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It is not yet too late to plant corn, Kafir-corn, cane, millet, soy-beans, or cow-peas.

The Utah Experiment Station has found "Sixty Day Oats," seed of which was obtained from the Department of Agriculture, a better yielder than any other variety.

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 GREAT FLOOD OF 1903.

Nothing like the present flood in eastern and northern Kansas has ever been experienced in these sections since the country was occupied by white men. The rains have been excessive and long-continued so that the waterways of the streams have been entirely inadequate to carry off the surplus. The water has, therefore, covered the second bottoms. These are known to geologists as "flood plains," a name which suggests that the men of learning realize that in times past they have been covered with water.

The interruption of communication has been so great and Topeka has been so engrossed with caring for her own flood sufferers that it is impossible at this writing—Tuesday forenoon—to state with certainty how widely extended or how great the calamity has been. In the city of Topeka it is estimated that 7,000 people are temporarily homeless. Some of the less substantial residences have been swept away and some even of excellent construction

have been undermined and rendered unsafe. The business of a large district has been brought to an abrupt stop. Two lumber yards have been consumed by fire started by the heat caused by the slaking of stored lime when the water reached it. Fortunately the fires were put out by the rain before they had reached other properties. It is feared that one person was swept into the burning lumber. The railroads, with the exception of the Santa Fe to the south and west, have been compelled to cease operations. All mails have come by way of Emporia. Gardeners and farmers in the lowlands have suffered severe losses the extent of which is at this time merely guesswork, the high water making it impossible to gain exact information.

Topeka has gone at the work of relief with a will—in some cases with more will than system. People who were perched in trees and on house roofs suffered greatly from the cold rains, and it is feared that many became exhausted and dropped into the water before relief could reach them. The swift currents that swept down the streets made it unsafe for any but expert oarsmen to venture into the vicinity of many of the sufferers. Many accidents occurred, and several rescuers have had to be rescued, while at least one or two of these noble men have lost their lives. The difficulty of the situation was augmented by the fact that Soldier Creek flows along the north side of the largest flooded portion of the city, joining the river just below. There is an old river-bed through the upper portion of the district. The island thus formed was soon carried with a raging torrent. The water went high over the approaches to the Melan arch-bridge, and finally the north approach went out, giving place to a current so strong that boats could not cross it. A cable was thrown over it, however, and people are being drawn across by this cable in a basket. Other cities have sent boats and boatmen. It is hoped that all who are now imprisoned by the flood will have been conveyed to dry ground by Wednesday evening.

The flooded district contained a few of Topeka's prominent citizens. A very large portion of the flood-sufferers are laboringmen and their families. Very many of these lost their all.

Not infrequently "society people" are written down as entirely useless people, devoid of the better instincts of humanity. The flood at Topeka furnishes a refutation of these aspersions. Everybody in Topeka who could in any way contribute to the relief of the imperiled and the suffering did what he could. Various relief headquarters were established and as rapidly as people can be brought over they are taken in buggies, hacks, and carriages to these headquarters. Here they are registered and their wants are attend-

ed to. In this work "society" is doing its full share and the lady whose hands may have known nothing rougher than a piano-key is working side by side with the mechanic's wife or daughter, fitting clothing to little ones regardless of position or color. Many of the poorer people are dazed at the transition from the perilous perch on the house-roof or the tree-top, in the school house or the elevator, to a comfortable seat in the auditorium, facing a platform piled high with tons of warm, dry clothing and bedding, while kind hands bring hot coffee and sandwiches and seek out clothing to fit the little ones. The homes of Topeka were at once thrown open for the sufferers. Strangely enough the relieved are so dazed by the sudden transformation that it is with the greatest difficulty that they can be induced to leave the auditorium to become the guests of the more fortunate. This reluctance is partly owing to the fact that the rescuers bring over first the women and children of a family. These, on reaching a place of safety, are more anxious for those left behind than for themselves. But the cordial hospitality offered, backed by the urgent advice of ladies in charge, generally prevails, the family is checked out by the registrar, hustled into the hosts' carriage and given the best there is in the home.

The experiences at Topeka are probably typical of those at all towns along the Kansas River and its tributaries and some of those along the Cottonwood. Kansas City reports 15,000 to 25,000 homeless flood victims. The latest report states that the water is fifteen feet deep in the union station at Kansas City.

TOWNS ON LOW LANDS.

The appalling losses of life and property from floods which have occurred in cities and towns along the Western streams during the last few days raise anew the inquiry why townsites are selected in these insecure locations. It may be answered that nobody ever suspected such high water, that it had never been known since the country was first visited by white men. But former overflows have left their marks all along the valleys so that it could not be said that people were not forewarned or that the Indian traditions of canoeing from bluff to bluff were without confirmation.

One of the strange facts of town-building is that the managers of townsites are able to exert comparatively little influence on the direction in which the town's development shall proceed. It was intended that the capital of our country, Washington, should occupy some beautiful lands of suitable elevation near the capitol. Perversely enough the city insisted on spreading itself over the malarious Potomac flats. Chicago became a big city on the former site of a swamp.

(Continued on page 618.)

Agricultural Matters.

REPLIES FROM THE AGRICULTURIST OF THE KANSAS EXPERIMENT STATION.

Soy-beans in Corn.

Several weeks ago I saw in the KANSAS FARMER an article on soy-beans planted between corn-rows, the last time cultivated corn. It is said they were easily harvested. I should like to know how it is done.

Cowley County. J. CHAS. WRIGHT.
Soy-beans may be planted between the corn-rows at the last cultivation of the corn by using a one-horse drill in a manner similar to the sowing of fall wheat in the corn. When the beans are sown in this way it is usually not the purpose to harvest the bean-crop but to use it as a pasture-crop for sheep before the corn is cut or as pasture for other stock later in the fall after the corn has been harvested and removed. Or the soy-beans may serve as a cover-crop and green manure, and put the ground in good condition for a corn-crop for the next season.

If the corn was harvested early enough for fodder and put in shocks the soy-beans might also be cut for fodder later with the mower or bean harvester. It is doubtful whether the beans would mature seed in an average season when planted in the corn as described above. The general purpose as stated is to use the soy-bean crop for a pasture- or cover-crop.

A. M. TEN EYCK.

Field Mice.

I am troubled with moles or mice taking my corn. Do you know of any way of fixing the seed before planting that will prevent its being taken?

T. H. BAKER.

Leavenworth County.

I have spoken to Professor Dean, of the Department of Entomology of this station. He informs me that he does not consider any method of treating the seed to prevent it from being taken by the mice or moles as being practicable. If you are planting a small patch of corn it might be advisable to soak the corn in a solution of Paris green before planting. But such treatment would not be advisable for field planting. It may be practicable to attempt to poison the mice or moles by scattering a little poisoned corn along the edges of the field or placing it in the runways of the moles near those spots where the damage is most marked. Doubtless for poisoning in this way, the prairie-dog poison which is being sent out by this station may be successfully used. I enclose you press bulletin on this subject and for further information you may write to Prof. D. E. Lantz, of this station.

In the KANSAS FARMER, April 23, Professor Ladd, of the North Dakota Agricultural College, describes a method of poisoning gophers by the use of strychnine, which may also answer for mice and moles.

A. M. TEN EYCK.

Wants to Exterminate Johnson-grass.

I have some Johnson-grass on my farm, and I would thank you very much if you would kindly inform me how to exterminate it.

WALTER SHANNON.

Cowley County.

Johnson-grass (*Andropogon halapensis*) is a very difficult weed to eradicate when it once becomes established over any considerable area. Like the dreaded quack- or couch-grass (*Agropyrum repens*) it spreads by running root-stalks as well as by seed. When once established in low wet land it is practically impossible to eradicate it and use the land for cultivated crops. In the case of the grass being on such land perhaps it is best not to try to destroy but to use the land for meadow or pasture taking due care to keep the grass from spreading to cultivated fields by not allowing it to seed and by restricting in any practicable way its spread by roots.

In the bulletin "Two Hundred Weeds, How To Know Them and How To Kill Them," L. H. Dewey, of the U. S. Department of Agriculture, recommends the following method of eradication: "Close grazing induced by salting the plants; alternate cultivation and heavy cropping, plowing to expose roots to frost or hot sun." Prof. A. D. Solby, in Bulletin 83 of the Ohio Experiment Station, says of Johnson-grass, "It has strong, creeping rootstalks and like quack-grass will spread by means of them. Unless one is ready to give the ground up to this grass the cultivation of it should not be undertaken."

On fields which are not especially wet it is possible to eradicate the weed. Summer fallowing is probably the most satisfactory method of destroying Johnson grass on a large scale, plowing immediately after cutting the grass for the first crop of hay and plowing again as often as any amount of grass appears above the ground. Harrow thoroughly after plowing and drag out as many roots as possible. Keep up this treatment until September when rye or wheat may be sown. It is best to remove fences and other obstacles to the plow, that make a harboring place for the hardy, underground stems. Small patches may be destroyed by covering the ground deep with straw or by planting the ground to some cultivated crop, provided clean cultivation is faithfully kept up. Patches of Johnson-grass in cultivated fields should not be crossed in cultivation in tilling the field because this is one of the most effectual means of spreading the underground stems. I will add that I believe that in lands which are ordinarily dry a large part of the year, Johnson-grass can be thoroughly eradicated by faithfully going after it with cultivator and hoe for two or three seasons, at the same time not allowing any harboring places about the field.

A. M. TEN EYCK.

Dock.

Will you please give me some help as to how to get rid of "yellow dock"? I think burdock is the same thing. I have so much of it on my farm, and I cut it down three or four times last year. Now I am discouraged at having to do it for the rest of my days. Is there any market for it for medical use? What is the easiest and quickest way to kill it?

Where did the horn-fly originate and how long has it been known?

Clay County.

A. CHILD.

Yellow dock, also called curled dock and sour dock, is not the same as burdock. Burdock is a biennial weed which bears seed only once in two years. It is not a bad weed in cultivated fields but in fence rows and waste places it thrives and is very much detested by stockmen because of the burrs that have a propensity for clinging to the coats of animals.

The yellow dock is a perennial; that is, it grows from year to year from the root. It also grows from the seed. Its characteristic of growing from the root is what makes it so hard to destroy. Continual mowing for two or three seasons, not allowing any seed to form will greatly decrease its thriftiness of growth though it will scarcely kill it out entirely. In cultivated fields, thorough cultivation and heavy cropping will usually keep the weeds in subjection. In pastures or meadows mowing the fields is practiced, but to thoroughly destroy the weed it is recommended to grub out the plants; that is, cut off the roots deep in the ground. The yellow dock is usually a hard weed to pull because of its large, strong root. Prof. Goff, of the Wisconsin station, recommends, in Bulletin No. 76, pulling by hand. Choose a time when the soil is very wet. "Clasp the stem just at the surface of the ground, give it a slight twist and a hard pull at the same time, the root will nearly always come out almost entirely. As the plants are not often very numerous this method of destroying them will seldom prove expensive. The common method of cutting off the stems with the scythe or hoe does not destroy the root and even the cultivator or plow is seldom wholly effectual unless supplemented by the hand.

Sour dock has some reputed medicinal virtues but it is so common that there is little market for it.

The horn-fly came from Europe and was first noticed in the United States in the vicinity of Philadelphia about the year 1885.

A. M. TEN EYCK.

Cocklebur.

Can you tell me the best method of exterminating cockleburs in pastures, introduced by streams from neighboring cultivated lands?

Clay County.

W. O. STURGEON.
The cocklebur is an annual weed which grows quite generally throughout the United States. Its seed-time occurs from August to December. It is a bad weed in fence-rows, pastures and meadows but can usually be kept in check by good cultivation in plowed land. In meadows and pastures the weed may be kept in subjection by frequent mowing although it will be necessary to pull and burn all mature plants.

Two seeds are enclosed in each burr. It has recently been shown that only one of these seeds can be caused to germinate the first year, the other al-

ways remaining dormant until the second season. Thus a thorough cleaning of the land one year will not eradicate the weed, because it takes at least two years to germinate all the seeds which may be in the soil. These weeds are scattered by the burrs clinging to animals, so that continual care will be needed to keep fields free from this weed even after it has been once thoroughly eradicated. Remember that the cocklebur is an annual and grows from the seed only. That it does not grow by sprout from the root and that if the weeds are destroyed before seeding there is no opportunity for renewed growth. Mowing, however, is not so successful as pulling, because branches will start from the stub after mowing. These may produce some seed.

A. M. TEN EYCK.

History of Alfalfa.

BY W. J. SPILLMAN, AGRICULTURIST, DEPARTMENT OF AGRICULTURE.

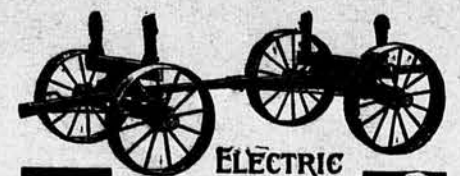
Alfalfa is probably the most ancient forage plant of which we have any record. It was cultivated extensively on the irrigated fields of Babylon, and it is known to have been the principal hay in the stables of the ancient Persian monarchs. It was brought from Persia to Greece about 470 B. C., and its cultivation began in Italy about 200 B. C. It is mentioned by a number of Latin writers, especially Virgil, Varro and Columella. From Italy it was introduced into Spain in the sixteenth century, and thence spread to many parts of the world. Its introduction into the United States seems to have been through the Spanish missionaries, at an early day, going up the western coast of the continent from Mexico and South America.

The name alfalfa is of Arabic origin and has persistently followed the plant throughout Latin America and into those parts of America in which the Spaniards introduced it. The plant is not unknown in the eastern United States, having been introduced a number of times from western Europe, particularly from France, where it is known as "lucerne," but it has never gained a foothold in the East, at least until the last few years. It is now being introduced under its proper name, "alfalfa." At present there is a genuine craze among the farmers of the eastern half of the United States concerning this plant and some of its more important varieties. It will undoubtedly become the leading hay crop of the East in those sections where soil and climate favor its development.

Alfalfa has always been the standard hay-plant of arid America, where it is grown almost exclusively under irrigation. In those parts of the irrigated section where the soil and climate are favorable, alfalfa is indeed a marvelous plant. In Southern California, where irrigation water is plentiful and intelligently applied, five crops of hay are cut in a single season, while as far north as central Washington three good crops are secured, and, in exceptional seasons, four.

Unfortunately, alfalfa is somewhat particular as regards soil and climate. From its habit of growth it is not suitable to heavy clay soils, or soils underlaid by clay hardpan. Its roots penetrate very deeply and if the soil is of proper texture it is no uncommon thing for the roots to penetrate the soil from 15 to 20 feet. In exceptional instances roots have been known to penetrate the soil more than a hundred feet. This great depth of root growth enables alfalfa to draw up stores of plant food that gives it great longevity. Many alfalfa fields in the West are yielding good crops of hay after having been cut for 25 years. It is seldom wise to leave a field of alfalfa for so long a time as this, because plants will be killed out here and there by tramping, making the stand thinner and thinner and allowing weeds to get a start; but as long as the stand is good and weeds do not bother there is no objection in plowing up an alfalfa field.

For its best development this crop requires a deep, sandy loam free from standing-water within several feet of the surface; abundant water to be preferably applied at stated intervals by irrigation, in not too large quantities; long, hot summers and winters not too severe. Where these conditions exist alfalfa has no competitor as a hay-producer, but it will thrive on a good many types of soil; in fact, almost anywhere except in stiff clays, light, dry sands and wet soils. The great value of alfalfa lies in its great yielding power, its palatability to stock and the large amount of nitrogen it contains. Most of the hay crops of this country contain too little nitrogen and it is necessary for the stockman to make up this deficiency by buying expensive mill-products, such as cottonseed-meal,



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linseed-oil cake, etc. Alfalfa is one of those plants which draw a large amount of nitrogen from the atmosphere. It enriches the ground upon which it grows as far as nitrogen is concerned, and it has been found that, almost without exception, a grain crop following alfalfa makes phenomenal yields.

Some recent experiments indicate that when alfalfa hay is run through a shredder and pulverized it is almost equal, pound for pound, to bran as a food for cattle. When stockmen learn this it will certainly have a decided effect upon the cost of keeping live stock, particularly dairy cows, in these sections where alfalfa is grown. Another point that should not be overlooked is the increased value of the farm-yard manure when live stock are fed rich, nitrogenous food like alfalfa hay.

Although alfalfa is somewhat particular as to soil and climate, or rather, it should be said, responds readily to favorable conditions of soil and climate, it is at the same time widely distributed in this country. On the Pacific Coast it has been cultivated from Southern California to the British line and even beyond. It is not grown west of the coast range of mountains, but in the interior valleys of the coast States it has proven itself perfectly at home. It has also done well in Louisiana, Mississippi and other Southern States, and last year a farmer in New York reports five tons per acre. This shows that the range of the adaptability of this plant is greater than was previously supposed.

During recent years agricultural explorers have endeavored to find varieties of alfalfa that were more hardy with reference to cold and that could be grown on arid lands without irrigation. Their efforts have been partially successful. It was mentioned in the first part of this article that alfalfa was known to the ancient Persians and Babylonians. It is still extensively cultivated in western and southern Asia, and several varieties of it have been recently secured from Turkestan and adjacent regions. Some of these give promise of being able to withstand the winter of our northern States, and it is possible that we may yet find varieties that will compete with sagebrush on arid lands.

Poisoning Grasshoppers.

A new method of poisoning grasshoppers is reported to have been discovered by Norman Criddle, Aweme, Man., and fully set forth in the 1901 and 1902 reports of Dr. Fletcher, the Dominion entomologist. In a letter written to Dr. Fletcher last November Mr. Criddle says:

"With regard to the strength of Paris green mixture, I had not much time to experiment personally at home; but experiments conducted by my brother, Evelyn Criddle, show that undoubtedly 60 parts horse-droppings can be used to one of Paris green (by measure) and probably 75 parts. Whether it can be made yet weaker, as you surmise, is yet to be found out. Several people who have used it as above, report it is not strong enough. The great difficulty is to thoroughly mix the stuff; this is best accomplished by mixing the Paris green in water first. Though I still recommend salt, yet I believe with fresh droppings it may be unnecessary. The poison mixture has been found much more effective when spread during hot, sunny weather.

"It is perhaps hardly necessary to add that the Paris green mixture has proved an unqualified success wherever persisted in and used according to directions, and that it is far ahead of any other remedy which has been tried here after the locusts have once hatched. My statement in your 1900 report that locusts eat the poisoned mixture more eagerly when they are old than when young, has not been borne out by recent observations; in fact, I now see that it is somewhat the other way."

In commenting upon the observa-

tions made by Mr. Criddle and the report given as quoted from above, Dr. Fletcher observes:

"As to the remark made by Mr. Criddle that some reported the mixture of 1 part of Paris green in 60 of horse droppings as not being strong enough, I believe that these observers were mistaken, and that the misapprehension arose from the fact that Paris green is a slow acting, although a very fatal poison. I have found dead locusts which had plainly been killed by this mixture, fully 100 yards from where the poison had been distributed around the edge of a crop. Mr. Criddle found that a simple way to keep locusts on the edge of a field of wheat is to sow a strip of rye around it. This grain grows much more rapidly than wheat, and takes a lot of eating to kill it. By this means the insects are held where they are easily poisoned.

"The plan which has been found most convenient for distributing this poisoned bait is described in my 1901 report. The Criddle mixture, as recently modified, consists of 1 part of Paris green, mixed thoroughly in 60 of fresh horse-droppings to which 2 pounds of salt per half-barrel of mixture have been added after being dissolved in water. This is placed in a half barrel and drawn on a cart to the edge of an infested field or one likely to be infested. The mixture is then scattered broadcast along the edge of the crop by means of a trowel or wooden paddle. The locusts are attracted to it from long distances and are killed in large numbers by eating the poison."

The method of preparing and distributing the mixture as set forth in the 1901 report is as follows:

"Mix thoroughly, adding enough water to make soft, without being sloppy. Scatter well, in quantity according to the number of locusts. They will be attracted for at least 40 feet by the smell. The horse-dung is preferable when fresh, but will do several weeks old, even after being washed considerably by rain. The above remedy has proved and must prove a great success wherever used correctly."

In reporting on the success of this method as tried in 1901, Mr. Criddle says: "In this section all used poison and only a few acres of crop were destroyed. I am convinced that, had we begun the fight earlier, hardly a bushel of grain would have been lost. It is no exaggeration to say that dead locusts could be gathered up in wagon loads and at times be smelled for half a mile."

The Kansas Broom-corn Bureau.

A. B. OLSON, SECRETARY, SAVONBURG, KANS.

The scope and purpose of this bureau is to promote the culture and marketing of broom-corn by furnishing to its members any information possible to obtain on the following topics: Culture, acreage, number of tons harvested, sold, unsold, existing prices compared with those of the past, effect of insects on and condition of growing crops; how, when and to whom to market broom-corn to best advantage at best prices; to discourage any trickery in the baling, and on any other topics pertaining to broom-corn.

It is not the purpose of this bureau to control the prices, its members being allowed to sell their crops to whom they choose and at such prices as they may deem to be reasonable and satisfactory. The promoters, however, believe that the information this bureau will be able to furnish to its members will have the tendency to place the grower on the level with any business man who is operating on a safe basis, whereas he is now merely playing a game of blind man's buff.

We maintain the bureau at a net cost to members of 5 cents per bale, payable as follows: 5 cents per acre on all growing broom-corn, and when harvested and in bale 5 cents per bale less the sum paid per acre. To become a member you must be a grower of broom-corn. The dues are spent in getting information which is furnished to the members at least once a month.

The bureau is not a secret organization, but should any member disclose to any one not a member the substance of the information we furnish him and marked private he will be dropped. We believe that to him who pays the fiddler, belongs the dance. We do not expect to limit our work to this county or State, but are gradually expanding by establishing branch bureaus in any and all broom-corn-growing districts. Our first move in a new district is to obtain the names of a few growers, one of whom we offer the position of local reporter for this bureau. Such person is termed precinct reporter, and has charge of a precinct

of four sections of land. When there are enough precincts established in a single district to warrant the establishing of a branch bureau it is so done. The duties of a precinct reporter are to furnish us with correct reports of his precinct (only) by answering such questions as we may propound to him from time to time.

The following are a few of the questions answered by each and every grower in a precinct:

Number of acres harvested in 1902.
Number of bales on hand August 1, 1902.

Number of bales harvested in 1902.
Number of acres expect to plant in 1903.

Number of acres growing broom-corn in 1903.

Number of bales now on hand.
Through our precinct reporters and district branch bureaus, we are constantly advised as to the selling-price in any State.

You will readily see from the above that we are in position to at any time give our members as true a forecast of what the future has in store for the broom-corn grower, as anyone, at least, we believe so, and our present members will corroborate we in this statement. Certainly outside of the bureau will be found many a grower who will say, "Here is another soap-bubble." If it is a soap-bubble to learn and be taught how to grow broom-corn for profit we will believe in a soap-bubble and wear diamonds while the other fellow will refuse a good price for his brush—hold it a year and then sell it at three-fourths or one-half of first bid. The next crop the fellow makes up his mind to sell at first sight, but lo! again the soap-bubble wins, again the lesson—have a little patience—comes well to hand.

How To Keep Moisture.

EDITOR KANSAS FARMER:—How to keep moisture in the ground, in the semi-arid regions, is a question of great importance. A short time ago, a Kansas farmer wrote a short article on this subject which was published in that worthy paper, the KANSAS FARMER. I read the same with interest and believe that he is right when he says that most of the Kansas farmers are plowing their land too shallow. If all would plow their land nine inches deep, as he does, and that at the right time, drouth could not injure the crops so much, and good paying results would be achieved. About 20 years ago I got acquainted with two young farmers who came from Indiana and bought a quarter-section of upland in central Kansas, in Geary County. They tilled the soil as diligently, carefully and thoroughly as they were taught and used to do in their native State and with good paying results. When others around them had complete failures with their crops or raised very little, they harvested good crops and consequently got good prices for their grain. Why did not many of their neighbors, who had just as good land, have the same success? Just because they did not till the ground as good as they did.

I believe that the ground in our State ought to be plowed deep—and subsoiled if possible—in the middle and western part. Plowing ought to be avoided as much as possible in the windy season of the year. The wind ought to have as little chance to blow the soil away as possible. After deep plowing the ground ought to be thoroughly harrowed, rolled and packed, so the surface gets crustlike. In this condition it will absorb the rain that falls and keep the necessary moisture for the growing crops.

I believe that when ground is prepared in the above described way in spring, very little need to be done to the same for fall seeding, and good wheat, rye etc., can be expected. Of course, for spring seeding the ground ought to be in just as good a condition. Douglas County. J. L. S.

Siberian Millet.

EDITOR KANSAS FARMER: As much is being written about drouth-resisting crops for Kansas, I want to say a word for Siberian millet. Last year I sowed twelve acres to Siberian millet, using about twenty pounds to the acre, which made a pretty thick stand.

I sowed about the middle of May and cut it with a binder about the middle of July, the seed being ripe, but the stalk and leaf were still green, not having changed color at all. In a few days the stubble began to throw out suckers, each of which ripened a little head of seed, and as there were several of these suckers to a stalk it made fine pasture. I thrashed 320 bushels of seed and had a large stack of excellent hay, unequalled for stock

by any hay except alfalfa. In growth, it is larger than the golden, but not so large as the German millet. A good crop can be raised after taking off a crop of wheat or oats if there are no chinch-bugs in the stubble and the season is favorable. I consider it one of the best drouth-resisting crops we have. G. W. BUSHNELL.

Butler County.

Fall Wheat Under Irrigation.

The Utah Experiment Station report contains the following statement of yields of some of the leading varieties of winter wheat under irrigation for the season of 1902:

Name of variety.	Yield in bus. per acre
Turkey.....	42.17
Red chaff (4633).....	39.08
Siberian.....	38.34
Ruby.....	38.77
Lofthouse (Winter La Salle).....	37.91
Golden Cross.....	37.49
Mediterranean.....	37.49
Zimmerman.....	36.64
Odesa.....	34.93
Tasmanian Red.....	34.51
Early Ripe.....	34.08
Martin's Amber.....	32.59
Turkish Red.....	32.38
New Zealand.....	32.38
Poole.....	32.38
Early Red Clawson.....	32.16
Canadian Wonder.....	31.95
Red Cross.....	31.95
Ramsey.....	31.95

Commenting, the agronomist of the station says: "The Turkey wheat is one of the chief varieties grown in the hard winter-wheat district comprising Kansas, a large part of Missouri, portions of Iowa, and Nebraska, and the larger part of Oklahoma. It has been grown on the station farm during the past two years. Last year its yield was above the average and this year it leads in a list of forty-eight varieties with a yield of 42.17 bushels per acre. It must be remembered that these yields were obtained on the shallow, gravelly soil of the college farm and the principal value of the table is the comparative yields. * * *

Macaroni Wheat on Arid Lands.

UTAH EXPERIMENT STATION REPORT.

Twelve varieties of macaroni wheat were grown without irrigation on the new farm at Greenville. These varieties are all spring wheats but we will grow them as fall wheats, and spring wheats next year. The following table gives the names of the varieties, the number used by the Department of Agriculture to distinguish them, and their yields without irrigation:

Name.	Number.	Yield of bus. per acre.
Mahmoudi.....	7792	42.46
Kahla.....	7784	38.30
Yellow Ghamouka.....	8230	36.21
Pellissier.....	7785	34.08
Black Don.....	8232	34.08
Fretes.....	8282	33.01
Maracuani.....	7778	33.92
Kahla.....	7581	30.89
Richtl.....	7795	29.82
Mohammed Ben Bachlr.....	7793	27.69
Medeah.....	7579	23.43
Aduni.....	7580	23.43

Horticulture.

State Forestry.

HON. W. L. HALL, WASHINGTON, D. C., BEFORE THE OHIO STATE BOARD OF COMMERCE.

Without discussing the process by which the forest has been removed from Ohio, I wish to point out briefly the present condition of the woodlands of your State and then suggest the means by which the State can reestablish and perpetuate at least a portion of its forest.

The United States Geological Survey, which bases its estimate on the census of 1880, reports concerning the extent of the forest of Ohio as follows: "With the exception of 2,460 square miles, or about 6 per cent, the entire area of Ohio was included in farms. The woodland in farms was reported at 9,300 square miles. The area not included in farms is little more than necessary to allow for roads, right of way of railroads, and the areas of cities. The area of woodland in farms, therefore, may be regarded as a close approximation to the total wooded area of the State. This is about 23 per cent of its area."

The report of the Ohio Secretary of State for 1899 gives the wooded area of the State as only 4,654 square miles, which is about 12 per cent of the total area. This estimate is based upon the statistics gathered by the assessors and furnished to the Secretary of State by the county auditors, and is probably much nearer the real forest area at the present time than the estimate given by the Geological Survey. Much timber has been cut, and the ground on



which it stood turned into farmlands or pastures, in the last twenty years.

Again, these are reports upon the wooded area and not the area of merchantable timber of the State. They include brushland and that covered by second and even third growth of timber. The area of original growth timber is very small. It is a matter of common observation that this class of timber is almost exhausted. Last summer in a day's drive in the vicinity of McArthur, Vinton County, a region which should be principally covered by forest, I found only one or two forty-acre tracts of virgin timber. In these, sawmills were in operation, cutting every tree that would make a two-by-four stick of sawn timber.

It is unfortunate for Ohio that its woodland should be reduced below 25 per cent of its total area. In the southern and eastern parts of the State, where the land is hilly, a large proportion of forest area is necessary to prevent great loss by soil erosion and to regulate the flow of streams. In all parts of the State a considerable proportion of woodland is necessary to maintain favorable conditions for agricultural crops. Not only is wind more destructive, but the extremes of heat and drouth are much more common in localities in which the forests have been cut away.

There can be no stronger plea for forests in Ohio than that lumber is absolutely necessary for the industries of the State. You must have lumber for your buildings, railroads and steamships, you must have it for your mines and wood-working industries. You can not expect to obtain this lumber from other States without paying them a high price for it, for the supply in neighboring States is diminishing almost as rapidly as your own. With them, as with Ohio, the problem is the protection of the forests in order to provide for their own future lumber-supply. The commissioner of forests in Pennsylvania, in a report issued in January of this year, states that the forests of Pennsylvania have now almost disappeared, and continues as follows: "The problem of another crop is now upon us for solution, a problem of no ordinary difficulty, and one that will take years of patient, intelligent effort on the part of our public and private citizens to solve." New York has but a small surplus of timber and has adopted strict measures to maintain it. There is yet a considerable lumber-supply in West Virginia, North Carolina, Tennessee, and Kentucky, and the movement of hardwood lumber from these States toward the wood-working industries of Ohio and Indiana is very large. It is indicated by the quantity of lumber received in Cincinnati, which is the main distributing point. This amounted in 1899 to 54,474 cars (12,000 feet to the car). In 1885 the receipts were 26,100 cars, or less than half as much. At the same time the Cincinnati prices on hardwood lumber have greatly advanced in the last decade, as shown by the following quotations:

This shows an average advance of 48 per cent, on the kinds of lumber mentioned, in the last ten years. Prices will not remain as they are now, but will constantly advance as the general lumber-supply decreases. With these conditions prevailing, it is not wise for Ohio to part with its timber-supply. Furthermore, there is much land in the State that will be more profitable if kept forested than if put to any other use. While it is an agricultural State and all the land is now held in farms, yet in 1899, 518,692 acres are reported as lying waste, and there is a great deal more on which farm-crops can not now be grown except with very small profits. Most of this land is in the southern and eastern part of the State. It is not too high an estimate to say that with 25 per cent of the total area forested—the forests in the main being restricted to portions least fit for agricultural crops—the State will be more productive than with a

smaller area of forest and a larger area of farm crops. Approximately, we may say that such a proportion would represent the State's greatest productiveness.

