the State, forming inducements to make great displays for their respective counties. The displays winning the premiums will become the property of the Kansas Commission, and will be shown at the World's Fair next year.

It is desired that all grains and grasses by shown in the sheaf as well as in the sack. Therefore it is important that every farmer who has some extra good specimens from the field, orchard, or garden which will make a creditable showing for Kansas at the World's Fair should carefully preserve such to become a part of his county display. This is especially true of wheat, oats, alfalfa, and other products now ready for harvest. Some magnificent specimens can be secured.

Every patriotic citizen of Kansas is interested in having Kansas make a representative showing at the World's Fair in St. Louis in 1904. The Kansas Commissioners are to be congratulated on this active movement in the direction of securing the choicest specimens of grain, fruits, vegetables, and grasses. The liberal prizes offered should bring out the best showing ever exhibited in Kansas. The two principal fairs in Kansas this year will be held at Topeka and Hutchinson, and the locations are such as will be most convenient for counties desiring to make a county collective display. The details concerning the county collective displays are now being prepared by C. H. Luling, Secretary of the Kansas Commission, Topeka, Kans., and as soon as they are ready will be published in the KANSAS FARMER.

Let every farmer who has something good enough to go to the World's Fair have the same in readiness for the State fairs at Topeka and Hutchinson.

With the exception of Missouri and California, Kansas has provided the largest appropriation of any State west of the Mississippi, consequently there is no reason why Kansas should not be creditably represented at the World's Fair.

A DELAYED MANUSCRIPT.

At the last meeting of the Kansas State Dairy Association, Prof. Ed. H. Webster delivered an address which called out much discussion and elicited very great interest on the part of all who heard it. The address had not then been reduced to writing. Just at that time Professor Webster was appointed to an important Government position. The press of duties incident to closing his work at the Agricultural College and taking up his new duties prevented Professor Webster from preparing his manuscript in time to have the address printed in the KANSAS FARMER with the regular proceedings.

There has been much inquiry for this address. The manuscript reached this office on Tuesday of this week. It is printed, herewith, among miscellaneous matter rather than to hold it over until next week to appear in its proper place in the dairy department.

Abuse of a Hand-Separator.

ED. H. WEBSTER.

To those who have studied the question of the hand-separator there can be no doubt but many abuses have attended its introduction and use. These come along two distinct lines. One of the abuses and one of the most important has come from the creamerymen themselves. The old systems of whole-milk creameries were well established and the creamerymen had learned how to handle the milk products in this way. When the hand-separator was introduced it brought an entirely different set of problems for solution. The creamerymen were fixed in their ideas in regard to the manufacture of butter. They could not see a necessity for a change. Consequently the very ones who should have been among the first

to take up the hand-separator idea were among its bitterest enemies. Many creamerymen would not entertain the idea of buying cream from the hand-machine, and insisted that all of these tended toward the production of poor cream. I for one am glad that I got my first impressions of the creamery business through the hand-separator and I have been a firm believer from that day to this in its use and application to our dairy problems in the West. Had the creamerymen from the start taken hold of this matter, and at the very inception of this machine begun to study the problems connected with its use, they would have been much better off to-day. But this was not the case. Most of the creamery companies until within a very recent date would not entertain in any way the hand-separator until it was forced upon them. All this has led to a condition of affairs which at the present moment is staring us in the face.

The benefits derived from the use of the hand-separators are so manifestly great that the dairyman has bought the machine regardless of the attitude of the creamerymen. We find ourselves swamped and we know not what to do.

This is the first meeting of the Dairy Association in Kansas that has given any thought or any time on its program to this subject. But that the hand-separator problem is uppermost in the minds of all in this session can not be doubted, for nearly every speaker on the floor has had something to say in regard to the hand-separator and the solutions of its many difficulties and problems. Had we as creamerymen been wiser we would have solved these problems as we went along.

The other phase of the abuse of the hand-separator comes largely from the men who have sold the machine. Too often they have given the farmers the understanding that cream did not need to be delivered as often as milk and that they need wash their machine only once a day, and various other ideas which are entirely contrary to the facts of the case. This state of affairs was perhaps brought about by the slowness of the creamerymen to recognize the use of the hand-separator, and agents were forced to these statements in order to sell their machine.

Other abuses were in time met with in the tendency of agents to follow methods that would be condemned anywhere else. One of the principles of separation, understood by all creamerymen, is that the warmer the milk the more complete will be the separation. Yet agents will run cold milk through just to beat the other fellow. This is wrong for various reasons: In the first place the milk should be skimmed when warm in order to get the best separation of the cream. It should be skimmed when warm in order to give the calves and pigs the warm skim-milk, and it should be skimmed fresh from the cow in order that the cream may be quickly cooled to prevent the development of bacteria. Everything is against cold skimming and in favor of warm skimming, and the tendency of these contests is to give the farmers erroneous ideas in regard to the hand-separator.

Another abuse which is very common and which comes from a different source still is in the turning of the crank of the machine. There is another principle of separation that says for perfect work the machine must be turned absolutely true and steady. This is a difficult thing to do with a hand-machine, but every unevenness in turning ultimately results in the loss of butter-fat. The speed must be completely uniform, it must be kept up to the proper number of revolutions.

These are only a few of the abuses that come in the use of the hand-separator, and the problem before the creamerymen to-day is to remedy the abuses. The farmer must be taught right methods of operating and the creamerymen should complete the sale of the machines themselves in order that they can have greater control over the product that they derive from them.

The hand-separator has come to stay and in every way will prove a blessing to all, and by its use the greatest number can be benefited, and when the creamerymen take hold of this proposition as they are now beginning to, it will be only a matter of time until every dairyman will be furnishing a higher grade of cream at much less expense than he now furnishes milk to his skimming-station.

Excursions to Boston.

June 25 to 27, inclusive; also July 1 to 5, inclusive, via Nickel Plate Road. Especially low rates. Liberal return limits. Particulars at City Ticket Office, 111 Adams St., and Union Ticket Office, Auditorium Annex, Chicago. (18)

Commencement at the Agricultural College.

Commencement week at the Kansas State Agricultural College is at hand. Another large class is about to finish the course. The programme bids fair to be one of the best in the history of the college, although flood conditions throughout the State will probably prevent many from attending the exercises.

The attendance increased from 1,396 last year to 1,574 this year, notwithstanding the entrance requirements were considerably strengthened.

Next year an incidental fee for Kansas students will be made of \$3 a term and a matriculation of \$10 and incidental fee of \$10 a term will be required of non-resident students. For the past twenty years it has cost the State of Kansas \$106 to put each student through a regular course of one year, and four times that amount to carry a student through the four years' course to graduation. The standard of work has been raised and admittance requirements are becoming more and more rigid.

The following comparison of attendance by classes for the past and present years shows an increase in nearly all classes, the most noticeable exception being the dairy course:

Classes.	1901-'02			1902-'03		
	Men.	Women.	Total.	Men.	Women.	Total.
Graduate.....	15	17	32	13	11	24
Senior.....	42	23	65	57	29	86
Junior.....	81	39	120	97	44	141
Sophomore.....	130	76	206	152	77	229
Freshmen.....	280	116	396	328	145	473
Preparatory.....	239	59	298	255	87	342
Special.....	7	12	19	16	20	36
Dairy.....	66	..	66	37	1	38
Farmers' short course.....	124	1	125	123	..	123
Dom. sci. short course.....	..	41	41	..	63	63
Apprentices.....	84	3	87	76	2	78
Counted twice..	51	8	59	43	14	57
Totals.....	1017	379	1396	1109	465	1574

A year ago the figures were given showing the number of students in the different courses. To the table published then is added the figures for the present year. Last year 76.6 per cent of the students were in the technical courses; this year 80 per cent.

During the summer more buildings will be erected. A new creamery and equipment will be built and an auditorium with a seating capacity of 3,000 people will be constructed, besides many additions and repairs to the various buildings.

Extensive preparations are being made in each department to give exhibitions during the week. Captain Andrew S. Rowan is drilling the four companies of cadets for an exhibition drill and sham battle. This is always an interesting feature of the commencement programme. There are over 300 cadets of infantry and one battery of two large guns. Just before the sham battle the cadet band directed by Prof. A. B. Brown, will give an open air concert on the campus.

The college possesses more pure blood stock than ever before and the live stock is made a part of the week's programme. Many of the cattle have taken first prizes at international stock shows.

Last Saturday night the commencement lecture was given before the various college societies by Professor A. M. Newens, of the Iowa State college, Ames, Iowa.

Rev. O. B. Thurston, pastor of the First Congregational church of this city, delivered the baccalaureate sermon in college chapel Sunday afternoon.

The following is the programme for the remainder of the week:

Tuesday, June 16—Examinations from 9 a. m. to 3.35 p. m. Class day exercises to invited guests, opera house, 8 p. m.

Wednesday, June 17—Examinations from 9 a. m. to 12.20 p. m. Business meeting of the Alumni Association, college chapel, 3 p. m. Alumni reunion, women's gymnasium, 8 p. m.

Thursday, June 18—Annual address, college chapel, 10 a. m., by Rev. Thomas E. Green, pastor of Grace Episcopal Church, Cedar Rapids, Iowa. Presentation of diplomas. Cadet band concert on campus, 2 p. m. President's reception to invited guests, Hotel Gillett, 8 to 11 p. m.

There are fifty-five members in this year's class, thirty-four men and twenty-one women. The president says this is a "good" class. Not once during the four years did the class spirit get the better of them. The authorities recall no instance of ever taking them to task. However, they are not slow. Every member came up squarely with his work on the final day, there was not a questionable candidate.

The following is the class roll, with subject of theses:

GENERAL SCIENCE.

R. F. Bourne, "A Comparative Study of the Dentition of Some Common Mammals."

Robert A. Eason, "College Ethics."

Corinne Fallyer, "Generic Characteristics in the Chrysomellidae."

Maud Irent Fallyer, "Spectrometry."

Arthur B. Gahan, "Modifications Adaptive to an Aquatic Habit in the Coleoptera."

Clara Goodrich, "The School Systems of Germany and the United States—a Comparison."

Hartley B. Holroyd, "Forestry."

Rose M. McCoy, "The Mental Unfoldment of the Child."

Ivan L. Nixon, "Variations in the Mouth Parts of Some Hymenoptera."

Russell A. Oakley, "Grass Gardens of the Great Plains Region, Their Management and Some Important Constituents."

Earl Nathaniel Rodell, "The Evolution of Printing."

Alice Mac Ross, "Suggestion."

Harold A. Spilman, "Municipal Government in Great Britain."

Helen B. Thompson, "The Missouri Compromise."

John A. Thompson, "Protective Coloration of Animals."

Harry N. Vinell, "Western Nursery Practice."

Alberta S. Vollis, "History of Diplomatic Relations of the United States to Cuba."

MECHANICAL ENGINEERS.

Howard M. Chandler, "Indicator Reducing Motions."

DeVerne Corbin, "Tests on the Effects of Shape on the Strength of Castings."

James A. Correll, "Tests of Small Compressed Air Plant."

Orrin P. Drake, "Tests of a Small Compressed Air Plant."

Axel A. Johnson, "Tests to Determine the Effect of Reserved Stresses on the Elastic Limit and Ultimate Strength of Medium Steel."

Raymond G. Lawry, "Tests to Determine the Effect of Reserved Stress on the Elastic Limit and Ultimate Strength of Medium Steel."

Leon V. White, "Tests on the Effect of Shape on the Strength of Castings."

DOMESTIC SCIENCE.

Estella M. Fearon, "The National and Linguistic Elements of the English Language."

Edith A. Goodwin, "The Necessity of Pure Water Supply."

Esther E. Hanson, "The Unity of the Senses."

Pearl Holderman, "The Sub-Conscious Idea."

Sarah C. Hougham, "The Relation of American Literature to American Nationality."

Lois Stump, "The Psychology of Suggestion."

Sarah P. Thompson, "Woman as an Executive Member of Society."

Dovile M. Ulrich, "Wordsworth as an Interpreter of Nature."

Bessie A. Mudge, "The Vital Touch."

Anna Louella O'Daniel, "The Cultivation of the Aesthetic Emotions."

Clara Pancake, "The Administration of Louis XVI."

Celso A. Perry, "Progress of Music from the Early Ages to the Present Time."

Emma E. Smith, "Evolution of the Home."

AGRICULTURE.

Amos L. Cottrell, "The Art of Steer-Feeding."

Claud C. Cunningham, "Comfort as a Factor in Stock-Raising."

James W. Fields, "Selection, Care, and Feeding of the Brood Sow."

Fred N. Gillis, "The Sugar-Beet Industry."

Ellsworth P. Goodyear, "A Comparative Test of Hand Cream Separators."

Alanson L. Hallstead, "Good Roads and Good Streets Beautified."

Edward H. Hodgson, "Soil Moisture Studies."

Jesse M. Jones, "Calf Management."

Hernon C. Kyle, "External Parasitic Diseases of Domestic Animals."

Edwin W. McCrone, "A Test of Hand Separators."

Harold T. Nielson, "Soil Moisture Studies."

Alfred H. Sanderson, "Crop Rotation."

John M. Scott, "Economic Values of Kansas Forage Crops."

Harry R. Thatcher, "The Principles of Stock-Breeding."

Louis I. Edwards, "The Production of Sanitary Milk."

ELECTRICAL ENGINEERS.

Alexis J. Reed, "Regulating and Testing of Water Meters."

Henry A. Sidorfsky, "The Alternating Current Dynamo."

George T. Fielding, "Regulating and Testing of Water Meters."

Souvenir Flood View.

The best illustrated book published on the great flood is that just issued by John F. Strickrott, 515 Kansas Ave., Topeka. Unlike other and smaller books of flood views published this is the most complete and desirable one yet published. It contains 75 views with descriptive matter showing pictures of the flood at its different stages. It is the most desirable thing to have in the way of a complete souvenir of typical flood scenes to be had. It is gotten out in good style and is quite unlike the cheaper and smaller editions which now flood the market. It is just such a book as you desire for your library or to send to your friends. It will be mailed to any address on receipt of 50 cents, sent to the publisher, John F. Strickrott, or the KANSAS FARMER will fill your order.

Low Summer Tourist Rates Via Chicago Great Western Railway.

\$15 to St. Paul and Minneapolis and return; \$19 to Duluth, Superior, and Ashland; \$13 to Madison Lake, Waterville, Faribault, and other Minnesota resorts. Tickets on sale daily to September 30. Good to return October 31. For further information apply to any Great Western Agent, J. P. Elmer, Chicago, Ill.

DON'T LET THE CALF RUN AWAY WITH YOUR MONEY



Don't let a \$15.00 calf eat up \$40.00 to \$60.00 worth of cream. The cream from the average cow will sell for \$40.00 to \$60.00 a year and just as good calves can be raised on sweet separator skimmed milk as with the cow. Don't waste Time, Labor and Cream by trying to skim your milk by hand. It is like trying to care for a 40-acre patch of corn with a hoe.

Buy a U. S. Separator and Save your Calves and Money. The U. S. skims the cleanest, cleans the easiest, wears the longest, is the most profitable, etc., etc.

Write for catalogue. For Western customers, we transfer our separators from Chicago, LaCrosse, Minneapolis, Sioux City and Omaha. Address all letters to Bellows Falls, Vt.