With 25 per cent of its area, or 9,975 square miles, in forest, an annual lumber-production of several hundred million board feet might be expected, without any diminution of the forest capital, provided the forested area is maintained at its greatest productiveness by proper management. With a system of forestry based on this area the lumber now introduced from the Southern States could be produced at home.

A FIELD FOR STATE ACTIVITIES.

If anything like such an area of forest is maintained and kept under a proper system of management it must be through the influence of the State. The past course of forest-cutting, which has reduced the wooded area to a small per cent and the merchantable timber of the State almost to exhaustion, shows that individual management can not be relied upon to perpetuate a lumber-supply. Let alone, individual management will still further reduce the wooded area of the State. The individual gives little attention to the reproduction of the forest—a feature that must be provided for if the forest is to be perpetuated. The reproduction of the forest requires so long a time that the individual has not considered it his business to provide for it. It is the business of the State, however, to protect its natural resources and, so far as possible, perpetuate them. It is a shortsighted policy that allows one generation to use natural resources wastefully, thereby entailing want upon succeeding generations, and yet that is the course which has been followed in dealing with the forests of this country.

Ohio is not alone in solving this problem. Many other States and the National Government are concerned with it. While the destruction of the forest was widely deprecated, there seemed for a long time no way to abate it. Means offered to regulate forest-cutting and burning were utterly fruitless.

A NATIONAL FORESTRY SYSTEM.

The National Government was the first to discover and adopt effective measures toward the perpetuation of the forest supply. Under the law of March 3, 1891, there have been withdrawn from settlement 46,828,449 acres of forest land, situated for the most part in scattered districts in the mountainous regions of the West, which land has been set apart as permanent forest reserves. The management of these reserves is carried out by superintendents, supervisors, and rangers who prevent theft of timber and destructive fires and provide for the improvement of the forest. The cutting and removal of timber is not prohibited, but is carried on with Government permits under the direction of the supervisors and rangers, who actually direct the cutting, marking the trees to be removed and seeing that they are properly felled and the brush piled.

Most of the reserves have now been mapped and fairly complete statistics have been collected on the kind and quality of timber standing. A long advance toward proper management of these public forests has been marked by the arrangement for the preparation of working plans for all of the National reserves. The surveys have already been made for a working plan in the Black Hills Forest Reserve, where the conditions for a tract of over one million acres are unusually favorable for forest-management. Working plans will show accurately the quantity of timber to be cut annually for the preservation and improvement of the forest upon the reserves.

As yet, no National forest reserve exists in the eastern part of the United States, but a bill has been favorably reported in Congress providing for the purchase of 2,000,000 acres in the southern Appalachian Mountains, including portions of South Carolina, North Carolina, Tennessee, Virginia, and West Virginia, and the setting of the same aside as a permanent forest reserve.

STATE FORESTRY SYSTEMS.

Following the example of the United States, the State of New York has within the last few years acquired title to 1,370,928 acres in the Adirondack and Catskill Mountains and has set the same apart as permanent forest preserves. The land has been acquired from many private parties either by tax certificate or by grantor's deed, and includes timbered areas in the

mountains unfit for agricultural purposes. The cost of this land to the State ranged from \$1.50 to \$7 per acre, averaging \$4.26 per acre. It is the purpose of the State to enlarge the area or the preserves much beyond their present extent. The management is vested in the State Forest, Fish and Game Commission, who administer them through a superintendent of forests. There are also additional foresters and, besides, a system of fire-wardens. The plan has been very effectual in the prevention of fire and also theft of timber.

The proper management of the New York preserves has been greatly handicapped by a clause in the State constitution which provides that the "timberthereon" shall not "be sold, removed, or destroyed." Hence, neither the mature, defective, nor fallen timber can be sold or used. The State is thus deprived of revenue, the use of which would greatly improve the condition of the preserves. At the same time, the restriction operates to prevent any practical application of good methods of forestry in removing mature, worthless, and fallen timber, and in thinning for the improvement of the forest. The superintendent of forests in a recent report expresses the hope "that the people may consent in time to some modification of the law, so that the public woodlands may be managed in accordance with well approved forestry methods, becoming thereby a source of profit instead of expense."

Notwithstanding the constitutional restriction, the managing commission applied last year to the Division of Forestry of the United States Department of Agriculture to have a working plan made for a representative township preserve. The working plan was made and is soon to be published. Besides showing the actual condition and rate of growth of the timber, it will give minutely the methods to be followed in perpetuating and improving the forest. Within the last five years Pennsylvania has begun a similar system of forest preservation. Under the Pennsylvania law,

"Authority is granted to the commissioner of forestry for the purchase of lands suitable for forest purposes, at tax sales, at a price not to exceed the amount of taxes for the non-payment of which the lands are being sold, together with the added costs. He has also authority, subject to the approval of the Board of Property of the State, to purchase forest lands at a price to be agreed upon and approved by the Board of Property, and not to exceed the assessed value of the property, and in no event to be above \$5.00 per acre.

"The Legislature has also constituted a Forestry Commission to locate and condemn, subject to jury damages, three reservations of not less than 40,000 acres each, upon the headwaters of the Delaware, Susquehanna and Ohio rivers."

The State has secured under these enactments 113,916 acres and is continuing its purchases. The land is located principally in the mountainous regions and is covered with timber, or brush, which with proper management will produce timber. Unlike the New York preserves, which are mainly in two bodies, the land acquired by the State of Pennsylvania is in many different tracts and in different sections of the State. There is in Pennsylvania no restriction on the cutting and sale of timber, so that the commissioner is free to adopt such a plan of improvement as he may find best. The plan of protection contemplated embodies a system of fire-wardens whose duty it is to put out fires as well as prosecute offenders who start them. It is probable that a system of scientific management will be adopted in Pennsylvania similar to that adopted for the National forest reserves.

The action of New York and Pennsylvania in establishing State forest reservations marks the greatest advance that has yet been made in State forestry. Neither of the two States has yet acquired the full area desired in the reservations, and neither has yet been able to perfect its system of management. But when the systems are in operation they will present such examples of practical State forestry that other States will be constrained to adopt similar systems.



THE SYSTEM ADAPTED TO OHIO.

Such a program of State forestry should appeal strongly to the people of Ohio for the following reasons: First, because of the almost exhausted conditions of the forests of the State. With an area a century ago almost entirely covered by forest, unsurpassed in quality in this country, it has now a very much smaller proportion of woodland than any other State east of the Mississippi River, with the possible exception of Illinois, which was never a well-wooded State. Second, the need of lumber in your various wood-working industries makes it necessary to seek some method of insuring the needed supply. In such a strait the successful example of another State with somewhat similar conditions should receive much consideration. Third, Ohio, while not mountainous, as the reserved portions of New York and Pennsylvania, includes, as has been mentioned, probably 20 or 25 per cent of land better adapted to forest than to agricultural crops. Some of this land is already covered by forests of greater or less value, or is in a condition to reproduce forest growth quickly under proper protection from fire and stock. Other portions entirely devoid of natural forest have conditions favorable to tree growth, and in a short time under proper care and management would again reproduce a forest. On lands of this class, regeneration would be slower than on land more recently covered by forest, but, with the State as owner, a few years would make but little difference. While it might be practical to resort to seeding and planting on some land to start forest growth, if proper care is used to select land already partially wooded, this will not be necessary on large areas.

MEANS OF ACQUIRING LAND.

Two methods are open to the State for acquiring land for the reserve, viz., by tax title and by purchase. The plan of taking land on account of the non-payment of taxes is, I believe, already in operation by the State. All that would be necessary would be to refrain from selling land acquired in this way in the localities where reserves are contemplated. Since the failure to pay taxes more often occurs on poor land, it follows that land adapted to timber can usually be acquired quite rapidly in this way. But it should not be necessary to resort to tax sales for the State to acquire land. A better system is that which allows private individuals holding forest-land that they do not want to relinquish the same to the State at a nominal price. This virtually substitutes a system of purchasing land for that of acquiring it through tax sales.

In connection with this, the right to condemn and take land by appraisal should be granted the State in acquiring land for the forest reserve. Both New York and Pennsylvania have used this method to a limited extent in acquiring necessary lands that could not be obtained by direct purchase.

The institution of such a forest system requires a competent commissioner or commission, with power to purchase and pay for land, and provide for its protection and management. It requires effectual legislation concerning protection of the timber on the reserve from fire and theft and for the punishment of offenders. Furthermore, it requires provision for the application of a system of practical forestry, including thinning, cutting and sale of timber for the improvement and perpetuation of the forest.

The establishment of State forest-reserves on such a basis as above outlined is the first line I propose for State forestry.

FORESTRY EDUCATION.

In order to carry out the system just outlined, men acquainted with the principles and practices of forestry must be placed in charge of it. Forestry is a business science. Only those who are trained in it can be depended upon to carry it into successful operation. Men trained in forestry are at the present time very scarce in this country. Till about four years ago there was no school of forestry in the United States, instruction upon the subject being confined to brief courses of lectures in some of the State universities and agricultural colleges. Enough time was not given to go deeply into the subject. At the same time this country

has been singularly lacking in investigations in forest values and management. Within the last four years three important forest schools have been established—one at Cornell University, giving a four-year course, one at Yale University, giving a two-year graduate course, and one at Biltmore, North Carolina, giving a one-year course. While these schools are yet small, they are established upon a good basis, are in efficient hands and may be expected to make very rapid growth in the next few years, drawing young men who are expecting to become professional foresters.

But the influence of these schools will not be sufficient to turn the general trend of thought in America toward a system of conservative forestry. It is only when the State universities and agricultural colleges are enlisted in promoting education in forestry, the same as in other agricultural branches, that the proper interest in the question will be awakened. Departments of forestry are needed in the State universities to rank with departments of botany and horticulture and give instruction in knowledge pertaining to forest-trees, forests and lumber. It is to be regretted that the effort to establish such a department in the Ohio State University ten years ago did not succeed. Had it succeeded, Ohio might now have not only a larger area of forest, but a system of forest management. Had such a system been established twenty-five years ago Ohio might not today be paying tribute to West Virginia, North Carolina, Tennessee, Kentucky, Michigan, Wisconsin and New York for the lumber it requires.

The promotion of education in forestry is the second line that I propose for State activities. It supplements the policy of forest reserves and is necessary in order to carry it out.

It will be argued that the system herein outlined will be expensive. It can not be denied that the first cost of it will be considerable, but within fifty years the cost will be fully repaid by returns from it, and thereafter it will be a source of great income. On the other hand, the cost of no system, which means no forest, will in fifty years be incalculable. It means that Ohio will annually pay an increasing tribute to other States for lumber and at the same time lay bare her fields to devastation from storm, flood and drought. It means that the wood-working industries must one after another withdraw from the State, going, as most of the sawmills have already done, to the source of supplies.

Between these two courses the State should not hesitate to decide.

Clover in Orchards.

FROM A PAPER BY HENRY BUCK, BEFORE THE MONTANA HORTICULTURAL SOCIETY.

To the persons contemplating the planting of trees, the first question that presents itself after procuring varieties is the best method of cultivating the same, so he may reap the best results. This is a question I have given careful study and I will only endeavor to portray my experience. Seven years ago I commenced planting apple-trees. I was told that I must clean cultivate them, commencing early in spring and continue the labor until some time in autumn. This method I followed four years. I found that the trees did fairly well, yet at the same time other conditions were in more or less degree responsible for the success or failure of the orchard. I also found that this method of growing an orchard was expensive.

I was reared in an apple-country and could not call to mind a single instance where one of our farmers clean cultivated his trees for the sole purpose of raising apples. This led me to inquire whether there was not some method by which trees could be grown and at the same time make the land pay for the cultivation and care of the same. My thoughts ran strongly on the subject of clover. I remember well how loose the ground was always found in a field of clover, and after about three years of cropping if we would turn under the sod and follow with a crop, perchance of grain, we would invariably reap a bountiful harvest. Scientists tell us that clover is a great gatherer of nitrogen from the air, depositing the same in the ground. Hence the thought comes up, why not

plant clover in your orchards to feed your trees?

Whether this hypothesis is true or not, I determined to try the experiment. Three years ago I sowed my orchard of forty acres to clover and my expenses ceased, except in irrigating and pruning. In the fall I found that I had some hay and a bountiful crop of weeds. I gave the crop to a farmer to cut and clean up preparatory to reaping a clean crop of hay the next season. This he did and did his work well. The following season I let the hay out on shares to harvest, giving one-half the crop and receiving one-half myself.

From a financial standpoint you will note the result.

From all that I could observe my trees did fairly well. Had I clean cultivated it would have cost me \$75 a month for man and team five months. My method cost me \$60 in working around the trees and caring for them in various ways, other than irrigating and pruning. My portion of the crop of hay netted me a profit of \$220.

The following year, that is, last summer, I followed the same plan with very much the same results, only that I may add my trees grew better and did the best of any year out of the seven. From this experience draw your own conclusions as to the financial and economical standpoint of growing clover in an orchard. It is well here to say a few words in regard to irrigation of the orchard by this method. My experience teaches me that much depends upon the irrigation as to your success or failure. Trees absorb considerable moisture and should be irrigated often. The clover growing dense serves a splendid purpose in holding the moisture even—giving the tree its food continuously, whereby no check of growth occurs, and with me the best results are obtained. Some no doubt, who condemn planting clover in an orchard, after seeding it down leave the trees to their fate, trusting to the clover to do the rest. Failure is inevitably the result and poor "clover did it."

The way I irrigate my orchard, I run water from the head ditch down, from eight to fifteen rows of trees at a time, according to my supply of water, taking care that every tree gets water. I try to change the water every two days, if possible, onto another set of rows, and so on across the orchard, getting back to place of beginning in about two weeks. This I keep up from spring until freezing-up time in November. By this method I find the trees are never allowed to dry in summer, and check their growth, thereby making a full season, ripening their wood, shedding their leaves and going into winter quarters in splendid condition.

In conclusion, I would advise that clover be grown in your orchard for, say, three consecutive years, turning under the second crop the third year for a fertilizer and then re-seeding the following spring. Many advantages could be enumerated which are the direct results of clover in an orchard. For instance, protection of the tree from sun-scald, protection of trees from rabbits, as rabbits love clover better than trees, and lastly a clean and inviting field in which to gather your fruit.

Fruit Growing as a Business.

In an address before the fruit-growers' association of New York, recently, J. H. Hale, the Connecticut-Georgia peach-grower said:

The demand for fruit is yearly increasing at a faster rate than population. I remember the time when Hartford, Conn., with 40,000 inhabitants, had only one fruit dealer, and only two men in the county grew strawberries. A sale of six bushels of berries in one day was an event. Now, with 80,000 population, 200 dealers sell 800 to 1,000 bushels daily. Handsome fruit is always in demand.

All over the West and South orchards of tremendous extent are being planted, and the owners thereof expect to send the best of their fruit to northern and eastern markets. These planters have no special favored conditions over us. My conditions in Connecticut are better than in Georgia. For production, the opportunity is here. We can make more money off a smaller area. A leading Chicago dealer told me he would rather have fruit from the Hudson River valley, if growers would give it the attention that western growers do theirs.

As to location, start where you are; locate near home. You can do just as well, and enjoy the old home surroundings and friendships. You want to live, as well as make money, and the best life is in or near the old home.

Grow the fruits that you like to care for. It is what we put our hearts into that brings the reward. Doubtless the apple is the best fruit to grow, for it is always wanted.

Plant the trees as closely as they will stand to fruit well, say 10 by 10 feet, then take out a part, later another part, till the trees stand 40 by 40. This means four times as many apples at the start, then twice as many. So with peaches. I believe in close planting, but many planters have not the courage to take out the superfluous trees when the time comes. I have some plum-trees set with peaches 9 by 9 feet, which will bear well next season.

Prepare the land thoroughly, stir it all through the season, and use cover crops, if nothing more than weeds and grass. Don't plant other crops; let the orchard have the first and best. The advocacy of orchards in sod is doing harm. On the Eldwell farm in the Sacramento Valley, California, worked with gang-plows, the yield of wheat is 15 bushels an acre. Nearby a woman farmer works her land more thoroughly, with the best tools, and gets 34 bushels. She does not know enough to vote, but she knows how to handle the land. Prune for shape and a low head. For vigorous growth, prune when trees are dormant; for less vigor, prune in summer. When heavy growth has ceased, cut out the strong leaders, and the small branches will develop fruit buds. Don't shorten it, but cut out entirely. Then keep up vitality by culture and fertilizing. Intelligent treatment is most important. In spraying, never use Bordeaux mixture after the buds have swollen. Spray thoroughly before; later, pick and burn all rotted fruit. Thinning the fruit is only important for the immediate crop, but tends to create the habit of annual bearing. Thinning costs less than the barreling and marketing of surplus fruit at low prices.

Potato-Bugs—Chicken-Lice—Ant-Beds.

Please tell me how to destroy potato-bugs. Also how to prevent chicken-lice, and destroy them. Will you ask your readers if it has ever been found out how to destroy ant-beds

C. H. MALONE.

To destroy potato-beetles use Paris green, either sprayed in water, one ounce to ten gallons, or dusted dry, mixed with equal parts of flour; in either case, apply to the plants every few days while the bugs are about.

True chicken-lice live on the fowl, and can be prevented from infesting the flock only by general cleanliness in nests and hennery, with the exclusion of lousy birds until they are rid of the lice by proper treatment. The best fresh insect-powder several times applied to lousy birds, will generally clean them out. Several "lice-killers" are advertised, and most of them depend for their value on creosote, oil of pennyroyal, and similar ingredients. If properly used they are effective, but their use must be supplemented by clean quarters for the flock.

The large ants of the plains are difficult to exterminate mainly because the attempt is rarely thorough, leaving in the hill the mother of the colony, and the abundant young brood, which through their situation in the more retired passages of the hill are rarely reached by the fumes of the carbon-bisulphide, the agent most usually applied. After the first and superficial application has done its work, it will be found desirable to open the mound in the center, clearing out the rubbish, and applying another dose to the deeper internal parts. Some farmers report temporary success by trapping the ants in a cup or bottle containing coal-oil, sunk to the level of the surface; most of the worker ants will quickly fall in, and perish, but this mode simply de-populates the hill for the time, and does not exterminate the family, for the reasons stated. E. A. POPENOE.

Kansas Experiment Station.

Pear-Trees Sprouting.

EDITOR KANSAS FARMER: I have a pear orchard consisting of one hundred trees, about seven years old, that are sprouting very badly, and would like to ask you where the trouble lies and what could be done with them?

Some of the trees have a perfect mat of sprouts extending for several feet from the body and all the way from ground to three feet high. The trees had a few very fine pears last summer. I have no experience with pears, nor did I plant these, as I bought this farm the past season. Do all pears sprout that way, or do these perhaps because of being budded on poor stock? They are planted in a rich, black, sandy loam bottom, and seem

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New Elk Combined Riding and Walking Cultivator

with balance frame. Only cultivator made that is equally satisfactory as Rider or Walker. Cut shows one of a dozen styles of rigs. Find out about it now before the cultivating season. Ask your dealer about it.

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Deere & Co., Moline, Ills.

to do very well otherwise. They are from twelve to fifteen feet tall, and set twelve by fourteen feet apart. What should I do with them, Harvey County. A. LUGINBILL.

There seems to be no reason why pears as young as these should sucker so badly though it is common in old trees. The suckering from any tree propagated by budding or grafting indicates that the scion is less vigorous than the stock. When the pear is grafted on seedling stock and the graft set so high that the scion itself does not become rooted, if the graft does not make a perfect union, the stock will send up sprouts, and if they are not kept down the scion will die.

As it is not stated what method was used in the propagation of this particular orchard nor what the treatment of it has been since it was set out, it can not be said absolutely why they should sucker so badly.

GEO. O. GREENE.

Kansas Experiment Station.

New Conditions for Farmers.

One day, late in the recent autumn, a half-dozen farmers, coming fifteen miles, drove into a prairie village with heavy loads of corn. They went to the principal elevators and asked the price. "Thirty cents a bushel to-day."

"We will go to the buyer at the other end of the town," said the spokesman.

"It will do you no good," was the reply, "as all the buyers pay the same price here."

"Very well; we will go home and send our corn to market on foot."

They drove back fifteen miles and unloaded the corn into their own granaries, to be shipped later in the form of fat cattle.

Such an incident would have been impossible ten years ago, when the average farmer was compelled to take what was offered for his crop. But two things have worked a transformation in the grain-growing portion of the West: the farmers have become conservative with prosperity and the railroads have widened the markets.

Five years of good crops in the West have not only paid the debts, but have also made the farmer capable of employing business methods. A few years ago a settler visited town only once a fortnight or once a month. He took home with him the county papers, the few magazines that he received from the East and large bundles of groceries and dry-goods. With rural delivery and rural telephones all that is passed.

One morning the telephone in my office rang and, answering, I recognized

HONEST MEN

are at a premium everywhere and an Honest Farm Wagon should be. If more men who misrepresent articles they offer for sale were put

IN JAIL

the farmer would have less trouble. When you buy a Farm Wagon see that it is the "NEW TIFFIN," for it is an HONEST wagon in every part. No Maple axles. No Elm or inferior Birch hubs. Nothing in the gears but first quality Hickory and Oak. If your dealer will not handle it write to THE TIFFIN WAGON CO., TIFFIN, OHIO, and they will tell you where you can get one.

Why RUMELY?

The thrasher has many reasons, too many to give here. Summed up, it means the model threshing outfit, the best money can buy. You will find the latest catalog on Rumely's Rear Geared Tractor Engines and New Rumely Separators full of thrashermen's logic, argument that convinces. Write us for it. Mailed free.

M. RUMELY CO., LA PORTE, IND.

Well Machinery.

For drilling and boring either deep or shallow wells, in any kind of soil or rock; with engines or horse power. Easily operated; built strong and durable. Used for over 20 years and they are no experiment. Before buying send for our free illustrated catalog.

THE W. M. THOMPSON CO., Sioux City, Iowa.

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, Merchants' Nat'l Bank Bldg., Baltimore, Md.

the voice of a farmer friend living a dozen miles from a railroad.

"I see in the Kansas City morning papers," he began, "that there is trouble in Venezuela. Is there anything later?"

"How did you know what was in the morning papers?"

"Oh, we get them from the carrier every day."

It was not noon, yet he had been in touch with the world's news up to 3 o'clock that morning, and this 200 miles west of the Missouri River.

Under these conditions the Western farmer has developed an independence in the movement of crops disconcerting to the market manipulators.—C. M. Harger, in the World's Work.

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For the Tourist who desires to unite pleasure with comfort at moderate cost. For those Seeking Health in the balmy and invigorating Lake Breezes. For the Business Man to build up his shattered nerves. Three sailings each week between Chicago, Frankfort, Charlevoix, Petoskey, Harbor Springs and Mackinac Island, connecting for Detroit, Buffalo, etc. Booklet free. JOS. BEROLZHEIM, G. P. A., Chicago.

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ALWAYS ON TIME.

The Stock Interest.

THOROUGHBRED STOCK SALES.

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

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 7 and 8, 1903—Combination sale of Poland-Chinas and Shorthorns. Poland-Chinas on the 7th, Shorthorns on the 8th. James P. Lahr, 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, at Monroe City, Mo.
 October 19, 1903—Oak Grove, Mo., Poland-Chinas. E. E. Axline.
 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.
 November 10-11, 1903—Marshall County Hereford breeders' annual sale at Blue Rapids, Kans.
 November 12, 1903—Central Missouri Hereford Breeders' Association.
 November 17, 18, 19, 1903—Armour Funkhouser, Herefords, at Kansas City, Mo.
 December 3, 1903—100 head of Herefords, at Chicago, Ill. C. R. Thomas, Secretary.

Fitting Cattle for Show.

Som Johnson, college herdsman at Ames, Iowa, tells in *Agriculturist* how he fits steers for show, as follows:

The first task that presents itself in preparing cattle for show purposes is the selection of the best individuals from the herd. It is not only necessary to know which is the best animal at the time of selection, but which one will respond properly to fitting and develop into a smooth, thick-fleshed beast. In making the selection, choose those with the head broad between the eyes, short from the eye to the nose, with large nostrils and mouths, eyes bright, yet placid, legs short, body broad and deep, back and underline straight, tail head broad and smooth with the tail well set in. Style and quality are essential points.

After a careful selection has been made, good feeding and management prize-winners of them, and although no two steers can be fed exactly the same, a few general principles may be stated that must be followed to insure success.

1. The eyes of the master fattens his cattle. This is a very true saying, for unless the feeder can see the needs of his charge, he can not administer to their wants.

2. You must be a good cook, clean in preparing your meals, careful in making your feed-stuffs and regular in feeding. No guesswork goes in preparing cattle for the show-ring.

3. Always keep a little salt in reach of the animals.

4. Keep your feed-boxes clean. Scald them out once a week with hot water. Never place more feed before a steer than he will clean up nicely. If, for any reason, any feed is left in the box, clean it out, for feed left before an animal is worse than wasted. You should note when you look at each steer how he is feeding and feed accordingly. Some days steers will feed heavier than on others. The worst trouble with most feeders is that they become too anxious, but experience is the best teacher. I remember the first steer I ever fed. I did not know the first principles, yet thought I knew it all. But I fed him according to directions and he was championship steer at Chicago that year. After five years I was convinced that I did not know very much about feeding and then went to work to learn. My strongest point in feeding and showing has always been my confidence. Never get discouraged. If you do not win the first year try it again; the more you show the more you learn and you will find that you can learn something every day. We never get too old to learn.

Preparing cattle for the show-ring is no easy task; it is an art. You must have judgment to make a success of feeding. It would be impossible for me to tell what to feed an animal without knowing its condition. You must understand the quality of your beast and feed according as he is hard or soft. There is a great difference between flesh and fat. Seldom, if ever, can you get two animals that will feed the same all through the season. Some will mature quicker than others, but you should be able to judge when making your selections approximately the time they will mature. A good feeder can bring his cattle out the third year as well as the first if he understands feeding them.

Feeding three times a day is usually sufficient, yet if you get a steer that is a little backward about feeding, give him all he can eat about four times a day, for an animal not fat is worthless in the show-ring. Greater care must

be taken with the good feeders for if given all they will eat they may easily be overdone.

Although corn-and-cob-meal is recommended for feeding market steers it is not as good as corn-meal for show-stock because meal is hard to digest and does no good except to add bulk to the ration; cut hay will answer this purpose more efficiently. Always give the animals what they want and they will respond to it. Perhaps you have noticed a steer standing at the door of his stall, looking you in the face as if to tell you there is something he is not getting that he wants. There is an expression in his face that will tell you. Try to find out what it is and after he gets it he will lie down and bother you no more. Some cattle require more corn than others, some more bran, some more oats, etc., but never feed too heavily of corn if you want to keep your cattle on feed and in a smooth condition. In addition to the grain ration some easily digested succulent feed should be fed, such as roots or silage.

Change your feed often to keep up the appetite of your steers. Give them variety. Shamrock was a hard steer to feed when I first took him and I continually changed his ration until I found out just what he liked, but it took a long time. After learning what he wanted he responded better than any steer I ever fed.

Oftentimes your steers get out of order as indicated by a dry coat or a dull eye; or pimples appear on the hide. These are indications that the blood is too hot, or the digestion sluggish, caused by too much corn or other carbonaceous food. Cut down the content of corn in the ration and feed a lighter food or let the animal miss a feed or two until his appetite returns and then start him again, taking care not to give him too much a second time. Never try to get very large gains. A calf should gain 50 pounds the first month, 75 pounds the second, 85 to 100 the third, and from that on until show-time over a hundred pounds gain per month is not to be desired. Larger gains may be obtained for a time, but the calf will drop back and not do as well as though he had been fed more slowly. Give him all the milk he can take and make good use of, taking care not to scour him. However, about once a month it is well to clean him out. No feedstuff can take the place of milk in making a show calf. Train the calf when he is young, for at that period he will learn easily and never forget his lessons.

Yearlings are the hardest class to fit. They should be fed the whole year to keep up the growth and to fatten them at the same time. Two-year-olds are probably the easiest to fit, having attained their growth and all that is necessary to fatten them smoothly. However, they should be fed for a period of ten or eleven months with a steady gain of forty or fifty pounds per month, thus giving them time to lay their flesh on evenly.

Grass is a valuable help to the feeder, and is the best doctor to keep the cattle in a healthful, thriving condition. Care must be taken not to allow the steers too much, however, or their flesh will become too soft.

The feeder should carry in his eye the ideal type of a steer that suits the judge and fit for his examination. Not always do you fit steers to suit yourself; tell me who is to be the judge and I will tell you how to fit your cattle.

Once a month the feet should be trimmed to free them from fever which centers at this point. Always keep the steers clean. A good washing every two weeks is not only cleaning but refreshing and is a stimulant to a good coat. Brushing with a soft brush each day assists the blood circulation, but never use a curry-comb as it irritates the skin, causes dandruff to grow, and eventually harms the coat.

When the flies are bad keep your charges in a well-ventilated and darkened barn, with stalls well bedded; then blankets are superfluous except for a week or two before the show, when they are helpful to smooth the coat.

All through the feeding-period care should be taken not to disturb the animals any more than is absolutely necessary. Allow them to rest, for when they lay stretched out on a soft bed they are doing well and laying on flesh. About six weeks before time comes for the show to open, the ration should be changed to one that is conducive to firm flesh in order to get the firm yet mellow touch which is so indicative of good quality.

The week preceding the show is one of severe tests and trials to the herdsman and his cattle. The horns are to be trimmed, if any are present; if not, the heads are to be trimmed to give a

fine, clean-cut appearance; portions of the body, where long hair interferes with the best of conformation, must be carefully trimmed, and horn covers must be provided to eliminate the danger of again getting the horns scratched up again.

At last the time to ship comes. Feed lightly of grain the last two days and wholly omit the last feed prior to loading, giving plenty of good clover hay. Feed nothing on the cars but hay. Have your cars well bedded and offer every inducement for your cattle to lie down during the trip, for a long ship is a tiresome ordeal for cattle. On reaching your destination unload and water; place the cattle in well-bedded stalls and feed lightly the first day, allowing the beasts to rest as much as possible. The next day begin preparing for the show and leave no stone unturned.

In showing, keep your eyes on your beast and the judge at the same time, holding your animal in the position at which he looks best. Always stay on the same side as the judge and look at your steer from the same point of view. Then you can see how to stand him to improve his looks.

All this feed and care necessitates a considerable expense, but to win, expense must be a secondary consideration. Such expense, of course, is warranted for exhibition purposes where advertisement of the herd at home is the advantage to be gained.

Controlling the Sexes.

This is a question that every now and then keeps cropping up and perhaps there is more in it than some people think. Eighty years ago an interesting experiment was tried in France. At a meeting of the Agricultural Society of Severac, held in July, 1826, it was proposed by a breeder, who had formed a theory as a result of experiments, that test should be made. He suggested that young rams should be put to the ewes from which the greater number of ewe lambs were desired, and the flock put on the richest and most abundant pasture, while to obtain a majority of ram lambs strong old rams should be used and the ewes put on rather inferior pasture. Two members of the society agreed to try the experiment, and in due course the results were announced as follows:

From flock for ewe lambs, served by two rams 15 months and 2 years old:

Age of ewes.	Sex of lambs.	
	Male.	Female.
Two years.....	14	26
Three years.....	16	29
Four years.....	5	21
Five years and over.....	18	8
Total.....	53	84

From flock for ram lambs, served by two rams 4 and 5 years old:

Age of ewes.	Sex of lambs.	
	Male.	Female.
Two years.....	7	3
Three years.....	15	14
Four years.....	33	14
Five years and over.....	25	24
Total.....	80	55

Since then there have been many discussions on the same subject all leading to the conclusion that sex is controllable to at least some extent.—*Nor-West Farmer*.

Inflammation Following Castrating.

EDITOR KANSAS FARMER:—Mr. A. Child, Industry, Kans., asks for information regarding a calf that died following castration. There was extensive swelling of the scrotum and along the belly, with passage of blood with a little dung before death. The calf probably died from inflammation following the operation caused by infection of the wound. This is not common in cattle if the operation is properly performed. A good, free incision should be made in the scrotum or the end of the scrotum cut off in order to give free drainage; otherwise a blood-clot is apt to form in the scrotum which decomposes and causes either blood-poison or inflammation. The cord should be taken off well up so it will not grow fast in the wound and cause a tumor to form. When swelling occurs, following castration, the scrotum should be opened, blood-clots removed, and a weak antiseptic such as a 3 per cent solution of carbolic acid in water injected. N. S. MAYO, Veterinary Department, Kansas Experiment Station.

\$19.00 From Chicago to Boston and Return, \$19.00

via Nickel Plate Road, account meeting of Christian Scientists, June 28-July 1. Tickets on Sale June 25, 26 and 27, with open return limit of June 28. By depositing tickets with Joint Agent in Boston on July 1, 2, 3 or 4, and payment of fee of 50c., extended limit returning until August 1st may be obtained. Stopover at Niagara Falls, in either direction, without extra charge. No excess fares charged on

GEORGE W. OUTCALT

How He Extricated Himself From A Serious Difficulty.

How George W. Outcalt, a well-known merchant of Wellston, Okla., recently succeeded in extricating himself from a serious difficulty is one of the interesting-stories now going the rounds of the papers.

"I had been working very hard," he says in telling the story. "For a long time I had given almost every moment of my attention to my business and I did not notice what effect this was having on me. But, finally, I saw that my health was giving way—I was getting thin, was always tired and easily out of breath, my blood was poor, my stomach bad. Every now and then I would be dizzy and any little exertion would exhaust me completely. In short, I was all run down.

"Then one day I saw an advertisement which led me to try Dr. Williams' Pink Pills for Pale People. They acted like magic. I felt better in a few days. My flesh came back till I regained my normal weight, my appetite returned and my general health is now better than it had been for many years. I have recommended Dr. Williams' Pink Pills to many of my friends and am glad of this opportunity to tell what the remedy has done for me."

What Dr. Williams' Pink Pills for Pale People did for Mr. Outcalt they will do for others similarly afflicted. They are different from ordinary medicine because they act directly on the blood and nerves. They have cured stubborn cases of locomotor ataxia, partial paralysis, St. Vitus' dance, sciatica, neuralgia, rheumatism, nervous headache, the after-effects of the grip, palpitation of the heart, pale and sallow complexions and all forms of weakness either in male or female. If you are sick and your doctor can not cure you, write us and we will tell you honestly and frankly whether Dr. Williams' Pink Pills are suited for your case. We will not recommend the pills in cases which we do not believe they will cure.

Dr. Williams' Pink Pills for Pale People are sold by all dealers, or will be sent postpaid on receipt of price, 50 cents a box, or six boxes for \$2.50 (they are never sold in bulk or by the hundred) by addressing Dr. Williams Medicine Company, Schenectady, N. Y.

any of our trains. Three trains daily. Through vestibuled sleeping-cars. American Club Meals served in dining-cars on Nickel Plate Road; also meals a la carte. Address John Y. Calahan, General Agent, 113 Adams St., Room 238, Chicago, for reservation of sleeping-car space and other information. (8)

Stock Gossip.

The Indianapolis combination sale of Herefords on May 20 and 21, resulted in the sale of 104 head at an average of \$158.15. Ninety-two females averaged \$165.65 and twelve bulls averaged \$100.80.

At Indianapolis, Ind., on May 19, was held a combination sale of Shorthorns in which 59 head were disposed of at an average of \$127.60. Fifty-three females averaged \$126 and six bulls averaged \$142.50.

A combination sale of Herefords at Wabash, Ind., on May 22, resulted in the disposal of 28 head at an average of \$225.90. Of these twenty-three were females which averaged \$243.05 and five bulls which averaged \$147.

W. I. Wood, Williamsport, Ohio, held his fifth annual sale of Shorthorns on May 21. A total offering of 45 head brought \$10,195, average \$226.50. Thirty-eight females brought \$8,520, average \$224. Seven bulls sold for \$1,675, average \$239.25.

A combination sale of Shorthorns was held at Clarksville, Ohio, on May 22, and was the last one of a series of fourteen days' sales of Shorthorns in that State. It was considered a success though the prices did not rule as high as at some of the other sales. Forty head averaged \$124.10, of these thirty-five were females which averaged \$123, and five bulls averaged \$130.

J. C. Robison, the big Percheron breeder at Towanda, Kans., tells us that he has arranged for the biggest and best sale of pure-bred live stock ever held west of the Mississippi. This sale will be held on February 4, 5, 6, and 7, at Wichita, at which time Percherons, Shorthorns, Herefords and Poland-Chinas of the choicest breeding and individuality will be offered for sale.

Mr. Thomas Evans, breeder of pure Hereford cattle, Hartford, Kans., writes us that he has just sold ten head of bulls to go to El Paso, Tex., and that we must change his advertising card to keep pace with the business he is doing. His cattle are in fine shape and are selling well which indicates that he knows how to breed whitefaces. His card is now on page 622.

After reading our editorial article of last week on the Tamworth hog some one in his haste to get prices wrote to Mr. C. W. Freelove, Clyde, Kans., and failed to sign his name to the letter. Should this

meet the eye of the writer it will inform him of Mr. Frelove's reason for not answering, and at the same time express his desire to do so when the name and address is furnished him.

The Live-Stock Sanitary Commissions of Kansas and Oklahoma are holding a meeting in Oklahoma City this week to discuss ways and means for the prevention and spread of the Spanish Itch. This disease is said to be somewhat prevalent in Beaver County, Oklahoma, and adjacent parts of Kansas. A report of the proceedings of the meeting will be published as soon as available.

W. M. McFadden, secretary of the American Poland-China Record, will have his office in Chicago after June 1. As it will require some time to remove all of the records from West Liberty, Iowa, to Chicago it is possible that business will not be actually begun in the new location until about June 12, after which time, however, the secretary may be found at the Live-stock Record building in Chicago.

Volume 9 of the Agricultural Advertising has just been issued in bound form and it makes a very satisfactory book of reference. It contains a complete list of all the poultry papers in the United States; a special live-stock number; report of the convention of the American Seed-Trade Association and matters of special importance to the implement men of the United States. It is issued by the Frank B. White Company, Powers Building, Chicago.

The American Aberdeen-Angus Breeders' Association have just issued a catalogue containing classifications, premiums, rules, regulations and information concerning exhibition of Aberdeen-Angus cattle for 1903. The association has appropriated \$3,500 for premiums for the American Royal at Kansas City, with \$300 for the State fair at Hutchinson, Kans. There will be premiums given by this association for the Chicago International, for two Canadian shows and for 12 State fairs, in addition to those just mentioned. A copy of this catalogue may be had by addressing Thos. McFarlane, 17 Exchange Ave., Chicago, Ill.

For more than thirty years the Powell Bros., of Lees Summit, Mo., have been breeding Shorthorns. The type they breed is the one which most nearly approaches the ideal for the farmer and general breeder. While they raise prize-winners and still have them in their herd, their main object in breeding is not the winning of ribbons so much as developing a useful type of Shorthorns which will meet the demands of the time. They have a fine crop of youngsters coming on and will be ready for almost any demand that can be made upon them a little later in the season. Watch this column for further particulars in regard to this herd.

Mr. C. D. Willems, proprietor of the East Reno Berkshire Herd, Route 3, Inman, Kans., has been having very successful sales from his advertisement in the Kansas Farmer. His herd is headed by Elma King 60656, who was sired by Premier Lee 63182, first prize-winner in a class of thirty yearlings at St. Louis in 1902. Premier Lee is by Lord Premier 50001, for which Mr. N. H. Gentry, president of the Missouri State Fair, refused \$1,000 cash. The dam of Elma King is Imp. Elma Lady 44668, for which Will J. Rhodes, of Tampa, Kans., paid \$150 in 1902. Mr. Rhodes took this sow home from the sale and she farrowed eight pigs in her first litter, six of which he sold for \$50 a head and with the other two he won the State prize and \$50 cash at the American Royal in 1902. Mr. Willems' herd boar is a litter brother of these prize-winners. Other boars in use on this farm are Rutger Judge 2d 62687 and Prince Reno 63897, both of which came from Chas. E. Sutton's herd of topnotchers at Russell Kans.

Hon. T. A. Hubbard, Rome, Kans., whom everybody in Kansas knows and likes, has still on his Rome Park Stock Farm a few choice Poland-Chinas and large English Berkshires. Although Mr. Hubbard has recently been elected to the office of County Treasurer, it has not entirely weaned him from his first love and we learn with pleasure that his little plunge into politics will not take him out of the breeding business but he will retain the choicest of his two herds for future sale and show. His Poland-China herd is headed by the prize-winning Cleveland 68070, who was sweepstakes boar at the State fair for two years. The other boars in service are Hubbard's World Beater 4493, the highest-scoring boar wherever shown. The Large English Berkshire herd is headed by Joker 19000, who was first-prize boar at Lincoln, Topeka, Kansas City and who won sweepstakes at Topeka. Gladstone 28310, first premium and head of sweepstakes herd for two successive years at Wichita. These two are assisted by Model, a fine youngster. It occurs to us that if we owned hogs of this breeding and of as fine individuality as those now on Rome Park Farm that politics would have no temptations for us—unless, of course, we could be sure of an election. See Mr. Hubbard's card on page 622, and drop him a line about what you will want this spring.

Rutger Farm, at Russell, Kans., belonging to Chas. E. Sutton, is a busy place at any season of the year. In the last few days they have sold a number of their famous doddies to people who know good things when they see them. Ed. Oswald, of Wood River, Neb., bought three splendid aged Angus bulls; Logan Elliott 28300, who is a son of Mr. Elliott's celebrated sire, Polar Star; Minor M. 34967, of the prize-winning Mina tribe, and Sunny Slope Knight 35836, a Kinochtry bred bull. Mr. Oswald is the man who has been furnishing prize car-lots at the American Royal fat-stock show and with these bulls in service we think the habit of furnishing prize lots will become a fixed one. Patrick Crady, Russell, bought the Drumin Lucy bull, Rutger Edgwood 8th 37717 for use on his Shorthorn cows. This is a round, close-made, blocky bull that ought to be the sire of some beef-makers. Chas. C. Spencer, Arlington, Kans., bought Rutger Thomas 57946 as a sire for his future market-toppers. They breed Berkshires at Rutger Farm also. W. B. Whitney, Garden City, Kans., has just bought a splendid young boar named Rutger Star by Elma Windsor 55080 out of the old

standby Rutger Blossom 51st. Jos. Talbot, Russell, bought Rutger Bachelor 4th, a splendid youngster of the Jewell tribe. At last reports Hon. Geo. Morgan, of Luray, was after one or more of these splendid Berkshire boars for use on his dairy farm. We regard this as a pretty fair week's business even for Rutger Farm. But the best of it is that there are more of the same kind still to be had there. Look at the advertising card on page 623.

At the D. L. Taylor & Sons sale of Shorthorns and Herefords at Manhattan, we noticed a young man who seemed disposed to bid on the best offering in Shorthorns and we noted that he finally succeeded in carrying away about the best young bull and heifer contained in the Shorthorns offering. The bull he bought is Dale 193549 and he is now using him in his herd. This young man's name is W. H. Shoemaker and his home is at Narka, Kans. His father has been breeding Shorthorns for many years but recent failure in health has compelled him to lay down the work so ably begun in favor of his son. The herd is headed by Bellina Joe 149240 who is now assisted by Dale. Bellina Joe is a bull of such quality that his get has always been in demand to such an extent that it has been difficult to supply it. At present all of the young stuff has been sold from this farm except a yearling bull which is still for sale, and a fine bunch of heifers which can not be bought. With the recent accession of the Taylor cattle to this herd, Mr. Shoemaker will be in better position than ever before to meet the demands of his large trade. As soon as his young stuff is ready you will hear from him in the Kansas Farmer.

We recently had the pleasure of visiting the herd of Hereford cattle owned by J. M. Curtice, near Independence, Mo. As there are a number of youngsters here on this farm which are under preparation for the American Royal and other shows this fall, it will undoubtedly be interesting to all Hereford breeders to learn something of their breeding and qualities. The head of the herd at present is Beau Champion 129532, by Beau Brummel 51317, out of Miss Christine 81669, by Lamplighter 51834, he by Don Carlos 35734. As second herd bull in this herd will be found Beau Perfect, by Beau Brummel out of Pertinent 8th 61582, by Don Carlos. It will be noted that these bulls represent one of the best lines of Gudgeil & Simpson's breeding and an inspection of the animals themselves show them to be a worthy representative of the great herd from which they came. Mr. Curtice has in preparation for the shows a splendid young calf out of Gentle Annie by Osceola 32669 out of Dollie 64217, who will be shown in the senior calf class. In the junior calf class will be shown a bull calf descended from Vida 56484 by Prince Solitaire 37691. Two of the best young cows we saw on the place were Miss Bird by Osceola out of Red Bird 57376 and Gentle Annie by the same sire and out of Dollie as just mentioned. Mr. Curtice's herd is located in the best farm-region of Missouri and is just across the road from the splendid Shorthorn farm of Alexander Fraser, reference to whose herd was made some weeks ago. We understand Mr. Curtice is a brother of the other Curtice at Eminence, Ky., who has also attained fame as a breeder of Herefords. This herd may be taken as a fair example of the results to be obtained by following the lines of breeding adopted in the great Gudgeil & Simpson herd at Independence, and will bear watching for future results.

Some of the very encouraging features to be found in the cattle-breeding industry at this time are embraced in the fact that the sale season for pure-bred cattle has ceased to be confined to the spring and fall months and is now practically continuous throughout the year. More important than this, however, is the fact that the day of inflated prices for registered animals is apparently gone by and, while the sales that have been held during the past season do not represent such high values as had previously been obtained, they do represent an even series of prices which more nearly shows the real value of the stock offered and the real condition of the market. Sensational prices have been rather uncommon, but good, profitable prices have been the rule. While it is true that no one can estimate the value of a noted sire, it has also been true that the prices for such in the past have been so high that many breeders were deterred from engaging in the business and a reaction has set in. The business of breeding pure-bred cattle is really upon a sounder basis than ever before, but the experiences of the past serves to emphasize the mistakes made by breeders in placing too high value on pedigree and too little value on individual merit. This is especially true in the matter of type. Certain breeds of beef cattle have of late come rapidly into public favor largely because their promoters have had a fixed type in mind and bred towards it. Other and older breeds have suffered because no general type is required and each breeder has been going it alone. One of the serious lacks of this time is that of definite requirements by the record associations and responsible breeders as to type. Should fixed requirements be made so that all engaged in breeding any particular breed could have the same ideals before them, advancement and not retrogression would be the rule. Right here it seems possible to use some of the specially trained agricultural college students both as breeders and judges. Uniformity of type is absolutely essential in any breed, and the young men trained in our colleges are the ones to whom we must look for the necessary knowledge that will enable breeders to fix a type. Our college authorities must see to it that the instructors of these young men are practical breeders who breed and know one breed thoroughly and can give instruction about it. Instruction from butchers or feeders or even college professors who have a good general knowledge of breeding but not special knowledge of one breed will no longer fill the bill. The instruction must be expert in its strictest sense.

Why Don't You

enter into the spirit of the times and progress? No better way to gain a few live pointers regarding Indian Territory than by writing for the May issue of "The Coming Country," now ready. Address "Katy," 508 Wainwright, St. Louis, Mo.

Publisher's Paragraphs.

Notice has been received that the De Laval Separator Company, whose general offices are at 74 Courtlandt St., New York City, have just secured an injunction against the American Creamery Supply Company, of Waterloo, Iowa, for infringement of patent.

The Dempster Mill Mfg. Co., whose factory and general offices are at Beatrice, Neb., and whose branch houses are at Kansas City, Mo., Omaha, Neb., Sioux Falls, S. D., and Memphis, Tenn., with wholesalers in Denver, Salt Lake City, Boise City, Minneapolis, Santa Anna, Fort Dodge, Portland, and New York City, have mailed us their latest catalogue. The book is bound in cloth, handsomely printed and copiously illustrated. It includes over 1,000 articles, among which are wind-mills and towers, pumps, cylinders, water-tanks, well machinery, pumping-jacks, horse-powers, gasoline-engines, grain-drills, cultivators and general farm and ranch supplies. They also are able to sell at wholesale iron pipe and casings, iron- or brass-fittings, drive-points, strainers, hose, belting and packing, engine and thrasher supplies and all kinds of water and steam goods. This is probably the largest manufacturing institution west of the Mississippi and their factory at Beatrice covers many acres of floor space. Indeed it would be difficult for a farmer to think of any article which he could not secure from the Dempster Mill Company. In our travels about the State we notice that the Dempster people have their name attached on very many of the pumps, wind-mills and towers, gasoline-engines and cultivators which we see installed on the good farms of Kansas and the Southwest. This means that they not only have a large sale area near home but that they have satisfied customers in whatever territory they do business. We have taken particular notice of their hand- and wind-pumps, both on account of their handsome appearance and the ease with which they work. These facts together with the other fact that their pumps and mills seldom get out of order makes them very popular wherever they are known.

Came Out All Right.

Chisholm, Iowa, Feb. 7, 1903. About two weeks ago your agent called here and stayed over night with me, and it happened that I had a calf sick with blackleg, had lost one a few days before and expected to lose this one, but the agent persuaded me to give the calf some of Watkins' Vegetable Anodyne Liniment. He helped me give him three doses of one and one-half table-spoonfuls each in a pint of hot water, and a small handful of salt, and the calf came out all right.—W. I. Best.

A Great Institution.

Not many persons are aware probably that one of the most complete and largest laboratories of its kind in the world is located in Winona, Minn., the home of the famous J. R. Watkins Medical Company. It is an institution which has had a remarkable success, and its success is all the more gratifying because it is founded on the strictest integrity, the highest business honor and principles of fair dealing.

The J. R. Watkins Medical Co. have nearly a million dollars invested in their business, and their line of household remedies and other preparations such as toilet articles, spices, soaps, perfumes, etc., are favorably known throughout the entire West. They work upon the unique plan of taking a complete line of their products to the farmer's door, guaranteeing every article, and when desired leaving their standard remedies on trial, to be paid for if satisfactory. They enable a farmer to be prepared for emergencies, and have saved, we feel certain, thousands of lives, to say nothing of millions of dollars to their customers in the past 36 years. It is an old established, honorable company, represented by reliable men whom we can recommend to our readers. The company issues an annual almanac, home doctor and cook book, which is well worth sending for. It gives home treatment for many diseases of man and domestic animals, and it is free. Address the J. R. Watkins Medical Company, 28 Liberty St., Winona, Minn.

Round-Trip Rates Via Union Pacific

to many points in the States of California, Colorado, Oregon, Washington, Utah, and Montana. FROM MISSOURI RIVER TERMINALS. \$15.00 to Denver, Colorado Springs and Pueblo and return, July 1 to 10, inclusive. \$17.50 to Denver, Colorado Springs and Pueblo and return, June 1 to September 30, inclusive. (Glenwood Springs, \$29.50.) \$30.50 to Ogden and Salt Lake City and return, June 1 to September 30, inclusive. \$34.50 to Butte and Helena and return, May 19, June 2 and 16, July 7 and 21, August 4 and 18, September 1 and 15. \$44.50 to Spokane and return, May 19, June 2 and 16. \$52.00 to Portland, Tacoma and Seattle and return, May 19, June 2 and 16. \$45.00 to San Francisco and Los Angeles and return, August 1 to 14, inclusive. \$50.00 to San Francisco, Los Angeles and San Diego and return, July 1 to 10, inclusive. 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)

Two Substitutes for a Hot Water Bottle.

Make a bag of linen or calico measuring sixteen inches by ten inches. Fill this with nice, clean sand and sew up at the end. Place in the oven until thoroughly hot, then slip into a

Warranted to give satisfaction.



GOMBAULT'S CAUSTIC BALSAM

A safe, speedy and positive cure for

Curb, Splint, Sweeney, Capped Hock, Strained Tendons, Founder, Wind Puffs, and all lameness from Spavin, Ringbone and other bony tumors. Cures all skin diseases or Parasites, Thrush, Diphtheria. Removes all Bunches from Horses or Cattle.

As a HUMAN REMEDY for Rheumatism, Sprains, Sore Throat, etc., it is invaluable. Every bottle of Caustic Balsam sold is warranted to give satisfaction. Price \$1.50 per bottle. Sold by druggists, or sent by express, charges paid, with full directions for its use. Send for descriptive circulars, testimonials, etc. Address THE LAWRENCE-WILLIAMS COMPANY, Cleveland, Ohio.

The Books Are Free

If you have a horse that is lamed or blemished by any kind of a growth or enlargement, that is Knee Sprung or Has Fistula, Poll Evil or Sweeney, or if there is a case of Lump Jaw among your cattle, write us at once. We will send you two big booklets. One tells you just how to cure these diseases and blemishes. The other proves that you can cure them, and we guarantee you success besides. Same methods employed by over 140,000 farmers and stock owners. Write for the books and tell us what kind of a case you have to treat.

FLEMING BROS., Chemists, 212 Stock Yards, Chicago, Ill.

Spavin
Ringbone
Knee Sprung
Fistula
Poll Evil
Lump Jaw

REX Is not a STOCK FOOD. Many times stronger and cheaper; worth ten times its cost to any stock raiser. Expels worms, builds up and makes stock thrive. Results guaranteed. Endorsed by State Veterinarians. Used by largest stock owners of this country. Dealers every where, or from us direct.

25 lbs. \$3.00; 100 lbs. \$10. Freight paid on 25 lbs. or more. Order today. Write for free bulletins, etc.

Rex Stock Food Co., Dept 9 Omaha, Nebraska.

CONDITIONER

BUY THE DOUBLE Dewey Hog Waterer

From Your Dealer, or Write Us.

Every Fountain Guaranteed



If not satisfactory, return and get another, or your money back. We make this guarantee to every dealer. Very cheap this year. The B-B Mfg. Co., 71 Masonic Tem., Davenport, Ia.

LUMP JAW

A positive and thorough cure easily accomplished. Latest scientific treatment, inexpensive and harmless. NO CURE, NO PAY. Our method fully explained on receipt of postal.

Chas. E. Bartlett, Columbus, Kans

NO HUMBUG. Three in One.

Swine V. B. Block Marker and Calf Dehorner. Stops swine from rooting. Makes 45 different ear marks. Extreme廉. Price \$1.50. Send \$1 for trial. If it fails, send back. Cash. Paid May 4, 1903. Hog and Calf Marker only 75c. PAPER BUREAU, FAIRFIELD, IOWA.



flannel bag. It is then ready for use and will retain the heat for a much longer time than the ordinary earthenware bottle. The other substitute is a brick heated in the same way and then slipped into a flannel bag.

The Young Folks.

Conducted by Ruth Cowgill.

ST. PETER AT THE GATE.

(By request.)

St. Peter stood guard at the golden gate
With a solemn mien and an air sedate,
When up to the top of the golden stair
A man and a woman, ascending there,
Applied for admission. They came and
stood

Before St. Peter so great and good,
In the hope the City of Peace to win—
To ask St. Peter to yet them in.

The woman was tall, and lank, and thin,
With a scraggy beardlet upon her chin.
The man was short, and thick, and stout,
His stomach was built so it rounded out,
His face was pleasant, and all the while
He wore a kindly and gentle smile.
The choir in the distance the echoes
awoke,
And the man kept still while the woman
spoke.

"Oh, thou who guardest the gate," said
she
"We come hither beseeching thee
To let us enter the heavenly land,
To play our harps with the angel band.
Of me, St. Peter, there is no doubt
There's nothing from heaven to bar me
out.

I've been to meeting three times a week,
And almost always I'd rise and speak.

"I've told the sinners about the day
When they'd repent of their evil way,
I've told my neighbors—I've told them all
'Bout Adam and Eve, and the primal fall;
I've shown them what they'd have to do
If they'd pass in with the chosen few.
I've marked their path of duty clear—
Laid out the plan of their whole career.

"I've talked and talked to 'em, loud and
long;
For my lungs are good and my voice is
strong.

So, good St. Peter, you'll clearly see
The gate of heaven is open to me.
But my old man, I regret to say,
Hasn't walked in exactly the narrow
way.

He smokes and he swears, and grave
faults he's got,
And I don't know whether he'll pass or
not.

"He never would pray with an earnest
vim,
Or go to a revival, or join in a hymn,
So I had to leave him in sorrow there,
While I, with the chosen, united in
prayer.

He ate what the pantry chose to afford,
While I, in my purity, sang to the Lord,
And if cucumbers were all he got,
It's a chance if he merited them or not.

"But oh! St. Peter, I love him so,
To the pleasures of heaven please let him
go!
I've done enough—a saint I've been,
Won't that atone? Can't you let him in?
By my grim gospel I know 'tis so
That the unrepentant must fry below,
But isn't there some way you can see
That he may enter who's dear to me?"

"It's a narrow gospel by which I pray;
But the chosen expect to find some way
Of coaxing, or fooling, or bribing you
So that their relations can amble through;
And say, St. Peter, it seems to me
The gate isn't kept as it ought to be,
You ought to stand by the opening there,
And never sit down in that easy chair.

"And say, St. Peter, my sight is dimmed,
But I don't like the way your whiskers
are trimmed,
They're cut too wide, and outward toss,
They'd look better narrow, cut straight
across.

Well, we must be going our crown to win,
So open, St. Peter, and we'll pass in!"

So St. Peter sat and stroked his staff,
But spite of his office, he had to laugh,
Then said with a fiery gleam of his eye,
"Who is tending this gate—you or I?
And then he arose in his stature tall,
And pressed a button upon the wall,
And said to the imp who answered the
bell,
"Escort this lady around to hell."

The man stood still as a piece of stone—
Stood sadly, gloomily there alone;
A life-long settled idea he had
That his wife was good and he was bad,
He thought if the woman went down be-
low

That he would certainly have to go—
That if she went to the region dim
There wasn't a ghost of a show for him.

Slowly he turned by habit bent
To follow wherever the woman went;
St. Peter, standing on duty there,
Observed that the top of his head was
bare.

He called the gentleman back and said,
"Friend, how long have you been wed?"
"Thirty years" (with a weary sigh),
And then he thoughtfully added, "Why?"

St. Peter was silent. With head bent
down
He raised his hand and scratched his
crown.

Then seemed a different thought to take,
Slowly, half to himself, he spake,
"Thirty years with that woman there?
No wonder that man hasn't any hair!
Swearing is wicked. Smoke's no good.
He smoked and swore—I should think he
would!

"Thirty years with that tongue so sharp?
Ho! Angel Gabriel! Give him a harp!
A jeweled harp with a golden string!
Good sir, pass in where the angels sing.
Gabriel, give him a seat alone—
One with a cushion—up near the throne!
Call up some angels to play their best,
Let him enjoy the music and rest!

"See that on finest ambrosia he feeds,
He's about had all the hell he needs.
It isn't hardly the thing to do
To roast him on earth and the future,
too."

They gave him a harp with golden
strings,
A glittering robe and a pair of wings,

And he said as he entered the realm of
day
"Well, this beats cucumbers, anyway!"
And so the scriptures had come to pass,
That "The last shall be first and the first
shall be last."

Stories of Wild Life.

We have once more offered a prize
of \$1 for a story—this time of your
personal observations of wild life.—Tell
what you have seen of animals, birds,
or insects in the woods or on the open
prairie.

The stories on animal intelligence
which came to us last winter were so
well and carefully done that we con-
sidered them really valuable. We
hope for even better ones this time.

The award will be made with regard
to the story alone, though we shall
be grateful for care in punctuation and
writing. Write on only one side of
the paper, and give your name and
address. We sometimes receive con-
tributions which we are unable to use
for the reason that they are unsigned.
If you do not wish your name to ap-
pear, state your wish and it will be
respected, but be sure to let us know
from whom it comes.

The contest will be closed the first
of July. Send your stories at once,
and we hope to hear from many of you
on this very interesting subject.

Wild Flowers of Kansas.

NELLIE HAMIL, GRENOLA, KANS.

Seeing the article about wild flowers
of Missouri in the KANSAS FARMER and
the request of the editor for a descrip-
tion of Kansas flowers, I will try to
give one. About the middle of March,
before a blade of green grass is to be
seen, comes the Easter flower. It is
white, with a delicate yellow center
and resembles the lily in shape. Next
comes the violet. Those that grow
along streams in secluded places are
of a deep blue, while those that grow
on the prairie are of a lighter hue.
Then comes the red and pink verbenas
which continue blooming from early
spring until frost comes. Soon after,
appear the white and blue larkspurs
and purple and white buffalo beans.
Closely following them are the daisies
with a yellow center finished with a
white fringe. A red and blue flag is
also found about this time. By Dec-
oration Day the yellow, wax-like blos-
soms of the cactus are adding beauty
to the prairie; also the stately yacca
is now seen. June brings the wild
roses and yellow and white rock lilies.
We do not have many flowers now un-
til August, when the goldenrod and
purple asters deck the meadows. There
have been many flowers which I have
not described. Last but not least, our
Kansas sunflower,

"A victor bold, with crown of gold,
Is the stately sunflower seen.
In her realm so fair she reigneth there
A peerless prairie queen."

The Farmer's Life.

The subject of farming and the
farmer's life is one that has been
much discussed. Sometimes it is the
question as to which is preferable,
country or city life. The fact is, one
can make a success or a partial fail-
ure of either. Peculiar advantages
pertain to one that are not available
in the other. In the city are muse-
ums, lectures, sights, etc., which are
of great benefit to an intelligent per-
son. But of the advantages of a farm-
er's occupation would we now speak.

It is an independent occupation.
The farmer depends upon his own la-
bor for returns. The business man
must have customers and work after
night, and frequently on holidays. This
the farmer need not do. He is not
confined indoors. He can always en-
joy the sunshine and the fresh coun-
try air, the sweet song of birds, view
the trees, and the beautiful flowers.
He raises his own vegetables and fruit
in abundance—in fact he raises nearly
everything he eats. This he does
not have to pay money for; even his
own clothing he may purchase with
wool if he has a herd of sheep. In ex-
cessively hot weather he can enjoy
the shade, and get the cool breeze if
there is any. He drinks pure well-wa-
ter, which is something to be appre-
ciated. He is seldom so far from
church, school, and Sabbath school
that all can not be reached.

While he sleeps his crops are grow-
ing, his fruit-trees bearing, his young
stock getting bigger every day, rain
or shine.

He has much to be thankful for. He
can study nature, appreciate the good-
ness of the great Creator of all things,
the symmetrical working of the laws
of nature as established by the Di-
vine Being who is above all and gov-
erns all. The corn, the wheat, the veg-
etables all have their season and ma-

ture in time. The wool, the flax, and
the cotton are for our clothing.

Different Nations have different com-
modities that they may traffic with.
China has tea and rice; Japan has tea;
the West Indies, sugar and coffee; the
Southern States, cotton and other com-
modities; the Northern, wheat, corn,
and oats; no Nation can be calmly in-
dependent of other Nations. It is not
so ordained; it is better for all, and
there is system in the universe.

The planets (of which the earth is
one) have their regular time for mak-
ing their annual circuit around the
sun. They vary not in time nor de-
viate from their course. So exact are
the heavenly bodies in their move-
ments that an eclipse can be known
beforehand and the exact date an-
nounced to a minute and a second
when it will occur. The laws of na-
ture are more exact than man.