Vermont Farm Machine Co., Bellows Falls, Vt.

FUND FOR FLOOD SUFFERERS.

KANSAS FARMER is pleased to acknowledge the receipt of the following amounts from generous patrons of the KANSAS FARMER which has been turned over to the relief committee for the special benefit of farmers and stockmen who have met with heavy losses by reason of the floods in the Kaw valley:

W. H. Ransom, North Wichita.....\$2.00
A. D. & H. L. Perrin, Prescott, Kans. 5.00
J. W. Vawter, Ulysses, Neb..... 8.00

KANSAS FARMER'S NEW WALL ATLAS.

The KANSAS FARMER has arranged with the leading publisher of maps and atlases to prepare especially for us a New Wall Atlas, showing colored reference maps of Kansas, Oklahoma, Indian Territory, the United States, and the world, with the census of 1900. The size of the New Wall Atlas is 22 by 28 inches and it is decorated on the outer cover with a handsome design composed of the flags of all Nations.

Tables showing products of the United States and the world, with their values, the growth of our country for the last three decades, and a complete map of the greater United States are given. This is an excellent educational work and should be in every home. The retail price of this New Wall Atlas is \$1.

Every one of our old subscribers who will send us \$1 for two new trial subscriptions for one year will receive as a present a copy of this splendid New Wall Atlas postpaid, free.

Any one not now a subscriber who will send us 50 cents at once will receive the KANSAS FARMER for five months and will be given a copy of our New Wall Atlas free and postpaid.

Garden Spot of the Earth.

The fertile fields of eastern Oregon or Washington yield, in overflowing abundance and in the highest perfection, every grain, grass, vegetable and fruit of the temperate zone.

To enable persons to reach these favored localities without unnecessary expenditure of time and money, the Union Pacific has put in effect Round Trip Homeseekers' Excursion rates as follows from Missouri River, May 19, June 2 and 16: \$32.00 to Ogden and Salt Lake City. \$34.50 to Butte and Helena. \$44.50 to Spokane.

\$52.00 to Portland, Tacoma, and Seattle. Also One-Way Rates every day until June 15, to many points in the States of California, Oregon, Washington, Montana, and Utah.

For full information address F. A. Lewis, City Ticket Agent, 525 Kansas Avenue, or J. C. Fulton, Depot Agent.

To Boston and Return for One Fare

for the round-trip from Chicago via Nickel Plate Road, for Christian Scientists meeting in June. Tickets on sale June 25, 26 and 27, with extended return limit of August 1. Stopover at Niagara Falls, in either direction, without extra charge, and at New York returning on payment of fee of \$1.00. No excess fare charged on any of our trains. Write John Y. Calahan, General Agent, 113 Adams St., Room 298, Chicago, for detailed information. (6)

Good feeding is in keeping animals in a good, thrifty condition.

Hay Baling Up To Date.

The man who purchases a hay press nowadays has a right to secure one with the latest improvements, and if he is wise he will do so. It is a simple matter to obtain descriptive circulars of the different kinds, and make the comparisons between them intelligently.

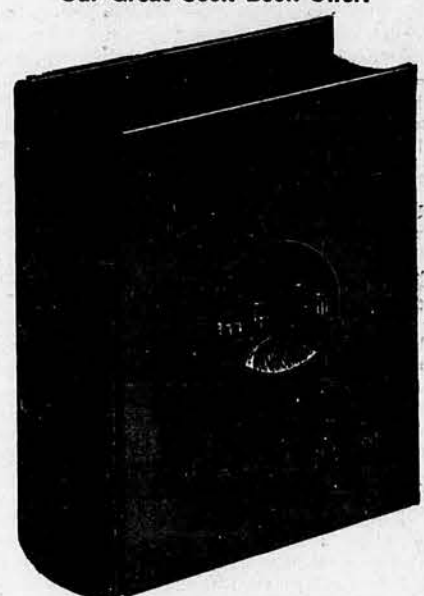
The Admiral Hay Press Co., Kansas City, Mo., will gladly forward full particulars of their celebrated Admiral Hay Press to all of our readers who wish them. They have a machine that is simple in construction, yet possessed of some exclusive and essential features found in no other press. It is a three-stroke baler with a self-feeder. With their triple lever power, they put three feeds in the baling chamber to each round of the team, insuring smoother and heavier bales, and more of them in a given time, than it is possible with the old style machines.

The self-feeding feature does away with the dangerous practice of foot-feeding; saves labor, and does all the heavy work of feeding.

The Admiral is easy on the team, and by making a solid, heavy bale, enables one to put full weight in the car and save freight to the shipper. It is the newest and most progressive machine made for its purpose.

Illustrated circulars, price-list, etc., will be sent you on request.

Our Great Cook Book Offer.



The White House Cook Book, 590 pages, comprehensive treatise on carving. All kinds of cooking and baking. Everything from soup to nuts. Cooking for the sick. Health suggestions. Kitchen utensils. Family recipes. Toilet items. Dyeing and coloring. Measures and weights, etc. Prepared by the former chef of the Hotel Splendide, Paris. Regular price \$2. Our price with the KANSAS FARMER for one year \$1.50.

This superstition about May marriages is traced back to the Romans. They kept, on the ninth, eleventh and thirteenth of the month, the festival of the Lemuria, to propitiate the Lemures or spirits of the dead, and considered the whole month as unlucky because of the festival. They had a proverb: Mense malo male nubent (Evils marry in May; or, more freely, it is bad to marry in May).

Replacing Drowned Crops.

Continued from page 649.)

July. It will be difficult for the farmer who depends on the sale of grain only to raise a marketable grain crop unless killing frosts come late. The best thing for the grain-farmer to do seems to be to raise forage crops and then take in cattle next winter to feed by the month. Many men who are paying cash rent can save themselves by this plan.

The best crop to plant on the bottom-lands is corn, and it will be safe to plant this as late as June 2 to 30. A late fall often follows a wet spring, and if Kansas farmers in the flooded section have a late fall, they can secure a good yield of well-matured corn planted any time before July 1, if thorough cultivation is given.

If early frosts come the corn will be soft, but soft corn will fatten hogs and steers when properly fed. It takes more of it than of matured corn. The past winter the Iowa Experiment Station fattened steers using soft corn only, and these steers nearly topped the market in Chicago. On Brookmont Farm last fall, 2,000 acres—half the crop—was caught by the frost while soft. We have been shipping two car-loads of hogs a week that were fattened on this soft corn, and it is seldom that less than \$6 per hundred has been received for the hogs. These tests show that soft corn is a good feed for both steers and hogs, and it will pay every Kansas stockman in the flooded district to plant now all the corn he can and take the risk.

Where the ground is muddy it should be disked as soon as it gets dry enough so that the horses will not sink in over three or four inches. This will turn up the soil lumpy but will dry it out ten days or two weeks earlier than if left to dry without treatment. As soon as the lumps on the disked soil begin to dry, cross-disk shallow, and when the surface from the second disking dries a little, harrow with a smoothing-harrow. This will put flooded land in good condition for corn, sorghum, Kafir-corn, millet, or rape.

It is very important to get an earth-mulch on flooded land as quickly as possible. This earth-mulch is as necessary after floods as it is in times of drouth. If land is allowed to dry after a flood without a mulch, it will bake and become lumpy. It is safe to disk flooded land while quite wet if the second disking is done as soon as the surface clods begin to dry.

Putting a good surface-mulch quickly on the flooded land is the surest thing that the Kansas farmer can do to secure a crop from late planting.

CORN.

Corn should be listed wherever practicable, but it will pay to put an earth-mulch on the surface before listing. List shallow, but cover the corn deeply if fine soil can be made in the bottom of the furrow. The corn should be covered with at least three inches of soil.

Leaming and other early varieties will be surest to yield mature corn, but it is doubtful if enough seed of these early sorts can be procured to plant the flooded districts. The next best thing to do is to get corn from the northern tier of Kansas counties. If the writer had flooded land to plant in Kansas he would go to Hiawatha, Kans., and get medium-sized ears of upland-grown corn. The farmers in that section of Kansas have taken special pains in selecting seed-corn for several years and their medium-early upland corn is suitable for any of the flooded districts. It will probably give better results than early corn raised further north that is not acclimated, and will cost less.

Late-planted corn on flooded land will require rather more than the usual amount of cultivation. It should be cultivated just as soon as planted and again as soon as it gets up. After that the usual treatment may be given, though it should be remembered that one cultivation with a one-horse cultivator set shallow after the corn is too tall to be cultivated with a two-horse cultivator will often add five bushels per acre to the yield.

If the farmer has the two-row lister-cultivator he can cultivate the first and second times the most cheaply with this. If he does not have the lister-cultivator he should cultivate the first and second times with a disk-harrow, taking two rows at a time, the second time straddling the row that was on the outside the first cultivation. One man and four horses can cultivate twenty-five acres of corn a day while it is small with a disk-harrow, and flooded ground will be put in better condition with this implement than with any other. The third and fourth cultivations can be made with the ordinary cultivator.

The writer one year saw in Kansas sixty bushels of good, well-matured corn per acre grown on Kansas River bottom on a

large area from plantings made June 25, and seventy bushels of soft corn per acre and a heavy yield of fodder grown in a wet season on Kansas upland from a planting of Leaming corn made early in July.

SORGHUM AND KAFIR-CORN.

Sorghum will make a good yield of hay if planted as late as July 1. A good earth-mulch should be put on the flooded soil as quickly as possible and it will pay to harrow the sorghum twice lightly with a smoothing-harrow after it is up, making the two harrowings ten days apart. Early Amber sorghum will be the surest to mature, later varieties will yield the most.

Red Kafir-corn will mature if planted as late as June 25, if a good earth-mulch has been made on the soil before planting, and if thorough cultivation is given. The Kafir-corn should be planted in rows three and one-half feet apart, with single seeds dropped four inches apart in the row. Plant shallow and cultivate often at first, and with ordinary weather for the rest of the season a yield of Kafir-corn grain can be secured that will produce as many pounds of pork and beef per acre as an ordinary crop of corn.

MILLET.

In 1901 rains came in eastern Kansas the first week in July. Millet sowed immediately after these rains gave a heavy yield. It will pay to get the flooded land thoroughly firmed to a depth of three inches before sowing the millet. Two or three days' time spent in extra work harrowing the ground for millet will have little effect in delaying the growth and may double the yield.

Millet should be cut as soon as the field is well headed out. Many stockmen stopped raising millet because they had poor results from feeding it. The trouble came from late-cutting.

RAPE.

Rape may be grown in Kansas with profit as late as September 15, as it will stand heavy frost. The earlier it is put in the better. From this date on the writer would sow one and a half bushels of oats per acre, cover them deeply, then sow five pounds rape-seed per acre broadcast on the same ground and cover lightly with a smoothing-harrow. This will furnish good pasture for hogs, and will do for cattle if nothing better can be obtained. Cattle will do best on rape if fed some straw or hay. Dairy-cows may be pastured on rape if the milk is aerated while warm, immediately after milking, with a machine that forces a spray of air through the milk. Oats alone will make a good fall pasture.

ALFALFA.

Thousands of acres of alfalfa along the river bottoms have been overflowed and covered up. Where enough alfalfa remains alive to make it desirable to save the whole field, the bare spots may be seeded to millet, this crop cut early and the ground reseeded early in September to alfalfa. Millet is the best crop that can be grown on washed land to mellow it up and prepare it for alfalfa.

Odebolt, Iowa. H. M. COTTRELL.

Crops for Late-Planting.

F. B. MUMFORD, ACTING DIRECTOR MISSOURI EXPERIMENT STATION.

The unprecedented rains have destroyed wheat, rye, oats, and corn in many localities of the State. It is not yet too late to secure good yields of several valuable forage and grain crops. Only 75 per cent of the corn has so far been planted in the State. There is yet time to plant corn, and with an average season secure a fair yield of grain. The following suggestions are offered at this time to farmers who failed to finish planting corn before the rains, and also to those whose crops have been destroyed by washouts, floods, and overflows. The stock-farmer especially can by good management, even at this late date, produce an abundant and sufficient supply of valuable feed for animals. The purely grain-farmer is not so well situated under the present conditions to get the most out of his land.

PLANT CORN UP TO JULY 1.

Farmers will be urged to try many sorts of new forage- and grain-plants which are recommended to be far better than corn. This station advises all farmers to plant corn in every case where the conditions will allow this to be done before July 1. The most important factor in securing a crop when planted so late, is the selection of the right variety. Select in every case that variety of corn which will mature earliest in your locality. Some early-maturing varieties of corn that can be recommended are Pride of the North, Riley's Favorite, Reid's Yellow Dent, and any variety of flint corn. Any one of these varieties will yield more grain or forage in Missouri than almost any other forage crop, if planted before July 1. These varieties should be planted

somewhat thicker than the varieties usually grown in Missouri.

SORGHUM AND KAFIR-CORN.

These crops are grown extensively every year in some sections of Missouri. They yield a large amount of forage, and if planted before the first of July they may also produce a good yield of grain. The best variety of sorghum for Missouri under the present late conditions is the Early Amber. For bottom-lands we recommend the Early Orange which stands up better. This should be planted in rows about three or three and one-half feet apart. The most practical way to plant sorghum is in the ordinary corn-planter, using the broomcorn disks. It can also be planted with a disk- or shoe-drill. On rich lands it should always be planted in rows. On poor lands it may sometimes be advisable to sow broadcast. Kafir-corn is successfully grown, especially in southwest Missouri, and may be grown with profit in other sections of the State. For the production of grain, Kafir-corn is to be selected always in preference to sorghum—for forage only, sorghum is probably better. The best varieties of Kafir-corn are the red Kafir-corn and the white. At the Kansas Station it was found that Kafir-corn yielded from thirty to fifty-eight bushels of grain per acre, and the grain was nearly as valuable as Indian corn for fattening cattle and hogs. The seed, if planted by drilling, should be sown at the rate of six pounds per acre.

COW-PEAS.

Cow-peas have been grown successfully in every section of the State of Missouri. The best time for planting them is from the 15th of June to the 1st of July. They can be planted as late as the middle of July. The yields of hay from cow-peas planted on good soil, are from one and a half to three tons per acre. This hay is as valuable as clover hay for all purposes of feeding. The best varieties for Missouri are Clay and Whippoorwill for hay, and the New Era, Warren's Extra Early, and Red Ripper for grain. If cow-peas are planted immediately it will be possible to cut them for hay during the last week in September and by disking the ground thoroughly, put it in splendid condition for wheat. Where it is desired to sow submerged lands for wheat in the fall, this will be found altogether the most satisfactory method.

SOY-FEANS.

This crop furnishes one of the most valuable grains for feeding purposes that can be produced on the average Missouri farm. The yield of soy-beans is from twenty to thirty bushels per acre. They can be planted in June at the rate of half a bushel per acre. They should be planted in drills about three feet apart. They can be harvested by pasturing with hogs or they may be pastured with other animals, or they may be harvested for their grain. The average two-horse corn-cultivator may be arranged with two inclined knife-edges which will cut two rows at a time. After drying, they may be raked up and stacked and the stack covered with some material that will shed water, or placed in the barn. They can be thrashed in the ordinary thrashing-machine by removing part of the concaves. The grain from soy-beans contains a larger per cent of digestible protein than any other of the grains grown on the farm. This makes this crop peculiarly valuable to be fed with corn.