In the evening the farmer can view
the heavens, the bright stars and the
visible planets. Few know the names
of all the stars, but all should be able
to point out Sirius, the brightest star
in Canis Major, called the "Dog Star,"
also Orion, the Dipper, and the North
Star, and distinguish the planets that
are visible, Jupiter, Venus, Mars, and
Saturn.

Much can be gained by reading good
books and papers. The practical farm-
er should have a good agricultural pa-
per. He may see things in it that if
applied may not only save him money,
but the life of a horse or of other stock.

To be industrious, economical, man-
age well, trust in and serve God, be-
lieve in the Lord Jesus Christ, live in
peace and friendship with neighbors,
goes to make of farming not only a
success, but a happy life. There may
be some crop failures, but not always,
and there will be prosperity.

PHILANDER C. CHANEY,
Pike County, Ill.

About Blackbirds.

Blackbirds with red or yellow spots
in their wings or on their head have
been quite numerous here during the
last few years but only once have I
seen them with white spots. A few
weeks ago I saw several with a small
spot of white in each wing but it could
not be seen much except when they
were flying. If any readers of this de-
partment have seen blackbirds with
more white, or if such are common to
them I hope they will report it to the
KANSAS FARMER.

WILSON G. SHELLEY,
McPherson County.

In response to our request for the
poem "St. Peter at the Gate," we re-
ceived several copies of it. We thank
our friends for their ready courtesy in
sending it so promptly.

A Noble Death.

A Southern paper prints the follow-
ing moving story of sublime self-sacrif-
ice by a dog—a fine large Newfound-
land. A camping-party on the coast of
Georgia, near Savannah, had been
amusing themselves by swimming in
the bay, and a venturesome lad named
Charlie Butler had swam much farther
and stayed longer than the rest. The
writer (who was the owner of the
dog) dressed himself, and was busy at
the camp ground, preparing supper,
when he heard an alarm.

A sudden outcry told me something
was going wrong on the shore. Grab-
bing a rifle and hastening back, with
Carlo at my heels, I beheld Butler
some distance away, swimming with
all his might, and only a few yards
behind him the vertical fin of a huge
shark. There seemed no possibility
that the boy's life could be saved; we
were without boats, and fish and man
were so nearly in line from us that I
did not dare to fire. In a second, Black
Carlo, comprehending the situation,
dashed through the surf, and started
to swim toward Charlie with a speed
I have never seen equaled by any land
animal. The boy, having leisurely cov-
ered most of the distance between the
reef and the shore when the man-eater
started after him, was comparatively
fresh, and when he saw a noble dog
hastening to his help, made a final
desperate effort to escape. In another
instant Carlo was close to him. Just
then, however, the shark, having come
near enough, turned so that we could
see his white belly glistening in the
twilight, and was all ready for the
spring that would surely have ended
Charlie's life, when Carlo, leaping
clean over Butler's form, appeared to
go straight into the monster's mouth;
and the latter, having got his supper,
disappeared in deep water, while the
lad in a few seconds was safe on shore.
That night our joy over our comrade's
rescue was mingled with sorrow for
the life so gallantly sacrificed in his

Who makes
the lamp chim-
neys?

Macbeth makes
the good ones.

His name on every one.

If you'll send your address, I'll send you
the Index to Lamps and their Chimneys, to
tell you what number to get for your lamp.

MACBETH, Pitts-

behalf, and to this day the memory of
that thrilling scene fills me with sad-
ness for the loss of Black Carlo, my
dog hero.—Massachusetts Ploughman.

For the Little Ones

FOR BOYS.

Six little marks from school are we,
Very important, all agree,
Filled to the brim with mystery,
Six little marks from school.

One little mark is round and small,
But where it stands the voice must fall;
At the close of a sentence all
Place this little mark from school.

One little mark with gown a-trailing,
Holds up the voice and, never failing,
Tells you not long to pause when hailing
This little mark from school.

Two little dots, both round and neat,
Pause, and these tiny guardsmen greet—
These little marks from school.

When shorter pauses are your pleasure,
One trails his sword, takes half the meas-
ure,
Then speeds you on to seek new treas-
ures,
This little mark from school.

One little mark, ear-shaped, implies,
"Keep up the voice; await replies;"
To gather information tries,
This little mark from school.

One little mark with an exclamation,
Presents itself to your observation
And leaves the voice at an elevation,
This little mark from school.

Six little marks! Be sure to heed us;
Carefully study, write and read us,
For you can never cease to need us,
Six little marks from school. —Ex.

Little Speckle's Adventure.

Old Topsy had thirteen little chicks
and Little Speckle was one of them.
Little Speckle was the smallest of all
the thirteen. She did not grow fast,
and this is the reason—she did not eat
enough. She would rather run
around and see the world than stay
close by her mother and eat, as the
others did. Often she would wander
away out of sight of Old Topsy, but
she always found her way back. But
two or three times she got into trou-
ble by her queer habit of wandering.
Once was when she was caught in a
rain-storm. She had been having such
a lovely time scratching up a flower
garden that she had not noticed that
the air was growing cold and damp un-
til she felt some big drops upon her
back. Then she ran as fast as she
could toward home, but when she got
there, the gate was closed and Old
Topsy and the other chicks were not
to be seen. She peeped and chirped
plaintively, and ran round and round
the hen-house, but she could not find
a way in. Presently a big girl ap-
peared. Now Speckle was terribly
afraid of this big girl. She often came
when she was enjoying herself in the
garden, and made a great noise, "shoo-
oo-shoo!" and flapped her apron at
her, so that she was sure she was a
very dangerous creature. So when
she saw this big girl coming toward
her, she cried louder than ever and
ran faster than ever. By this time
the rain was coming down very fast
and poor Speckle was wet and cold. At
last the girl caught her, and she
squeaked one faint little squeak, that
meant good-by to all the chickens, for
she was sure she was as good as dead
now. You may imagine how surprised
she was when the girl put her down
again, gently, beside Old Topsy! She
gave a glad little chirp, and ran under
her mother's protecting wing. I would
like to have heard the story she told
her brothers and sisters there under
her safe shelter, wouldn't you?

The Home Circle.

Conducted by Ruth Cowgill.

SOME FAMOUS "LIMERICKS."

Carolyn Wells in Frank Leslie's Monthly for March, gives a short history of the five-line stanza, commonly known as the "Limerick." From the numerous examples of the stanza which accompany the account the following are selected:

There was an Old Man of Aosta,
Who possessed a large cow, but he lost her;
But they said, "Don't you see,
She has run up a tree,
You invidious Old Man of Aosta?"

There was a young person of Crete,
Whose toilet was far from complete;
She dressed in a sack
Spickle-speckled with black,
That omniferous Person of Crete.

There was an Old Man with a beard,
Who said, "It is just as I feared!
Two Owls and a Hen,
Four Larks and a Wren,
Have all built their nests in my beard."
—Edward Lear.

There was once an Old Man of Lyme
Who married three wives at a time.
When asked, "Why the third?"
He replied, "One's absurd,
And bigamy, sir, is a crime."
—Cosmo Monkhouse.

There was a small boy of Quebec,
Who was buried in snow to his neck;
When asked, "Are you friz?"
He replied, "Yes, I is,
But we don't call this cold in Quebec."
—Rudyard Kipling.

There was a brave knight of Lorraine,
Who hated to give people pain;
"I'll skeer 'em," he said,
"But I won't kill 'em dead."
The noble young knight of Lorraine,
—Mary Mapes Dodge.

I'd rather have fingers than toes,
I'd rather have ears than a nose;
And as for my hair,
I'm glad it's all there,
I'll be awfully sad when it goes.
—Gelett Burgess.

There once were some learned M. D.'s,
Who captured some germs of disease,
And infected a train,
Which without causing pain,
Allowed one to catch it with ease.
—Oliver Hereford.

There was a young lady of Niger,
Who smiled as she rode on a tiger;
They came back from the ride
With the lady inside,
And the smile on the face of the tiger.
—Anon.

A very grandiloquent goat
Sat down at a gay table d'hote.
He ate up the corks,
The knives and the forks,
Remarking, "On these things I dote."

"There's a train at 4:04," said Miss Jenny,
"Four tickets I'll take; have you any?"
Said the man at the door,
"Not four for 4:04,
For four for 4:04 is too many!"
—Carolyn Wells.

A Prairie Paradise.

When we returned from our honeymoon, we went at once to the mid-prairie town selected for our home. The place had "boomed," failed, and on the support of two wheat crops, partly recovered. The boom houses on the additions were unoccupied and could be bought for a trifle, compared with their original cost. We bought a lot and prepared to move one of the dwellings on it.

We selected a five-roomed, Colonial affair with leaded glass in the front hall, and soft pine floor in the kitchen. "But it has possibilities," declared Caroline. "We must build a porch and put in a furnace and—"

"Let's move in first," I suggested. I only regretted that the condition of my purse would not allow me to buy the two vacant lots on the same-time-to-be shady side of the choice street of the town, instead of one.

"We will buy the other when we can," declared Caroline, confidently, "nobody will want it now."

So we filled and graded and sodded, making rapid progress toward homelikeness, and it was with considerable complacency that we noted the admiring glances of the townspeople as they drove by evenings. Buggy-riding takes the place of parks, seashore, and mountain climbs for dwellers on the level lands. There is nothing else for them to do.

We planned a huge canna bed for the center of the other lot, and had made a long list of shrubs and hardy plants to be ordered for its adornment. And then came trouble.

I kept it from Caroline as long as I could but one day she met me on the half-grassed lawn where blue-grass struggled with pusley, cockleburs and ambitious sunflowers her face showing signs of deep grief.

"Oh John," she began, "what do you think—Gobsons have—"

"Yes, I knew it last week."

"That they bought the other lot?"

"Yes."

"And can't we get it?"

"I've tried—he don't want to sell."

Her pink apron went over her head and she fled to the house.

Gobsons were common—no denying that. Not two square feet of grass grew on the lawn at their present home on Harrison boulevard. Western towns do not have streets, all are boulevards and avenues. Boxes, barrels, and trash littered the back yard.

"And they run to castor beans," broke out Caroline when I overtook her. "Just think of that forest of monstrosities along their sidewalk!"

"But they've got money, and Gobson told me they intended to fix up the lot in fine shape."

Caroline was not convinced and refused to look southward across the vacant lot all the remainder of the day.

Gobson also got a boom house—one of the rambling, dry-goods-box style—and he set it close to the northern edge of his lot, bringing it very near to our own lot. He covered the lawn with the buffalo-grass of the Western prairies, because that wiry gray growth would survive the hot summer months without sprinkling.

Caroline watched it all dismally. One day she broke out crying. "Oh, John," she muttered, "castor beans—I saw them—a hundred are coming up along the line."

"They'll hide some of the ugliness, anyhow," I suggested, but that did not soothe her.

A firm-set purpose marked her features the remainder of the day, and I was not much surprised when, late in the evening, she slipped out through the kitchen and into the back yard. I followed her. She seized a hoe from its accustomed place on the grape arbor, and stealthily took her way amid the sprouting catalpas and tree honeysuckles.

"Caroline!"

She started guiltily at the sound of my voice.

"What are you going to do?"

"Dig 'em up," fiercely. "No one has a right to inflict castor beans on a front yard."

It was time to act firmly, and I gave her a stern lesson on the prerogatives of property owners, and then we walked back to the house, arm in arm.

The castor beans grew and grew and grew. By midsummer they were seven feet high—and still growing. It was hideous—desperately so—but perhaps no worse than the cinder walks and patches of jimson weed that lay beyond. Gobson put up hitching-posts, iron effigies of red-clothed negro boys holding the hitching rings in outstretched hands. Caroline shuddered at the sight.

Our neighbor on the north was not ambitious. His lawn was without shrub or flower, but its smooth-shaven greenness was a delight to the eye.

As for our own lawn, the sunflowers had been swept away and blue-grass and white clover were making a pretty growth. A snowball and several altheas in contrasting colors promised well for next year, while the canna bed was showing brilliant spikes above the rich tropical foliage. All the time the castor beans grew and grew aggressively.

The fierce hot suns had withered the caladiums a little, and the sweet-pea vines were turning brown. The young rose bushes, so glorious in May, showed signs of a struggle, and summer grass was increasing on the lawn. The blue-grass could not withstand the blistering rays of an unclouded sky. One white birch was dead, another dying. The one thing in the landscape that flourished and bade the elements defiance was—Gobson's line of castor beans.

Caroline worried a great deal about the flowers and, though perhaps I should not tell it, neglected her household duties in order to give them watchful care. And then Mrs. Gobson gave a party and did not invite her.

On the day of the tea-party I went out on the prairie fifteen miles to see a ranchman on a business matter for an Eastern client. Caroline stood on the porch and waved cheerily to me as I drove past the house. The undertaker, who also rented chairs and tables for parties, was at the time carrying supplies for the reception into the dwelling of our neighbors. I remember that I noticed the contrasting green of the castor bean leaves and the grayish brown of the lawn, and wondered if an artist would not find a subject for an impressionist picture in the ensemble. I turned in the buggy as I reached the limit of vision and looked again at the promising little home, with its flowers and shrubs and start of trees. It was worth looking at. "A good deal can be accomplished in this country," I mused, touching up the team, "if one only knows how to do it."

It was different when I returned.

During the afternoon a storm, one of

those fierce prairie terrors, swept over the country. It was so dark at the ranch that lamps were lighted. Hall and wind accompanied the clouds, and sheets of rain made the level plain a lake. It was long after night when I drove into town and turned down South Empire avenue, a little anxious for the safety of our lawn decorations. A block from home a watchman stopped my horses.

"Your wife is here at a neighbors'," he said, "and wishes you would come in at once."

"Is she hurt?" I gasped, and, without waiting a reply, hurried up the lawn to the house.

The door opened, and in the half-lighted hall Caroline met me, clasping her arms around my neck and burying her face on my shoulder.

Beyond, in the illumination of the parlor, stood a dozen people, and among them—the Gobsons.

"What is the matter?" I asked puzzled.

"Well, sir," said Gobson, coming forward and frankly extending his hand, "about everything that could be the matter and leave us alive and well. There's been a twister."

"And it's gone—and he carried me across the lawn!" incoherently exclaimed Caroline, again hiding her face.

Gobson and the others laughed heartily.

"I'll tell you how it was," went on Gobson. "About three o'clock the storm came up and it looked mighty bad. We Westerners know what to expect, and the folks at the party went home. Your wife there didn't seem to understand the danger, and when the most serious part came and I'd sent the folks to the cellar, what did I see but her out there in the yard trying to cover up the posey bed."

"I was afraid the hall would hurt the coleus," put in Caroline.

"I called to her, but she didn't seem to want to hear me—"

Caroline tightened her arms a little—I understood.

"—And there wasn't any time to lose. I saw a funnel-shaped cloud in the Southwest and I just hustled across the yard, picked her up and carried her to our cellar."

Caroline's arms tightened again.

"That's about all. We stayed there until it was over and then came out—and the houses are gone with a lot of others—but no one is seriously hurt."

He told the truth. The day had been a serious one for that part of the town, and our block was visited by the cyclone's worst wrath.

Caroline and I walked down South Empire avenue the next morning. Our pretty house was a mass of lumber on the rear of the lot; Gobson's was not far away, likewise wrecked. Everything was rainsoaked and dismal.

For a long time we gazed at the ruin. Then Caroline turned a laughing face to me. "John," she whispered, taking care that the other sightseers might not hear, "there's something to be thankful for—the castor beans and porch are gone!"

I kissed her goodby at the depot that evening and caught a farewell wave of her hand from the Pullman window as she was borne away for a visit to the home folks in that blessed haven of the dweller on prairie lands—"back East."

Gobson called at my office this afternoon. He will buy or sell, so that one of us may own both lots on South Empire avenue. I have written to Caroline. On her reply depends whether or not we shall undertake again the building of a "habitation in the wilderness."—C. M. Harger, in N. Y. Evening Post.

Where Women's Clubs Are Not.

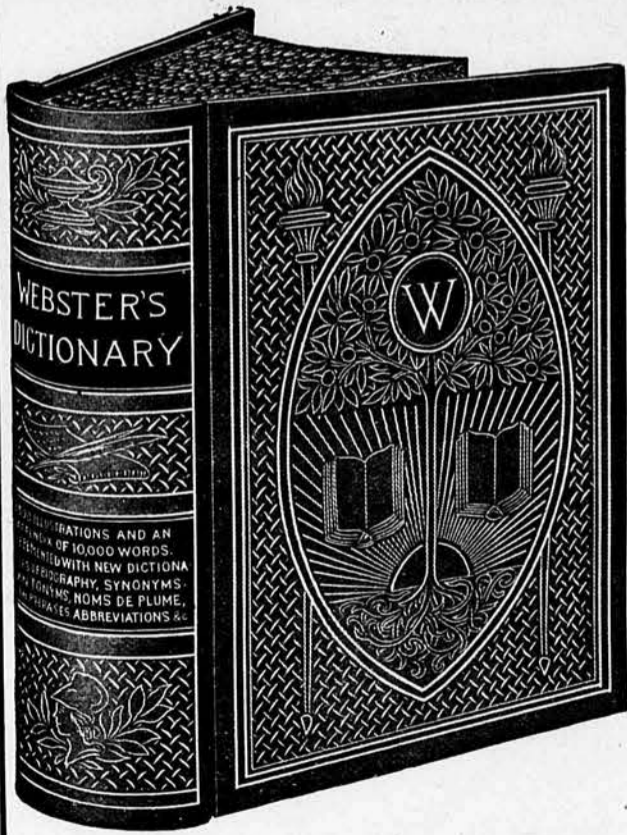
In Pearson's Magazine is an article by Miss Pelton that is very interesting. It is about the "mountain whites" of North Carolina, whose peculiar ways of living have furnished material for numerous story-writers.

It is only within twenty years that the railroad has penetrated the mountains of western North Carolina. It found there a people made self-reliant through generations of isolation. They hewed their own logs and burned their own bricks; they spun their own yarn and wove their own cloth; they harnessed mules of their own breeding to harrows made of split rails and whittled pegs; and they refreshed the inner man with home-stilled corn-whisky drunk from a gourd cut from the vine on the porch.

Steam brought nearer to them markets for their chief exporting crops—apples and cabbage. It also introduced moths, Mormon missionaries, and invalids. Money reached the coves as it never had before, and with it came "sto'-bought" clothing that lasted only a fraction as long as the homespun it replaced, and chemical dyes that faded before the yarn wore out.

But the advantages and disadvantages of civilization both make slow progress in a district where a man lives for fifteen years within five miles of a station, and rides on the train but once during that time. New ideas move sluggishly, and there are many parts of the mountains by no means remote from the railroad where the simple inventions mothered by Necessity never have been replaced by "modern improvements." That family is lucky whose goodwife spins her own yarn from wool shorn from the sheep that scramble up and down the steep hillsides. It is like a glimpse into centuries past to see one of the

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mountain women standing beside the large wheel that whirs under her deft touch, or sitting with her foot on the treadle of the smaller flax wheel. Left undyed, the yarn is knitted into socks for the Sunday wear of husbands and sons. Colored with the vegetable dyes whose preparation is a lesson handed down from mother to daughter, the yarn is ready for weaving.

Even a hand-loom occupies an inconveniently large portion of a cabin that never is large enough for the family it contains, and it can not be set up every morning and taken down every night. Therefore it is put in place only when the weaver is sure of many days of comparative freedom from other work, that her task may be done once for all, and the apparatus taken away.

Backward and forward she throws the shuttle with skilful fingers, and longer and longer grows the web of homespun that is to be fashioned by her needle into whole suits of clothes for the men, and into petticoats for herself and the girls. It is one of the toughest of materials, this gray jeans, and it takes years of even the rough life of a North Carolina mountain farmer to wear it out.

When this roll has been cut from the machine the house-mother perhaps varies her toil by weaving some towels of flax or cotton thread. Then she makes rugs and rag carpeting from the big rolls of rag strips that she has been sewing together for the purpose for months, and then she sets her loom for the coverlets of which she finds herself in need.

The warp of these coverlets is of cotton, the woof of wool, and they are, as the French say, "of an endurance." The writer has one over twenty-five years old whose white is as clear as when it was made, and whose blue is as vivid as when the home-bolled indigo first soaked into the newly spun yarn.

The temperate climate of the North Carolina mountains for a large part of the year allows work to be done out of doors that women usually accomplish within the house. The light is better, too, than inside of the cabins, that often are windowless, and so spinning and sewing and ironing and soft-soap-making go on under the trees; and the washing is done beside the spring, where the water is heated in a kettle hung gipsy-fashion over a fire of twigs, and the clothes are hung to dry on Nature's clothesline—the bushes.

Farmers' wives the world over interest themselves in the dairy and the poultry-yard, but the North Carolina mountain women often take part in the labor that elsewhere is more frequently done by men. In the preparation of the land for the spring planting a woman's hand may guide the plow. Later a woman sows the seed, and a woman's hoe is as effective as a man's in "working" corn. When the crop is harvested, a woman can "pull fodder" and gather ears. In the autumn, when the sorghum is boiled to make the syrup that sweetens the winter's corn pone, it is quite as often Myra as John who feeds the cane into the crusher, or who skims the mass of liquid.

At the first glance it seems inappropriate and perhaps shocking to see women engaged in work that we have come to consider distinctively the employment of men; but, after all, is a day's work hoeing corn more exhausting than a day's work washing? And there is a pleasant comradeship and an evident unity of interest in the working together of a whole family under a brilliant sky, in one of the best climates of the world, that may have something to do with explaining the content that welds these people to their rocky farms.

A New and Pretty Sofa-Pillow.

There are a thousand different ways of making sofa-pillows, all of them pretty, and many of them inexpensive. One never can have too many pillows, the more the cosier. Here is one that is both pretty and easy to make. It is called the handkerchief pillow. This seems to be a season of handkerchiefs. You find them made into neckties, stocks, corset-covers, dressing-jackets, and cushions. For the pillow get one of the larger printed cotton handkerchiefs, choosing one with rather elaborate designs in the corners, and of dainty coloring. Cut it, in the straight, into quarters. Buy some pretty beading of any width you desire, and sew the four pieces of handkerchief to it so as to make a square again, only with the hemmed and colored sides toward the center, the beading crossing in the center. Run narrow ribbon, color harmonizing with handkerchief,

through the beading, make a ruffle and back of India linen, and your cover is done. Some of these covers are really exquisite. If the pillow is first covered with lawn of some plain color, it adds to the attractiveness of the finished product.

Hawaii's American Frogs.

"American sovereignty is not the only good that has come to Hawaii from the United States," said Dr. Hugh M. Smith, deputy commissioner of fish and fisheries, in a Washington report. "American frogs are proving to be a great blessing to those islands. Four years ago seventy-two were shipped from California and set down in various places around Hilo. They thrived and multiplied, and have now been introduced into most of the Hawaiian Islands.

"These batrachia, by cleaning stagnant pools, have diminished sickness among the herds of cattle, particularly on Kauai. They have also averted the death of cattle and sheep by devouring the fluke, a little animal that makes its habitat in Hawaiian grasses. Though small this creature has the power when swallowed to gnaw its way to vital organs of cattle and sheep and cause death. For frogs, however, the fluke has been a fattening diet, and now cattle grazing in Hawaii is largely rid of its former dangers and losses.

"Another service rendered by frogs is their warfare on noxious insects. These batrachia are an edible variety, but the way they set to work at once to purify stagnant waters and purge the islands of animal and insect pests assured them immunity from capture.

"Now, as frogs are plentiful, frog-hunting is beginning to be a profitable industry. They are purchased eagerly in the markets of Honolulu. The success attending this recent introduction of frogs into the islands is in marked contrast to an attempt made a number of years ago by an agricultural society in Hawaii. Frogs were imported and placed in taro patches, but no trace of them was ever found afterward."

Substitute for Swearing.

The man who finds it necessary to relieve an overburdened soul through exclamatory utterance might just as well adopt a pleasant as an unpleasant verbiage. The relief is attained through explosive speech, and this need be neither vulgar nor profane; it need have no reference to present material conditions or future spiritual state; the one essential is that it shall be explosive. Why not, then, use the names of flowers and other beautiful objects instead of words and phrases offensive alike to decorum and to good taste? Why not deal in analogies which are artistic in their implications? The man so unfortunate as to hit his thumb with a hammer might, for example, exclaim: "Roses and violets!" Doubtless such utterance would quickly alleviate the pain and vexation, and the spiritual uplift would be immense. While nursing the injured member a reference to "accentuated rhythms" would fitly express that peculiar throbbing which once to have felt is ever to remember, says the Philadelphia Ledger. Under the barbaric usage of the present day the language of a man so situated is best expressed in print by a series of dashes. This is inconvenient in practice and erroneous in theory; let us reform it. Even for him who misses his train by forty seconds balm might be found in such a locution as "Shadowy perspectives! It's gone!" Self-respect would be retained, and the period of waiting for that train be no whit extended.

Lakes Always Frozen.

"There are in the State of Oregon two lakes that are frozen stiff from one year's end to another," said F. G. Harper, of Portland. "They were discovered in Baker County not very long ago by a party on a hunting and fishing trip in the mountains of the Panhandle district. After passing through a particularly wild stretch of country the party discovered the lakes on the north summit of one of the mountains in the neighborhood. The lakes are both small, one of them barely 150 feet across, while the other is less than 1,000 feet in diameter. Both are covered with a heavy coating of ice, as clear as crystal and as smooth as glass, and of such strength that it held several members of the party who rode across on horseback. It is believed the ice never melts, because the lakes are so situated behind two peaks that the rays of the sun never strike them for sufficient length of time to make any impression."

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Club Department.

Our Club Roll.

Mutual Improvement Club, Carbondale, Shawnee County (1885).
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).
Chollitso Club, Highland Park (1902).
Cultus Club Phillipsburg (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.]

At the head of our column is a list of the country clubs thus far heard from, with the date of formation of each. Hereafter this roll will always head the Club Department, and from time to time, as others report, their names will be added. We hope the list will speedily grow so long that even a whole column will not contain it.

Nothing rejoices the heart of the club editor more than to learn of a new country club. And when it is in the "short-grass" region, where people are more widely separated than farther east, and where therefore clubs are both more needful and more difficult to organize, then our joy is complete. We are glad to welcome this new club, the youngest on our list. We shall hope to hear from them of their work and study and enjoyment, which will all be evidences of their prosperity and continued growth. We hope they will both find some help and bestow it, through these columns.

Literatae.

MRS. O. N. NEVINS, FORD, KANS.
We have organized a club at Ford,

with eight members. The name we have chosen is "Literatae." We have been reading the club department of your paper, and find it very helpful, especially the programs, which are sometimes printed.

Profit in Fir-Trees.

A few years ago the balsam fir-tree was considered one of the most worthless of forest trees, but since the growth of the Christmas tree industry it has taken on an added value. The contractors pay from 3 to 4 cents apiece for the larger ones. This price seems insignificant when taken alone, but when it is considered that from 3,000 to 4,000 trees will grow on an acre and that the trees can be raised on land worthless for anything else, it is a different story.




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Miscellany.

Disposal of Sewage on the Farm.

At many country homes where it is desired to introduce modern improvements in the way of waterworks to supply bath-room, closet, sink, and laundry, the disposal of sewage is quite a serious problem.

Fortunately, it is a problem quite easy of solution by the "Septic Tank" system, at once scientific and simple though but little known. The system can be easily applied in any place where sufficient fall can be secured to carry away the sewage. It is inexpensive, absolutely automatic, and thoroughly effective and satisfactory. It can perhaps be best illustrated by describing a plant now in operation at the Western Hospital for the insane at Watertown, Ill. The system is the result of an accidental discovery, and was first put in successful practice by Dr. W. E. Taylor, superintendent of the above-named institution though now being installed at other public institutions in Illinois and attracting much attention elsewhere. That it is perfect in its action may be gathered from the fact that it receives all the concentrated sewage from an institution whose inmates and employees number nearly eight hundred people, thoroughly and completely disposes of all organic, effete, and poisonous matter with no residuum or deposit, and the product flows away in a clear, sparkling stream of water, 98 per cent pure by chemical analysis when it strikes the air, the remaining 2 per cent of impurities being liberated upon exposure to the atmosphere, leaving a stream of clear water pure enough for any purpose whatever. That this sewage can enter at one end of a tank a foul, of-

causes less current in discharging than would a circular opening. In the end wall is a row of curved tile so placed that the outlets are two feet above the sewer inlet and the opening in the cross-wall. The cross-wall forms a weir, or dam, which retards the outflow from the main tank, and of course there can be no discharge until the contents of the tank and weir box reach the level of the curved tile outlets. Thus both inlet and outlet are submerged about two feet below the surface of the sewage in the tank. The filter box is filled with sand and gravel and has an outlet at the bottom through which the water finally discharges.

The operation of this system is simplicity simplified. The sewage entering the tank remains until it fills the tank and the weir box to a level with the overflow from the curved tile outlets. In twenty-four hours or a little over, after entering the tank, a scum will have formed on the surface an inch or more in thickness, consisting of a solid mass of filth bacteria, which prey upon the poisonous matter and the solids contained in the sewage, constantly fighting among themselves and destroying each other like the Killenny cats, which devoured each other until nothing was left but the tail, the tail in this case being represented by the 2 per cent of poisonous matter left in the water as it escapes, and which is at once eliminated upon exposure to the atmosphere.

Light and air are fatal to these bacteria, hence the necessity of keeping them in a dark, air-tight place that they may accomplish their work. For this reason the tank must be air-tight. Again, to do their work effectively they must be left in perfect quiet, hence the inlet and outlet are submerged below the surface in order that from inflow

Largest Map of United States.

Growing on six acres of a gentle southern slope of Tesson Hill at the Louisiana Purchase Exposition, St. Louis, is the largest geographically correct map ever constructed.

This map is 480 feet long from east to west and extends from north to south 240 feet. The map is the main feature of the large, open-air exhibit by the Bureau of Plant Industry of the Department of Agriculture, and is personally superintended by D. A. Brodie, late superintendent of the Western Washington Experiment Station, under the direction of Prof. W. J. Spillman, agronomist of the United States Department of Agriculture.

The several acres were fenced off early in April, and the entire tract was richly fertilized. The ground was plowed and harrowed, the soil pulverized, and the entire tract sowed to cow-peas. This crop not only enriches the soil, but prevents the growth of weeds, and will render the subsequent plowing unnecessary. As the crops to be grown will be required to be planted at intervals up to a short time before the opening of the exposition, further plowing would prove impracticable. When an exhibit is ready to be installed, the gardeners simply pull up the cow-peas covering the space required. The ground is found to be in receptive condition and requires but little work upon it.

The monster map is, of course, the main feature of this comprehensive exhibit, and the crop grown on this small farm will cost the Government considerably more than \$1,000 per acre.

A belt of blue-grass lawn twenty feet wide establishes the boundary and coast-lines of this gigantic map. The boundary-lines between the States are marked by cinder paths three feet wide. The territory comprising the



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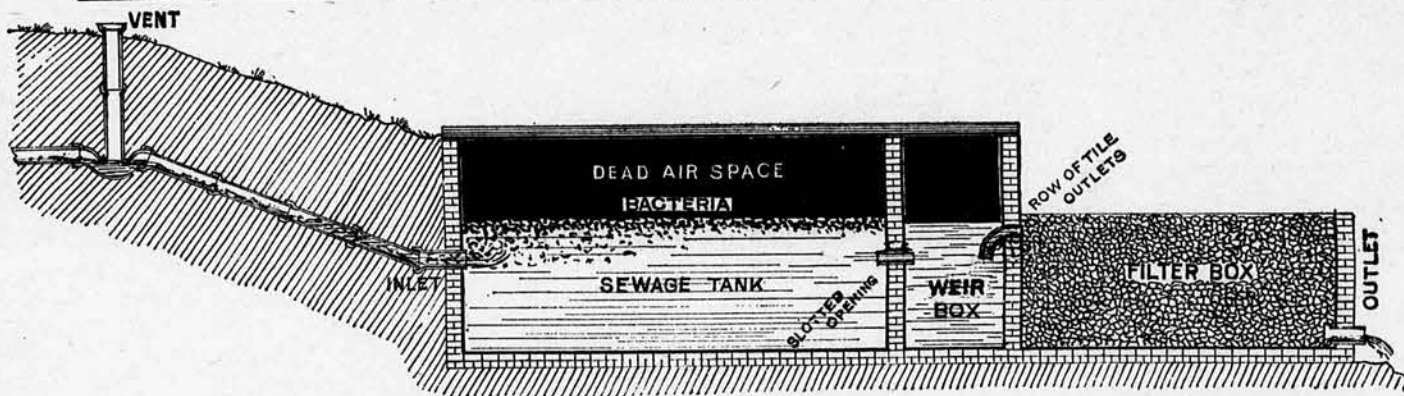
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challenge the admiration of every visitor at the fair, the agriculturist and horticulturist will find in the surroundings of the map other exhibits of equal interest and importance.

Pathology of plants is treated in an extensive exhibit in the territory of the map that would be British Columbia did the map extend further than the United States. This exhibit is under the personal direction of Professor Woods, of the U. S. Department of Agriculture, and illustrates how the growing of plants of economic value are affected by diseases peculiar to plant life. Experiments will be conducted for the benefit of the agriculturist. Economic plants that are already affected are growing on the tract, and other areas of strong and healthy plants of the same species are inoculated with the spores of the disease and the results are carefully noted. The blight of the pear, the black knot on the plum, potato blight, and all the other diseases of plant life will be shown, and practical experiments showing the methods of treating will be carried on and the results shown.

Plant-breeding is given a large section to the east of the pathology exhibit. Here is shown the effect and value of cross-fertilization. Cherries, for instance, fertilized by their own pollen, show no change in their fruit, but when fertilized by the pollen of other varieties of cherries show a marked change. Sometimes the result is good and sometimes otherwise. A strawberry that yields bountifully but is soft and will not bear shipment, is cross-fertilized with a variety of firmer berry, with the probable result, after much patient experimenting, of securing a large increase in the yield, while the fruit will bear long shipment. From the seed of the fruit grown by cross-fertilization many of the valuable hybrids are obtained.

A unique feature of the Government's open-air exhibit is the school garden that occupies a large section extending (on the garden map) over the Dominion of Canada from Maine to Minnesota. This exhibit is under the personal direction of Professor Wheeler, of Michigan, of the United States Department of Agriculture. The liberal space allotted to this exhibit has been cut up into numerous subdivisions, and each of these subdivisions is turned over to the various St. Louis schools. A class of pupils is selected by the principal of the school so honored, and the actual work of planting and cultivating the garden is left to the pupils, under the general direction of Professor Wheeler. Liberal prizes are offered for the best-cultivated garden and for the best results. The sight of the little tots in their knickerbockers and gingham dresses, their sailor hats



Septic Tank Sewage System. (Courtesy of the John Deere Plow Co.)

fensive stream, reeking with filth, and emerge from the other end a limpid stream of water actually pure enough to drink, seems wholly incredible, and yet such is the case, and the wonder of it all is that it cleanses itself automatically, without any artificial agency, solely through the work of the filth bacteria preying upon each other. This system works continually, summer and winter, year in and year out, with absolutely no attention and without change in any season, never freezing. It is practically adapted to use in the country at a distance from city sewers, and even for the use of towns and cities is entirely reliable and effective.

At the Watertown Asylum the system consists of two oblong tanks of 70,000 gallons capacity each, placed side by side, one tank emptying into the other through a pipe. For all practical purposes, however, the tank with a weir box at one end is exactly as good as two tanks, as it has been found that the water as it emerges from the first tank is just as pure as after it has passed through the second tank. The object of this weir box is to check the overflow and prevent any agitation of the sewage in the tank.

The tanks in this system are located about a quarter of a mile from the buildings. They might be located forty feet or four miles away, according to convenience, the result would be the same.

The sewage tank as shown in the illustration, consists of a brick box with eight-inch walls and floor, lined within and without with cement. Concrete would make a better tank. The roof is made air-tight with a heavy coating of pitch and all crevices are tightly sealed with the same material. The sewer inlet is about two feet below the surface of the sewage in the tank. A short distance from the opposite end of the tank a cross-wall is built, having a narrow opening extending across the tank on a level with the inlet. This opening has little if any greater capacity than the inlet. Such an opening

and outflow as little current as possible may be caused, and this quiet is further assured by means of the weir box.

Upon emerging from the tiles the water is as clear as crystal, and by chemical analysis contains but 2 per cent of bacteria that would be in the slightest degree injurious to the human system. This water is allowed to filter through the sand and gravel, its exposure in this manner to the air destroying all remaining bacteria, so that it emerges from the final outlet absolutely pure.

Knowing its source, one would not care to drink it, though it is pure enough for this purpose, and stock may drink it with perfect safety.

A system of this kind will not freeze in winter, as the gases arising from the sewage in the tank generate enough heat to counteract the cold and prevent freezing. The water as it emerges will be found much warmer than the air, in cold weather.

In cases where the sewage discharge is scanty and intermittent, there might be danger of the water freezing in the filter box during a long cold spell, and then it would be advisable to erect a small, tight building, well protected from frost, over the whole outfit, including both tank and filter, but when the sewer is in constant use this would be unnecessary.

The secret, if secret it may be called, of the whole system is the dark and air-tight tank, the submerged inlet and submerged outlet, and that is all there is to it. The bacteria will do the work if let alone. If stirred up they refuse to perform as desired. When properly working the tank might be opened, the bottom scraped and not a handful of solid matter could be found.

The tank should be large enough to hold all the sewage that is ever likely to run into it within a period of twenty-four to thirty-six hours. For a private residence this would rarely need to be larger than three feet wide, six feet deep and eight to ten feet long.—The Furrow.

fourteen States and Territories of the Louisiana Purchase is marked by a white gravel walk. The States themselves are to be planted in growing crops of the principal agricultural products of the State. The cinder and gravel walks serve as promenades, and are of sufficient width to permit the free passage of visitors. Thus a labyrinth of passageways is created and the visitor may wend his way through the maze and see by actual demonstration just what crops are grown in every part of the United States and how they are raised. The cereals will be the features of the great Northwest, while down in Florida will be seen growing the pineapple and orange and other semi-tropical fruits and crops. Tobacco will be a prominent feature of Kentucky's allotment, while sugar-cane and cotton will be found growing in the plots of ground representing other Southern States.

Not only will the products of each State be shown on this map by growing crops, but the section of the State on which each commodity is most grown will be shown. In the great northwestern State of Washington the map shows that wheat, corn, potatoes, hay, and the wild grasses that thrive in the semi-arid districts are more largely grown in the eastern portion, while in the west, hay, clover, vetches, timothy, orchard hay and grasses, hops, strawberries, raspberries, and blackberries are more grown. Thus on the small plot of ground that represents one great State will be found a score of different crops growing. There will be no actual dividing line between the growing crops, though in the cases of the various grasses, wheat, barley, and buckwheat, the line is as distinctively drawn by a wave of color as is the line that divides the muddy waters of the Mississippi from those of the comparatively clear Ohio at the junction of the two rivers at Cairo, Ill.

While the arrangement of the exhibits in the form of the monster map will fasten the eye more quickly and will



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and sunbonnets, equipped with hoe and rake, is one all too seldom seen.

The immense grass-garden grown under the personal direction of Professor Spillman, is one of surpassing value and interest. This grass-garden occupies on the five-acre plot, all of the space in the Atlantic Ocean from Maine to Florida, and, rounding the peninsular, occupies a large portion of the Gulf of Mexico, off Florida's west coast.

In the northern section of that exhibit are a series of sand-dunes, constructed so as properly to exhibit the sand-binding grasses. These grasses send their strong and vigorous roots down through the shifting sands and finally entrench themselves in the solid soil. As the plant becomes more firmly established and sends up its super-growth, the roots firmly anchor it, protecting it from the ravages of the wind, and hold it in its place. The plant enriches the barren sand on which it was originally planted, and in the course of not a great many years a rich soil takes the place of what was once a barren, sandy stretch of no value.

Off the east coast of Georgia is a circular collection of twenty plots of an average size of ten by twenty feet planted to the best-tested varieties of lawn grasses. These plots are artistically arranged and are separated by gravel walks. The small lawns are marvels of the landscape gardener's art, and the turf is so thick and so well kept that it appears as a velvet carpet.

Still further south is the section devoted to the ornamental grasses. Here is shown the pampas-grass growing up ten, twelve, and fifteen feet high, and all the other ornamental grasses, including the ribbon-grasses attaining a height of three and four feet, down to the dainty little sweet vernal-grass that seldom reaches a foot in height. In this section, as in all others, the shorter grasses grown in the plots nearest the huge map centerpiece, while the taller grasses occupy the spaces on the edge of the exhibit. This adds to the artistic and uniform appearance of the display, and the view of no section is impaired.

In the Gulf of Mexico, west of Florida, are the sections given over to the cultivated grasses, such as timothy, red-top, orchard-grasses, English and Italian rye-grasses, etc.

The seed-production section will be of immense value to the agriculturist. This exhibit occupies that portion of the Gulf of Mexico extending from Florida to the interior of Mexico. Here the seeds grown in all parts of the world are tested side by side. As an example, seed-wheat grown in Washington, the Dakotas, Maine, Florida, and in Europe, Asia, and Africa, are planted in adjoining sections. The growth and results are carefully noted, and it is thus accurately determined for the region where the experiment is conducted from where the seed should be obtained to get the best results. Other experiments with all the other important agricultural products are similarly made and the results may be noted by the visitor to this City of Knowledge.

Another section west of that devoted to seed-production is one equally important and interesting. It illustrates the fiber plants, their growth, and the best approved methods of handling. Here may be seen growing in the same manner as in their native homes, hemp, flax, cotton, and other important plants grown for their fiber. Scarcely less interesting are the appliances for picking and handling the cotton, and the retting of the stalk that contains the flax fiber.

West of this, in the deadly parallel column, are displays of the poisonous and medicinal plants. Growing side by side are the poison and its antidote. Prominent in the poisonous section are plants that are injurious to stock, notably the famed loco-weed. This plant when eaten by a horse crazes the animal and drives it frantic and sometimes even produces death. Another dangerous plant is the wild parsnip, little less desirable than the loco-plant. In this section are shown the best methods for the extermination of the poisonous plants and also the best remedies for the treatment of horses and cattle after they have partaken of the poisonous growths.

In the medical section beautiful beds of poppies are to be seen, and the methods of obtaining opium and all of the medicines and poisons produced from the wierd drug are shown. Here, too, is the fox-glove, from which is made digitalis and the deadly nightshade, from which is produced belladonna, and numerous other medicinal plants and herbs.

Professor Sarleton, of the U. S. Department of Agriculture, has charge of

the immense exhibit of cereals that grow in the space west of the map. Here may be seen the various specimens going to make up wheat, corn, oats, rye, and barley families.

Each sectional exhibit outside the map is divided from the section adjoining it by a broad gravel walk, while the beauty of the exhibit is enhanced by a strip of smooth blue-grass lawn completely surrounding it.

Some New Industrial Uses for Corn.

Excerpt from a paper by F. L. Stuart, Murraysville, Pa., before the Interstate Cane-Growers' Convention, at Macon, Ga., May 6, 7, and 8, 1903.

I beg pardon for saying new uses, because we shall be called upon to look at this familiar plant from a new standpoint, and at another side of it very different from that which is usually presented to our view. We have been regarding it through all the years, like many other common things, with indifference, until some time they astonish us by assuming some new adaptation or development, much as we regard the moon, with her familiar face turned toward us all the time, forgetting that if we could alter the conditions or our point of view should have another and very different side to show. Briefly stated, the proper utilization of this plan along these new lines depends upon two factors or modes of treatment:

First, upon what I call physiological control of the growing plant, and,

Second, regarding one of the substances so regarded as the main product, to secure the almost equally valuable by-products in the best condition to benefit them for the almost numberless applications to which they are so well adapted and for which at the present time the need is so urgent and so well understood.

The first point I have mentioned, the necessity of seeming physiological control of the living plant, is the crux of the whole matter since everything that is to be said in this connection follows from that and depends upon it. I fear I shall have great difficulty in explaining just what such control means. And here at the very threshold of our inquiry we are confronted by one of the most significant facts that can engage the human mind. We are carried beyond the realm of chemistry and physics, so-called, and find ourselves face to face with a mysterious psychic force in the plant, which we readily recognize as such because it is akin to our own. Thought rules everywhere, and, under God, all that the earth holds is and was intended to be under the supremacy of man. Every conscious act of ours must be directed by intelligence. We recognize also in some sort that there is an intelligence in nature beyond ourselves, resident in every organism while its life lasts.

THE RESPONSE OF NATURE.

Now, I think I am not going beyond the experience of any of us in saying that there is, in effect, intelligent communication maintained between ourselves and those types of existence that are most closely associated with us—our agricultural plants and domestic animals. We cultivate plants, as we say, and the plant responds in an intelligent way to our treatment of it. If not thus responsive, improvement would be impossible. Some of our cultivated species have been so modified through human association as to have, now what we might term an artificial existence. The maize plant is to-day the wonder that it is because it represents in its present condition a combination of the characters which it bore in its earliest primitive form, with those wonderful modification superadded which represent in the aggregate, through perhaps hundreds of generations of men, just so much well-directed human insight, skill, industry, and patience in friendly cooperation with nature itself.

CORN THE HIGHEST PLANT.

I believe Indian corn to be the most advanced and the highest type of all our cultivated plants in existence. In its present form it seems to bear on one side the expression of infinite creative energy and skill, and on the other just as plainly the impress of man's modifying hand. This is so true that if the race of man were to be blotted from existence at once, but the climatic and other conditions to remain the same as they are, Indian corn could not survive him a single year. His cooperation has made it what it is, and its death must follow his. The now naked seed would rot in the soil, and the plant has lost the power, if it ever possessed it, of reproduction by root,

stalks, or buds, as in the case of the sugar-cane.

SUGAR IN CORN.

I have laid stress upon this one point particularly because of its importance, and the intimate relation which it bears to sugar production from the plant itself. It is true that maize has always been known to contain sugar in the juice of the green stalk, and at many times during the century just passed strenuous efforts were made to utilize it, but always without success from a commercial point of view, and the reason for it was plain. It contained too little sugar at any stage of its development, and this was associated with relatively so large an amount of impurities as to make its manufacture unprofitable. But even in that condition the sugar content was more than the average of that in the beet seventy-five years ago; and, the susceptibility of corn to modification being so remarkable, hope was entertained that some variety of it might be improved so as to increase its capacity in that direction.

SOME EXPERIMENTS.

With such an end in view, one season, I had planted different sorts of corn for experiment. In connection with one of the plots my attention was arrested by the very different condition of the plants in different parts of the plot, although all were of the same variety, the same age, and grown in the same soil. It was during the month of September, and some of the ears had ripened on the stalk, and from some the ears had been pulled about a month before when in the roasting-ear condition, the stalks still standing. Other stalks in the plot had formed no ears at all, but were totally abortive. A remarkable difference was noticeable between the plants bearing the ripe ears and those standing just alongside from which the ear had been removed. In the one case the stalks were withered and dry, the grain was ripe and the plant was dead. In the other the plant was alive, the stalks fresh and vigorous, and yet green leaves were borne upon the upper joints, showing continued growth. When samples of them were cut it was evident that they had not diminished in weight as compared with other plants cut before the grain had matured. Some of the juice was pressed out for examination, and to my surprise it showed qualities much superior to any previously noticed that season. These indications were more than confirmed when the sample was subjected to analysis. I give the results of the tests to determine the relative percentages of the sugar and other solids contained in this juice, as taken from my note book at the date of this first experiment made upon the maize in this condition. The variety was the common yellow dent corn, usually grown in that locality (western Pennsylvania). Alongside of it I give the composition of the juice of the same variety when the grain was yet soft and the cane sugar percentage was usually the highest:

	Sample Sept. 10, 1884. Specific gravity of juice, 1.071	Sample Aug. 23, 1884. Specific gravity, 1.084
Cane sugar....	13.84 per cent.	6.70 per cent.
Glucose	1.07 per cent.	2.50 per cent.
Organic matter not sugar and salts	2.39 per cent.	1.80 per cent.
Total solids,	17.30 per cent.	11.00 per cent.
Purity	80 per cent.	61 per cent.

OTHER EXPERIMENTS.

The experiment was speedily repeated upon another plant in the same condition and with almost precisely the same results. An increase of sucrose was indicated exceeding by nearly 100 per cent the normal as found in plants at the period of their life when it ordinarily has reached its highest limit. This was a remarkable result in itself, but its chief significance seemed to rest in the fact that the highest percentage of sugar was in some way correlated to the condition of arrested development of the grain.

NATURALLY STERILE PLANTS.

Attention was at once directed to some naturally sterile plants—those upon which no ear had formed. These were still alive, green and vigorous, and closely resembled those from which the immature ears had for some time been removed. Experiment soon disclosed an almost complete identity between them in the chemical composition of the juice. The only logical interpretation of this, supposing the results to be constant, was that the suppression of vital activity in the ear induces functional changes in other parts of the structure, especially in the

stem in which the reserve products are chiefly lodged, whereby the existence of the plant is prolonged and a new direction given to the unspent energy which would otherwise have been consumed in the final development of the seed.

TWO CROPS INSTEAD OF ONE.

Taking only the totally abortive plants—abortive as to the seed—into account, an analogue to them seemed to exist in the sugar-cane, which produces ordinarily no seed at all. The relationship of the latter to Indian corn is very close. Was it possible that the arrested development of the seed, however brought about, conditions the more active building up and storage of the soluble carbohydrates, and especially cane-sugar, within the cells of the stalk, which seem so highly specialized for this end in both? If so, it was hardly credible that such a circumstance should have eluded observation heretofore. Yet to that conclusion the facts so far gathered seemed to point. If it could be fully verified as a physiological trait, under the specified conditions, it was easily seen that it would result in an enormous gain in the productiveness of the plant in two opposite directions—two crops instead of one, the grain almost equal in amount and superior in nutritive value to the ordinary hard corn, and, instead of an almost worthless mass of dead fiber, fully developed canes, in full life and vigor, richly charged with true cane sugar.

It thus began to be evident that a new principle in the economy of the plant, unnoticed before, was in action, controlling its activities under the changed conditions.

The suggestion that the extraordinary accumulation of sugar in the juice was apparent only, and not real, the result simply of concentration by evaporation from the stem, had to be dismissed at once, for it is well known that true evaporation can take place only from dead cells, the process involving the destruction of their organized contents and not their accumulation, and is followed by immediate loss of weight.

RESULTS CONFIRMED.

Enough had now been learned certainly to stimulate further research, but not enough to establish the absolute constancy of the new results reached under variously modified influences, all of which could not manifest themselves during a single season of growth. But if a thorough investigation during a series of years subsequent, covering all important points, should be found to confirm fully the outcome of these first experiments, it would be regarded as decisive. Nothing less would dissipate the incredulity with which a disclosure of the facts would be received when 400 years of accumulated experience of the plant in cultivation, in every quarter of the world, had failed to bring it out.

In brief, it may now be said that the outcome has not only abundantly confirmed the conclusions first reached, but shows that there can be no middle ground between the common estimate of the plant and that which a logical interpretation of all the facts now disclosed forces upon us. Each successive season a fresh series of analyses and practical tests were made and put upon record, beginning with that stage of the development of the plant, when the percentage of cane sugar had previously been supposed to have reached its maximum, and extending them through after period of juice-ripening, brought on by the timely separation of the immature grain, up to the time of frost. It was found that the saccharine strength of the juice, under the new conditions, constantly increased in a fixed ratio, and that the life of the plant was prolonged from a month to two months beyond the natural period. Thus, at a stride, what cost seventy-five years of selection and gradual improvement of the beet to accomplish, is now accomplished for corn by the simple act which prevents development of the un-ripened ear, and increases by 100 per cent the sugar content in the plant. And this is to be said, not in disparagement, but in admiration for the consummate skill, industry, and patience bestowed upon the beet to build up the sugar industry from it—a plant naturally so much less plastic and controllable.

ELSEWHERE.

To set at rest the question as to the capacity of corn to produce sugar abundantly and regularly over the corn belt of our country, I would state that during the past five years it has been grown at properly selected points

widely separated, and tests of the sugar content made by chemists selected for their skill in such work. It is thus shown that in districts separated as widely as Pennsylvania, Nebraska, Georgia, and South Carolina and southern California, the law of control upon which the sugar accumulation depends is equally certain in its operation everywhere whatever the soil condition, wherever the plant will grow at all. The sugar percentage in the juice ranges from 12 to 17, and the weight of the trimmed stalks or corn-cane (the name by which I distinguish it when in this condition) from 12 to 20 tons. Moreover, already certain varieties have developed better qualities than others, and further improvement is not only probable but certain.

The constancy of these results is further assured by the fact that the changes produced by the interference have to do with the reproductive system of the plant, and its responsive action, in the premises, is a systematic and intelligent attempt to accumulate reserve materials in the stalk for the building up of a future ear, in place of the one removed, to perpetuate its life—and I see no difference in the nature or rank of the intelligence which prompts the plant to do this and that which prompts the ants to rebuild their store-houses when demolished, or the bee to replenish new honey and brood cells for the same common end. The point is, to secure the certain cooperation of nature for what we call useful ends. But it may be said that a forced transformation like this is unnatural and artificial and an upsetting or unsettling of the order of nature, and therefore inconstant and at war with nature herself.

ART.

I am reminded of the colloquy between Perdita and her visitors in "The Winter's Tale." She was showing them her flowers and says she will have no spotted gilliflowers among hers, but only plain ones, for she has heard that those are produced by an art which dares "to share with Great Creating Nature" in their making. And Polixines explains:

"Nature is made better by no man,
But Nature makes that man.
So over the art which you say adds to Nature
Is an art which Nature makes.
You see, sweet maid, this is an art
Which doth mend Nature, change it rather,
But the art itself is Nature."

COOPERATION WITH NATURE.

And so it is; it is the art of the skilled gardener, of the enlightened stock-grower, of every improver of nature who deals with her at first hand. Shakespeare has made luminous for us the law. What man thus adds to nature is in conformity to her original plan—cooperation is the word for it. So we stand upon a high platform; the infinite and finite mind meet here on common ground, and who shall say that our agriculture is only to delve among the clouds! Its science is the highest of all. It deals with the problems of life. Its foundations are fixed in natural law indeed, but as Emerson has grandly said, it is conscious law, and "Conscious law is king of kings."

SUGAR.

I only say in passing to the second part of my subject, which I must treat very briefly, that until the facts already mentioned were fully verified by tests covering a sufficient number of years, and under a great diversity of conditions, up to the present time, sugar was manufactured constantly in the practical way such as I have employed in a little experimental plant, set up in Pennsylvania, which, though small of size and depending upon open-air evaporation, has demonstrated beyond all doubt the capacity of this plant to produce centrifugal sugar as easily as from the sugar cane, at the rate of

160 TO 200 POUNDS TO THE TON

of trimmed stalks. Outside of the use of a combined system of saturation and pressure, for which the nine-roller mill in its best form affords the best facilities of anything yet built for the extraction of the juice exhaustively, together with a regulated treatment of the juice, and such chemical control as will prevent inversion during evaporation, are the only points of difference in the regular manufacture between this and sugar-cane. The after treatment needed is precisely the same as that used in the very best sugar-houses, necessitating the employment of the best modern appliances in all departments of work upon the sugar and syrup; and all that Dr. Stubbs said yesterday in his very lucid way concerning central factories and all the

economies of modern sugar-making as applied to cane, including the much-needed use of hard common sense as well as technical skill, will apply to this plant as well. Moreover, it can be said that whatever improvement in conditions, general or special, are going to come from this new source of supply is not going to be at the expense of either the sugar-cane or the beet, because the best part of the corn belt for this purpose covers a vast gap which is incapable of being filled by either for sugar production. Dr. Wiley has explained this very clearly so far as the beet is concerned, and the limit of the successful growth of the sugar cane is, as you know, very well defined.

OTHER PRODUCTS.

The clean fiber and the cellular matter with its infinity of practical uses result directly from the previous operation required to extract the sugar. The stalk while growing must first have been subjected to the treatment—removal of the ear at the proper time—to secure the best natural conditions of the fiber and cellulose as well as the sugar. The one largely conditions the other. It is essential to both that the plant be taken in the green and living condition; and with the perfect extraction of the sugar, all the other dissolved solids accompany it, and the cellulose and fiber are left clean by one operation, and at the same time not a step has been taken toward this end which would not have been necessary if the sugar had been regarded as the by-product or thrown away. It is necessary in either case that the cell contents be exhaustively discharged, and that the plant should be in the fresh green state when used, and in a finely divided condition. The cellular material obtained from the dead dry stalks of the corn fields is inferior because it retains, as shown by the microscope, the worst of the decomposition products, in an insoluble condition in their cells and not easily removable.

CELLULOSE.

Time would fail me to speak of the enormous value the unique physical properties and the multiplicity of the applications of this wonderful material thus stored up for our use along with the sugar in the stalk of corn thus grown and developed. From the sugar-makers' point of view this product cuts nothing, although it is of almost equal value with the sugar itself. But, if produced in quantity to meet the inevitable demand for it, the derived products would range in present market value at from 3 cents to 90 cents per pound. Our forests are disappearing and are not renewable in a lifetime; but this material is renewable annually from the fields, and, along with sugar, in any quantity to meet the demand for it. Paper pulp is as much a necessity of our civilization as the bread that we eat.

OTHER THINGS IN CORN.

All this leaves out of account the grain product, the husks, the tops, and the leaves, which at a suitable time, and previous to the time of cutting, will all have been properly cared for. The adaptation of the immature grain for the preparation of table delicacies and substantial elements of our everyday diet, for the poor man's table as well as the rich, and upon which no trust can put any interdict, is unquestionable. As to the remaining field products, only this mention can be made, namely: that their composition, soft texture, and ready assimilation give them a high value for that purpose; and as I have long known, their absorptive power and ready combination when in a finely divided condition with the molasses and filter press cake give us a model stock food, concentrated, dry, and unfermentable and capable of transportation any distance.

NEGLECT.

And now in the light of to-day, what has been our characteristic attitude toward this most bountiful product of our soil? It has been neglect. Away across the Gulf, from where we stand to-day, yet survives the remnant of an ancient race, the Mayas of Yucatan, to whom originally in their former home, perhaps in Mexico, seems to have been committed the original plant from which our modern corn has sprung. The evidence is that through uncounted centuries of patient toil they had developed this plant from some primitive form. Lumholtz, whose work on "Unknown Mexico" has just recently been published, found what seems to be a transition type of the plant in northern Mexico. In the New York Museum of Natural History they show us what may have been the primitive plant itself, obtained from

Central America. However that may be, we to-day owe a debt of gratitude to the aboriginal people who developed it to the condition in which we have received it at their hands. Like all the other ancient people of this continent everywhere, they stood in grateful awe of it as a divine gift. The Mayas gave it a name which in their language means "the grace of God."

APPRECIATION.

Of old time the people of Athens enshrined upon the heights of the Acropolis a statue of Athena, wrought by the marvelous hand of Phidias, in ivory and gold, which was the then unequalled wonder of the world. The motive which actuated them to do this thing and to make it significant to future ages was not so much that this statue symbolized to them the protecting genius who kept watch over their city, but the divine wisdom and beneficence which had given them the olive—the olive to them the most precious product of their soil; and that, too, in highest esteem not when they were a mere tribe of peasants among the hills of Attica, but when they were at the hitherto unapproached height of their civilization of their fame.

What I ask is, that we should show such appreciation of this God-given plant of ours as shall be worthy of the land and the time in which we live.

Questions About Hessian Fly.

EDITOR KANSAS FARMER:—Owing to delays in the mail I did not get my FARMER of May 21 until after I had mailed letter and samples of wheat containing Hessian fly. In that issue I find my questions answered by L. V. Sanford. My observations teach me he is right when he says those that passed the winter in the "flaxseed" state emerge as the adult of the spring brood during April and May.

In answer to my question you say those which will hatch from the present crop of flaxseeds will lay their eggs upon volunteer wheat if they can find it and will then die. I think you are wrong in that statement. Nearly all that I find in the "flaxseed" state are in the dead shoots of wheat they killed last fall. I also find a great many of the flaxseeds are hatched, and the flies are now laying eggs on the standing wheat.

The object in writing my first letter was to find out how much devilment they would do between now and harvest. The rascals are beginning to put the wheat down now, and it will keep going down from now until harvest. Of course what is going down now will have nothing in it, but I have seen heads with very good berries in them go down just before harvest, especially if we have much heavy wind. What the damage will be this year, I do not know. Between the fly and so much rain I am afraid the damage will be more serious than most people are aware of. H. D. COMPTON. Sedgwick County.

The question raised by Mr. Compton is an interesting one. The eggs laid last fall should, according to the entomologists, have all passed the "flaxseed" stage and laid their eggs in April and the early part of May in localities as far south as Sedgwick County. The flaxseeds found in the wheat sent by Mr. Compton had apparently but recently passed the condition of little worms and showed no signs of being nearly ready to transform to flies as did samples received in April. If the flies are now hatching and laying eggs on the wheat the little worms into which the eggs hatch should be found at the point where the plant is damaged. If Mr. Compton and others will examine for the worms and report the result through the KANSAS FARMER they will perform a service for wheat-growers. Examine carefully and determine whether the stalks that go down are not those injured by the worms before assuming the present "flaxseed" state.

Rate of the Underflow.

The KANSAS FARMER has received from Mr. Charles S. Slichter, Madison, Wis., the engineer who made the investigation for the U. S. Geological Survey, the following statements of the results of the investigation so far as it has been carried: "In 1901 I made several measurements of the rate of motion of the underflow near Dodge City and Garden City, Kans. The object of these measurements was not a systematic survey of the underflow, but to test a method of measurement and apparatus which I was devising for the United States Geological

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will make you more money than any other separator can or will, because the Empire turns more easily, is more easily cleaned and kept clean, and has fewer parts to get out of order. Send for our book, "A Dairyman's Dollars," investigate all claims and decide for yourself. Empire Cream Separator Co. Bloomfield, N. J. Western Office, Fisher Bldg., Chicago.



Survey. I found velocities varying from three to fourteen feet per day at the different localities that I investigated, the direction of motion being east or slightly south of east.

"These results were far from exhaustive, and it may be hazardous to draw general conclusions from so broad an area. They seem to indicate, however, that the groundwaters of the plains are not stationary, but possess a moderate rate of motion in a general east or southeast direction. I should be greatly surprised if velocities greatly higher or greatly lower than those measured by myself should be found on further investigation, as the slope of the groundwater surface is quite uniform. These measurements were the first of the kind made in this country and they attracted wide attention—in fact a wider attention than the number of my measurements would warrant."

Dr. Selim H. Peabody Dead.

Dr. Selim Hobart Peabody, aged 74 years, assistant director of exhibits of the Louisiana Purchase Exposition and a well-known educator, died suddenly at his boarding house in St. Louis of apoplexy. Mr. Peabody was a noted mathematician, linguist, naturalist, and astronomer. He was born in Rockingham, Va. In addition to holding positions with some of the principal schools and colleges throughout the country, Dr. Peabody was for eleven years president of the University of Illinois. That position he resigned to become chief of the liberal arts department of the Columbian Exposition. Since then he held offices with the Pan-American and Paris Expositions. Dr. Peabody leaves a widow and daughter, Miss Grace Peabody, and two sons, Arthur Peabody, of Chicago, and Cecil Peabody, who is a member of the faculty of the Massachusetts School of Technology.