Every farmer who has land that has not been planted on account of the recent rains, should plan to put in some of the crops suggested above. It is not at all necessary that the land should lie idle, and Missouri may yet produce a maximum crop. The station will upon application gladly give more detailed information regarding the production of any of these crops.

Admiral Hay Press.

One of the most remarkable inventions in the implement world is the new Admiral Hay Press which, unlike others, is built on the three-stroke principle, and with its triple-lever power it puts in three feeds in the baling chamber to each round of the team, and thus makes smoother and heavier bales and more of them in a given time than is possible by any of the old-style two-stroke balers.

By dividing the work of the horses into three parts, the work becomes very much easier on both men and teams.

The power end of the Admiral is composed of few and simple parts, with the necessity for delay and expense for repairs reduced to the minimum.

Another feature that distinguishes the Admiral from all other balers is its original self-feeding attachment, which does away entirely with the deadly foot feeding, accomplishing better results with perfect safety. The steel feeder forces the feeds, whether big or little, down into the bottom of the baling chamber.

Uniting, as this modern machine does, every element that any hay-press can have any many possessed by no other, it is little wonder that the demand is nearly equal to the supply.

The manufacturers, the Admiral Hay Press Company, Kansas City, Mo., will take pleasure in forwarding free to any of our readers descriptive list of this great little machine, and will promptly

IN PATH OF TRAIN

YARDMASTER ELLIOTT FALLS ALMOST UNDER ENGINE'S WHEELS.

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Yardmaster J. T. Elliott had thrown a switch in the Pennsylvania railroad yards and was crossing the track in front of an engine when he was seen to stagger and then suddenly to collapse. He fell almost under the pilot but fortunately rolled off the track to one side. He was not injured.

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"A different physician this time said I had locomotor ataxia, but I only grew worse under his treatment. I began to have attacks of vomiting, one of which lasted for sixteen days. I grew thin as a skeleton and very weak. Finally I had a consultation of three Pittsburg physicians and they pronounced me incurable. The pain in my body and legs continued to increase and became so severe that I had to take morphine sometimes to get a little relief. I became just about helpless with no control of my legs."

"One day a friend sent me a clipping from a newspaper telling of a remarkable cure of locomotor ataxia by Dr. Williams' Pink Pills for Pale People. So I began taking them. I followed directions carefully and soon began to improve. It was gradual but sure and now I am like another man. I can go around and took a three weeks' trip a little while ago without experiencing any bad results. I have not had a pain or vomiting spell since I began taking Dr. Williams' Pink Pills."

Mr. Elliott was in the employ of the Pennsylvania railroad for fourteen years as a brakeman, then conductor, and finally as yardmaster. He lives at No. 5818 Parker Street, Pittsburg, Pa., and is ready to corroborate the above statement.

Dr. Williams' Pink Pills for Pale People are sold by all druggists, or direct by Dr. Williams Medicine Company, Schenectady, N. Y., 50 cents per box; six boxes for \$2.50 postpaid.

answer any correspondence regarding the subject of hay-presses and hay-baling.

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For full information address F. A. Lewis, City Ticket Agent, 525 Kansas Avenue, or J. C. Fulton, Depot Agent.

Christian Scientists'

meeting in Boston, June 28-July 1. It will be to your advantage to obtain rates applying over the Nickel Plate Road before purchasing elsewhere. No excess fare charged on any of our trains. Tickets on sale June 25, 26 and 27. Final return limit August 1st. Call on or address John Y. Calahan, General Agent, 113 Adams St., Room 238, Chicago, for particulars as to stopovers, train service, etc. (7)

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THE SHARPLES CO.,
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In the Dairy.

Conducted by George C. Wheeler, Kansas Experiment Station, Manhattan, Kans., to whom all correspondence with this department should be addressed.

Does it Pay to Feed Grain to Cows in the Summer.

D. H. OTIS, KANSAS EXPERIMENT STATION.

Mr. C. B. V., of Hutchinson, Kans., writes: "Do you think it pays to feed grain to dairy cows during the summer months when they are on good blue-stem pasture? Bran is worth 70 cents per hundred, and we are selling all of our butter to private customers at 25 cents, what is not sold at this price is sold to the grocers at 20 cents."

When cows are feeding on luxuriant June grass very little feed of either grain or roughness is needed, although cows seem to relish a little dry feed even then. But this condition does not last throughout the entire period of from five to five and one-half months. It is not uncommon in July and August to see the pasture so short and so dry as to furnish but very little feed. The amount of extra feed will vary greatly with the season. A good plan is to have a rack that will hold considerable quantity of hay and let the cows eat it out at will. We consider it advisable to feed cows two or three pounds of grain daily, increasing this gradually six or eight pounds for best cows. The value of extra summer feed is shown in the comparison made at the Agricultural College during the summer of 1898. "The college herd consisted of thirty head of common cows and were fed an average of three pounds. These were compared with fifty-five head of a similar class of cows belonging to eight different patrons of the Manhattan creamery, but which had received no extra feed in addition to pasture. On July 5 the college cows were yielding an average of 18.42 pounds per day, while the patrons' cows were yielding 12.67 pounds per head. On August 16, six weeks later, the college cows were yielding 17.59 pounds per head, while the patrons' cows were yielding only 7.71 pounds per head. This makes a drop of 0.83 of a pound per day per cow—four and one-half per cent—for the college cows and 4.96 pounds per day per cow—thirty-nine per cent—for the patrons' cows. The fact that it is practically impossible to restore a cow to her original flow of milk after she

once shrinks should induce us to use every effort to keep up the flow during the critical period of dry weather or short pasture, even though for the time being it be at a loss of the feed consumed."

Cottonseed-Meal for Young Calves.

D. H. OTIS, KANSAS EXPERIMENT STATION.

Mr. A. F., of Bronson, Kans., writes: "Is it safe to feed cottonseed-meal to young calves and if so how much? My calves are mainly Jerseys and receive hand-separator milk."

Cottonseed-meal is not considered desirable feed for young calves. In bulletin 109 of the North Carolina Experiment Station a report is given of two calves receiving from one to six ounces of cottonseed-meal. They both died after one month's feeding. Other experiments tell the same story.

Outside of its injurious effects it is not desirable to feed calves that are receiving skim-milk such a nitrogenous ration as is furnished by cottonseed-meal or oil-meal. The effort should be to supply some feed that will take the place of the butter-fat that has been extracted from the milk. Skim-milk has more protein in it per hundred pounds than whole milk. Since this is true we certainly do not want to feed what contains a large per cent of protein but should look for some carbonaceous feed or some feed that will give starch or oil to replace the butter-fat. For this purpose the Kansas Experiment Station has found nothing better than shelled corn and ground Kafir-corn mixed.

We find that calves will begin eating shelled corn when two or three weeks old. We find that when shelled corn is used the calves will do better and are less liable to scours than if it is ground. This ration has the advantage of being cheap and can be raised on nearly any farm in the State of Kansas.

A Cheap and Efficient Calf Stanchion.

A. F. TURNER.

Take two one by four inch strips eight feet long. Nail one end of common salt-barrel staves between these two pieces leaving but one nail in those staves that must open for the calf's head to pass them, and giving about four and one-half inches of space for the calf's neck. At the other end of the staves nail two one by four, nailing all the staves but one at the side of each calf's neck. Bore a quarter-inch hole through both pieces and the stave in this one and put a spike nail or heavy wire key through to hold it in place when the calf is in. The upright pieces at the end of the stanchion should be one by four also.

Now make square frames just large enough that a four-quart milk crock will stand snugly in the square, the rim resting on the frame. Bolt by the four corners to fence posts, so that top of crocks are about fourteen inches from the ground, for more calves simply increase the length, always allow two feet to the calf. Put staves close enough together so the calves can only get their heads through where they belong.

As soon as calves are through drinking their milk, the corn or Kafir-corn meal may be put in the crock. These crocks will be found more durable than pails and much more easily cleaned.

BILL OF MATERIAL FOR FIVE STANCHIONS.

Four 1 by 4 by 16 feet.....	\$0.50
Salt-barrel.....	.10
Nails.....	.10
Four 6-inch bolts.....	.05
Five 4-quart milk crocks.....	.50
Total.....	\$1.25

Separators That Turn Hard.

It is a common complaint among hand-separator users that their machines become gummed and run hard. From time to time I receive letters from users telling me of this trouble, and I find in nearly every case it is due to the gumming of the bearings. This is a trouble so easily remedied that the user is often surprised at the simple method necessary.

When a separator becomes gummed and turns hard it may be quickly righted by using kerosene, gasoline or benzine in the oil-cups and whirling without the bowl in socket. Repeat this fast whirling several times, flushing in a good quantity of oil. In the great majority of cases the separator will then turn as easy as when new. It often happens that the oil used is of too heavy a quality, which naturally would tend to gum the bearings and cause the machine to turn hard. The oil should be light and thin, except where it is used with the steam turbine machines, when the heating would naturally demand a heavy oil. We find it practical to keep a special oil-can for kerosene among our separator uten-

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sils and make a regular practice of flushing the oil-cups and bearings with kerosene at least once in every two weeks. I have found very good results by mixing kerosene with ordinary

sperm-oil, but this is not always desirable.

Some makes of separators require adjusting at times, and such machines as have bearings with steel points will

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bear watching to prevent flattening of the bearings and thus cause hard turning. Take for example the United States and De Laval separators. When the bowls are dropped into the machine they are liable to flatten the lower bearings, and this will cause the machine to run heavily. Machines which have ball-bearings are liable to have the same trouble only in the flattening of the balls, or the wearing of the cones. It is a very safe practice from time to time to examine the bearings of the separator.

The question of "How long will a separator last me?" can be answered by the user. A machine well taken care of will give good service for a good many years. I have in mind a small hand-separator purchased seven years ago, which is now in good running condition and has only required a few dollars' worth of repairs during that time. This separator has been running twice a day during the seven years.

I know of other machines that have gone to rack and ruin in two or three years' time. It does not require any great length of time to take care of a separator in a proper way, and it is time well spent when we consider the life of the machine and the power required to run it.—A. L. Haecker, in Kimball's Dairy Farmer.

The Poultry Yard.

Scientific Poultry Raising.

The tremendous growth, during recent years, of the poultry and egg industry, which, in point of value of the product, now ranks as one of the leading American wealth-producing activities, has resulted in the introduction of modern scientific methods, which are quite as markedly in contrast to former practices as the advances in any other progressive field of endeavor. Indeed, to present-day achievements in this direction must be attributed the recent development of the American export trade in eggs, which has recently invaded markets as far distant as the Orient.

Perhaps the most convincing demonstration of what scientific methods are accomplishing in the poultry industry is afforded by the unique poultry-farm at Sidney, Ohio, which ranks as the largest in the United States, and probably in the world. The buildings which comprise the plant consist of two main structures and a number of smaller inclosures. All are of brick construction, with slate roofs; and more than \$100,000 has been expended in buildings and equipment, exclusive of the cost of the site, which comprises one hundred and forty acres.

The hatchery, or broiler plant, is 480 feet in length. The main portion of the building is built in the form of the letter U, and has a periphery of 840 feet. In the basement of the other part are thirty incubators, each containing three hundred eggs, so that there is a total of nine thousand eggs daily in a state of incubation. The filling of the machines is so timed, that one incubator will discharge its brood each day, and thus the plant may be said to have a daily hatching capacity of three hundred chickens. From the incubator cellar, the small chickens are taken to what is known as the "nursery," which constantly shelters six thousand young chickens, ranging in age from one to thirty days. When the chickens have attained the age of thirty-one days, they are lowered by an elevator to the ground floor and put in the U-shaped part of the building, which is divided into sixty pens. The chickens advance one pen each day, so that at the end of two months they have completed the circuit and are ready for transference to the shipping department. It may be noted, in this connection, that the U-shaped portion of the building is constantly tenanted by about twenty-one thousand chickens, ranging in age from thirty to ninety days. The egg-house at the Sidney plant is 537 feet in length, and similar in construction to the building above described. It is bisected lengthwise by a four-foot aisle, on each side of which are thirty pens containing fifty hens apiece. The three thousand high-grade Leghorn fowls produce daily two hundred dozens of unfertile eggs for culinary purposes. The eggs for the incubators are produced by nine hundred high-grade Plymouth Rock fowls. As indicating the proportion of loss, it may be stated that out of every four hundred and fifty eggs which go into the incubators, an average of three hundred perfect broilers are obtained. Connected with the egg-house is an egg-washing and marketing room, where the date is

stamped upon each egg sent to market.

One of the notable advances which have been made by the scientific poultry-farmer of the present day is found in the practice of herding chickens. Instead of allowing the hens to run at large as formerly, mingling freely and picking their food from all kinds of refuse, they are now divided into colonies of not more than thirty hens. Each colony has its own reservation, maintained in the highest state of hygienic cleanliness, and each group of hens is separate and isolated at all times from the others. This also facilitates the use of feed calculated to insure the greatest possible productiveness—a subject to which the United States Department of Agriculture, as well as progressive poultrymen, have of late years given great attention; and, as an indication of what has been accomplished in this direction, it may be pointed out that the average yearly yield at these scientific poultry-farms is in the neighborhood of two hundred eggs from each hen, whereas under the old conditions the average yearly yield per hen did not exceed forty eggs.

Another advantage of this new policy of segregation is found in the fact that, should a chicken become sick or breed vermin, the trouble can not spread beyond the one reservation without detection; and thus there is obviated the danger from epidemics such as have frequently in the past resulted in serious loss to poultry-raisers. Another new adjunct is found in the automatic nest, which preserves the eggs free from the taint of incubation. No degree of incubation is possible, because, by means of these new nests, the egg is removed immediately after it is laid. The automatic nest has a hole in the bottom, beneath which is a revolving disk that receives the egg as soon as it is laid and moves it away from the nest.

The growth of the poultry-business, as conducted on a large scale, could find no more significant criterion than the recent marvelous development of the incubator industry. The center of the incubator manufacturing business is found in the middle West, and one town in Illinois turns out more than fifty thousand incubators every year. It is estimated that not less than five hundred thousand incubators are now in use in the United States. Many of the large poultry-farms have incubators with a capacity of one thousand eggs each, and from which there may be hatched ten thousand chickens a year, the loss varying from five to twenty per cent. From a scientific standpoint probably the most interesting incubator plant is that erected by former Vice-President Morton, at Ellerslie, on the Hudson, although ex-President Cleveland has a high-class installation on an experimental farm at Princeton, and President Diaz of Mexico has a costly incubator built especially to his order by an American manufacturer.

Even in the testing of eggs, improvements have been made in the prevailing method. The most effective way of testing an egg is to subject it to the light, but under the old plan, when the egg was held close to the flame of a candle, it almost invariably happened that the shell was blackened. The use of electric light has, however, rendered conditions perfect for a thorough test of the eggs and the utmost speed in handling.