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.

The Vermont Experiment Station has just issued Bulletin 99, an 88-page publication, concerning commercial fertilizers. It is one of the most comprehensive publications on this subject that has been printed. It not only gives a review of the trade of the year, but discusses the nature and use of fertilizers and gives suggestions as to choice, etc. The bulletin is well-indexed and contains a dictionary of the terms used in fertilization. This is the first of a series of bulletins in which is expected to discuss the whole subject of fertilizers and fertilization from A to Z. It may be had for the asking. A postal card addressed to the Experiment Station, Burlington, Vt., is sufficient.

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. Eichelard, V. S., 110 East Tenth Street, Topeka, Kans. Telephone No. 319, either phone.

Quitter.—I have a mule that has a maturing sore on her right fore foot just above the hoof about the size of a cent. The mule is slightly lame at times, while at other times she does not limp at all. She has been worked on a feed wagon all winter. Sore came about December 1. I want advice from brother farmers or any one else as to treatment. G. W. D.

Greenwood County.
Answer.—Your mule has got a quitter, and the sore should be thoroughly opened up and cleaned out. If you are not able to do that, would advise you to have some veterinarian do so for you. Then keep cleaned out by using a strong solution of carbolic water, say teaspoonful of acid to the half-pint of water. After you have it cleaned out with that, inject the cavity full of solution of bichloride of mercury (solution) strength 1 to 500. Repeat the treatment of keeping it clean each day and you will have very little trouble in healing.

Thoroughly examine the foot to see that you have not got a snag of some kind in the opening which has caused the sore.

Mamitis.—I have a Holstein cow that at times has a part of her udder swollen and hard, and at next milking will give stringy milk from that side of udder. It seems to change places, sometimes in one quarter, sometimes in half, and once in three-fourths of udder. She was fresh in January and gave no trouble this way until running on green feed. Can anything be done for her or will I have to dispose of her as a milch-cow? J. H. T.

Mitchell County.
Answer.—Your cow will more than likely come along again if a little care is given her. Grass as a diet is all she should have. Medicinal treatment.—Phytolacca decandra fluid extract given in 10-drop doses in a couple of tablespoonfuls of water three times a day, followed closely for awhile will help your trouble. Keep the udder well milked out, if necessary, three times a day.

Cribber.—Last February I wrote you in regard to a 2-year-old colt (is 3 years old now) that is a cribber. He will take a coal in his mouth and put it on a post or any object and suck it, and now he groans when doing this. You sent me a prescription and I filled it and gave it to him, but it failed to cure him. If you know of anything that will cure him please publish in the KANSAS FARMER. He is a good young horse and I am very anxious to cure him. A. M. MASON.

Crawford County.
Answer.—Aside from removing all objects that the colt can reach with its mouth, but little can be done. However, in a young colt would advise placing colt in a box-stall with everything removed the colt can bite upon. Feed everything from floor, and in time he may forget the habit. Further than this nothing can be done.

Heaves.—Will you please give me a food treatment for a horse with a bad case of heaves from eating alfalfa hay. Horse coughs a great deal at times. Reno County. F. R. NEWTON.

Answer.—The only treatment attended with any degree of success is to attend strictly to the diet. Feed the cleanest of prairie hay in small quantities dampened slightly. Give water often and in small quantities. Fowler's solution of arsenic in tablespoonful doses works

Kendall's Cures



Spavin, Ring Bone, Splint, Curb and all forms of Lameness.

Kendall's Cures Best Results. Crivitz, Wis., Feb. 14, 1903.

Dr. B. J. Kendall Co., Gentlemen:—Enclosed please find a two cent stamp for which send me your "Treatise on the Horse and His Diseases," giving full directions for using Spavin Cure, etc. I have used Kendall's Spavin Cure a great deal and have always obtained the best results with it. Yours respectfully,

JOHN FELDHOUSEN, Sr.
Works thousands of cures annually. Endorsed by the best breeders and horsemen everywhere. Price \$1; 6 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. B. J. KENDALL CO., ENOSBURG FALLS, VT.

well in some cases. In others, tincture of lobelia in teaspoonful doses, or oil of tar in same quantity two or three times a day is good, but the dieting is of most account in this trouble.

Diseased Eyes in Mule.—I have a mule 6 years old which has film of one year's standing over his eyes. He can see a little, and I think he could see if the film was removed. Please answer in the KANSAS FARMER, giving me your opinion and remedy if there is any. Indian Territory. C. F. MAPES.

Answer.—Your mule will, or has, lost the use of the eye you mention. Would recommend that no treatment be attempted. Any medicine that would remove the film would be attended with great pain and the present condition of the eye would be resumed after a short time.

Lame Mare.—I have a gray mare 4 years old that is lame in the left stifle-joint, caused by a sprain last harvest. She seems to drag the leg along, as the toe of the hoof is worn down. Rest relieves her some but as soon as she works she gets lame again. I have not done anything for her until a week ago I began using a liniment of one ounce of turpentine to one pint of cider-vinegar. Please give me your reply as soon as possible, telling what I can do for her. Rush County. GEO. L. STULLKEN.

Answer.—Would advise absolute rest, and repeated blisters every ten days with the following blister: Red iodide mercury one part, vaseline six parts, mix thoroughly, rub well in with the hand over the affected joint. Tie the head up for twelve hours to avoid biting while the blister is working. Grease after twenty-four hours.

Dropsy.—I have a mare 14 years old that has raised several colts. About April 1, she appeared to have something like colic. She would lie down, get up, and had fever for two days; then she began to swell in front of her udder on each side to her front legs and stood on her feet until the last of April. Had her colt and appeared to feel better and had good appetite, but is badly swollen and appears to get worse. Can you tell me what to do for her? WM. McDONALD.

Neosho County.
Answer.—Dropsy—due to pregnancy. Treatment: Puncture the swellings with point of small knife-blade in several places along the most dependant parts. Feed generously of good, wholesome food, and for medicinal treatment give the following in the feed: "Fowler's solution of arsenic in doses of one tablespoonful night and morning.

Albuminaria in Colt.—I had a mare foal a horse mule colt the night of May 16, and the colt died at 7 o'clock next morning. From appearance it had stood up and had a passage, also passed bloody urine. Last year the same mare lost the same kind of a colt; it had lived until next night. The two mule colts that came last year were horse colts and both passed bloody urine and died. The two colts previous to the last two were filleys by the same mare and all right. The mare had had good care and fed on corn, bran, prairie hay, and pasture the last two weeks, and had not worked any. She was healthy and in good order. Is the Mammouth mule subject to any such disease? M. L. JOHNSON. Lyon County.

Answer.—It is a form of albuminaria in the foal. There is no more reason for a horse colt than a filley to be thus affected. The bloody urine may be due to some irritation of the kidneys from causes that can not be explained in so young a foal; if more aged you would surmise the trouble to be due to the milk from some diet of the dam. But when the foal has had scarcely any chance of even nursing, the trouble can hardly be explained satisfactorily.

The Apiary.

Conducted by A. H. Duff, Larned, Kans., to whom all inquiries concerning this department should be addressed.

Questions About Bees.

EDITOR KANSAS FARMER:—I confess myself to be very inexperienced in caring for bees, but am trying to inform myself as to their proper treatment. I have perused the many facts relative to them in No. 65 bulletin of the entomological department of the State University, and appreciate the information gained, but the questions I wish to ask are as follows: Will the spraying of fruit-trees injure bees or honey? If so, could bees be confined in the

**BIG LOSSES IN THE USE OF
INFERIOR CREAM SEPARATORS.**

A very important practical-use test just concluded by one of the big western State Colleges and Experiment Stations of the different makes of \$100. farm separators discloses the fact that the **amount of cream or butter-fat left in the bowl!** (something the average user never thinks of at all) in the "Empire" and other machines of that type amounts to enough **in the course of a single year** to alone pay the cost of a DE LAVAL machine in the first place, aside from the many other advantages and superior construction in every way of a DE LAVAL machine.

It was found too that only the DE LAVAL and one other machine would run milk as cold as 70 deg. (something every user is frequently called upon to do) for as long as 10 minutes without clogging up, and this one other machine—the "National"—skimmed very poorly at low temperature while the De Laval work was almost as clean as at high temperature.

A De Laval catalogue and any desired particulars in reference to Cream Separators will be gladly furnished upon application.

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RANDOLPH & CANAL STS., CHICAGO.	General Offices: 74 Cortlandt Street NEW YORK.	121 YOVILLE SQUARE, MONTREAL. 75 AND 77 YORK STREET, TORONTO. 248 McDERMOT AVENUE, WINNIPEG.
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hive on days of spraying with safety or advantage? If so, how? In shipping bees, is the cover of the hive left off as shown in cut on page 136 of the aforesaid bulletin, or is it just so placed to show the inside arrangement? In encasing hives in chaff hives for winter, are the openings to inside hives covered over so as to extend them to the outside hive and prevent the chaff from interfering with the exit of bees? These may seem simple questions, but our success or failure often depends on little things we know or do not know. Lyon County. R. E. HARVEY.

Spraying fruit-trees while in full bloom if the material used is efficient will certainly kill the bees, and all insects that visit the blossoms. One who is posted on spraying will never spray when the bloom is on. Spraying while the bloom is open is very damaging to the fruit crop. Tables have been published time and again in the agricultural papers, giving the material used, and when to use it, and in no case should spraying be done while the blossoms are open. Fertilization of the bloom by insects, of which honey-bees are the most useful, can not take place, and is prevented if spraying is done while the blossoms are open. Those who intend using the spray should thoroughly post themselves before undertaking it.

There is no manner in which bees could be confined in their hives that would be a success through the fruit-blooming time. Beekeepers should see to it that their neighbors are posted on this subject. They may secure these tables on spraying and distribute them in their neighborhood.

In shipping bees in summer weather the lid is not placed upon the hive, but the same is covered with wire cloth, thus giving the bees plenty of ventilation. The cut you refer to, shows it as it should be in shipping condition. The entrance proper to the hive should also be enclosed with wire screen, and in this manner a good strong colony of bees may be sent safely any distance.

In encasing hives in chaff hives for winter the entrance for the bees should be tightly encased, thus keeping the chaff from getting in the entrance to interfere with the exit of bees, and keeping the packing intact.

Hives, Etc.

EDITOR KANSAS FARMER:—Your interesting "bee writes" often meet my gaze, and I presume you are posted in supplies. Do you know any one who has the old American hives, or who makes them, and also makes foundation 12 by 12 inches? I have an extractor which I bought about twenty years ago. I now have only five colonies, but have an excellent location for bees, on account of bass-wood, white clover, and alfalfa. G. A. McVICAR.

Pottawatomie County.

We do not know of any one who

**Big Profit
in Cows**

is but a question of getting all the cream (butter fat) out of the milk. With the old setting system your loss is over 80 per cent greater than with a

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A valuable machine you can test in your own home or dairy
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If you like—buy it; if you don't, we take it back and pay all expense—you have nothing to risk. Our catalogue gives full particulars.
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**FOR OUR FREE SPECIAL BICYCLE
CATALOGUE** showing the most complete line of new 1903 model gents', 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.

now uses the old American hive or any manufactory that makes it. The fact is, no beekeeper of note uses this hive at the present. You can get foundation from any supply dealer almost, who will furnish it cut to any size you wish. I would certainly advise you to get the latest standard hives, and transfer your bees to them, for if you do much business in bees you will surely see your mistake later on, when perhaps you have a large apiary, and the expense of changing would be heavy, while you can now put your five colonies in profitable shape at a very light expense. I have known of this mistake being made so often in earlier days, and then later on greatly regretted. I do not know of a single beekeeper to-day using the American hive, and I am more or less acquainted with every beekeeper of note in the United States.

TUBULAR Cream Separators

If we cannot show you wherein our separators are worth at least fifty per cent more than other separators, don't buy them. We want you to know that you have the best when you buy a Tubular. You cannot help being convinced if you examine a Tubular. You will find it entirely different from other separators. Write for free catalogue No. 165.

THE SHARPLES CO., P. M. SHARPLES,
Chicago, Illinois. West Chester, Pa.

In the Dairy.

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

Rye for Hay.

Mr. E. R. S., of Farmington, Kans., writes: "Please give me information as to the feeding-value of rye hay. I can use the hay to good advantage chopped up and mixed with a little grain for milch-cows. I intended pasturing the rye but have a good stand of clover and timothy which I am afraid the cows will tramp too much. The clover and timothy were sown with the rye in the fall as an experiment with fine results."

The writer is unable to find any experiment where rye has been used as a feed for dairy-cows. It is frequently used with excellent results as pasture although it has a tendency to taint the milk. This can be greatly reduced or entirely overcome by aeration of the milk immediately after it is drawn. Professor Henry in his book on "Feeds and Feeding" says: "It is probable that the limited use of rye with dairy-cows will prove satisfactory." In the absence of any data on the feeding of rye hay I am unable to say just what can be done with it, but if this correspondent cuts it up and mixes it with the grain-ration it seems as though he ought to get fair results; at least it is worth a trial. But on account of its taint it would be better to feed it in limited quantities with other rough feed and then thoroughly aerate the milk. D. H. OTIS, Kansas Experiment Station.

In using rye for hay the time of cutting is very important. Mr. C. S. Arnold, in Hoard's Dairyman, writes as follows: "Many farmers have condemned rye simply because they thought they must wait until it was fully headed before cutting, and naturally the resulting product was more like straw than hay, tough and unpalatable, fit for little but bedding. The time to cut rye for hay is just when it first begins to show heads; then if properly cured (and it is not hard to cure) it makes a fine hay, relished by all kinds of stock. When cut thus early there will be an almost equally large second crop of hay or pasture. I learned to make good rye hay only this past season. I did not make much and it is long since fed out, but if I am ever confronted with the prospect of a short hay-crop, I shall not hesitate to go into the rye-field with mowing-machine and hay-loader and expect to fill my barn with good winter forage." G. C. W.

Vetch, Cow-Pea, and Soy-Bean Hay as Substitutes for Wheat-Bran.

The following is a summary of Bulletin 123 of the Alabama Experiment Station:

The object of the feeding experiments herein described was to ascertain whether hay made from vetch, cow-peas, and soy-beans could be advantageously substituted for most of the wheat-bran in the ration of dairy-cows.

The following values per ton were used in calculating the cost of feed:

Wheat-bran, \$20; vetch hay, \$10; cow-pea hay, \$10; cottonseed, \$12; cottonseed-meal, \$20; cottonseed-hulls, \$5.

Vetch hay proved fully equal in feeding value to a similar weight of wheat-bran. By this substitution the cost of feed required to make a pound of butter was reduced 25 per cent, which is equivalent to a monthly saving of \$22.20 in a herd of twenty cows.

With the vetch ration the cost of food for one pound of butter averaged

10 cents in contrast to 13.4 cents when wheat-bran was fed.

The waste in feeding vetch hay was, with most cows, about 6 per cent of the amount offered them, and with cow-pea hay about 16 per cent; the latter residue, being useless, is charged as a part of the ration.

That portion of the cow-pea hay eaten proved fully equal in feeding-value to wheat-bran. Charging the cows with all the cow-pea hay offered them, we find that cow-pea hay had 86 per cent of the feeding-value of wheat-bran, one ton of this hay being equal to 1,720 pounds of wheat-bran.

When wheat-bran was worth \$20 per ton, cow-pea hay was worth \$17.20 and vetch hay \$20.

The monthly profits per cow were \$4.65 on the vetch ration and \$4.35 on the cow-pea ration.

One of the Jersey cows used in this test produced butter at a cost for food of only 8 1/2 cents per pound, when fed on the vetch ration.

Running cow-pea hay through a feed-cutter did not decrease the waste of feeding this food.

Four and one-half per cent more butter was produced with soy-bean hay than with cow-pea hay, if we take account of the portion of each actually eaten; however, a larger proportion of the coarse stems of the soy-bean hay was left uneaten.

When corn-hearts were substituted for wheat-bran the yield of butter was increased by 8 per cent.

J. F. DUGGAR, Agriculturist, Alabama Experiment Station.

A Pasture Inquiry.

Mr. E. R. S., of Hutchinson, writes: "I have high-priced labor hired for the year. I am milking some good cows that are money-makers, but I am located six and one-half miles from factory which takes all the profits in hauling. I want to milk enough cows to pay to send a team. If I get more cows I will be short of pasture. I want to know how to get the cheapest substitute for pasture, labor included."

If our correspondent had started earlier in the season it would have been advisable to put in some oats, or possibly a mixture of rape and oats, or still better, a mixture commonly called "succotash," the latter being a mixture of any spring grains and winter rye. Wheat, rye, oats, and in some localities, barley might have been used for this purpose. It is now too late for these crops. Wheat and rye may be put in late in the summer for fall pasture.

For two years the Kansas Experiment Station has secured excellent results in pasturing green sorghum. This feed was ready to use when pastures were dry and it afforded an immense amount of feed from a small area. Notwithstanding our success in pasturing green sorghum, we are not ready to recommend it. Numerous cases are on record of deaths caused by it (sorghum poisoning). We believe that danger from sorghum can be materially reduced by getting cows used to it gradually and by having them go on to it with full stomachs. However, the man who pastures it must do so at his own risk.

If our correspondent does not want to take the risk of pasturing sorghum he will probably have to resort to soiling crops. For this purpose, green alfalfa heads the list. During the summer of 1899 the Kansas Experiment Station soiled ten head of cows from May 10 to August 1 (seventy-four days) from 2.97 acres of alfalfa. While we have used green alfalfa successfully for a soiling crop we have not made a success of pasturing it. During the month of August of the same year the ten cows were fed green corn from 1.22 acres, during September green sorghum and Kafir-corn from 1.39 acres. While it appears dangerous to pasture alfalfa and sorghum we seldom hear of a case of injury resulting from feeding it green as a soiling-crop. D. H. OTIS.

We are glad to note that Mr. H. N. Holdeman, whose pure-bred herd of Holstein-Friesians the writer visited early in April, is keeping records of the productions of his cows. He has just sent in the report for the remaining sixteen days of the month:

Cows on record.....	10
Average age.....	4 yrs. 5 mos.
Average period of lactation.....	4 mos. 21 da.
Total milk for 16 days.....	5268.35 lbs.
Average daily yield per cow.....	32.925 lbs.
Average per cent of butter-fat.....	3.3

G. C. W.

Mr. J. G. McKean, one of Manhattan's progressive dairymen, recently purchased a 7-month-old bull calf

An Army Invades Kansas.

A year ago a few modest, delicate, unobtrusive Empire Separators went into Kansas with glad tidings of joy to the patient dairymen who had waited for years to receive the reward promised them, but which reward has never come. This little group of silent workers met some "bullies" and were told to go back from whence they came. When this noisy bluff failed, they were laughed at and made all kinds of fun of. They were told they were too little, too insignificant, too weak, and every now and then some great big duffer, who imagined himself proof against any kind of exposure, would douse this little visitor with ice milk. But this little band of crusaders (who soon won favor with that element in whom everybody is interested—the women and children) continued to carry their silent message of a better way to handle milk, and they sent back to their old home for more help to tell this beautiful story of less work, less expense, better calves and above all a market from 25 to 50 per cent better than the old one. Each silent appeal brought a helper until at the expiration of the first year. There are 3000 of these little simple, silent workers preparing (in their easy way) the cream from 100,000 cows to be shipped to the Blue Valley Creamery Co., of St. Joseph, Mo where the highest price is paid. Do you want to know more? If you are interested write us.

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Blue Valley Creamery Co.

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IF NOT, YOU SHOULD SEE THAT IT IS.

In buying butter or cream, always ask if the milk was run through an Improved U. S. Cream Separator. If it was not, you may be sure the product is not as good as it might be, for

It Takes the Best to Make the Best, and it has been proved many times that **The U. S. Separator Excels All Others.**

At the Pan-American Model Dairy it **Won World's Record for Clean Skimming, averaging for 50 consecutive runs .0138 of 1%.**

For further particulars write for illustrated catalogues.

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BEST IN THE WORLD EASIEST CLEANED MOST DURABLE CLOSEST SKIMMER

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CHICAGO, ILL.

Save time and freight by ordering from
PIONEER IMPLEMENT CO.
Council Bluffs, Iowa.

from the Kansas State Agricultural herd of Jerseys. The calf is sired by Brown Elsie's Grandson 60412 and his dam is Miss Ita 152841.

Mr. McKean, who is engaged in supplying a private butter trade, has some good grade Jersey cows, all of which are now making over a pound of butter per day. His intention is to improve his herd by the use of the pure-bred bull just purchased. G. C. W.

Garden Spot of the Earth.

The fertile fields of eastern Oregon or Washington yield, in overflowing abund-

ance 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,

The Poultry Yard.

"16 TO 1," "6 TO 1," AND THE EGG-PRODUCING HEN.

"16 to 1"—She Eats 16 Times Her Weight in the Year. "6 to 1"—Her Eggs in the Year are 6 Times Her Own Weight. "16 to 1"—Her Eggs Bring 16 Cents per Pound; Her Food Costs 1 Cent per Pound. "6 to 1"—Her Yearly Egg-Product is Worth 6 Times the Cost of Her Food.

BY T. E. ORR, SECRETARY OF THE AMERICAN POULTRY ASSOCIATION, BEAVER, PA. FROM BULLETIN OF THE MISSOURI STATE BOARD OF AGRICULTURE.

With my topic thus outlined no one will accuse me of talking politics or of discussing the relation of gold to silver; but the above is my text and I'm going to preach the "Gospel of Hen" and discuss the relation of feed to eggs, and how to turn our farm products into cash at a good profit.

In doing this I shall try to give you an outline of the food supply necessary for carrying a flock of forty-five pullets one year and give the average cost of these foods and tell something of the relation they should bear to each other.

WHERE AND HOW OBTAINED.

A glance at the table found in this article shows that of the ten foods outlined, six are found on nearly every farm. On most farms the other four must be purchased. But even if you are a villager and must purchase them all, you are simply carrying your merchandising a little further than does the farmer, and the farmer and egg-producer must both remember that if they are to succeed in this twentieth century they must be both merchants and manufacturers. As a merchant, the farmer must buy his necessities for business at the lowest possible cost and then sell them in a somewhat different form at the highest obtainable price. As a manufacturer, he is constantly converting the raw material into the finished product.

THREE COMMENTS ON OUR FOOD TABLE.

1. The foods are very largely cereal. I am a firm believer in the theory that the hen can subsist and yield a fine profit in eggs on a ration of grains alone. I have no objection to soft feed, cooked feed, steamed feed, etc., but it has been shown that these are not necessary to profitable egg-production. You can probably increase the egg-output for a short time by these expedients, but your yearly product will, we believe, not greatly exceed that form a grain- and meat-ration. By cooked or steamed feed you can surely increase the egg-product at the time of year that eggs sell for the most money.

2. I give this table of foods not as the best one for all, but as a good one for most people, especially the amateur. If your market, location, and surroundings enable you to substitute potatoes, turnips, beets, cabbage, etc., for some of the items, well and good; I have no quarrel with you and shall be glad to hear of your success. Or if you can obtain fresh bones from the butcher and will grind them, you can dispense with much of the cut-bone and beef-scrap I have prescribed and reduce materially the cost.

3. You may not be able to purchase in small quantities the feeds I have prescribed at the prices named. Feed promises to be cheap this year and eggs will surely be high. This article is written in western Missouri, and a prominent stock-feeder in looking over the table said: "You have those grain prices 50 per cent higher than is necessary for this section this year." Now, you may need to pay higher prices than those specified, but if so you are in a locality where you can sell your eggs higher than "16 cents per pound." At our Beaver Hill farm we believe that our feeds cost us perhaps 25 per cent higher than our estimate, but we will realize more than 25 per cent advance on the price of eggs, for at no time this summer did we sell eggs lower than 20 cents per dozen, and in September people were coaxing for our eggs at 24 cents per dozen, or "16 cents per pound." Right here in the country districts of western Missouri eggs are selling now for 18 cents per dozen.

THE PRACTICAL APPLICATION.

The problem I am asking you to demonstrate is the possibility of starting November 1 with forty-five pure-bred pullets of an "eggs-early-and-often" strain and on the rations I prescribe, or one of equal cost and merit, make them produce in 360 days 240 eggs each, "two eggs each three days."

CAN IT BE DONE?

There are many to rise and cry: "That's all theory; it can't be done." Well, such people are the ones who will also say "A hen can't possibly consume sixteen times her own weight in one year, any more than she can lay six times her weight of eggs in a year." Well, I'm not afraid of a calamity-howler nor of the man who continually decries the theories of others but has no good practices of his own to present. Nearly twenty years ago the writer of this article experimented for a full year with one pen each of Brown Leghorns, Silver Wyandottes, and Barred Plymouth Rocks. Our surroundings were very unfavorable, but those hens gave us then a product of 184 eggs, 172 eggs, and 160 eggs per hen, in the order named, and convinced us that the hen to lay "two eggs every three days" was a coming reality. In 1890-91 we conducted an experiment with several different breeds, and the variety that stood second in our first test stood first this time, with 202 eggs to the credit of each hen.

MANY HAVE DONE IT.

In 1893 the writer of this article conducted an experiment participated in by 230 people. There were a few pens of grade and cross-bred pullets, but most of them were pure-bred and of the standard varieties. Twenty different breeds were entered and ten different States were represented. One hundred and forty-three of these pens continued in the contest for the entire year and sent in their weekly and monthly reports on blanks furnished them. Many of these reports were verified by credible witnesses and attested by affidavits. Of these 143 full-year pens the twenty leading pens produced each an average of more than 200 eggs per hen, and the average of the total of these twenty pens was 240 eggs per hen.

When the above contest was started there were some poultry-papers that predicted failure and disaster, but after it was completed in all its details their comment was favorable and several of the leading poultry-journals devoted pages to publishing its particulars. Its results have been accepted as accurate and it has demonstrated clearly the ability of hens of several varieties to do just what we are urging you in this article to allow and help them to accomplish, namely: to produce 240 eggs per year of an average weight of two ounces, a total of thirty pounds, or six times the weight of the pullet at starting.

A UNIFORM EGG PRICE.

In the experiment above referred to the number and weight of the eggs were reported to us and we fixed the price by the average retail prices of eggs in Pittsburg for that month. The average price that year was 1.8 cents per egg, but prices were lower then than they have ever been since, so in our calculation in this article we are fixing the price at 2 cents per egg, or 16 cents per pound for two-ounce eggs, and as prices are sure to average considerably higher this year, we feel that we have taken a conservative position, both on the price of feed and on the price of eggs. A produce of 240 eggs at 2 cents each gives an annual income of \$4.80 per hen. In the above-named experiment one pen reached an income of \$5.02 per hen at 1.8 cents per egg. So we are quite below the leading pen in our estimate for you, even at the advanced price.

LOW COST OF PRODUCTION.

We are now down to the question: Can we feed the hen on 80 cents per year, so as to come within the requirements of the fourth item of our text, namely, that her yearly cost for food is only one-sixth of the value of her yearly egg-product? Again referring to that large experiment, we must admit that the reports of those who kept account of food-cost ranged from 83 cents to \$1.60 per hen per year, the average being \$1.20; but it must also be remembered that those people were competing for prizes for highest production, and but little attention was given to cheapness. Under those circumstances one would not hesitate to feed food costing 5 cents per pound, or even more, in order to make his favorites win.

SOME OTHER EXPERIMENTS.

Some two or three years ago one of our leading agricultural papers secured statistics showing that the farm hen costs for feed from 47 to 83 cents per year, an average of about 65 cents. But two objections arise here: First, these hens ran at large quite a portion of the time and picked up much of

their food; second, these hens were not kept up to the high-pressure standard necessary to secure "two eggs every three days," so did not consume nearly so much feed as must your forty-five pullets in this experiment. Two ounces of grain per day is the highest estimate we have seen given, but we are sure from our own experience and that of others, that this alone is not enough. We have, therefore, allotted to each one of your forty-five pullets, weighing five pounds at the start, sixteen times her own weight of food, or a daily ration of three and five-ninths ounces.

A RICH RATION.

Even the critic will admit that this is a pretty rich diet—much better in both quantity and quality than he feeds—and we are ready to admit that it requires a hen with a good digestive apparatus to do the work. She must have the assimilating powers of the dairy-bred Jersey or Holstein cow to reach the mark. No dung-hills need apply. No drones need undertake the management. But it has been done; it is being done; you can do it if you will supply the comforts and conveniences that Madam Hen calls for. To consume ten and two-third ounces of food in three days and give you in return four ounces of egg is no small undertaking on her part, nor is it a small business on your part to secure it.

Remember one point just here: two-thirds of the egg is water. The remaining one-third you must give her in the proper solid foods, not forgetting the water, and also provide liberally at the same time for her animal heat, the wear and tear of her system and for the ashes of her animal fires. In other words, you must expect lots of your feed to find its way to the dropping-board, but even there it is a valuable product which we have not figured in.

COMMENTS ON THE FOODS.

A few words about these foods in the order named in our table:

Corn.—We use it in smaller proportion than here specified, partly because with us in western Pennsylvania it is very expensive, but more because it is too fattening. Our hens are kept for breeding as well as for egg-production. The fat hen may be kept so and be made to lay eggs up to our requirements of "two eggs in three days," but the eggs from a fat hen do not hatch well.

Oats.—We consider oats our very best feed. Oats cost us 2½ cents per pound the past season, but they are cheaper now. With an abundance of grit there is no danger in feeding whole oats. We bought hulled oats the past year for the same price as the whole oats. Fed alone, they are not satisfying to the hen. They do not furnish bulk enough. Hulled oats must be accompanied with plenty of clover and other coarse food.

Wheat.—At 80 cents per bushel the past season wheat was our cheapest feed. Don't think to economize by buying poor wheat or screenings. If you buy, buy the best quality obtainable.

Kafir-corn and Sorghum.—These are two of the very best of grains, as nearly a balanced ration for the fowls as you can get; but don't depend on these or any other one grain. You must keep up the hen's appetite with variety. Skip from one grain to another frequently. Keep her happy and busy. It pays.

Bran.—We esteem bran as the one essential ground food. We use it dry, in large, flat boxes about the yards, where the birds, young and old, can jump in and pick a lot of it. We also use it as a basis of all our soft feeds, a carrier for our meat-meal, etc. We always use salt on our soft feeds. Bran is rich in protein; it is a good regulator; it seems to neutralize poisons.

Clover.—I take great care in harvesting my clover for poultry, both the first and second crop. It should be cut in good time, cured nicely without dew or rain on it, and may be stored in gunny-sacks or otherwise until it is needed. We run it through the cutter and then wet or steam it over night, then add bran, meat, bone, salt, etc. Do not skimp the clover. Better waste some rather than that the hens should not have enough.

Alfalfa is the only forage plant that approaches clover as "hen hay."

Meat.—The egg is rich in albumen. You must feed it into your hens or the whites will be thin and watery. Granulated beef-scrap and the meat-meal and dried blood are obtainable on the market. If you have an abundance of butcher-shop bones, and can obtain cheap meat to boil, thickening the

POULTRY BREEDERS' DIRECTORY.

SILVER WYANDOTTES—Standard bred, farm range, prize winners for fourteen years. Eggs, 100 for \$4; 50 for \$2. Mrs. J. W. Gause, Emporia, Kans.

BARRED PLYMOUTH EGGS, 15 for 75 cents; none better. Ethel J. Williams, Agrioola, Kans.

BLACK LANGSHAN EGGS for sale, 5 cents a piece. Minnie M. Steel, Gridley, Kans.

SUNNY NOOK POULTRY YARDS—S. C. B. Leghorn eggs, from vigorous, good layers, \$1 per 15. John Black, Barnard, Kans.

EGGS—For hatching at half former price. To still further introduce my White and Barred Plymouth Rocks, I will sell eggs at \$1 per 15 from White Rocks scoring 94 to 97% and Barred 90 to 92. Circular free. You can have only one setting. Order at once. Herbert Johnson, Live Stock Auctioneer, Chanute, Kans.

BARRED PLYMOUTH ROCKS—Special summer prices. 15 eggs, 60 cents; 30, \$1. E. J. Evans, Box 21, Fort Scott, Kans.

B. P. ROCK EGGS—15, \$1.50; 100, \$4. Mrs. J. W. Holsinger, Cottonwood Falls, Kans.

FOR SALE—Light Brahma cockerels, \$1.00 each; four for \$3.00. WANTED—White Holland turkeys. Nellie E. Stallard, Sedan, Kans.

PURE S. C. B. Leghorn eggs, 30 for \$1; \$3 per 100; entire new blood. Orders promptly filled. F. F. Flower, Wakefield, Kans.

WHITE LIGHT WHITE PLYMOUTH ROCKS, the prize-winners at the Kansas State Poultry show, 1903. Remarkable for clear white plumage united with exceptional size and shape. Eggs from our best matings, \$2.50 for 15. Usher & Jackson, 1735 Clay St., Topeka, Kans.

FOR SALE CHEAP—Pedigreed Scotch Collie pups. W. H. Richards, V. S., Emporia, Kans.

CORNISH Indian games, White Plymouth Rocks; score 93½ and 94; eggs \$1.50 for 15; \$2.50 for 30. G. I. G. cockerels, \$1.50 to \$3, scored. Mrs. J. C. Strong, Moran, Kans.

COCKERELS—Indian Games and Black Langshans, farm-raised, price \$1 each, if taken soon. H. Baughman, Wymore, Neb.

BARRED PLYMOUTH ROCK EGGS—From fine flock Hawkins strain, 15 for \$1.50; 45 for \$3. Annie Wynkoop, Bendena, Doniphan Co., Kans.

EGGS—At \$1 per setting from our White Plymouth Rocks or White Wyandottes that will produce fine stock. W. L. Bates, 1829 Park Ave., Topeka, Kans.

REDUCED PRICES on eggs balance of season. \$1 per setting, \$4 for five settings on B. C. W. Leghorns, White Guineas, Fine B. C. Leghorn cockerels cheap. Mrs. Winnie Chambers, Onaga, Kans.

EGGS FROM GEM POULTRY FARM are sure to hatch high-scoring Buff Plymouth Rocks. No other kind kept on the farm. 15 for \$2; 30 for \$3.50. Satisfaction guaranteed. M. B. turkey eggs, 11 for \$2. C. W. Peckham, Haven, Kans.

WHITE WYANDOTTES EXCLUSIVELY—Eggs—15, \$1.50; \$2.50; 100, \$5. MRS. E. F. NEY, Bonner Springs, Kans.

BLACK MINORCAS—World's greatest laying strain, beautiful in shape, color, and comb, and winter layers. Eggs \$1.50 per 15, \$6 per 100. George Kern, 817 Osage st., Leavenworth, Kans.

COLLIE PUPS AND B. P. ROCK EGGS—I have combined some of the best Collie blood in America; pups sired by Scotland Bay and such dams as Handsome Nellie and Francis W. and others just as good. B. P. Rock eggs from exhibition stock; none better; 25 years' experience with this breed. Eggs \$1.50 per 15. Write your wants. W. B. Williams, Stella, Neb.

SCOTCH TERRIERS—Finest bred in this country. Heather Prince, the champion of Scotland, and sire of Noregay Foxglove, out of the champion imported Romany Ringlet, best service at our kennels. G. W. Bailey, Beattie, Kans.

Rose Comb Brown Leghorns—Exclusively. Farm raised. Eggs per setting of 15, \$1. Incubator users write for special prices in 100 lots. F. H. MAHON, R. D. No. 3, Clyde, Cloud Co., Kans.

Sunny Summit Farm Pure-Bred Poultry.

Silver Spangled Hamburgs, American Dominiques, S. C. and R. C. Brown Leghorns, Barred and Buff Rocks, S. C. Black Minorcas, Mammoth Bronze Turkeys. Eggs \$1 per 15; turkeys \$2 per 9.


VIRA BAILEY, Kinsley, Kans.

BLACK MINORCAS

Biggest Layers of Biggest Eggs. Eggs for hatching, \$1.50 per 15. Also at same price eggs from choice matings of Light Brahmas, Dark Brahmas, Black Langshans, White, Silver and Golden Wyandottes, Barred and Buff Plymouth Rocks, S. C. White and Brown Leghorns, Rose Comb American Dominiques, Houdans, White Crested Black Polish, Buff Laced Polish. JAS. C. JONES, Leavenworth, Kans.

Pure-bred Light Brahma Eggs For Sale.


EGGS from our best pen headed by a cockerel scoring 94 points, mated to twelve extra fine pullets, for \$2 per setting of 15. Eggs from birds having run of the farm, \$1 per 15. Can furnish large orders for setting incubators on short notice as we have a large number of laying hens. Our stock is first-class and sure to produce good results that will please you. Address F. W. DIXON, Holton, Kans.



DUFF'S POULTRY

Barred Plymouth Rocks, White Plymouth Rocks, Buff Cockerels, Partridge Cockerels, Light Brahmas, Black Langshans, Silver Wyandottes, White Wyandottes, Silver Spangled Hamburgs, Brown Leghorns, and Belgian Hares. First-class Standard Stock of Superior Quality. For Sale. Eggs in Season. Write Your Wants. Circular Free.

A. H. Duff, Larned, Kans.



TWO GIRLS

hatch 2,183 chicks; one woman 716; one man over 2,000. New System again beats incubators. Market Free. F. GRUNDY, Northville, Ill.

soup with bran and vegetables, you are to be congratulated, provided you do this work regularly.

Grit.—This is the most essential grain fed. Without it your corn is of little good and your hens soon die of disease.

Use mica-grit, pearl-grit, gravel-grit, cinder-grit, any old grit, and, still better, all of them. Waste some grit to be sure you get enough grit.

Shell.—One-tenth of the shell is lime. Your egg-shells must be heavy if you would hold a choice market. You can well afford to buy oyster-shells at 75 cents per hundred pounds if you sell it at 16 cents per pound, and that is what you do in the egg-business.

Bone.—Every one admits that the growing animal requires bone-building material to give him strength of limb. Many, however, imagine that the hen old enough to lay eggs no longer needs this kind of supply. The hen, however, is the best judge, and the eagerness with which the laying hen will turn even from grain to pick up fresh cut bone or even dry bones, is the best evidence that she needs it in her business. Do not deny her this.

CONCLUSIONS AND SUGGESTIONS.

Now, here is the table of rations we suggest for feeding forty-five pullets 360 days. It fills the first condition of our text in that it gives each pullet sixteen times her own weight in feed. It fills the third condition of our text in that it can be obtained in most sections of the country at a cost of 1 cent per pound. It also fills the fourth condition of our text in that the cost of her feed is only one-sixth the value of her egg-product. Do not condemn it until you have made an honest effort to realize the third condition of our text, namely to make your pullets produce in eggs five times their own weight.

ONE YEAR'S FOOD-SUPPLY FOR 45 PULLETS.

Three hundred pounds corn at 5-8c per pound.....\$1.87 1/2
Six hundred pounds oats at 1c per pound..... 6.00
Four hundred pounds wheat at 1c per pound..... 4.00
Three hundred pounds Kafir-corn or sorghum at 5-8c per pound..... 1.87 1/2
Four hundred pounds bran at 3/4c per pound..... 3.00
Four hundred pounds clover at 3/4c per pound..... 3.00
Three hundred pounds beef-scrap, meat-meal, dried blood, etc., at 2-3c per pound..... 8.00
Four hundred pounds grit and fine gravel at 1/2c per pound..... 2.00
Three hundred pounds oyster-shell at 3/4c per pound..... 2.25
Two hundred pounds cut bone at 2c per pound..... 4.00
Total, 3,600 pounds, at a total cost of \$36, an average of 80 pounds of feed per hen, at a cost of 80 cents.

SOME POULTRY EXPERIMENTS.

The following summary of the results of experiments at the Utah Experiment Station contains some interesting information. (Bulletin No. 67, Experiment Station, Logan, Utah, James Dryden, Poultry Manager.)

SUMMARY.

1. What is the most profitable age of the hen? Two pens of Leghorns averaged 175 eggs per fowl during the first year. During the second year the same fowls averaged 132 1/2, and during the third, 116 1/2 eggs per fowl. The per cent profit on food was 188 the first year, 118 the second, and 97 1/2 the third. A test with two other pens of Leghorns gave the following results: First year, number of eggs laid, 159; second year, 119 1/2; per cent profit on food, first year, 184; second year, 99.

2. What is the effect of exercise on egg-production? The results for three years are in favor of feeding grain in a box against feeding it in straw and making the hens scratch it out. One pen with all grain fed in a box averaged 147 1/2 eggs per fowl per year for three years. A like pen having the grain fed in a litter of straw averaged 132 eggs. During the first year as pullets the results were in favor of the exercise, the pen fed in a box averaging 158 eggs per fowl, against 182 for the pen fed in the straw. These results were secured with Leghorns. With two other pens of Leghorns, during the first year as pullets the pen with "exercise" laid 160 eggs, and the pen with "no exercise," 157 eggs. During the second year the "exercised" pen laid 119 and the "no exercise" 120, the results of the two years being practically the same for those two pens.

3. As to the effect of exercise on food-consumption, the average of pens 3 and 4 for three years shows that the pen with "exercise" consumed 62.4 cents worth of food, and the pen "without exercise" 60.8. In the case of two other pens the average was 63.5 cents and 62 cents respectively per fowl in favor of "no exercise."

4. During the year the Leghorns

consumed an average of 62 cents worth of food per fowl. The Wyandottes consumed 81.6 cents per fowl, and two pens of Plymouth Rocks averaged 87.7 cents per fowl.

5. The Leghorns consumed during the year an average of about 75 pounds of total food or about 55 pounds of dry matter per fowl; the Wyandottes 100 pounds total food, 73 pounds dry matter; and the Plymouth Rocks about 110 pounds total food and about 80 pounds dry matter.

6. The three years' results from Leghorn pullets show an average of 162 eggs per fowl per year at a food cost of 4.6 cents per dozen. These results are not from selected or "pedigree" layers.

7. The record of weights of fowls shows that Leghorns weigh about 10 per cent more during their second year than during the first year as pullets. During the third year there is practically no increase in weight.

8. The largest egg-production was during the period of greatest food-consumption. The smallest egg-yield was when the food-consumption was least. The hens attained their greatest weight immediately preceding the periods of greatest egg-production. After the periods of heavy-laying they showed a loss in weight.

9. Five pens of Leghorns 2 and 3 years old laid eggs averaging 1.56 pounds per dozen. Five pens of Leghorn pullets laid eggs averaging 1.37 pounds per dozen. The eggs from the



Lightning Got There First.

Homestead, Live Stock Indicator, Wallace Farmer, of Des Moines, Ia., Cashier of Bank of Topeka, Kan., and The Mail and Breeze.

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Endorsed by the Farmers' Mutual Insurance Company of Kansas. Prices the very lowest. Send for free booklet on the Laws and Nature of Lightning and how to control it. A good man wanted in every county to handle our goods. References—100,000 farmers in Iowa and adjoining states, and the Kansas Farmer, Topeka, Kans., Iowa



Dodd, Dooley & Co. Got There First.

ing to the greater cost of the sunflower-seed the financial results were in favor of the corn.

15. The results of a test with Leghorn pullets showed that a nutritive ratio of 1:4.95 was very much superior to one of 1:6.66. With Plymouth Rocks the results were inconclusive.

16. An initial test with one cockerel and one capon gave no indication of increased growth from the operation of caponizing; but the appearance of the dressed bird and the quality of the meat showed a decided advantage from the operation.

Fountain for Chicks.

The illustration shows a very handy form of drinking-fountain for young chicks. This may also be used as a feed-trough, for which it has no equal.

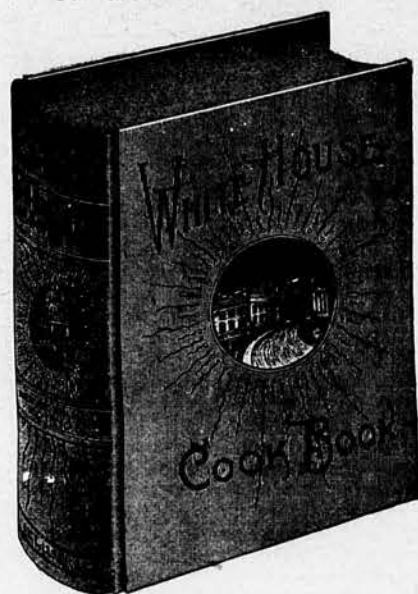
acted dumpy and refused to eat. I brought them in the house, wrapped them up and some died in a few minutes, some lived several hours. The longer they lived the more they shook their heads and drew them back as though they had a terrible pain in their heads. I lost about half my flock this way. I have read of ducks dying with spinal-meningitis and I wondered if that could be the trouble with mine. If it is, or whatever the disease may be, can some one tell me what to do? I have a good many duck-eggs setting yet, and hope I may find a cure before the others hatch.

The ducks have bread and milk, wheat and Kafir-corn, and dry bread, and occasionally, worms to eat. The last day or two I have given them a little lime-water. I have a nice large pen in blue-grass for them to run in. Shawnee County. Mrs. C. A. S.

Poultry and Eggs—Number of fowls 3 months old and over June 1, 1900. (12th United States Census.)

Table with columns for State, Chickens, Turkeys, Geese, Ducks, Value of poultry raised in 1899, and Value of all eggs produced, 1899. Lists data for all 48 states and territories.

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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. The two for the price of one, delivered to you.

Address, Kansas Farmer Company, Topeka, Kans.

pen of Wyandotte pullets averaged 1.56 pounds per dozen, and those laid by four pens of Plymouth Rock pullets averaged 1.52 pounds per dozen.

10. Eggs from different hens of the same breed varied in weight. One pen of Leghorns 2 years old laid eggs averaging 1.45 pounds per dozen. The other pens of the same age, but of a different strain, laid eggs averaging 1.63 pounds per dozen. The eggs from the latter two pens weighed more than those of the Plymouth Rock or Wyandotte pullets.

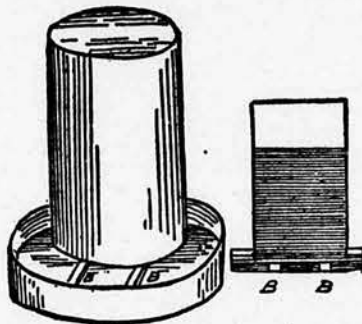
11. The eggs from five pens of Leghorn pullets averaged 1.44 pounds per dozen. The eggs from the same pens during the second year averaged 1.54 pounds per dozen. In other words, the size of the eggs was 8 per cent greater the second year than the first.

12. A test of wheat versus corn gave results in favor of wheat for egg-production.

13. In the case of Leghorn pullets, the addition of dried blood to the ration considerably increases the egg-yield. With Plymouth Rock pullets no effect was noticed on the yearly record. With both, the pens having dried blood began laying earlier than the others.

14. The discarding of corn (except the little used in mash), and substituting a small quantity of sunflower-seed, did not materially affect the egg-yield, there being but a slight increase. Ow-

In order to use it, fill a small tin can with water or food, lay on it two pieces, B B, one-half inch thick, and



POULTRY DRINKING FOUNTAIN.

on these put a lid of a larger can. Invert the whole quickly and the lid will remain filled with water till the can is empty.—Richard Scheiderer, in Orange Judd Farmer.

What Ails the Ducks?

EDITOR KANSAS FARMER: Will some one please tell me through the columns of the KANSAS FARMER what is the matter with my ducks? I had twenty-four of about the same age. They grew and did finely for a week or ten days, when I noticed some had their eyes about half closed and they

Business and professional men whose labors are largely mental, whose work is a constant drain upon the nervous system, find it necessary to have a reserve of nerve force to withstand the effect of mental strain.

When sleep is courted in vain, when the stomach is frequently out of order; when the daily stint becomes a burden instead of a pleasure; when you rise in the morning with less of energy and ambition than when you retired, your condition is so serious as to demand instant attention and treatment. It is not a case to be cured by a few weeks' rest; nor of "my stomach slightly upset;" nor of "I'll be all right in a few days." It is a nervous disorder, which, if neglected, will lead to nervous prostration with its attendant horrors of fainting spells, of mental and physical weakness, irritability, morbid fears and ultimately, insanity. Under certain conditions these symptoms may lead to chronic headache, insomnia or nervous dyspepsia and, if the sufferer is predisposed, to heart trouble, the most common cause of sudden death.

When the system receives that aid from without which will replenish nerve force and vitality; rebuilding and restoring nerve cells and tissue; strengthening the nerve centers of the brain, heart, stomach, lungs, or whatever organ is affected, the annoying symptoms will disappear.

Dr. Miles' Restorative Nervine nourishes the nerves. It quiets and strengthens them, rests and recuperates them, builds new tissue and restores health. It restores the exact element which weakened, exhausted, tired and hungry nerves lack.

Dr. Miles' Nervine will preserve the balance of health and restore it when lost. It will counteract natural decay and establish a reserve of nerve-force which will withstand the attacks of overwork and disease.

All druggists sell and guarantee Dr. Miles' Nervine. If the first bottle does not benefit you—you may have your money back. Send for free Treatise on Nervous Diseases. Dr. Miles Medical Co., Elkhart, Ind.

TOWNS ON LOW LANDS.

(Continued from page 601.)

A part at least of almost every city insists on growing in the low country even when there is plenty of high ground obtainable. At Topeka a considerable portion of the city spread itself over the second bottom lands on both sides of the river to the neglect of abundance of high situations. The catastrophe of the last week has been universal in these low lands, which have been covered with water of varying depths up to fifteen feet. Kansas City has suffered similar catastrophe. Indeed, many of the cities and towns of the West have seen their lowlands submerged, people driven from their homes and business brought to a stop.

To people living away from any of these towns it probably seems absurd to ask whether these low-lying districts will be reoccupied. It may be interesting to trace a few of the forces that will influence this matter. In Topeka, for example, the high portions of the city are south of the river and there is a broad belt of second bottom between the river and the rising ground. North of the river is a broad, rich second bottom and beyond this a rich and prosperous upland farming country. The Union Pacific Railway has its road and station on the north side second bottom. The Rock Island comes in from the north and from the east on that side, but it has its station on the south side. The merchant who has been doing business on the north side has his customers among the north-side farmers. If he comes over to the south side he will probably see his old stand occupied by some new man with at least a small stock. This new man will pick up a considerable part of the customers who have in the past found it convenient to trade on the north side, while the merchant who has moved over to the south side is competing with the well-established houses here for a portion of their trade. The prospect does not look bright for the change. But if the old north-side merchant should change that would not move the town. There will be business houses where there is business for them, whatever may be the dangers of losses.

Doubtless many of the people whose homes have been inundated will seek higher locations. Should this movement be general there will be a lot of good houses for rent or for sale at low prices—possibly at very low prices. In considering ways and means of making the family income do its most in providing things needful, these low prices will weigh against a danger which has proved harmful only once in more than a third of a century.

Influences of business, of economy, and convenience to business control the location of towns in a free country regardless of considerations which seem more important to the superficial observer.

KANSAS GRIT IS STILL EFFECTIVE.

During the recent excessive rains some writers have indulged in expressions of despondency. Some have even ventured the assertion that the farmers are discouraged. Those who have imagined these things are surely "tenderfeet." It is barely possible that some newcomers feel a little blue over the situation, but the old-timers, the men and women who went through the border-ruffian days, suffered from drouth, were eaten out by grasshoppers, saw the calamities of financial depressions and panics, and have had crops drowned out in other years are not the kind that experience discouragement, neither do their children who are worthy of their sires suffer despondency. Has not everything happened to Kansas that can possibly happen to anybody—everything except volcanoes and earthquakes—and have not Kansas people come up smiling, happy, energetic, hopeful, and prosperous after every vicissitude? Discouragement never helped anybody past a difficulty. The word can scarcely be heard in the vocabulary of the tried and true Kansan.

When the clouds roll away the Kansan man congratulates his wife on the fine growth of the alfalfa; calls attention to how well the calves and pigs have done, notes that the cows are giving a remarkable flow of milk; finds that the hens have kept busy all the time, and that the horses have had a fine rest and are nickered to get ahead of that lister and finish corn-planting. He rushes work with a will. That alfalfa must be cut, the corn must be tended, and wheat harvest is looking the farmer so straight in the face that there is no time to take an inventory to see whether he is discouraged or in high spirits.

This kind of cooperation with the generous forces of nature soon distances all adverse conditions and leaves the damages done by the rains in the dim and vanishing past. The Kansas brand of grit is very handy to have around of a wet season. It is the brand that has brought prosperity in times past and will continue all who use it on the highway to opulence.

BUSINESS—OR SHOW CATTLE.

The sun never rose when it did not shine on a starving people. The demand for food is common to all humanity but the quality demanded is an index of the civilization attained. In the heroic days of old, when man's greatest glory was achieved by the sword, his appetite for food was on a par with his other appetites and all were coarse. Our ancestors lived by the sword and they fed instead of dining. Civilization has developed the brain with the biceps and men now dine. Formerly the producers of food were mere beasts of the field and occupied the lowest rank in society. With the advance of civilization has come new wants and with these a demand for newer and better methods of supplying them. Hence it is that the standing in society occupied by the farmer, who is conceded to be almost the only creator of wealth, is an exact and perfect index of the advancement of his race in civilization. When the farmer was a mere ignorant drudge, the civilization of the race was at a low ebb, and this was more startlingly apparent by reason of its few brilliant exceptions.

Farmers as a class are not yet wholly emancipated, nor for that matter is any other class, but farmers are to-day the greatest and most influential class in this, the greatest and most enlightened of Nations. There are classes among farmers. The man who devotes his entire attention to the raising of grain only may be successful, intelligent, and enlightened, but he is not so successful as he might be did he but convert his crude grain products into the more condensed form of pork, beef, and butter-fat on his own land. This being true, it follows that the man who raises the best pork, beef, and butter-fat in the shortest time and at the least expense is the man who will succeed most rapidly. The pushing, energetic, strenuous business man of to-day is rapidly learning that there is not only wealth but health to be gained on the farm, and he is turning his energies in the direction of solving the problem of how to make the high-priced land in his possession a profitable piece of property.

This problem has been solved in large part by the raising of pure-bred live-stock, and he who owns a noted herd or is a successful breeder is the only man who rightfully claims a place among our democratic aristocracy. He is not only a producer but a producer of the best. He not only produces the best, but he produces an article that will never cease to be in demand. Just as long as men eat beefsteak so long will good cattle be profitable.

And right here let us make a distinction between good pure-bred cattle and show cattle. The work of the agricultural colleges of the United States during the last thirty-odd years has resulted in returning to the active walks of life a great army of young men and young women whose sympathies are with the farm, and the later work of these institutions has developed young men and young women of such calibre and such training that their residence is on the farm. Thousands of these young men are now taking up the work of breeding pure-bred life stock. With the college training which they have enjoyed has come to each of them a knowledge of facts and of methods which enables them to begin their active work where their fathers have left off after a lifetime of experience. But even with these advantages there are many questions yet unanswered and problems yet unsolved. Many whose inclinations and training would lead them into the breeding industry hesitate because of the enormous capital required to create the show herds with which they are perhaps most familiar.

These show herds have been simply invaluable, not only to the breeds they represent but to the general advancement of the whole country along breeding lines. They also have been the most potent factor in calling attention to and creating a demand for pure-bred cattle. At the same time it is possible to breed the best of cattle which will possess all of the qualities necessary in any given breed and which will bring financial success to their owner without his being included in the show classes at all. By this we do not wish to be understood as favoring inferior or short-pedigreed cattle. The best that can be bought is none too good. But

we do desire to make plain that a broad and profitable field now lies open and waiting for the young breeder whose object shall be to breed cattle for business, rather than for show purposes. A bull may be almost ideal in form and usefulness without having ever seen a show-ring. The owner of this bull may easily build up a lucrative business from his herd with very much less expense than would be necessary if he undertook to win all the prizes to which he is eligible. We have in mind at this time a breeder of a beef breed of cattle who enjoys a wide reputation and who is rapidly acquiring wealth from his herd and who has never yet led an animal of his own into the show-ring. One of the best-known swine-breeders in Kansas is a graduate of the State Agricultural College, and his success, like that of the cattleman just mentioned, and like that of hundreds of others, has been attained at an early age by reason of the training received at this institution, which was large instrumental in keeping his sympathies with the best that it is possible to attain on the farm.

In our constant mingling with breeders throughout the West we are frequently surprised in two ways. First, at the quality that has been reached in his herd by some breeder and second by the wonderful lack of real knowledge of the art of breeding as well as of correct ideals that may be

the success of the State Fair, both at home and abroad.

It is an institution whose growth and prosperity will benefit the community, and in working to promote its success we are working for ourselves as well as for our State."

WEEKLY WEATHER-CROP BULLETIN.

Weekly weather-crop bulletin for the Kansas Weather Service for the week ending May 30, 1903, prepared by T. B. Jennings, Station Director.

GENERAL CONDITIONS.

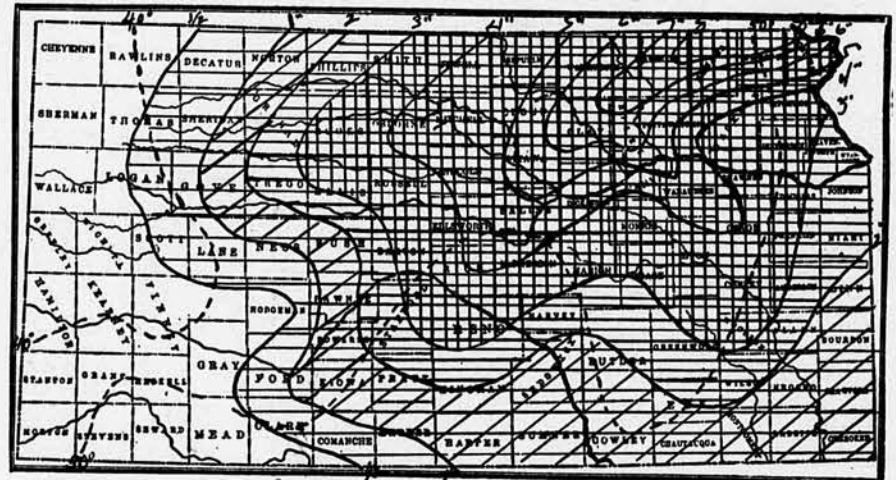
The week has been cool and cloudy, and, over the larger part of the State, very wet, the rainfall ranging from less than half an inch in the extreme western and southwestern counties to over eight inches in the extreme northeastern, bringing all streams to the flood mark, and raising the Kaw higher than it has been since civilization reached its valley.

RESULTS.

EASTERN DIVISION.

Wheat in general is in good condition but it now needs sunshine; it is in bloom in Chase and rusting some in Linn; wheat on bottom lands has suffered, in some places being badly damaged. Corn is needing sunshine and cultivation; it is getting quite weedy; much damage has been done by floods and washouts; much of the corn land remains unplanted—some even unplowed. Oats are making a good growth. Grass has made a heavy growth and pastures are very fine. Alfalfa has been damaged by the floods in some of the counties; it is just blooming in Greenwood, is ready to

Rainfall for Week Ending May 30, 1903.



Minimum temperature shown by broken lines.

SCALE IN INCHES.



Less than 1/4. 1/4 to 1. 1 to 2. 2 to 3. Over 3. T, trace.

found among other breeders. This latter is a result in part of an apparent belief that pedigree makes the animal and that any animal that is eligible to record is of necessity a good one. The breeder who aims at the form and quality that is shown by the best prize-winners and who studies his business may attain the object sought in breeding strictly business cattle or swine and may possess animals of show quality which will bring his prosperity or even affluence without his ever having led one of them into a show-ring. It is such a man as this who is the real cornerstone of the breeding business and whose example is worthy of emulation by the younger and less experienced in this walk in life.

"A Clean State Fair."

At the close of the fair and show-season of 1902 the KANSAS FARMER published an editorial on page 1239 in our issue of December 18, which has the title given above and which Col. W. N. Graham, of the Sedalia, Mo., Democrat, reproduces in a late issue with the following editorial comment:

"The Democrat to-day reproduces, from the KANSAS FARMER, an able editorial on 'A Clean State Fair,' in which the Missouri State Fair is held up as in many respects a model.

"It is encouraging to note the high rank our State Fair has been accorded from its first exhibition, and Missourians should feel proud that this particular State institution is given such strong commendation.

"The generous praise accorded by the agricultural paper of a sister State is not only a high compliment to the officers and directors of the fair, but is strong testimony to the resources of grand old Missouri and to the energy and enterprise of her people.

"If the State Fair is given the support and encouragement it merits, it will soon become the best advertisement the State ever had, not only attracting the attention of investors in other States, but also stimulating our own people to greater efforts to develop those resources.

"Sedallans, especially, should improve every opportunity to work for

out in Woodson, cutting has begun in Chase and Elk and in the latter is being damaged in the stack by the rains. Potatoes are in good condition on the upland but are not doing so well on the bottoms. Farmwork at a standstill. Crawford reports apples nearly gone.

Bourbon.—Half of corn crop planted; only about three-fourths of a crop in acreage will now be planted on account of lateness of season; oats and grass are making a heavy growth; smaller acreage of flax than last year.

Chase.—There was some farmwork done during the fore part of the week, but none during the last four days; sunshine is much needed for alfalfa haying and for wheat which is in bloom; pastures fine and stock doing well; Cottonwood river highest since 1856, covering entire bottom and ruining crops; much damage done to property and stock; no farmwork can be done for at least a week; small tornado passed through the west part of the county night of the 28th doing damage to orchards and out-buildings.

Coffey.—Farmers are delayed by excessive rains; not done plowing and planting; much of river bottoms under water, causing some damage to crops.

Crawford.—Too wet for much farmwork; only little over half of the corn planted, and nearly half of that will have to be planted over; oats looking a little better; pasture good; strawberries damaged by wet weather; blackberry bushes full; cherries ripe and a full crop.

Greenwood.—Ground too wet for work during the entire week; corn land not half planted, and much that is planted has washed out; the rest is in need of cultivation; pastures and meadows very good; grazing cattle doing well; alfalfa just blooming and poor on upland.

Johnson.—No farmwork being done on account of wet weather; much of the corn will have to be planted over; corn that is up is very weedy, some of it is almost past help; grass good; cherries turning, but light crop.

Leavenworth.—Wet, cold week; much corn to be replanted; wheat generally good; some fruit; gardens fair; pastures good and stock doing well.

Linn.—But little progress in farming this week; only about half of the corn planted; what corn is up needs working badly; some reports of wheat rusting; too much rain for all crops; no high winds or hail.

Miami.—Cool and very wet; only about half of the corn crop planted; grass, oats and wheat are doing well on upland; too wet on low lands.

Morris.—A very wet week; highest water in river for 40 years; considerable corn to be replanted; wheat badly damaged on bottom lands; early planted corn very weedy; alfalfa badly damaged and almost a total loss on bottoms.

Shawnee.—Wheat heading; oats in fine condition; too wet to plant corn; no damage done by heavy rains in southern part; gardens and potatoes fine; pastures and meadows very good.

Woodson.—Too wet for farmwork; some damage to crops by high water along the Verdigris; alfalfa ready to cut.