Finally, credit must be given to the new methods of securing speedy transportation for poultry products. Crude "freezers" have been displaced by modern refrigerator cars, and special "dairy trains" now convey eggs from Chicago to New York in less than sixty hours. Even in the event of unexpected delays, no serious loss is entailed, inasmuch as railroads such as the Pennsylvania, which handle much of this traffic, have extensive re-icing plants at various points, where the refrigerator-cars are freshly stocked with ice.—Scientific American.

Seasonable Poultry Points.

Always use a pure-bred male in the flock, no matter what breed it may be, and the chicks will not only be uniform but superior to those of the previous season. In no way can a flock of poultry be improved at so little cost as by the use of pure-bred males.

While fresh bone ground or broken into little pieces can not be excelled for feeding to poultry, they should, as nearly as possible, be fed just as they come from the shop as in those conditions they usually contain more or less gristle, grease and marrow; burning or allowing to dry loses these materials.

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Difficulty in Hatching Chickens.

Mrs. W. M. C., of St. John, Kans., writes: "I have a great deal of trouble trying to hatch chickens this spring. Many of them develop until they fill the shell but seem to die in the shell. My hens have the run of the farm and are very healthy. They sit well and I am unable to account for the difficulty."

The Kansas Experiment Station has been dealing in chickens for only two years and we have a good many things to learn. So far as our experience goes we think the difficulty with the eggs may be that they have too much or too little moisture. Where there is too little moisture the shell and the membrane next the shell become dry and hard and difficult for the newly developed chicken to work its way through.

On the other hand where the eggs contain too much moisture the young chickens are large and nearly fill the egg-cavity, the flesh however is largely composed of water and the young chicks do not have the strength necessary to work their way through the shell. D. H. OTIS.

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Principles of Horse-Feeding.

(Continued from page 655.)

beans are a common feeding stuff for horses. Though such feeds are known to be useful and valuable, they are seldom given to horses in the United States and few if any tests have been made with them at the American experiment stations. Muntz found that beans were quite thoroughly digested even when fed in such large quantities as 14 pounds per day. According to an English authority this amount would prove harmful, and 5 pounds of beans per day or a slightly larger quantity of peas is considered all it is desirable to feed.

OIL-CAKES AND OTHER COMMERCIAL BY-PRODUCTS.

The various cakes, gluten materials, and similar feeding stuffs are, generally speaking, commercial by-products. Thus, cottonseed-cake is the material left after the oil has been expressed from the cottonseed. In the same way, linseed-cake is the residue obtained in the manufacture of linseed oil. If this cake is ground it becomes linseed meal. In the manufacture of beer the malted grain is known as brewers' grain and is best fed after drying. When starch is manufactured from corn, the nitrogenous portion of the grain is rejected and constitutes gluten feed and gluten meal. The cereal breakfast food companies have placed many feeding stuffs upon the market made up of various by-products obtained in the manufacture of their breakfast foods and similar products. These feeding stuffs vary in value, but may generally be said to represent the branny portion of the grains from which they are derived.

Several years ago the New Jersey Station reported an extended study of the value of dried brewers' grains replacing an equal weight of oats in the ration of work horses. The uniformity in the amount of feed consumed and the weight of the animals, taken in connection with the work performed, indicates that there was no material difference in the value of the oat ration and that containing dried brewers' grains.

Timothy hay at the time being worth \$18, wheat bran \$17.50, corn-meal \$22, dried brewers' grain \$17, and linseed-meal \$29 per ton, it was calculated a farm horse weighing 1,000 pounds can be fed for \$30.84 during the six months of the year when the most work is performed if dried brewers' grain furnishes the bulk of the necessary protein, and for \$33.49 if wheat bran and linseed-meal are the chief sources of this nutrient. If the fertilizing value of the feeding stuffs is taken into account the difference in favor of the brewers' grain is less marked.

According to W. J. Kennedy, of the Iowa Station, gluten feed has been fed with excellent results by many prominent feeders, and is especially valuable in fitting horses for market. A ration composed of 2 parts gluten feed, 1 part bran, and 1 part soaked shelled corn was recommended. This is rich in protein and is suited to the needs of a hard-working animal. It is stated that the amount of the above mixture required averaged from 12 to 14 pounds per day for a horse weighing 1,400 pounds, or in general, a pound per 100 pounds live weight.

Cottonseed-meal has been fed to a greater or less extent to horses, especially in the South, with varying results; though on the whole the weight of evidence seems to be in its favor, the North Carolina Station, for instance, finding that 2 pounds per head could be satisfactorily given as a part of a mixed ration. The New Hampshire Station, as noted above, did not find cottonseed-meal as satisfactory as other materials in a mixed grain ration.

At the Louisiana Station this feed has given satisfactory results with horses and mules, 1 to 2 pounds per mule per day being fed with success. Six pounds is regarded as the maximum quantity which it is desirable to feed and animals should be led up to this amount gradually. Only bright yellow cottonseed-meal of a nutty, pleasant odor and taste should be used and no reddish or musty meal should ever be fed. As cottonseed-meal is a very concentrated feed excessive quantities should be avoided. Care should be taken that uneaten residues do not ferment in the feed-boxes.

The cereal grains, ground and unground, commercial by-products, leguminous seeds, oil cakes, and similar products are very frequently called concentrated feeds, the name being suggested by the fact that, generally speaking, the food value, especially the protein content, is high in compari-

son with the bulk. So far as the general experience and the results of American and foreign feeding experiments go, most of the common feeding stuffs in the group are wholesome and valuable for horses. If any one of these feeding stuffs is substituted for oats, which may be taken for a standard, the substitution should be proportional to the composition of the two feeds and not pound for pound.

FORAGE CROPS, FRESH AND CURED.

The various forage crops—grass, clover, Kafir-corn, corn, etc.—all have a high water content; that is, they are more or less succulent and juicy. They contain, however, considerable nutritive material, usually protein and carbohydrates, and are valuable feeding stuffs.

The leguminous forage crops—alfalfa, clover, cow-peas, soy-beans, vetch, etc.—are richer in protein than the grasses. When the forage crops are dried and cured the resulting hay is richer in proportion to its bulk than the green material; in other words, it has been concentrated by the evaporation of the greater part of the water present. However, this is not the only change which has taken place. When hay is properly cured it undergoes a peculiar sort of fermentation or oxidation which materially affects its composition.

As shown by recent investigations, fermentation improves the hay by diminishing the quantity of crude fiber and by increasing the relative amount of other nutrients, especially nitrogen-free extract. The greater the fermentation the more the crude fiber is diminished, and this is especially marked when hay is dried on racks. Hay which has undergone proper fermentation has a better flavor and agrees better with animals and is apparently more digestible than hay which has dried quickly in the sun without fermentation.

The feeding value of different forage crops, fresh and cured, depends in considerable degree upon the stage of growth, as has been shown by a number of chemical studies of the composition of different crops and cuttings of alfalfa, young and more matured corn forage, etc. Generally speaking, the nutritive value of the crop increases until growth is complete and diminishes somewhat as the plants mature or become overripe. Straw, the fully ripened stalk of cereal grains, contains some nutritive material, but is less nutritious than the same portion of the plant cut before ripening. In the perfectly ripe condition the nutritive material, elaborated in different portions of the ordinary forage plants, has been largely conveyed to the seed and used for its development or stored as reserve material.

Green forage crops are frequently preserved by ensiling. In this process the material undergoes a peculiar oxidation which correspondingly changes it in composition and food value. Some of the carbohydrates are changed into alcohol, acetic and other acids, and crude fiber is undoubtedly softened somewhat, and possibly the silage is thus rendered more digestible. Bodies having peculiar flavor and odor are also formed.

The green crops, hay, straw, other cured crops, and silage are frequently called "coarse fodder" or "roughage." This term is due to the fact that they contain a comparatively small amount of nutritive material and a high proportion of crude fiber as compared with their total bulk. Although inferior to concentrated feeds in composition, they are an essential part of the ration of horses and other farm animals, serving to give the required bulk to the food and being useful in other ways.

It is believed that unless the food, when taken into the stomach, is comparatively bulky and the mass is more or less loose in structure, it is not readily acted on by the digestive juices. The intestinal tract of the horse is long in proportion to the size of the animal, and food remains in it for several days. Experiments indicate that crude fiber, which is only slightly digestible by man, is quite thoroughly digested by horses, and even more thoroughly digested by ruminants, owing its digestibility to the fact that it is fermented for a comparatively long period by micro-organisms in the intestines.

A number of experiments have been made to learn the comparative value for horses of different forage crops, fresh and cured, the American experiment stations naturally having given their attention to the coarse fodders of most importance in this country.

The Virginia Station reported a number of trials on the value of corn silage for horses and mules. Gradually increasing amounts were fed until they

were given all they could eat, with hay and grain in addition. The tests indicated that silage is a satisfactory feed provided the animals are gradually accustomed to it. The New Hampshire Station, in connection with a study of the value of different grain mixtures for work horses, compared the relative merits of timothy hay and corn stover, the two sorts of fodder being found equally valuable under the experimental conditions. From the work of the Oklahoma Station, Kafir-corn stover is said to have a feeding value about equal to corn stover. Running the stalks through a thrashing-machine is considered a satisfactory method of preparing this feeding-stuff.

The value of oat straw, prairie hay, and brome-grass was shown by the work of the North Dakota Station, the brome-grass giving as good results when fed to work horses as timothy hay. When Bermuda grass hay and timothy hay were compared at the Mississippi Station, no marked differences in the cost of the rations nor in the gains made by mules were observed.

The results of extended series of experiments at the Utah Station have been very favorable to the use of alfalfa hay as a coarse fodder for horses. The fact is recognized that, like other leguminous crops, it contains a larger amount of protein in proportion to its bulk than timothy. Feeding alfalfa did not exercise any bad effects on the health of the horses. It is stated that attacks of colic and other digestive disorders can be prevented by a judicious system of feeding. In discussing their investigations the station points out that it is absurd to claim that a horse will not eat more than is necessary if allowed the liberty of the stack and the grain bin. The argument is sometimes advanced that a horse under natural conditions, on pasture, never eats more than is necessary, and that under these conditions he is never subject to digestive disorders. While this is undoubtedly true, it must be kept in mind that as soon as the horse is stabled and required to work, he has been taken away from his natural condition and placed in an unnatural environment.

It was observed that larger amounts of water were consumed on the alfalfa ration and that the amount of urine excreted was also larger and had a higher specific gravity. The excess, however, was never found great enough to cause any inconvenience. These experiments at the Utah Station are especially interesting since they confirm the results of twelve years' practical tests of the feeding value of alfalfa. During this period the station horses have always received this material as a coarse fodder, except when they were fed other rations for experimental purposes.

The Wyoming Station has also made some experiments which demonstrate the value of alfalfa hay as a horse feed. In discussing the subject of alfalfa for horses, the California Station says in effect that in regions where it is a staple crop the quantity of protein which can be supplied in green and cured alfalfa is so great that much less grain is required than when the coarse fodder consists of cereal hays only. For the Pacific coast, where cereal hays replace so largely those from meadow grasses, the station recommends a ration of alfalfa hay with wheat hay or barley hay and grain.

In a recent discussion of horse-feeding under local conditions the Louisiana Station has pointed out the value of cow-pea-vine hay.

The outcome of the different experiments is in accord with the observation of careful feeders, viz., that the various common coarse fodders may be fed to horses as circumstances demand. Although timothy hay is in many regions regarded as the preferable coarse feed, yet experience has shown that corn fodder, hay from wheat, barley, and other cereal grains, and from clover and alfalfa may be substituted for it. That this is what might be expected is shown by a study of the composition of these feeding stuffs. They resemble one another very closely in the character and amount of nutrients which they contain—alfalfa, clover, and other leguminous hays being richer in protein than the cured grasses and cereal forage. Straw is not much fed to horses in the United States, but is a common feeding stuff in Europe. As shown by its composition and digestibility it compares quite favorably with other coarse fodders. In accordance with the general principle the substitution of one coarse fodder for another in a ration should always be made on the basis of composition and digestibility, rather than pound for pound.

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Very few tests have been made on the comparative value of different uncured feeds or different sorts of pasturage in horse-feeding, though all the common forage crops are regarded as wholesome if properly fed.

Such feed is known to be very dependent upon the fertilizer used for the crop, the method of harvesting, and the condition of the animal fed. Thus it is said that for young horses grass grown on dry land rich in lime produces compact and well-developed bone. Green fodder does not contain sufficient nutritive material in proportion to its bulk to make it an adequate feeding stuff for horses performing much work, but its importance as pasturage is well recognized.

ROOTS AND TUBERS.

Carrots, Swedish turnips or rutabagas, and other roots and tubers, green vegetables, and fruits contain a high percentage of water and small amounts of the different classes of nutrients. Generally speaking, the percentage of crude fiber is smaller than in the green forage crops; but since the proportion of nutritive material is small in comparison with the total bulk, they are ordinarily referred to as

coarse fodder. The use of these materials as food for horses has been attempted at different times with varying success, but it is not followed to any great extent in this country, though quite common in Europe.

Ten pounds of roots has been suggested as the maximum quantity which may be fed without unduly distending the stomach or being too laxative. "An addition of five or six pounds of carrots to the daily food ration of ordinary working horses," Captain M. H. Hayes believes, "will almost always be of benefit; and three pounds a day will not be too much for race horses, even in the highest state of training. It is safest to give carrots sliced longitudinally, so that they may not stick in the animal's gullet and thus choke him."

In the opinion of a recent German writer, about twelve pounds of raw potatoes per thousand pounds live weight may be fed to horses with advantage and, if supplemented with proper feed, there need be no fear of physiological disturbances. When fed in this amount the potatoes should be mixed with hay or cut straw to insure their being properly chewed. If small, they may be fed whole; if large, they should be sliced. In any case only ripe, healthy, unsprouted tubers should be used. It is said that horses should not be watered immediately after a ration containing potatoes.

MOLASSES AND OTHER BY-PRODUCTS OF SUGAR-MAKING.

The beet chips, diffusion residue, and other by-products obtained in the manufacture of beet-sugar, consist of the sugar-beet from which a considerable portion of the carbohydrates has been removed. The total amount of nutritive material present, however, is fairly large. These products, properly speaking, are coarse fodders. Molasses, which consists almost entirely of carbohydrates (sugars), was used as early as 1830 as a feed for horses, and has recently attracted considerable attention in this connection. When used for this purpose it is usually sprinkled on dry feed, being first diluted with water, or it is mixed with some material which absorbs it and renders it easy to handle, such as peat dust, or with some material rich in nitrogen, as dried blood. In the latter case the mixture more nearly represents a concentrated feed than the molasses alone, or molasses mixed with an absorbent material only. Cane-sugar molasses is also used as a feeding stuff. It differs from beet molasses, in that it contains glucose in addition to cane sugar, and has a much smaller percentage of salts.

The number of experiments which have been reported in the last few years on the feeding value of molasses is fairly large. According to the Louisiana Station, cane-sugar molasses has been extensively used for some time locally as a feed for horses and mules, many feeders keeping mules exclusively on rice bran and molasses in addition to cow-pea hay. The general custom is to feed the molasses from a large trough, allowing the mules to eat ad libitum. It is said they will consume, with apparent relish, from eight to twelve pounds per head daily. The mules at the Louisiana Station have been fed molasses daily ad libitum for eight or ten years, and, it is stated, show its good effects "in their splendid condition, lively action, and endurance of work."