MIDDLE DIVISION.

Wheat is doing well, and is in fine condition except where injured by overflows, though some was damaged by hail in Barber, and some by too much rain in Sumner; soft, or May wheat, is ripening in Sumner and the hard has headed.

Barber.—Cool, windy week; destructive hailstorms throughout the county; considerable wheat and other growing crops and fruit of all kinds greatly damaged; some wheat is being plowed under; corn is being replanted.

Barton.—But little work done in the fields; too much rain; alfalfa cutting will begin as soon as the rain stops and the ground is dry enough; grass in fine condition and growing rapidly; cattle doing well.

Cowley.—Farmwork at a standstill awaiting dry weather; wheat and oats doing well; corn needs sunshine; alfalfa is ready to cut; grass is fine; stock doing well; cherries plentiful and in market; streams have been full and some have overflowed, but no great damage done.

Edwards.—Crops doing fairly well; some hail is reported; millet and Kafir-corn are doing well; most too cool for corn; considerable replanting in wet places; wheat well jointed; rye in bloom, and lodged some; late freeze did not damage gardens materially.

Harper.—Corn still backward; wheat doing well, but needs warmer weather. Kingman.—Wheat and oats heading out and looking fine; corn growing well; grass fine; ground very wet; potatoes are in bloom and doing well.

Reno.—Another rainy week with high winds which have done considerable damage to orchards, windmills, and small buildings; wheat headed out, and has been benefited some by the rains; oats look well; ground too wet to cultivate and fields are becoming very weedy.

Sedgwick.—Corn, wheat, oats, and rye looking fine, but corn is becoming very weedy; ground too wet to cultivate. Sumner.—Cloudy and wet all week; rain has injured the wheat; soft wheat turning, hard all in head; hail in the southern part of county on the 28th, but not much damage done; oats doing well; too wet for corn, weeds thick, but little cultivated; pastures good; some alfalfa cut; cherries ripe.

WESTERN DIVISION.

Wheat is in fine condition in Ford and Finney and has greatly improved in Morton. Corn, though a good stand is making slow growth in Ford, while in Hodgeman the weather is too cool, and in Ness it needs cultivation. Oats are fine in Finney and Ford and in Finney are heading. Rye is heading in Hodgeman, and barley in Finney. Alfalfa is ready to cut in Clark but it is too wet; the first crop is being cut in Ford but the yield is not satisfactory. Grass is fine and stock are doing well. Some damage to crops by hail in Finney and slight damage in Ness. Kafir-corn and sorghum are being sown. Potato-bugs are numerous in Hodgeman, giving poor prospect for potatoes.

Clark.—Favorable for growing crops, but not for harvesting; first crop of alfalfa ready to cut; Kafir-corn being planted. Finney.—A cool and wet week for most parts of the county; considerable damage by hail in north and west parts; vegetation not making rapid growth because of cool weather; oats and barley heading; wheat and rye doing well; pastures fine.

Ford.—Wheat, oats, barley, and all other small grains are fine; corn makes slow growth, but stands well; first crop of alfalfa being cut, yield and quality poor on account of the late freeze.

Grant.—Grass is fine for stock; other crops very backward; too cool. Hamilton.—Two good rains this week; very cool all week; grass good and stock doing well.

Hodgeman.—Farmwork at a standstill the last two days on account of rain; all small grain looks fine; rye is beginning to head nicely; too cool for corn to make much progress; cane is coming up; potato-bugs very numerous; potato crop will probably be very poor.

Lane.—Cool and cloudy with excessive rains in some parts of the county; cane and Kafir-corn are being planted, also sweet potatoes; gardens very backward. Morton.—A week of growing weather; grass and wheat greatly improved; spring planted fodder crops slow about starting; soil moist but cold; very little fruit in the county; gardens late.

Ness.—Another wet week; vegetation of all kinds making good growth; planting of forage crops interfered with by rains; corn a fair stand; but little cultivating done on account of wet weather; some hail on Tuesday and Thursday, but little damage done; small grain looking unusually well for the season.

Kansas University Commencement Program.

Thursday, June 4, concert of the Department of Music, School of Fine Arts, Fraser Hall, 8.00 P. M. Sunday, June 7, Baccalaureate Sermon, Dr. Frank Strong, Chancellor of the University, Fraser Hall, 8.00 P. M. Monday, June 8, Phi Beta Kappa Address, Prof. R. M. Wenley, University of Michigan, Fraser Hall, 8.00 P. M. Tuesday, June 9, Class Day Exercises of the Class of 1903, University Campus, 7.30 to 10.30 A. M. Annual Alumni Address, H. F. M. Bear, '90, of Roswell, N. M., Fraser Hall, 10.30 A. M. University-Alumni Baseball Game, McCook Field, 3.00 P. M.

Annual Meeting of the Alumni Association, Spooner Library, 7.00 P. M. University Reception, The Chancellor and Mrs. Strong, Library Hall, 8.00 P. M. Alumni Banquet of the School of Law, Eldridge House, 9.00 P. M. Wednesday, June 10, The Thirty-first Annual Commencement, Address by Justice David J. Brewer, of the Supreme Court of the United States, Fraser Hall, 10.00 A. M. University Dinner, Natural History Museum, 1.00 P. M.

Admission to the Alumni Banquet, the University Dinner, and the Commencement Address will be by ticket. A special ticket rate to Lawrence of one and one-third fare for the round trip will be in effect on all railroads from June 7 to June 10 inclusive, on the certificate plan. On arrival, guests may obtain information and detailed programs at the general offices of the University in Fraser Hall, or at the committee headquarters, room 9, Fraser Hall.

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 298, Chicago, for particulars as to stopovers, train service, etc. (7)

THE MARKETS.

Kansas City Live Stock and Grain Markets.

Kansas City, June 1. Continued high water in the Kaw river paralyzed the live-stock business here the close of last week. On Saturday, Swift and Schwartzschild were forced to quit as water had reached their basements and the fires of the engine were put out. Cudahy was nearly as bad off, and another short advance in the food promised to put Fowler out of business. Armour was the only packer that could operate on Saturday and he took some 2,000 hogs that were offered but was forced to buy at low prices. The local live-stock trade is fearful of results if the Missouri and Kansas continue to rise this week.

Receipts of cattle here last week were 26,900 head and at Chicago were 64,700 head. Most of the offerings ran to beefs and they were in two ample supply to suit the demand. Plain cattle reached the low point of the year, fair to good kinds of beefs selling from \$4.25 to \$4.45. It took very good beefs to bring \$4.75 or better. Cow and heifer stock sold at a decline of 25 to 50 cents from two weeks back and medium light heifers broke 75 cents in spots. Best stockers and feeders sold right in line with beef cattle and the demand promises to continue good. Among those on the market with best beefs this week were J. L. Jones, Mitchell County, \$4.70; John Walton, Louisburg, \$4.85; J. F. Bates, Hardin, Mo., \$4.65; J. R. Kregar, Junction City, Kans., \$4.67 1/2; Rowe & Co., Hymer, Kans., \$4.85; heifers; Finney Bros., Paxico, Kans., \$4.70; heifers; J. E. Downing, Scandia, Kans., \$4.85; Johnson Bros., St. Marys, Kans., \$4.90; J. A. Norton, Madison, Kans., \$4.70; H. S. Boice, Hymer, Kans., heifers, \$4.60; Otto Buchheim, Wilson County, Kans., \$4.70.

With 54,000 hogs here during the week and bigger runs elsewhere, the market broke 25 to 35 cents, closing at the low point of the winter and \$1.30 to \$1.40 under quotations this time last year. The floods throughout the West will result in shutting down hog shipments for some days and the market ought to strengthen in the East on that account. The paralyzation of business by reason of the high water may upset all calculations however. Shippers are urged to buy cautiously. Sheep receipts were liberal at 31,500, just double the supply that arrived the same days in 1902. Offerings were largely Texans but arrivals of native sheep and lambs showed an enhancement. After Monday killers started in to break the market and they succeeded. The close was 25 to 40 cents lower on all grades of sheep and exceptional cases were 50 to 60 cents off. Best lambs are now quoted at \$6.00 to \$6.50 and muttons at \$4.00 to \$4.50. Horses sold dull and at the low point of the year. Shippers should buy at a general decline of \$15 to \$20 per head from March or April quotations. Mules held firm through light runs.

Poultry quotations are as follows: Eggs, 11 1/2 to 12 cents; hens, 9 1/2 cents; roosters, 20 to 25 cents each; turkeys, 8 1/2 to 9 1/2 cents; ducks, 10 cents; strawberries in request at \$1.50 to \$2.50 per crate. Fresh vegetables of all kinds are wanted. Corn advanced a little during the week because of reports of belated planting. No. 2 is worth 44 to 45 cents; No. 4, 40 to 41 cents; No. 2 wheat 70 to 71 cents; No. 4, 65 to 67 cents; oats No. 2, 34 to 36 1/2; No. 4, 30 to 32 cents.

G. M. Walden, former president of the Kansas City Live-Stock Exchange, died at the home of his father-in-law at Osa-tomie, Kans., on Tuesday, May 26. He had been troubled with stomach and heart complications for several months. H. A. POWELL.

New York Butter Market.

The New York spot market for the past week is as follows: Monday, 22c; Tuesday, 22c; Wednesday, 22c; Thursday, 22c; Friday, 22c. The average for week of May 25 to May 29 is 22 cents. Saturday not included for the reason that there is no market on a holiday.

DRAFT STOCK FOR SALE.

500 draft-bred Mares, Geldings, and Mules for sale, in car-load lots, from 1 to 8 years old; good bone and colors.

Scott & Rhodes, Deer Trail, Colo.

PATENTS.

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

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.

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

FOR SALE—Five good, high-grade Red Polled bulls, 14 months old, gentle, price reasonable. E. H. Burt, Bronson, Kans.

FOR SALE—Registered Aberdeen-Angus cattle. Fifteen bulls of serviceable age, 2 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.

RED POLLED BULL for sale, 4 years old, dark red, good individual, gentle, sure breeder, weight 1800 pounds, price \$125. A bargain for some dairyman. Charles Morrison, Phillipsburg, Kans.

FOR SALE—Five good 1-year-old registered Hereford bulls. Will be sold if taken soon. Come and see them; they will suit. H. B. Clark, Geneseo, Kans.

FOR SALE—Two Scotch-topped bulls, from 10 to 18 months old, and a few cows with calves by their side. J. P. Engle, Alden, Rice County, Kans.

FOR SALE—10 head of registered Hereford bulls, 6 to 20 months old, good individuals, and in good condition. Visitors met at trains if notified. Farm 20 miles southwest of Wichita. A. Johnson, R. F. D. 2, Clearwater, 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, 428 Altman Building, Kansas City, Mo.

SWINE.

FOR SALE—Extra fine pedigree Duroc pigs, and all bred sow cheap. C. Dorr, Peterton, Kans.

POLAND-CHINA PIGS—Eligible for registry, 3 months old, \$5 each; 3 months or older, \$10 each. P. H. McKittrick, McKittrick, Kans.

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

FOR SALE—Duroc-Jersey boar, ready for service. He is from the famous Blocher-Burton stock. J. P. Lucas, 118 West 23rd St., Topeka Kans.

SEEDS AND PLANTS.

FOR SALE—A small quantity of yellow, early variety, soy-beans. Fine seed, price \$2.25 per bushel. T. T. Perry, Girard, Kans.

FOR SALE—Siberian millet seed, 30 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.

SOY BEANS—(Early yellow), \$2.25 per bushel. Sacks included. George Wheeler, Tyro, Kans.

500,000 Yellow sweet potato plants for sale at \$1.25 per 1,000 by A. G. Landis, Lawrence, Kans.

FOR SALE—50 cents per bushel, 1000 bushels first class Siberian millet. Sacks 15 cents. E. D. King, Burlington, Kans.

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.

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.

FARMS AND RANCHES.

FOR SALE—320 acre farm, improved, lays nice, and good land, grove around buildings, 1 1/2 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.

FARMS FOR SALE of any size, 160 acres of well-improved, in Wabunsee County, Kansas, 70 head of stock, 6 horses, 10 hogs, household goods, and 100 acres in crop. Price \$6,500, good terms. A fine 253-acre farm, well-improved, at \$25 per acre, half cash. Write at once enclosing stamp. W. L. Seeling, Paxico, Kans.

FREE—Farm descriptions, prices, information. State pocket map 1900 Census 10 cents. Buckeye Agency, Agricola, Kans.

FOR RENT—160 acres, s. w. 1/4 of 5, 18, 36, near Leoti, and 160 acres n. e. 1/4 of 9, 18, 36, near Selkirk, all in Wichita County, Kansas. Make offer to Ulrich Schwarz, Anaocortes, Washington.

FOR SALE—A 400-acre farm, two and one-half miles of Maple Hill, Wabunsee Co., Kans., good improvements, 130 acres in cultivation, school house adjoining. Address E. Worsley, Maple Hill, Kans.

SUBURBAN HOME FOR SALE—Forty acres adjoining city limits. Beautiful grounds, fine orchard, large brick house in good condition. Olin Templin, Lawrence, 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.

MISCELLANEOUS.

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.

A BARGAIN SALE—One 16 horse Nichols & Shepard traction engine, 32 by 54 Avery Separator, self-feeder, wind-stacker, wagon-loader, water-tank and pump, all complete and in first class shape. If you are wanting a bargain write me at once. Henry Kratzberg, Greeley, Kans.

ANOTHER LITTER of those fine working Collies, bred by A. P. Chacey, North Topeka, Kans. Males \$6, females \$4. Rural Route No. 1.

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 Bolte, Webster, S. Dakota.

THE STRAY LIST.

HOW TO POST A STRAY.

THE FEES, FINES AND PENALTIES FOR NOT POSTING.

BY AN ACT of the Legislature, approved February 27, 1886, section 1, when the appraised value of a stray or strays exceeds ten dollars, the County Clerk is required, within ten days after receiving a certified description and appraisement, to forward by mail, notice containing complete description of said strays, the day on which they were taken up, their appraised value, and the name and residence of the taker-up, to the KANSAS FARMER, together with the sum of 50 cents for each animal contained in said notice. And such notice shall be published in the FARMER in three successive issues of the paper. It is made the duty of the proprietors of the KANSAS FARMER to send the paper, free of cost, to every County Clerk in the State, to be kept on file in his office for the inspection of all persons interested in strays. A penalty of from \$5 to \$50 is affixed to any failure of a Justice of the Peace, County Clerk, or proprietors of FARMER for a violation of this law.

Broken animals can be taken up at any time in the year.

Unbroken animals can only be taken up between the first day of November and the first day of April, except when found in the lawful enclosure of the taker-up.

No persons, except citizens and householders, can take up a stray. If an animal liable to be taken up, shall come upon the premises of any person, and he fails for ten days, after being notified in writing of the fact, any other citizen and householder may take up the same. Any person taking up an stray, must immediately advertise the same by posting three written notices in as many places in the township, giving a correct description of each stray, and he must at the same time deliver a copy of said notice to the County Clerk of his county, who shall post the same on a bill-board in his office thirty days.

If such stray is not proven up at the expiration of ten days, the taker-up shall go before any Justice of the Peace of the township, and file an affidavit stating that such stray was taken up on his premises, that he did not drive nor cause it to be driven there, that he has advertised it for ten days, that the marks and brands have not been altered; also he shall give a full description of the same and its cash value. He shall also give a bond to the State of double the value of such stray.

The Justice of the Peace shall within twenty days from the time such stray was taken up (ten days after posting) make out and return to the County Clerk, a certified copy of the description and value of such stray.

If such stray shall be valued at more than \$10, it shall be advertised in the KANSAS FARMER in three successive numbers.

The owner of any stray may, within twelve months from the time of taking up, prove the same by evidence before any Justice of the Peace of the county having first notified the taker-up of the time when, and the Justice before whom proof will be offered. The stray shall be delivered to the owner, on the order of the Justice, and upon the payment of all charges and costs.

If the owner of a stray fails to prove ownership within twelve months after the time of taking, a complete title shall vest in the taker-up.

At the end of a year after a stray is taken up, the Justice of the Peace shall issue a summons to three householders to appear and appraise said stray, summons to be served by the taker-up; said appraisers, or two of them, shall in all respects describe and truly value said stray, and make a sworn return of the same to the Justice.

They shall also determine the cost of keeping, and the benefits the taker-up may have had, and report the same on their appraisement.

In all cases where the title vests in the taker-up, he shall pay into the County Treasury, deducting all costs of taking up, posting and taking care of the stray, one-half of the remainder of the value of such stray.

Any person who shall sell or dispose of a stray, or take the same out of the State before the title shall have vested in him, shall be guilty of a misdemeanor and shall forfeit double the value of such stray and be subject to a fine of \$20.

The Stray List

Week Ending May 23.

Crawford County—John Vlets, Clerk.

PONY—Taken up by W. D. Slat, (P. O. McCune), May 13, 1903, one sorrel pony, 8 or 9 years old, four feet eight inches high, white face, all four feet white, left hip dull; valued at \$15.

Cherokee County—W. H. Shaffer, Clerk.

HORSES—Taken up by J. M. Keith, in Lyon tp. (P. O. Columbus), May 1, 1903, one grey horse, silt in left ear, 15 hands high, mane roached; valued at \$20. One sorrel mare, callus on each shoulder, one hind foot white, brand or scar on left shoulder, blaze face, mane roached, 14 1/2 hands high; valued at \$10. One sorrel mare, blaze face, mane roached, 14 hands high; valued at \$20.

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, 1903, one bay horse, 15 1/2 hands, foretop clipped, tail bobbed, 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. Danica), January 1, 1903, one 2-year-old red heifer, Y on left hip, also underlash in left ear. Also one 6-months-old roan steer, underlash in left ear. Also one 8-months-old red heifer, white face, underlash in right ear. Total value, \$40.

Grange Department.

"For the good of our order, our country, and mankind."

Conducted by E. W. Westgate, Manhattan, to whom all correspondence for this department should be addressed. Papers from Kansas Granges are especially solicited.

NATIONAL GRANGE.

Master..... Aaron Jones, South Bend, Ind.
Lecturer..... N. J. Bachelier, Concord, N. H.
Secretary..... John Trimble, 514 E St., Washington, D. C.

KANSAS STATE GRANGE.

Master..... E. W. Westgate, Manhattan
Overseer..... J. C. Lovett, Bucyrus
Lecturer..... Ole Hilmer, Olathe
Steward..... R. C. Post, Spring Hill
Assistant Steward..... W. H. Coultis, Highland
Chaplain..... Mrs. M. J. Ramage, Arkansas City
Treasurer..... Wm. Henry, Olathe
Secretary..... Geo. Black, Olathe
Gate Keeper..... G. F. Kyner, Lone Elm
Ceres..... Mrs. M. J. Allison, Lyndon
Pomona..... Mrs. Ida E. Filer, Madison
Flora..... Mrs. L. J. Lovett, Larned
L. A. S..... Mrs. Lola Radcliff, Overbrook

EXECUTIVE COMMITTEE.

Henry Rhoades..... Gardner
J. T. Lincoln..... Olpe
A. P. Reardon..... McLouth

[Readers of the KANSAS FARMER will regret that Bro. Ed. Blair, editor of the Grange department and manager of the prosperous Grange store at Cadmus, Kans., has severed his connection with the store and resigned the editorship of the department. Brother Blair will hereafter reside at Kansas City. The La Cygne Standard gives an extended account of a public farewell reception given to Brother and Sister Blair by Cadmus Grange. The occasion was one long to be remembered by all who were present. The labor of conducting this department will devolve upon Worthy Master Westgate, of the State Grange, at least for the present. Doubtless Patrons generally will join the writer in the opinion that the executive committee would do well to so arrange that Brother Westgate can afford to devote the necessary time to the work and continue it at least until the next meeting of the State Grange.—EDITOR KANSAS FARMER.]

Every Patron in Kansas will learn with regret that Bro. Ed. Blair has resigned his position as manager of the grange store at Cadmus to accept a position in a wholesale house in Kansas City. This compels his withdrawal from the charge of this department in the KANSAS FARMER and makes it the duty of the executive committee to appoint some one to take his place as soon as possible.

Bro. Blair feels that his duty to his children requires him to furnish them better school privileges than can be furnished at Cadmus, but makes the change with many regrets at severing the ties of friendship with so many of his acquaintances of long standing. Bro. and Sister Blair will be greatly missed in their home grange as well as in the State Grange in which they have both held official positions for many years. Appreciating and commending the motives which lead to this change, we wish them success in their new sphere and ask from them an occasional reminder in this department of their continued interest in the Order of Patrons of Husbandry.

In obedience to a kind invitation from Bro. W. T. Dickson, worthy master of Osage County Pomona Grange, we attended the meeting of that grange at Scranton, Saturday, May 23. This is the only Pomona Grange in the State and was organized one year ago. Every subordinate grange in the County was represented. The citizens of Scranton furnished two halls for the accommodation of the grange. This is especially noteworthy as showing the interest of those outside our gates in the objects of our order. The attendance of voting members and others was as large as that at the average State Grange meeting. It was our privilege to install the newly elected officers for the ensuing year, to confer the fifth degree upon a class of thirty-two members, and at request of the grange we gave instructions in the secret work of the order.

The Patrons of Osage County are to be congratulated upon the interest and enthusiasm manifested during this meeting. The next meeting will be at Overbrook the first Thursday in August.

The field meetings to be attended by Gov. N. J. Bachelier, of New Hamp-

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are everywhere noted for shedding strong, clear, white light. Hand lanterns, street and driving lamps, etc., many sizes and styles for all purposes. Send for free illustrated catalogue. R. E. DIETZ COMPANY, 25 Laight St., NEW YORK. Established 1840.

shire, lecturer of the National Grange, accompanied by the master of our State Grange, have been assigned as follows: Monday, July 20, at McLouth; Tuesday, July 21, at Madison; Wednesday, July 22, at Lone Elm; Thursday, July 23, at Bucyrus; Friday, July 24, at Wellsville; Saturday, July 25, at Olathe. E. W. WESTGATE.

Exemplification of Principles.

We, who have entered the ranks of Patrons of Husbandry, are like soldiers partially equipped for warfare. If we are patriotic enough to stand by our order and heed the counsel of our captains we shall win the right to be called Patrons of Husbandry in every sense of the title. It is only in the exemplification of the principles endorsed that we are justly entitled to be called Patrons of Husbandry. To become worthy of the appellation, it is necessary to drill ourselves in the tactics of a glorious warfare for equality and justice. What has induced many of us to join the ranks of this class of artisans except to better our condition or that of others while plying the art of industry as agriculturists or Patrons of Husbandry. We believe that individual exemplification of the principles on which this order is founded will do more to revolutionize the world about us than any amount of preaching or lecturing from our various pulpits or rostrums.

So many join us as they have joined the church in the past, without catching a glimmering of the truth represented by the Master whom they think they are following by a mere observance of forms and ceremonies. Putting on the garb or outer equipments of a soldier does not make a soldier, who must drill or make practical application of his knowledge or the principles taught him by his instructors. And so we, who wear the badge of our order, ought not to assume the position of worthy Patrons without exemplifying in our conduct the principles inculcated, else we subject ourselves to the ridicule and scorn of the world about us. Unless we live the truth we stand for we shall bring reproach upon ourselves and cause, just as impractical Christians do to the cause they represent.

Are we not simply endeavoring to make practical the same laws of righteousness which the Christian church as well as the Jewish represents? We are not antagonistic to either, as some suppose, because we accept not their forms. We accept truth as authority and leave all free to determine what is truth. To be good Patrons we need to cultivate the soil in which the seeds of truth find lodgement, or we, like the man spoken of in Scripture, who allowed the weeds to choke the growth of the seeds that had been planted, shall waste our time for naught.

The mind is like a fertile piece of land which will produce weeds as well as grain, and as Jesus taught, needs cultivation to bring forth the life desired. If we let the weeds of error grow up in our minds to choke out the precious seeds of truth our lives will be spent in producing thistles and tares instead of the truths of righteousness. Truth enlightens, while error darkens the mind. Truth saves, while error destroys the peace of the ignorant.

It is not apparent that our lack of intelligence fosters the conditions we deplore and which our order is trying to make better by educating us in the science of truth? Does it not show us that we are responsible for most of the ills we suffer in not taking thought, as we should about the phenomena of natural law—the law of life? The Grange calls out the latent forces of the mind by causing each of us to contribute our mites for solving the problems of thought in which we are all interested. And here is where it differs from the church in the unfolding of the mind to grasp the truth: it is better able to understand through some practical demonstration of its resources of power. Our schools, like our churches, with their present methods of teaching, can never save from ignorance of truth those who merely catch the echoes thereof that come like waves of sound and disappear in the twinkling of an eye, especially if there has not been a cultivation of the mind for its reception.

Let us, then, manifest our appreciation of what the Grange is doing for us by a practical exemplification of its principles, which will increase the influence of the Grange and add to our stature as individual members thereof—a suggestion we think worthy of consideration.—CHAPLAIN OF IONA GRANGE, N. J., in Grange Bulletin.

Cooperation Coming.

The Grange stands for cooperation. Let this truth be told over and over again. But talking is not enough. Year by year we must be showing additional results of our talking and our planning. We must be doing things in the cooperative way. Of course we are doing things. There are Grange enterprises in nearly every State that are increasingly successful cooperatively. These beginnings, however, are only beginnings.

In a recent article setting forth the need of a National honey exchange, Prof. A. J. Cook, of Claremont, Calif., makes a strong plea for organization by farmers for the purpose of cooperation in the handling of their products, and shows the need and the advantage of working together for the common good. He believes that there are "two tremendous movements now on foot"—consolidation and cooperation.

Professor Cook declares that "cooperation is wider and more general than consolidation." And then he goes on: "Unwritten cooperation is wider in its reach than most of us even dream. In all our towns and cities three or four meat- or milk-carts traversing the same street show how consolidation would ply a helpful oar. Cooperation is already at work; for all sell at the same price, and each, if rational, regards the interest of the others. The fact that livery hire in a large city is precisely the same at each stable for like service shows how cooperation is reaching out everywhere. Uniform sleeping-car rates and the nickel car ride are further evidence. We can all organize and cooperate. That is what we must do.

Our heading says cooperation is coming—which is the truth, but much less than the whole truth. Cooperation is here and has been with us for many years. The process is so common and so simple that we cooperate without knowing it. But we do not go far enough. We act cooperation more than we think it. We must deliberately plan to work together for our mutual benefit. It will do no harm to begin with small enterprises, to work together in little things before we try to organize to accomplish big things. We have some successful experience, we must reach out—carefully and wisely—and get more. Time is one our side; but we must not think that eternity is ours. We should begin promptly.

Professor Cook sees in the successful working of the Southern California Fruit Exchange a forerunner of other useful cooperative associations. Here is his brief recital of its history: "Half of our citrus groves have already combined and done a business of \$30,000,000 in less than nine years, and \$9,000,000 in one year, and yet have sustained almost no loss—less than one-fortieth of one per cent. Even its enemies admit its marvelous success. Our orange-growers were far from markets; freights were exorbitantly high, competition with sunny Italy, with short distance and cheap transportation, was terribly severe; except for the wise management of interested salesmen, the industry would have been swamped. On the shoulders of the exchange it has risen from the ashes of a red-ink decadence to perhaps the most prosperous rural industry of the country."

Cooperation is not only coming, it is

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here, proving its usefulness every day. The Grange must take a new grip on its cooperative work and make things "go."

A Mistake.

Mr. Farmer, if you are living in a community where there is no grange, you are making a mistake. If there is a grange in your community and you are not an active member, you are not doing justice to yourself or family. If you have children over fourteen years of age and they are not members of the grange, you are depriving them of educational and social advantages of almost as much value as the public school. Do not put the time off year after year for becoming an active member of the grange. For the good of your wife and the coming men and women, for the good of yourself and best interests of State and home, join the grange and lend a hand towards making the country a "brighter, happier, and better place to live." This is the mission of the grange.

At a Pomona grange meeting held in Warren County, Pennsylvania, the following brought out some excellent papers:

1. "What stock is the most profitable to keep on the farm in this section?"
 2. "What influence can be exerted by the Grange for the improvement of rural schools?" The sister who opened the discussion suggested centralization of schools, to be accomplished as fast as possible.
 3. "Are literary exercises primarily for the entertainment of the Grange, or for the mental development of its participants?"
 4. "What is the best method of restoring lost fertility to the soil?"
- Who can judge the value of such discussion among the farming class? What but the Grange gives the opportunity for such discussions? Brother farmer, be a working member of the grange; it develops thought and action and that is what the world needs today.

The State Grange of Ohio offers four prizes to the four subordinate granges showing the largest increase in membership from April 1, 1903, to April 1, 1904. We would not be surprised to hear that the membership in Ohio had increased one hundred per cent by the time the contest closes. Each county in Ohio has at least one grange and the whole State will soon be organized.

It is a mistake for the entire evening of any grange to be taken up with degree work to the exclusion of the lecture-hour. This lecture-hour is the hour of education and the most should be made of it. It should not be given over to any one or two persons, but the more who take a part the better. Get the most out of the lecture hour.

A correspondent of the La Cygne, Kans., Standard writes as follows:

Wanted—A few old maids to join the Brooklin grange. Have a surplus of old bachelors, having taken in five new names lately.

Brooklin grange is one of the Linn County granges and it is coming to the front, and if there is a surplus of old maids in other parts of the State the readers of this will no doubt confer a favor by sending a marked copy of above.

Talks With Lecturers.

We are living in a wonderful age. One does not need to be old to remember when the telephone was invented. It is within the memory of thousands of people when the Atlantic cable was supposed to be an impossibility. Not many years before that, Morse's little telegraph line from Baltimore to Washington was the wonder of wonders.

But the wonders of earlier days are the commonplaces of our day. Only a few weeks ago a paper was published on an Atlantic steamer containing the important news of the world. How did it get the news? By means of Marconi's telegraphic system—sending messages over the invisible conductors that seem to girdle the earth in all directions. The thing is wonderful.

We have yet to learn what electricity is, although we are using it for many purposes. Our present business system would be impossible without it. Think of doing without the telegraph, the telephone, the electric cars, and the numberless electric belts which are advertised to cure all human ills! Great is electricity! Great is the power which man has acquired over this swift, tireless, and invisible worker of miracles! Greatest of all is man who is daily extending his dominion over the powers of nature!

Is the Grange keeping abreast of the

times? Do its members realize that agriculture needs to keep up with the car of progress? Let it be repeated that we are living in a wonderful age. There is something new to be learned every day. Perhaps every grange has one or more members who could report from week to week the new things in science that are likely to have a large meaning within a few years.

The Grange and the Schools.

Mrs. B. M. Shannon, of Albany, Ore., reports a meeting of Fairmont grange of that State which was followed by a public meeting in which the county superintendent of schools, a representative from the agricultural college, school teachers, and parents took an active part. The object of the meeting was the betterment of the public schools.

Says Mrs. Shannon: "We had papers from every view point, and discussions followed the reading of the papers. All seemed to think that getting acquainted with one another is a potent factor in good school-teaching. Parents and teacher, scholars and teacher could help insure a good school if they knew one another better. Our hall was full, and all seemed to feel that such an assemblage must help the good cause. The best feeling was manifested all through."

After the general meeting, Professor Coote, of the Oregon Agricultural College, gave an illustrated lecture on beautifying the school grounds. He advised teachers and pupils to work together; to clear up the yard, and have the front a smooth, grassy plat that can be mowed a few times a year. Mrs. Shannon summarizes his concluding advice as follows:

"Have a few clumps of hardy shrubs or rose-bushes scattered around. Have all out-buildings hidden by small fir-trees and climbers. We don't have to go to the nursery for them; we can get all the trees, shrubs, climbers, and creepers we want in our own forests, almost at our doors."

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