When molasses, diluted with water and sprinkled over chopped hay, was fed to some army horses in Porto Rico for about five months the condition of the horses improved. Apparently a daily ration of thirty-five pounds of grass and thirteen to fifteen pounds of molasses per 1,000 pounds live weight was sufficient to maintain a horse in good condition. It was noted that molasses possessed some disadvantages, namely, it attracted insects, notably flies and ants, stuck to the animal's coat, smearing his face and breast, halter and halter strap, etc., and caused some trouble and delay in mixing it with the other feeds.

Other tests in the United States, France, Holland, and elsewhere have been favorable to the use of molasses as a feeding stuff, and from the results of all these, it seems fair to conclude that it can be safely fed to horses when its cost in comparison with other feeding stuffs warrants its use, a quart night and morning, diluted with water, being apparently a reasonable amount. Apart from the nutritive material molasses supplies it has a value as an appetizer and frequently renders poor hay or other feed more palatable.

In Europe favorable results have attended the use of such mixtures as

blood-molasses, but these feeds are as yet little known in the United States.

FRUITS, FRESH AND DRIED.

Although horses are often given apples as they are given lumps of sugar, fruit is not generally thought of as a feeding stuff, yet its use for this purpose is by no means novel. The Arabs, it is said, commonly feed their horses fresh dates, which are apparently eaten with relish. Sometimes the dates (three or four pounds at a time) are mixed with water to a sort of mush before feeding. It is believed that dates are fattening, but that they do not produce muscle.

In California, and possibly in other regions, fruit, especially prunes and other dried fruit, is sometimes fed when the market is overstocked or when for some other reason it can not be profitably sold. According to a statement recently published, small prunes of low market value have been successfully fed to horses for a long period. It is stated that the horses eat them with relish. The pits should be crushed before feeding.

All common fruits when fresh are very succulent, containing on an average 80 to 90 per cent water, the nutritive material consisting almost entirely of carbohydrates. When dried—i. e., concentrated by evaporation—they are much more nutritious. Raisins, prunes, dried peaches, etc., contain about 25 per cent water and about 70 per cent carbohydrates, of which a considerable part is sugar. The value of sugar as a nutrient is recognized, and it is not surprising, therefore, that fruits, especially after drying, should have a considerable feeding value. The feeding value of fruit has been especially studied at the California Station.

Succulent fruits or vegetables are little used in the United States, but it is interesting to note that in South Africa pumpkins are often given to horses as green feed. In Oklahoma and doubtless other regions where they are grown extensively, stock melons are fed to all farm stock, including horses, when there is a shortage of other succulent crops.

INJURIOUS FEEDING STUFFS.

In feeding horses precautions should always be taken to avoid materials harmful in themselves, or those which have become harmful. Dirt, small stones, etc., should be removed from grain by proper screening, and all feeding stuffs should be clean.

There are a number of plants which are poisonous to horses when eaten in any considerable amount. The loco plants, mostly species of *Astragalus*, are ordinarily regarded as of this class. These plants have been studied by the Colorado, Kansas, South Dakota, Montana, and Oklahoma Stations among others, and by this Department, but the results obtained are not entirely conclusive. The poisonous properties of rattlebox (*Crotalaria sagittalis*) were demonstrated by the South Dakota Station, and those of some lupines by the Montana Station. According to recent experiments at the Vermont Station the common horsetail (*Equisetum arvense*) may cause poisoning when present in hay. It was found that when horses were fed cured horsetail equal in amount to not more than one-fourth of their coarse fodder ration, symptoms of poisoning were noticed, and if the feeding was continued the horses died. The symptoms of poisoning were less noticeable with young than with old horses, and also when a liberal grain ration was supplied. It was also observed that the green plant was less harmful than the dry, possibly owing to the fact that green fodder is somewhat laxative.

Feeds which are ordinarily wholesome may under certain conditions be harmful. Thus, there is a widespread and apparently justifiable prejudice against moldy or decomposing feeding stuffs. Experiments carried on at the Kansas and Indiana Stations showed that the continued feeding of moldy corn induced intestinal and nervous disorders of a serious nature. It is a matter of common observation that feed which has been wet will ferment or sour readily and cause intestinal disorders. This has to be guarded against especially in warm climates.

Plants which are ordinarily wholesome may become harmful if infested with ergot. The effect of ergot on horses has been studied by the Iowa, Kansas, and Montana Stations and others. It is generally conceded that the presence of ergot is a cause of rheumatism. Some feeds which are regarded as wholesome when properly fed may sometimes prove injurious if fed for a long time or in improper quantities. Thus, millet hay, in many sections of the Western United States,

is believed to cause the so-called millet disease of horses. This question was studied by the North Dakota Station. It was found that long-continued feeding of millet hay caused lameness and other symptoms of poisoning, but the specific cause to which the dangerous properties of millet are due was not learned, though later work at the station indicates that it is a glucosid.

An explanation of the poisoning of stock by young sorghum and some other forage plants is offered by the discovery of a peculiar glucosid in a number of varieties of sorghum (*Sorghum vulgare*), which, under the influence of a special ferment present in the plant, liberates prussic acid. It is thought probable that this acid, which is a very active poison, may be likewise liberated in the digestive tract of animals feeding on the young plants.

For a number of years the Nebraska Experiment Station has studied sorghum poisoning, and has recently demonstrated the presence of prussic acid in the green leaves of young and old sorghum plants and Kafir-corn. The poison, it is stated, is always present in at least minute traces, but becomes dangerous only when the plant is arrested by dry weather at certain stages of its growth. Sunlight, such as prevails in the arid and semi-arid regions of the United States, causes the development of the poison in excess.

(To be continued.)

WEEKLY WEATHER-CROP BULLETIN.

Weekly weather-crop bulletin for the Kansas Weather Service for the week ending June 16, 1903, prepared by T. B. Jennings, Station Director.

GENERAL CONDITIONS.

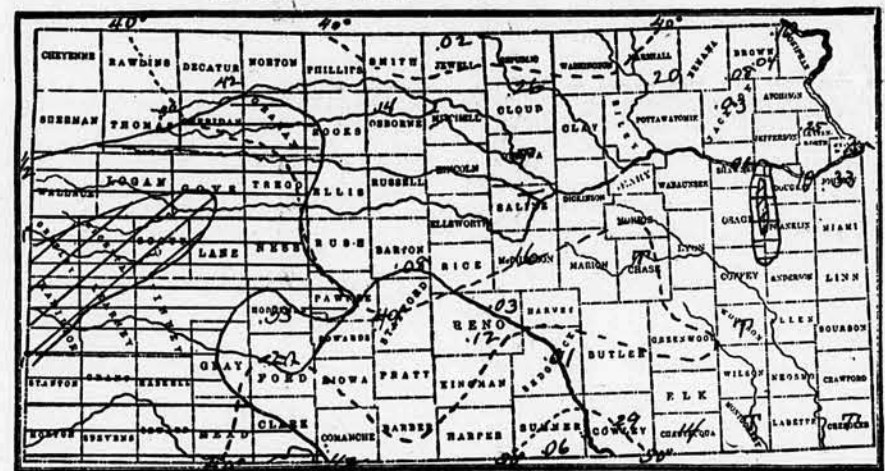
Light showers occurred in most of the central and eastern counties while over the larger part of the western division fair to good rains fell. The week was cool, some mornings being cold, with much northerly wind.

RESULTS.

EASTERN DIVISION.

Wheat is ripening in the central counties; in the extreme southeastern counties it has been damaged and will be a poor crop; it has improved very much in Bourbon and Chautauqua and will now yield a better crop than expected

Rainfall for Week Ending June 13, 1903.



Minimum temperature shown by broken lines.

SCALE IN INCHES.

Less than 1/8. 1/8 to 1. 1 to 2. 2 to 3. Over 3. T, trace.

In those counties; the general condition in this division is good. The drying weather has enabled the farmers to work and the cultivators have been busy in the cornfields; the upland corn is getting a better color and otherwise improving. The corn though small has grown rapidly in Chautauqua this week where most of it has been cleaned; in Coffey many have planted their second crop. The bottom corn is weedy and yellow, but the color improves as the fields are cleaned. Oats are in very good condition, and have begun heading in the central counties. Grass is fine—wild and tame. The first cutting of alfalfa is in progress and a fine crop is being gathered. In the extreme south apples will yield nearly a full crop, but over the rest of the division the yield will be light and in several counties the quality will be inferior. Upland potatoes are growing well and are now in bloom. Flax is looking well in Cherokee, but in Coffey it is not doing so well. Peaches will be abundant in Crawford and blackberries in Cherokee. Montgomery reports destruction of crops by overflow on 15,000 acres in the Elk and Verdigris valleys; in the Kaw river bottoms the farms were either washed out, or covered with sand.

Allen.—Wheat improving and promises well; oats very good; corn conditions bad and much to be planted yet; alfalfa fine and all grasses good.

Brown.—Planting for field-work; about sixty per cent of corn ground planted; the rest will be planted to forage crops or remain idle except on the bottoms where it will be prepared for wheat; oats heading; alfalfa should be cut but there is too much other work on hand; land baking badly and is hard to work.

Bourbon.—Wheat promises large yield; corn not all planted, but some is up and being worked; some of it looks sickly; apples about a half crop; have been dropping badly.

Brown.—Planting, replanting, and cultivating corn in progress; considerable land yet unplanted; early planting a fairly good stand, but much was washed out by the heavy rains; wheat prospects good on uplands, but considerable damage was done on the lowlands; rust on the leaves in places; oats in good condition; crops need good weather.

Chase.—Alfalfa cutting being rushed; corn backward; considerable washed out in the bottoms; many fields are weedy; ground hard and difficult to work; apples very light crop, confined to a few winter varieties; wheat damaged on bottoms, very fine on uplands.

Chautauqua.—Apples now doing well, a full

crop is promised; corn is small but mostly clean and is now growing rapidly; wheat coming out better than expected and a fair crop is promised. Cherokee.—Farmers very busy in fields; corn is yellow and weedy; oats and flax generally look fairly well; wheat promises but light yield for the county; good crop of blackberries promised. Coffey.—Corn planting and cultivating being rushed; early planted corn weedy and making slow growth; surface of ground hard and dry; needs a shower; flax not looking well, has had too much rain.

Crawford.—Apples very scarce; corn poor; very few farmers have much in; wheat poor and not growing well; oats doing well; there will be plenty of peaches.

Doniphan.—Wheat will be a light crop; oats fairly good; corn very backward and yellow; will be some fruit; week has been cool and dry.

Franklin.—Considerable corn planted and replanted during the week; some corn was a fair stand and is growing all right.

Greenwood.—Prospects for apple crop very poor; corn land not all planted; some planting; stand poor; growth unsatisfactory; pastures and meadows good; stock doing well on grass.

Jackson.—Very few apples on the trees and these are knotty and of bad shape; wheat promises an average crop except where damaged by high water; farmers are very busy planting and working their corn and the prospects are much more favorable than a week ago.

Jefferson.—Apples only about one-fourth crop and inclined to be knotty; small acreage of wheat left after the overflow, but the prospects are fair to good; much corn yet to plant and the early planted is very weedy.

Johnson.—Apples about one-half crop; prospects for corn very poor; much corn ground will not be planted; much replanting needs to be done; wheat looks fairly well except on low ground where some is damaged; timothy and clover look well; all crops badly damaged in the Kaw valley.

Leavenworth.—Wheat not damaged by high waters promises a good crop; corn grows slowly; much not yet planted or to replant; potatoes look well but are weedy; pastures are good; stock doing well.

Linn.—Cool weather good for wheat which promises a fair crop; corn prospects not good; only half the corn planted when the rains came; the first planting looks fairly well but needs working; apples not over half a crop.

Marshall.—Wheat and oats are doing finely; corn on uplands is in good condition but the bottoms have been damaged, not so much as was feared however; surface of ground hard but breaks up fairly well; grass is doing well; alfalfa is being cut and is a fair crop; potatoes and gardens are good; there will be a very few apples.

Miami.—Apple crop very poor; wheat shows rust and will be poor; corn about half planted and what is up is a very poor stand.

Montgomery.—Farmers busy planting and working the corn; some flooded bottoms are being replanted; upland corn has made a good growth; some rye has been cut; wheat harvest begins next week; only a light crop is expected; 15,000 acres in the Elk and Verdigris valleys a total loss; many varieties of apples will make a full crop, and there will probably be over a half crop altogether.

Morris.—Corn planting on overflowed land being pushed rapidly; alfalfa being put up in good condition, but making slow growth by reason of standing too long; potatoes in bloom on higher ground and very promising, but nearly a failure on low ground.

Pottawatomie.—Clear and cool week; apples

outside flooded district very light; corn late and much to replant; wheat almost a failure; all crops destroyed in flooded district; very few sweet potatoes will be set as most of the plants were destroyed.

Riley.—Apples poor stand and dropping from cold weather and hailstorm; wheat and corn good on upland; alfalfa good except on lowland where it was flooded.

Shawnee.—Corn planting and cultivating resumed; early corn is growing rapidly, but is weedy; pastures and meadows good; cattle doing well; alfalfa rusting and leaves dropping; some beginning to cut first crop; very few apples in some parts of the county, but a good half crop in others.

Wabaunsee.—Wheat not hurt so badly as expected; corn grows slowly, nights too cool; second crop being planted in flooded fields, alfalfa very fine; grapes making second growth and bloom.

Woodson.—Apple crop will be light; corn is backward but has improved during the last week; wheat damaged some by excessive rains; much of the unplanted corn ground will be planted to Kafir-corn, millet and sorghum; oats heading and promise well.

Wyandotte.—A good week for work; wheat beginning to turn; oats heading; corn weedy and yellow; pastures fine and stock in good condition; meadows fair but weedy; potatoes in bloom; cherries ripe.

MIDDLE DIVISION.

Wheat harvest has begun in the south; wheat is ripening in the central counties and is blooming in the northern; in general the crop is in very good condition though there is some report of rust in Barton and Butler; much of the wheat in Saline was injured by the wet weather, and many fields were ruined by flood; the bottom wheat is not in good condition in Clay or Cloud but the upland wheat is very fine. Corn is small and backward but it is now being cultivated and has commenced to grow, though warmer weather is needed for that; much replanting has been done. Oats are generally in fair to good condition though Sumner reports some poor and yellow. Oats are headed in Sumner. Rye is doing well in Phillips. The first crop of alfalfa is being cut in most of the counties while in Barton it is nearly all stacked; it is a very good crop. Grass is fine. Early apple trees are loaded in Clay and some apples are found on all the trees in Sumner, there is nearly half a crop

promised in the south, but few in the north.

Strawberries are ripe, and a fair crop in Reno. Potatoes are doing well in Phillips and Washington. Kafir-corn and cane are being sown in Reno.

Barber.—Good week for farmwork; wheat ripening and will be ready to harvest in about ten days; too cool for corn to grow rapidly, yet it is doing well; apples continue to fall and will be scarce; oats doing well; cattle on range doing well.

Barton.—Some complaint of rust in wheat; fair crop promised; oats and barley promise fairly well; alfalfa nearly all in the stack.

Butler.—Fair progress has been made in cleaning the corn; considerable acreage unplanted; average stand poor; good crop of alfalfa being harvested; oats good; wheat yellow with leaf rust; will be light crop; light crop of early cherries ripe; apples showing more scab than usual, early varieties worst.

Clay.—Wheat on upland generally much better than expected; large yield expected; corn growing slowly; replanting nearly finished; first crop of alfalfa harvested.

Cloud.—Apple crop not very promising; wheat on bottom lands not in good condition but that on uplands promises a good crop; good stand of corn on uplands, but it needs warmer weather; corn is being replanted in the river bottoms where the ground is dry enough to work.

Cowley.—Fine week for farmwork; harvest has begun; good yield of early wheat, late also promises well; nights too cool for corn to grow well but good weather for cultivation; stand of corn poor in many places; alfalfa crop fine; apples promise more than last year; early trees heavily loaded and will soon be ready for market.

Ellis.—No fruit of any kind in this vicinity, killed by frost and snow; corn is backward, too cool and wet; most wheat looks fine, but some stubble fields are only fair.

Harper.—Wheat harvest has begun; crop ranges from fair to very good; corn backward but doing well now; oats fine; not over half a crop of apples promised.

Jewell.—Fine week for farmwork; corn nearly all planted and some cultivated; alfalfa delayed on account of shortage of help.

Kingman.—Apples doing well and promise a fair crop; rather cool for corn, but there is a good stand; fields are being rapidly cleaned of weeds; wheat in good condition generally; the grain is in the dough and hardening in some fields; good prospects for a large yield of good quality.

McPherson.—Wheat is generally good, nicely headed, but most stubble ground is a poor stand; corn small but growing well since cultivation began; oats good; good crop of alfalfa in shock; grass fine; no fruit.

Osborne.—No apples or fruit of any kind; corn very backward on account of cool weather; wheat in bloom and looks fine.

Ottawa.—Apples almost a failure; corn stunted and yellow, doing no good; too cool, some to plant yet; wheat prospects very good where the ground was well prepared, and where it was not drowned out.

Phillips.—Wheat, rye and corn doing fine; weather favorable for harvesting alfalfa which is a heavy crop; prairie hay growing nicely; potatoes good.

Pratt.—A fine week for all growing crops; wheat heading and filling well; pastures are fine; corn-plowing is well under way.

Reno.—Corn growing well and cultivation progressing rapidly; cane and Kafir-corn being sown for fodder; good crop of alfalfa being put up; wheat much improved, fair to good crop promised; fair crop of strawberries now ripe; apples will be very light crop, nearly all have dropped off.

Republic.—Very busy week; some planting corn, others replanting and planting cane and Kafir-corn, but plowing fine is the principal industry just now; wheat looks fair but shows some rust; oats look fair; alfalfa is being cut.

Saline.—A favorable week; thousands of acres of corn have been drowned out and washed away, and very few fields have a good stand left; wheat greatly injured by continued wet weather, and many fields ruined by floods; many large fields of alfalfa destroyed; apples practically a failure.

Sedgwick.—Corn is good, some being plowed the second time; wheat looks fine and is turning; apples good in some localities but very poor in others.

Stafford.—Good week for all crops; wheat in blossom; farmwork progressing well.

Sumner.—Very favorable weather for wheat; soft wheat ready to cut, hard wheat filled and beginning to turn; corn small, ground hard and very weedy; this week is the first that the ground has been dry enough to work; some oats are poor and yellow, and other fields are very good; apples not very plentiful, but they appear to be healthy and growing well.

Washington.—Farmers busy replanting corn; too cold for corn to grow well; heavy rains and high waters have greatly damaged all crops; wheat and oats look well; alfalfa is being harvested; potatoes and gardens are doing well; there is no fruit.

WESTERN DIVISION.

Wheat is in good condition, though Clark reports some rust, and too cool to ripen the grain; it has headed over most of the division and is heading well in Ford and Kearny, and is in bloom in Thomas. Corn though backward is about all up, and has made fair growth this week; in Thomas it is having a struggle between the dry weather and the squirrels. Oats are very promising, and in Ness are beginning to head. Rye promises a good yield in Finney. Barley is doing well; it has headed in Finney and is heading in Lane and Thomas. Alfalfa is doing well; the first crop is being cut in most of the counties while in Finney the second crop is well advanced. The range grass is very fine and is Lane some June grass is being cut. Potatoes are very promising, and in Ness are large enough to use.

Clark.—Some rust on wheat; weather too cool for grain to ripen rapidly.

Finney.—Crop conditions fine; wheat, rye and barley in full head and promise a large yield; range grass unusually good and cattle in fine condition; second crop of alfalfa well advanced.

Ford.—Rain has revived wheat in west part of county and all wheat now promises a good yield; wheat stands fine and is heading nicely; barley and oats are fine; corn is very backward and the prospects poor; apples and all other tree fruit killed by the frost.

Gove.—Corn all planted, but grows slowly; alfalfa is being cut with a light yield, but spring sown alfalfa looks fine; oats and barley improving; millet and cane doing well; grass unusually fine, and cattle in good condition; cherries are falling off.

Hodgeman.—Favorable weather during the past week, except cool nights.

Kearny.—Alfalfa harvest begun; crop light on account of cool, wet weather; corn all up with a good stand, but too cool for rapid growth; wheat very promising; fruit about all killed; there will be no apples; plenty of moisture in the ground.

Lane.—Corn grows slowly and is somewhat yellow; barley is heading but is uneven; some alfalfa and June grass being cut; abundant moisture in ground but too cool.

Ness.—Sunshine needed for corn and cane; wheat nearly headed and is very good; barley very uneven; oats looking fine and beginning to head; early millet covers the ground; more Kafir-corn being planted than ever before; alfalfa being cut and is damaged by rain; range-grass unusually good; stock doing well; corn being cultivated and is improving; new potatoes big enough to use, late potatoes in blossom; wild grapes blooming.

Norton.—Good week for farmwork; alfalfa being cut, crop light; wheat unusually good; too cool for corn to grow; gardens and potatoes fine; no fruit except strawberries, which are now ripe.

Sheridan.—Wheat nearly all headed; most of it rather thick, but looks well; corn backward, too

cool; grass fine; alfalfa mostly out; more sunshine needed.

Thomas.—Rain has benefited all kinds of small grain; wheat looks fine except in the northeast part of the county where the heads are short; corn and Kafir-corn have poor stand owing to dry weather and squirrels; barley heading and looks well.

Trego.—Alfalfa nearly all cut and half stacked, heavy crop and good quality; wheat all in head; oats promising; corn still backward.

Wallace.—Rye, wheat, and barley promise good crops; forage crops not all planted, but some are up and doing well; corn doing nicely, rather cool for good growth; range-grass fine, and cattle doing well; gardens look fine; there will be a fair crop of cherries and plums, and a few apples.

A Lesson of the Times.

It is a very neat and attractive hanger in several colors and half-tone effects, handsome enough for home decoration, which the Studebaker Bros. Mfg. Co. are sending out under the above title. It would be more aptly described as a pictorial history of the rise of a great manufacturing establishment. The upper panel pictures the unpretentious but now famous Studebaker blacksmith shop of 1852—the bud in which was wrapped up the brilliant Studebaker future. For it was this humble shop that by growth, development and enlargement is the logical predecessor of all that the great plant now boasts. Following this is an excellent reproduction of the plant as it now is, with the legends "Largest in the World" and "Plant Covers 101 Acres." Below are tastefully grouped the five Studebaker brothers whose faces have become so familiar, and from a cornucopia on either side of this group comes all manner of vehicles, typical of the endless stream which flows from the Studebaker factory to all corners of the earth. This hanger, 20 by 38 inches in size, framed top and bottom, may be had by writing the Studebaker Bros. Mfg. Co., South Bend, Ind., an enclosing six cents in stamps to pay postage. It ought to be in every school-house in the land.

THE MARKETS.

Kansas City Live Stock and Grain Markets.

Kansas City, Mo., June 15, 1908. After an enforced cessation of business for two weeks, owing to the presence here of the most disastrous flood in the history of the city, the stock yards officially reopened for business to-day. Receipts were 1,500 cattle, 4,000 hogs, and 500 sheep. Two packers were in the field for supplies, while three are still crippled. Moderate supplies of all classes of stock, with the exception of quarantine cattle, can be handled here for the coming week and after that it is expected heavier runs can be taken care of. Top cattle brought \$4.85 to-day. They were consigned by Z. T. Heath, of Erie, Kans. The bulk of the best steers sold at \$4.50@4.80; with Southwesterns at \$3.75@4; and cow and heifer stuff at \$3@3.85. Hogs brought \$6 for top with the bulk of all sales at \$5.70@5.95. Sheep sold at \$4.50 for native ewes; \$6@6.50 for good lambs and \$4@4.25 for plain muttons. The horse market will not start up until Monday, June 22.

The damage done to the yards proper by the flood approximates \$200,000. None of the brick barns collapsed but several sections of the walls were torn away. The exchange building stood in about ten feet of water, the basement offices being damaged to the extent of \$25,000. The loss of live stock was comparatively light, owing to the flood coming on Sunday. About 500 cattle were drowned, 1,600 hogs, and 1,850 sheep. The sheep loss included 1,500 head in private feed-lots across the river. Sixteen bridges spanning the Kaw at this point were washed down the stream, only one, the Missouri Pacific railway bridge, withstanding the current. Nineteen heavy locomotives were placed on this structure to weight it down and the attempt was successful. Two bridges belonging to the stock-yards company were washed away and it will cost \$100,000 to replace them. Twelve hundred mules were quartered in the barns when the floods came up, but all except fifty head were driven to places of safety.

The wooden pens and fences of the yards company withstood the floods far better than was expected and no great difficulty was experienced fitting up enough pens in time for business to-day. One of the serious problems that confronts the yards company is the question of transportation of live stock across the river now that the drive-way bridges are out. The yards company proposes to hastily construct a pontoon bridge over which newly purchased stock will be driven to the Schwarzschild, Swift, Cudahy, and Ruddy plants. The Armour and Fowler plants are luckily on the same side of the river as the yards.

The damage done to property in the river bottoms is enormous, that to private residences exceeding calculations, while the damage to packing houses will not prove so great as was anticipated. Armour's loss was mainly caused by mud covering basements. Fowler's was the same. The waters were twenty feet deep around the Cudahy, S. & S. and Swift plants and the losses were necessarily greater. It will take about another week for these last-named plants to be in good running order.

Although the yards were not officially opened for business until to-day, 400 cattle, 700 hogs, and two cars of horses arrived Saturday. The first cattle sold belonged to Robinson & Capelle, of Oak Grove, Mo. They were steers weighing 1,234 pounds and brought \$4.85. Charles Coppack, of Rosedale, Kans., sold the second draft, two bunches of grass cows bringing \$2.85. W. J. Buster, of Lyons, Kans., shipped a car of horses into the yards on Thursday and this was the first consignment of stock to arrive since the flood came on May 31.

Poultry and grain quotations at Kansas City to-day were as follows: Eggs, 11@11½c; hens 9½c; springs 12c; broilers 18c; ducks 10c; geese 6c; turkeys 8½@9½c; butter 15@20c; potatoes, new 90c@1.20; strawberries 75c@82c per crate. No. 2 wheat 68@71c; No. 4, 65@68c; corn, No. 2, 50@52½c; oats, No. 2, 40@42c. Tame hay \$9@13; prairie \$7@12; alfalfa \$9@12.

H. A. POWELL.

When writing advertisers please mention Kansas Farmer.

Special Want Column

"Wanted," "For Sale," "For Exchange," and small or special advertisements for short time will be inserted in this column without display for 10 cents per line of seven words or less per week. Initials or a number counted as one word. Cash with the order. It will pay. Try it.

CATTLE.

REGISTERED HOLSTEINS FOR SALE—If you want a herd bull, write me for price on an elegant young bull, 15 months old, Sir Henry of Buffalo. His dam has a record of 72½ pounds milk in one day, 481 pounds in 7 days, and 2040 pounds in 30 days. His sire was one of the prize bulls at Omaha Exposition. Also a few splendid cows and several other young bulls. C. C. Lewis, Baldwin, Kans.

FOR SALE—A. J. C. C. St. Lambert bull calf dropped September 30, 1902, solid dark color; guaranteed a No. 1 individual or money refunded. Edward Hunzicker, Colony, Kans.

FOR SALE—60 head good grade Hereford 2-year-old heifers. Evans Wilcox, Leoti, Kans.

FOR SALE—Five head of pure bred Hereford bulls of serviceable age. Address, A. Johnson, Clearwater, Kans., breeder of high-class Herefords.

FOR SALE—Two shorthorn bulls, one my herd bull Belina Joe 149240 and General Washington 197264. Write W. H. Shoemaker, Narka, Kans.

FOR SALE—Registered Aberdeen-Angus cattle. Fifteen bulls of serviceable age, 9 from 18 to 24 months old, also my herd bull for sale or exchange, and a number of young cows with calves at side. I am making special prices to reduce herd on account of shortage in pasture. A. L. Wynkoop, Bendena, Kans.

FOR SALE—A few choice Shorthorn heifers and young bulls. M. C. Hemenway, Hope, Kans.

FOR SALE—Guernsey bulls from best registered stock. J. W. Perkins, 423 Altman Building, Kansas City, Mo.

SWINE.

FOR SALE—B. F. Tecumseh (68087), a fine yearling Poland-China boar. A first class individual and breeder. Write for breeding. I. R. Moore, R. F. D. 1, Wichita, Kans.

FOR SALE—Duroc-Jersey boar, ready for service. He is from the famous Blocher-Burton stock. February pigs now ready for sale. J. P. Lucas, 113 West 23rd St., Topeka, Kans.

FOR SALE—A few nice young boars of October farrow, sired by Kansas Chief, a son of Chief Tecumseh 3d. C. M. Garver & Son, Abilene, Kansas.

SEEDS AND PLANTS.

FOR SALE—Siberian millet seed, 50 cents per bushel, new sacks 15 cents extra. L. A. Abbott, Wamego, Kans. Can ship over C. R. I. & P., Santa Fe, or U. P.

FOR SALE—Golden Yellow popcorn, very productive, excellent for popping, very tender. Packet 6 cents; 7 pounds 50 cents. J. P. Overlander, Highland, Kans.

200,000 FRUIT TREES! Wholesale prices; new catalogue. Baldwin, Nurseryman, Seneca, Kans.

HORSES AND MULES.

MULES FOR SALE—A car-load of 1- and 2-year-olds; willing to take part pay in trotting-bred stallions. Address Otto D. Stallard, Sedan, Kans.

WANTED—To buy or trade, a Clydesdale stallion for a span of good mules. H. W. McAfee, Topeka, Kans.

PROSPECT FARM—CLYDESDALE STALLIONS, SHORTHORN CATTLE AND POLAND-CHINA HOGS. Write for prices of finest animals in Kansas. H. W. McAfee, Topeka, Kans.

POULTRY.

BARRED ROCKS ONLY—Heavy boned, vigorous stock, unlimited range. Eggs carefully and securely packed. 100, \$4, 15, \$1 Adam A. Wier, Clay Center, Neb.

South St. Joseph Live Stock Markets.

South St. Joseph, Mo., June 15, 1908. Owing to the fact that both Kansas and East St. Louis markets were drowned out, liberal receipts of cattle were expected last week, but supplies were not large, which indicated that the condition of the railroads is still bad from the heavy rains, although 10,000 cattle were received to-day. The demand was vigorous from all of the dressed beef men and prices advanced 25@35c. Cow stuff was in good demand at 15@25c higher prices. Stock cattle were under the needs of the buyers on each day and the week closed with prices up 15@25c.

Arrivals in the quarantine division were small and far under the needs of the buyers, and values for both steer and cow stuff gained 15@25c.

The trend of hog prices was upward the greater part of last week, although towards the close receipts were materially increased and a small part of the advance was wiped out. The demand was strong from all of the buyers. The quality was of good average, but weights did not show up so strong as for the past several weeks. The tops to-day were made at \$6.15 with the bulk of sales at \$6@6.05.

Arrivals in the sheep department were larger than of late, but the demand was fully equal to the increased supplies. The markets East were bad late in the week, which caused local buyers to pound the native market to the tune of 25@50c, with spring lambs selling to the least advantage. Western lambs and Southwest sheep, however, sold steady with early in the week, or 40@50c higher than previous to the flood.

New York Butter Market.

The New York top market for butter the past week was as follows:

Monday, June 8, 22½c; Tuesday, June 9, 23½c; Wednesday, June 10, 22½c; Thursday, June 11, 22½c; Friday, June 12, 22c; Saturday, June 13, 22c.

General average for week of June 8 to 13, 22.46c.

FARMS AND RANCHES.

I HAVE a 160-acre stock farm in Miami County, Kansas, that I will sell or trade. For price and description, write J. A. Blow, LaCygne, Kans.

IF YOU WANT a farm in eastern Kansas, let us figure with you. Write us what you want. No trouble to show our farms, and they sell themselves. Good farms for from \$10 to \$20 per acre. Garrison & Studebaker, Florence, Kans.

FOR SALE—320 acre farm, improved, lays nice, and good land, grove around buildings, 11½ acres alfalfa started, 5 miles northwest Ellis, Kans. Write J. D. Rippey, Ellis, Kans., Box 115.

SNAP NO. 15—160 acres, no improvements, good, nice, smooth land, all under cultivation; close to Florence and school; will make nice home; price \$2,800, good terms. Other good farms, large or small, easy terms. Garrison & Studebaker, Florence, Kans.

FREE—Farm descriptions, prices, information. State pocket map 1908 Census 10 cents. Buckeye Agency, Agricola, Kans.

RANCH FOR SALE—1360 acres, 1120 acres of creek bottom, with model improvements, 140 acres alfalfa, 600 acres pasture, balance number one farm land. For further information address G. L. Gregg, Real Estate Dealer and Auctioneer, Clyde, Kans.

SOME BARGAINS in farm lands in Anderson County, Kansas, in farms ranging from 80 acres up. S. B. Hamilton, Welda, Kans.

FOR SALE—Farms and ranches in central and western Kansas. We have some great bargains in western ranches. Write us. R. F. Meek, Hutchinson, Kans.

PATENTS.

J. A. ROSEN, PATENT ATTORNEY
418 Kansas Avenue, Topeka, Kansas.

MISCELLANEOUS.

WANTED—Married couple, daughter 14 to 18 no objection, for farm work. Woman to cook and do housework and man farm work. Must be intelligent, trustworthy people used to farm work. \$35 per month and board; yearly employment if satisfactory. Chas. E. Sutton, Russell, Kans.

WANTED OIL AGENTS—Good, reliable, energetic men to sell our high grade line of Lubricating Oils, Greases, Belting, also Roof, Barn and House Paints, White Lead, etc., either exclusively or as a side line, locally or traveling on commission. Specialty to the thrashing and farmers trade. Address The Industrial Oil & Supply Co., Cleveland, Ohio.

DE MIER BROS.' POPOTILLO, the Mexican herb cure for the kidneys, bladder and bed-wetting, 25c and 50c size, postpaid. Sample free. Las Cruces, New Mex.

TWO more litters of those high-bred Scotch Collie pups, only one week old, but you will have to book your order quick if you want one. Walnut Grove Farm, H. D. Nutting, Propr., Emporia, Kans.

WANTED WOOL—Send us samples of your whole clip, we will pay market price. Topeka Woolen Mills, Topeka, Kans.

500,000 POUNDS WOOL WANTED—Write us for prices; send sample and we will offer you the highest market price by return mail. Western Woolen Mill Co., North Topeka, Kans.

CREAM Separators Repaired at Gerdorn's Machine Shop 820 Kansas Ave., Topeka, Kans.

WANTED—Money to get patent on a quick-selling toy. Will give 25 per cent of what it sells for. Henry Boite, Webster, S. Dakota.

The Stray List

Week Ending June 4.

Cherokee County—W. H. Shaffer, Clerk.
HORSE AND MARE—Taken up by F. M. Gust, in Shawnee tp. (P. O. Messer), May 13, 1908, one bay horse, 15½ hands, foretop clipped, tail bobbed, shod all around, 8 years old; valued at \$65. Also one black mare, 15 hands, few white hairs on head and neck, shod in front, had bell on; valued at \$35.

Kearny County—J. C. Hart, Clerk.
CATTLE—Taken up by Isaac E. Bruner, in Hibbard tp. (P. O. Oanica), January 1, 1903, one 2-year-old red heifer, Y on left hip, also underslash in left ear. Also one 6-months-old roan steer, underslash in left ear. Also one 6-months-old red heifer, white face, underslit in right ear. Total value, \$40.

Week Ending June 11.

Labette County—A. H. McCarty, Clerk.
CATTLE—Taken up by J. H. Andrews, in North tp. (P. O. Parsons), May 15, 1903, one red Hereford cow weight 800 pounds, split and under-cut in left ear, dehorned, white face, 8 years old; valued at \$15. Also one red Hereford cow, weight 800 pounds, split in left ear, dehorned, white face; valued at \$15.

Week Ending June 18.

Wabunsee County—Simeon C. Smith, Clerk.
COWS—Taken up by G. M. Morrison, in Kaw tp. (P. O. Belvue), May 21, 1903, one red cow, valued at \$30; also a red cow, with mottled face, valued at \$30.
MULE—Taken up by Frank Schmidt, in Alma tp. (P. O. Alma), May 9, 1903, one white mule, 15 hands high, valued at \$20.

BIG MONEY IN OIL

We own 15,000 acres choice oil land at Fossil, Uinta County, Wyoming, worth \$1,000,000. We are capitalized for 2,000,000 shares. Par value \$1.00 each. Land values alone therefore make stock worth 50 cents per share. We have one oil well which will pay 5 per cent dividends on all outstanding stock. Any 5 per cent stock is worth 85c. Total value of our stock \$1.35. We are selling for short time only at 25c flat. We have two rigs, one working night and day. Officers, directors and management thoroughly competent and reliable. Our president is worth over \$100,000, and there is scarcely a man connected with our company but what is worth from \$10,000 up. Our oil fields will prove best in America. We are surrounded with oil wells, derricks and oil springs, and expect gusher within 60 days.

Telegrams coming constantly asking us to hold stock for someone. Every 20c you invest now should reasonably net you \$25.00 when we get gusher. Four governors, five U. S. senators, many millionaires and hundreds of other well-known men are financially interested in our fields. Our list of references, which include many banks, will satisfy any man living. We will prove we have everything we claim if you will write us. Get our prospectus and references. Telegraph them all. If replies are not favorable draw on us for the cost of telegrams. Price may advance or we may get gusher any minute. We sold 150,000 shares in five months. Write us and we will satisfy you.

IDAHO-WYOMING OIL CO.,
Loan & Trust Bldg., Minneapolis, Minn.

The Star Valley Woman's Club.

(Continued from page 653.)

asked every lady, young and old, in the district to become a member.

We have not succeeded in interesting every one, but as we are proving our good intentions by our works, others gradually drop in. We have at present a membership of eighteen with an average attendance of perhaps eight.

We have no dues. Our constitution says the object of the club is to promote and obtain for its members the means of general culture and the improvement of the home and neighborhood.

Our program problem is not yet solved. Taking in, as we do, every woman in the neighborhood who will come, it is next to impossible to adopt a course of study that will be agreeable to all. So we have allowed the utmost liberty in the makeup of our programs, not assigning anything, but asking each one to bring and read or talk of whatever she has found of interest. We are, however, gradually dropping into more original work.

One of the ladies who had served delicious devil's-food cake was asked to show the rest of us how to do it. At the next meeting we retired to the kitchen of our hostess and saw the cake put together. Needless to say, we ate it when it was done. At a more recent meeting we had a paper on "How to Economize Strength." Another member gave us recipes for new dishes. Some of these, with recipes given during the discussion, we decided to send to the Home Circle in the FARMER.

At the next meeting one of the ladies will show us how to make the delicious ginger cookies she bakes. Another who reads a great deal, and cares well for her home and family, will tell us how she finds time to read. The member who makes a success of raising turkeys will tell us how she does it. One of the school-girls will give a recitation and all the school-girls present will sing school songs. I know that this plan of program will seem very simple, but I send it, in the hope that it may help some who are hesitating about trying to organize a club because they do not know what to do.

Certainly a club is a benefit to any neighborhood if entered into in the right spirit. Gossip and all unkind speech must be prohibited and a kindly, charitable feeling for all be exercised. Surely a less promising community than ours was a year ago could hardly be found.

Women who had lived within a mile of each other for a number of years had barely a speaking acquaintance. Everybody stayed at home and let everybody else do likewise. Now, through the acquaintance gained at the club we feel and act as neighbors should.

A word about the work our club has done outside its club meetings.

A Sunday school, that never had been able to live for any length of time before, is in a flourishing condition, due largely to the unity of interest aroused by the club.

In the fall when school opened we filled the windows at the schoolhouse with plants, which were appreciated by both teacher and pupils.

After school closed in the spring the club-women went, armed with brooms, brushes, and buckets, and gave the schoolhouse a thorough cleaning. Now we meet every Sunday in a beautifully clean house, which can not fail to have its effect on the character of the school. Early in the life of the club we decided to increase our school library which consisted of ten books.

We gave two socials at the schoolhouse during the winter. We made a quilt which we asked the audience at one of the socials to pay for and then donated the quilt to the newly opened Iola Orphanage as a gift from the neighborhood. With the money earned in these ways we have added thirty-three new volumes to the library and subscribed for the Youth's Companion.

This is a story of homely work, but it is helping us to do the homely work that falls to the lot of the farmer's wife, in a better way and with greater ease and cheerfulness. We can not but wish that other communities that need a woman's club as badly as we needed one, could find the inspiration we have found. And they can if they will.

The Topeka Federation of Clubs has decided to take a hand in the relief work for the flood sufferers. They have chosen one of their ablest members, a woman whose literary fame is more than State-wide, Mrs. Margaret Hill McCarter, to write up a truthful history of the flood and its results, with an account of the various means em-

ployed for rescue and relief. It will be a book of real value historically and of the victims of the great disaster. The proceeds from the sales of the book will be used exclusively for the relief of the victims of the great disaster. The club woman's abilities are diversified and you never can tell what she may do next, but you may generally be reasonably sure that she will use her talents profitably either for some other one, or herself. In this case, it is for some other one! If it is desired to obtain one of these books, orders may be sent to the Club Department of KANSAS FARMER.

Miscellany.

About Public Schools.

[A REPLY.]

EDITOR KANSAS FARMER:—I saw an article in your issue of April 30 entitled "Some School Questions," written by J. Herbert Schump, that I would like to say a few words about. I have read Mr. Schump's article over very carefully several times, but I can not make out exactly what he is driving at. His article reminds me of several very funny occurrences, such as a "wet hen," a dyspeptic, a mule with both feet tied, or a man who had eaten a bed mess of biscuits for breakfast, and was afraid of his wife. It seems as if he was in a very bad humor on this particular occasion and there being no dogs handy to introduce his shoemaker to, he vented his vengeance upon the poor, innocent, inoffensive public school, and the man who can not or does not own a farm, but has to rent one. As to the denominational church quarrels between school children, I will say that they never amount to anything more serious than the existence of ill feeling between the children for a few days, perhaps a black eye or two for the boys and the loss of some hair for the girls. If Mr. Schump endeavors to take part in all the petty difficulties that occur between school children, he will find that he will be busier than a cranberry-merchant or a bird-dog.

Concerning the parish school I know very little as we have only a very few of them here; these are open only during the intervening time between the regular district school sessions and teach only foreign languages, mostly German. But in localities where the parish school exists, if the money used to maintain the parish school was paid into the public school fund there would be ample means to provide suitable buildings and teachers for all the pupils in the district. As the gentleman seems to be very apt at supposing, he might suppose that we have no schools or colleges so that his children would grow up in "blissful ignorance." This would save him a few dollars expense in the way of clothes, books, and perhaps the expense of a hired hand a few days in the fall and spring while his oldest son was in school improving his mind and making his battles with the world easier. He would also save that enormous tax of 5 or 10 mills that he pays to maintain the public school. All this he would gain and how? Very easily answered. At the expense of his children's education. But how about the children? This is easily answered, also. They would do as the uneducated people of to-day have to do; they would go away back and sit down, and let some more competent person take the place they should have occupied. I am personally acquainted with several wealthy men who would give half of their fortunes for the education they should have had in youth. I have seen the interior of a good many schoolhouses and I never saw one yet that was too well equipped in the way of maps, libraries, or furniture; and as a general thing the principal part of the fixtures and things that are in the schoolhouses have been supplied out of the proceeds of box supper or a fake play gotten up by the ambitious teacher. If the tax-paying people would not grip their pocket-books so tight when they pay their school-tax they would not have to rent the building to every fake play and Tom, Dick and Harry to obtain money to get necessary articles for running a successful school. I am in favor (and I have the school-law on my side) of using the schoolhouse for all public, political, and educational meetings, also for religious meetings in the absence of any better place. I have heard as good sermons in schoolhouses as I ever heard or expect to hear in churches. The law says that a district must hold and maintain a school for at least four months in each year in order to get their portion of the State fund; and there is just one thing wrong with this

law; it should be six instead of four months. Any man or woman that has so great an affection for the almighty dollar that they object to paying their school-tax, small as it is, should be deprived of the privileges of American citizenship. My advice to a person who is not satisfied with the school laws of the present day would be to change the laws if they can, and if they can not, why then move on to a better country where the laws are in accordance with their views.

We would like to ask who those idiots he referred to that want to tax the school parish are? Are they not the voters and property-owners of the community? Has it ever occurred to Mr. Schump that these idiots he mentions also use endearing terms when they refer to him, such as "cranky," "old fogey," etc. As to the renter I see on reason why he should not live high; and when it comes to paying taxes, it is not the poor renter's fault that you have property that you have to pay tax on. I feel perfectly assured that the renter would be perfectly satisfied if he was allowed to keep all he-raised, provided he paid all the taxes. Now if Mr. Schump is tired of owning a farm and paying taxes, we believe he could find some person in this wide, wide world, perhaps without any great difficulty, whom he could give his farm to, or possibly he might sell it for a few dollars, on long time, and then he could start out as a renter and get rich quick without any school-tax to pay. He would have such a nice, easy time then, with no farm or home to look after and call his own.

I am not going to tell you that our schools are perfect, as very few things ever attain that high degree, but I do say that the school system of Kansas is so near perfect that it would be a difficult undertaking to try to make it more so, unless it could be done in the way of consolidation.

FORREST BAIRD.

Lincoln County.

Harder Than Work.

A man who is getting well up toward seventy and still putting in a good ten hours at his work every day was asked why he didn't stop and take it easy.

"Well," said the old man, "I tried that about nine or ten years ago and somehow it didn't turn out just as I had figured it would beforehand. You see I wasn't born with a silver spoon in my mouth. I had to commence earning my own living as soon as I was able and from that time on I was mighty busy. I commenced as a chore-boy and worked up till I was able to own a small farm and I finally bought out this place. From the time I started as a chore-boy till I got control of good broad acres I generally put in every day in the week except Sunday and sometimes a good bit of the night. Well, after I got control and was my own boss I said to myself, 'Now, if I have good luck till I'm fifty I will clean up and retire and enjoy myself.' When I got to be fifty I was feeling pretty young and coltish and concluded that it was foolishness for a young man of fifty to quit work and that I would just put off the quitting time for ten years and then I would quit for certain. Well, the time ran along until I was sixty. A couple of fellows who had more money than experience came along just then and offered me what I thought was a big price for the farm and entire equipment and I sold out to them, cleaned up everything and said to myself, 'Now I'm going to take that rest I have been dreaming about for thirty years.' I had a lot of relatives that I hadn't seen for a long time, some that I never had seen, and I concluded that I would enjoy myself for about a year visiting. Well, after I had settled up the business transfer, my wife and I started out to visit. By the time I had visited for four weeks it seemed to me that I had been doing nothing but visit for a year. It was just eat and talk and ride around. I never was so mortal tired of anything in my life. I managed to stick to it for six weeks, and quit. Then I told my wife we had never been away from home much and we would just take a trip and enjoy ourselves. Well, it was all right for a little while but I got tired of that in the course of three months and wanted to get back home. I had bought a place and started in to fix it up to live in. Between the carpenters and plumbers I had enough grief to keep me busy for the next three months but when that was over and I had nothing in particular to do I commenced to get uneasy. I could putter around the yard and manage to put in part of the time but it didn't seem like business. I used to wander down to the old farm nearly every day

Boys! Girls! Men! Women!
Everybody likes to wear the
New Moline Wagon
Gold (Trade Mark) Pin
We are giving these away free. Write us for one before they are all gone.
Moline Wagon Company,
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EIGHT DOLLARS
AND NINETY-FIVE CENTS
BUYS THE GENTS' HIGH GRADE
NEW 1903 MODEL BURDICK
BICYCLE. Shipped to any address with the understanding and agreement that you can give it ten days' free trial, put it to every test, and if you do not find it handsomer, stronger, easier riding, better equipped, better tires, hubs, hangers, bearings, and in every way higher grade than any bicycle you can buy from any other house in Chicago, at home or elsewhere for less than \$20.00, you can return the bicycle to us at our expense, and you will not be out one cent.

FOR OUR FREE SPECIAL BICYCLE CATALOGUE showing the most complete line of new 1903 model gent's, ladies' and children's bicycles at prices so low as to be really startling, for everything in bicycle sundries and supplies, for the most astonishingly liberal offer ever heard of, cut this advertisement out and mail to
SEARS, ROEBUCK & CO., Chicago, Ill.

COLORADO RED MINERAL PAINT

Use No Oil—Mix With Water

A 12 year old boy can apply this paint successfully. Satisfaction guaranteed. We pay the freight. Paint your houses inside and outside. Your barns, fences and agricultural implements. This **Elk** Tuscany Red Mineral Paint is shipped dry in 100 lb. packages. 100 lbs. will cover 1000 square feet of rough surface such as rough boards and undressed stone and 2000 square feet of smooth surface such as walls and ceilings. This paint will not wash, rub or peel off and can be polished like hardwood finish.
PRICE \$3.00 PER 100 LBS.
delivered in Iowa, Kansas or Nebraska. We pay all freight charges and guarantee safe delivery. Remit by Draft, P. O. Order or Express Order to
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Paid up Capital \$150,000.

FARMERS

who wish to better their conditions are advised to write for a descriptive pamphlet and map of Maryland, which is being sent out free by charge by
THE STATE BUREAU OF IMMIGRATION OF MARYLAND.

Address
Mr. H. Badenhop, Secretary,
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BROADWAY AND 41ST STREET, NEW YORK.

HANDY TO EVERYWHERE. EUROPEAN PLAN.

G. T. STOCKHAM,
Formerly Manager Midland Hotel, Kansas City.

and watch how things were going. It seemed to me that there were a good many things that might be improved and it was just all I could do to keep from butting in and making suggestions.

"Well, you might not think it, but at the end of that first year of rest I weighed fifteen pounds less than when I retired from business. My appetite wasn't as good as it had been, my clothes didn't seem to fit me. I was feeling kind of miserable and out of sorts and my wife persuaded me to see a doctor. He looked me over and asked questions and finally told me that if I didn't get back into the harness I would probably furnish the leading character in a funeral within a year or two. I was ready to believe him and the next day I commenced to scent round to find out whether I could get my old place back. I found out the fellows who bought me out weren't traveling on asphalt pavement exactly. They were ready to sell and I was ready to buy. I have buckled down to the business end of farming ever since. I'm 69 and feeling like a 3-year-old colt. If I had kept on resting I would have been dead five or six years ago. After a man has stuck to it for 60 years he can't jar loose and enjoy himself loafing. If you will call round here fifteen years from now and I am still on earth you will find me running this farm."

The Veterinarian.

We cordially invite our readers to consult us whenever they desire any information in regard to sick or lame animals, and thus assist us in making this department one of the interesting features of the Kansas Farmer. Give age, color, and sex of animal, stating symptoms accurately, of how long standing, and what treatment, if any, has been resorted to. All replies through this column are free. In order to receive a prompt reply, all letters for this department should give the inquirer's post office, should be signed with his full name, and should be addressed to Dr. Geo. C. Frichard, V. S., 110 East Tenth Street, Topeka, Kans. Telephone No. 319, either phone.

Collar Bruise.—I have a 6-year-old gray horse that had his shoulder hurt from the collar while working. It appeared about two weeks ago, when one side of his shoulder swelled. In a few days the swelling disappeared and a big bunch formed; it was soft. I cut with my pocket-knife a hole in the lower part of the bunch and pressed about half a pint of bloody water out of it, but it did no good. The water keeps collecting as soon as I stop probing it. I have reopened it several times, but, as it does no good, have quit it. It is now swelled up again. I have used some liniment on it and have worked the horse some. Can you tell me what to do for him? FRANK JAKUBOWSKI, Phillips County.

Answer.—You have not made your opening large enough. Open up thoroughly a good large opening, and use plenty of hot water twice a day bathing inside and out.

Sore Throat.—I have a mare that had distemper the first of March and seems to have never recovered from it. She was with foal and brought a colt the 14th of May. Since the colt came she has become stiff in the neck but has quit running at the nose. The glands under her jaws are swelled some but the throat don't seem to be enlarged on the outside. I called a veterinarian and he claimed her throat was swelled on the inside and that she could not swallow. When she drinks water it nearly all seems to rush back through her nose. She ate good until the last few days when her appetite has failed and she has a dry hard cough. Veterinarian claims it is just distemper. What shall we do for her? Labette County. J. B. JOHNSON.

Answer.—Blister throat thoroughly with following blister: Powdered cantharides, one part; lard, six parts; mix thoroughly, and rub well in with the hand about the throat. Feed on good clean feed with plenty of pure water. Medicinally, give tablespoonful doses of Fowler's solution of arsenic in feed, night and morning.

Suspected Hydrophobia.—My neighbor has heifer alling for about three days, bawls all the time, and is continually walking around. Slobbers some at mouth, seems weak in back. Supposed first to have been in heat. Woodson County. GEO. D. DANIEL.

Answer.—Symptoms are so meager, as given, that it is impossible to diagnose case with any degree of certainty, but would suspect hydrophobia. If correct death will follow in 4 or 5 days, or less. One peculiarity of hydrophobia is that the mortality is 100 per cent.

Inflamed Udder.—I have a Jersey cow 7 years old that had a calf two months ago. About three weeks afterwards her bag got lumpy and it hurt to milk her. I applied turpentine, coal-oil, and lard equal parts; it seemed to help her, and I thought she was cured. Three weeks after that it became clogged again and I applied more of my remedy, but it has not entirely left her. The upper part of her bag is swollen and somewhat inflamed while lower down is a lump about the size of a hen's egg. From one teat the milk comes in lumps and not much of that. She has shrunk two-thirds in amount of milk in the last week and does not seem to gain any. She did not eat much for a few days, but seems to be better now, but not well; she walks stiff in her hind quarters. I shall be pleased to get a remedy. Wabaunsee County. W. E. H.

Answer.—It is a little late to treat your cow now, but perhaps some benefit might be derived yet. Give as a drench one pound of Epsom salts in sufficient water (warm) to dissolve it. Bathe the udder with hot water as often and as much as possible, and feed one tablespoonful of pokeroor (powdered) once a day.

Debility.—I have a calf 2 months old that was only about two-thirds as large as it should have been at birth, though dam went full time. She was milked about a year and a half, and up to a month of calving. Calf is weak and slobbers a green slime when it chews

NOTHING SO GOOD



has ever been presented to the public and which has been of such wonderful merit as

Kendall's Spavin Cure.

It is the old reliable remedy for Spavins, Ringbones, Splints, Carbs and all forms of Lameness. It cures without a blister because it does not blister. Price \$1.00 for \$5. As a liniment for family use it has no equal. Ask your druggist for KENDALL'S SPAVIN CURE, also "A Treatise on the Horse," the book free, or address DR. E. J. KENDALL CO., Knoxville, Tenn.

cud. I let it run with dam two weeks, then fed it whole milk from cow for a week. Since then have mixed whole milk and hand-separator milk equal parts, and fed warm. Have put an egg in milk each time for a week.

Mitchell County. C. F. CRETZ.
Answer.—With the great debility so marked in your calf one should expect a corresponding weakened condition of the digestive tract. Treatment: Feed on the most nutritious food that is easily digested. Feed often in small quantities, and give in the milk night and morning 10 drops Fowler's solution of arsenic.

Bad Teeth.—I have an 8-year-old bay mare that seems to chew all of her hay up fine and then throw it out of her mouth into the manger. The hay is nice, bright, prairie hay. She looks good and is in medium flesh and seems to be all right. I noticed one day when she was on grass she did the same thing. At another time she seemed to eat grass all right. I feed her corn, six ears three times a day and she swallows that all right, but I notice a good deal passes through her whole. What is the cause of this? Brown County. JOHN D. ZILLER.

Answer.—Have your mare's teeth looked after at once. There are either long, decayed, or uneven teeth that are bothering her. Employ a qualified veterinarian or horse-dentist.

Publishers' Paragraphs.

The much-regretted passing of the Boston Museum is made the occasion of an admirably illustrated article by the dramatic critic, Howard M. Ticknor, which opens the June number of the New England Magazine. Old-time footlight favorites are shown in pictures taken approximately, at the time of their first appearance at this historic house. Particularly interesting is the picture of Edwin Booth and his father, taken in the year of the former's first and the latter's last appearance on the stage.

That negro slavery is not the only one that this country has had to contend against is surprisingly shown in Miss Bourne's "White Slavery in Colonial Times."

Among the illustrations that crowd the number are some remarkable photographs by T. E. Marr showing the home life of the Chinese in their Boston settlement. Again timeliness seems to be the ruling note of the issue and we observe with pleasure that there are fewer graveyards and more live heroes than formerly. (American Company, Boston, 25 cents.)

For thirty-six years the Geo. Ertel Company, of Quincy, Ill., have been manufacturing baling-presses, incubators, etc. They gave much time and thought to the production of a baling-press that would be the most durable of anything of the kind for the purpose. The result of this careful study and numerous experiments was the placing upon the market of "The Gem" Baler. This baler, it is claimed, has no equal in simplicity, compactness, and ease of operation; it fulfills every requirement; is correct in principle and exact in operation.

If you contemplate buying a baling-press you should by all means investigate the merits and points of superiority of "The Gem." To help you in this investigation you should send to the manufacturers for a very valuable and interesting book, illustrated and full of information for farmers and all who are interested in the hay-baling question. This book goes thoroughly into details, and by means of illustrations shows the advantages "The Gem" Baler has over other makes. It will be mailed free to any address.

Fast and Easy Hay Baling.

The Admiral Hay Press Company, Kansas City, Mo., have established a reputation for speed, ease and safety, as well as for making a handsome and heavy bale, with their celebrated Admiral Hay Press. The three-stroke principle, by which they put three feeds in the baling chamber to each round of the team, is responsible largely for its success, while the successful self-feeding adjustment does away with the dangerous foot feeding, and renders the Admiral a safe machine to use.

This company will be pleased to send descriptive circulars and price lists to such of our readers as wish them.

CORN IS KING.

If you raise corn you need to use the latest and most approved appliances, not only for cultivating the crop, but for harvesting it as well. We can not urge upon our readers too strongly the importance of investigating the merits of the Badger Corn-Harvester, as manufactured by I. Z. Merriam, at Whitewater, Wis. See advertisement in another column.

HORSES.

Percheron Horses

HENRY AVERY & SON, WAKEFIELD, KANSAS.

Registered Stallions For Sale

15 HEAD AT SPECIAL PRICES CONSISTING OF

Five Percherons, 2 to 5 years old—all black but one, and that a black-grey; two black yearling Percherons; four Shires, 3 to 7 years old; three trotting-bred horses, 3- and 4-year-olds; one registered saddle stallion. All but two at prices from \$200 to \$1,000 each. Come at once for bargains.

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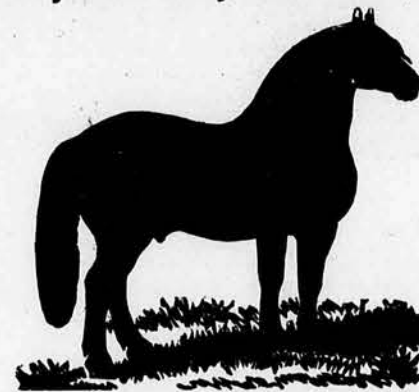
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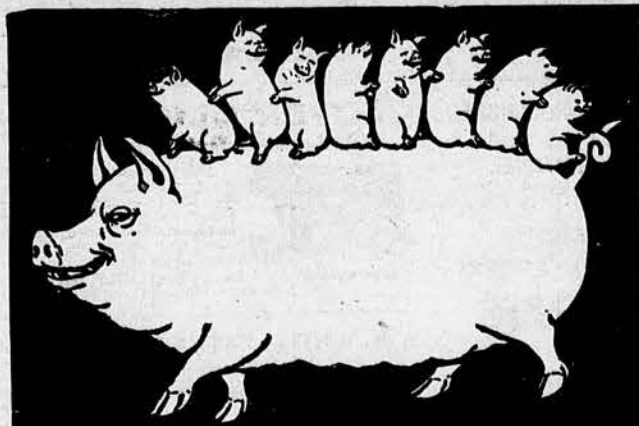
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